

# Arsenic Rule

## Small Systems Implementation Strategy & Exemptions

- EPA recognizes the special challenges faced by small water systems and is committed to using the suite of tools and mechanisms provided under the 1996 Safe Drinking Water Act (SDWA) Amendments to help address small system implementation issues.
- This presentation will describe some of the tools available to States and systems to assist in implementation of the Arsenic Rule including:
  - Financial assistance;
  - Exemptions;
  - Prioritization of systems with arsenic problems; and,
  - Point-of-use (POU) devices.
- For more information on Arsenic Rule implementation, including EPA's Report to Congress: *Small Systems Arsenic Implementation Issues*, see the EPA Office of Ground Water and Drinking Water's web site at [www.epa.gov/safewater/ars](http://www.epa.gov/safewater/ars).
- *Throughout this presentation, the terms "State" or "States" are used to refer to all types of primacy agencies including U.S. territories, Indian Tribes, and EPA Regions.*

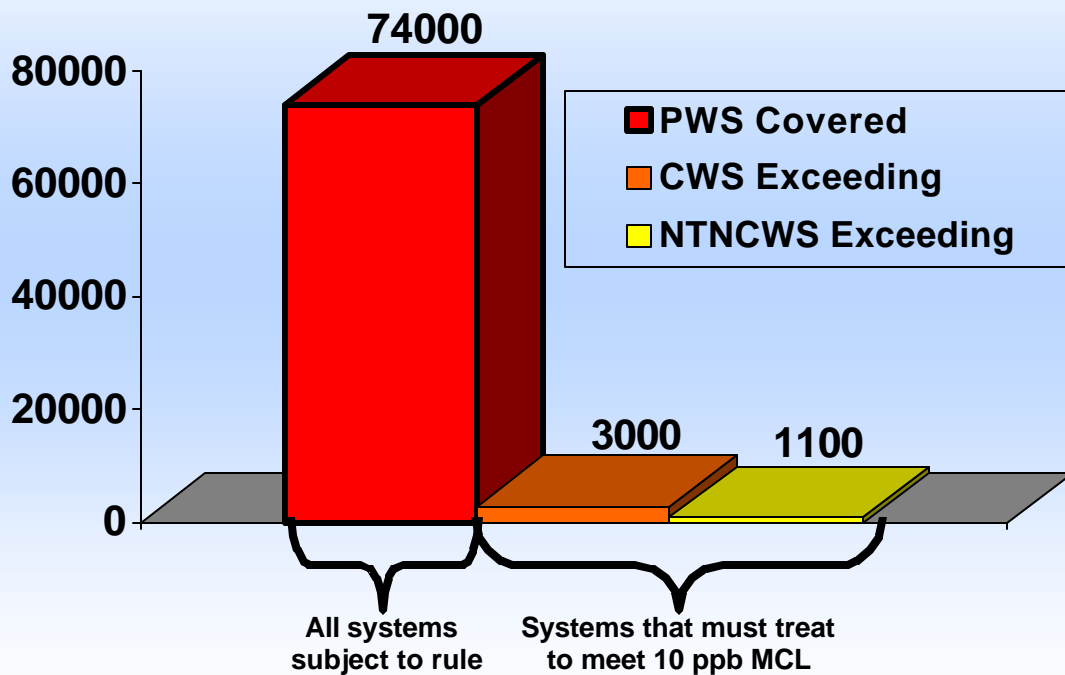
## Arsenic Compliance in Perspective Water System Challenges



- Infrastructure Repair & Replacement
- Competitive Pressure
- Source Water Protection & Supply
- SDWA Compliance
- Public Expectations
- Newly Recognized Threats / Terrorism

- Public Water Systems (PWSs) already face a wide variety of challenges:
  - Continuous need for infrastructure repair and replacement;
  - Competitive pressure from other water utilities or pressure to simply provide water at a reasonable cost;
  - Source water protection and supply issues;
  - SDWA compliance;
  - Public expectations of low water bills and safe water; and,
  - Newly recognized threats, including worries about terrorism.
- The Arsenic Rule gives systems -- in some cases for the first time -- an additional set of public health challenges.
- Water systems must plan for compliance with the Arsenic Rule while addressing their other technical, managerial, and financial pressures. This may place a large burden on some systems.
- The primary responsibility for addressing these challenges rests with systems. However, State drinking water programs, which administer the SDWA in 49 States, and EPA are working to support local communities in this effort.

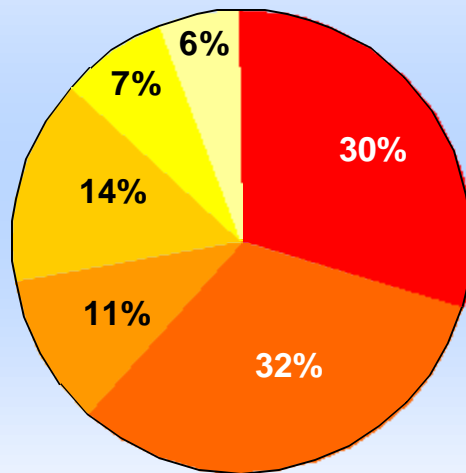
# Number of Systems Affected by Arsenic Rule



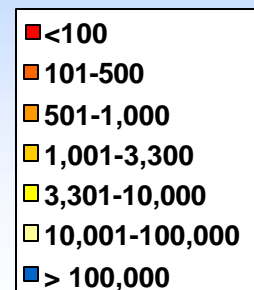
- Out of 74,000 community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) in the US, EPA estimates that 4,100 will need to make improvements or take other measures (e.g., locate a different source of water) to meet the revised arsenic maximum contaminant level (MCL). While the percentage of systems that will need to make improvements or take other measures is small (18%), the implications of those changes may be significant for some systems, especially small systems.
- EPA's estimate that 4,100 will need to treat to meet the revised arsenic MCL is based on arsenic occurrence data from across the US. The estimate is not derived from system monitoring data and so is not expected to change solely because some systems will begin monitoring with analytical methods that have lower detection limits.

# SCOPE

## Most Of The ~3000 CWSs Affected by the Arsenic Rule Are Very Small



**Percentage of systems serving different size populations**



- While most people obtain their water from large PWSs serving 10,000 or more people, many people rely on small public drinking water systems.
  - 216 million people receive their water from PWSs serving more than 10,000 people.
  - 68 million people receive their water from PWSs serving fewer than 10,000 people.
  - However, small public drinking water systems serving fewer than 10,000 people represent 94% of all PWSs.
- 94% of CWSs serve fewer than 10,000 persons each.
- 86% of CWSs serve fewer than 3,300 persons each.
- Approximately 60% of ground water systems under 10,000 persons are private systems.
- The vast majority of systems affected by the arsenic rule are very small. Of the CWSs affected by the arsenic rule:
  - 30% serve fewer than 100 persons;
  - 62% serve less than 500 persons; and,
  - 73% serve less than 1000 persons.

## KEY ISSUE



- For many of the 4,100 systems needing to install arsenic treatment ---- it will be the first significant treatment they have EVER had to provide!!!!

**No Treatment to Any Treatment is a Quantum Leap**

- For many of these 4,100 systems, the Arsenic Rule presents the first time treatment will have to be provided. For these systems, the purchase, installation, and operation of a treatment technology will necessitate a quantum leap in:
  - Capital investments in new treatment technologies or development of a new source of supply;
  - The technical expertise of water system owners needed to evaluate and install new treatment technologies; and,
  - The technical expertise of water system operators needed to operate and manage new treatment technologies.
- This will involve more effort from States and technical assistance providers.

# Implementation: The Math



4100 water  
systems  
above 10  
ppb

+

66% serving  
500 or fewer  
persons

+

<4 years to  
compliance  
date

=

**Implementation  
Challenge**

- The challenge facing both systems and regulators seems daunting.
  - Approximately 4,100 systems need to make improvements in order to meet the revised arsenic MCL.
  - A large majority of these systems are small (serving fewer than 3,300) or very small (serving fewer than 500).
    - System size raises the question of solution affordability since these systems have a small customer base and, therefore, may lack the opportunity to benefit from economies of scale.
  - In addition, these systems need to determine a solution and raise funds within 4 years.
- While the challenge seems daunting, it is not impossible. EPA is committed to researching the implementation issues in more detail and exploring the range of options.
  - As part of the 2002 appropriations process, Congress directed EPA to “begin immediately to review the Agency’s affordability criteria and how small system variance and exemption programs should be implemented for arsenic” as well as to “recommend procedures to grant an extension of time in meeting the compliance requirement for small communities when a community can show ...that compliance by 2006 poses an undue economic hardship on that community” (Conference Report 107-272, page 175).
  - The EPA Administrator has testified before Congress that EPA will make exemptions and POU devices as useful as possible to allow States all the flexibilities provided by the SDWA.

# Rule Implementation Strategy



- Simplify Implementation
  - Exemptions
  - Point-of-Use (POU) Treatment
- Target Financial Assistance
  - Drinking Water State Revolving Fund (DWSRF)
  - Rural Utilities Service (RUS)
- Focus Technical Assistance & Training
  - Compliance Guide
  - Design Manual
- Enhance System Sustainability
  - One-on-One State Assistance
  - Capacity Development Focus

- The 1996 SDWA Amendments include a number of provisions specifically intended to help minimize the impact that new regulations will have on small systems, including exemptions (compliance extensions); affordability, variances, and variance technologies; and small system technical, managerial, and financial capacity.
  - The EPA Administrator has testified before Congress that EPA will make the exemptions and POU provisions as useful as possible to allow water systems all the flexibilities provided by the SDWA.
- Other tools available to small systems include:
  - Targeted financial assistance through the Drinking Water State Revolving Fund (DWSRF) and the US Department of Agriculture's (USDA) Rural Utilities Service (RUS).
    - EPA and USDA signed a memorandum of understanding (MOU) making arsenic compliance a priority for RUS funding.
  - The development and provision of guidance materials such as:
    - The *Implementation Guidance for the Arsenic Rule and Clarifications to Compliance and New Source Contaminants Monitoring*,
    - *Small Systems Guide to the Arsenic Rule* (STEP Guide); and,
    - A Draft *Arsenic Treatment Design Manual for Small Systems*.
  - Enhancing system sustainability through technical assistance (TA) and capacity development.
- The Administrator pledged to provide \$20 million over the next two years (2002/2003) for research and development of more cost-effective technologies and for TA and training of operators of small systems to reduce their compliance costs.



## Targeting Financial Assistance

- The next series of slides examines the current financial assistance programs available to small drinking water systems, and their potential to provide needed capital.
  - The focus is on federal programs, primarily EPA's DWSRF and the USDA's RUS Water and Wastewater Loan and Grant Program.
- Systems are encouraged to check with their State to discuss financial assistance opportunities.
- EPA believes that, by pooling and leveraging existing resources and taking advantage of federal, State, and private funding sources, systems will have the financial resources to come into compliance with the Arsenic Rule.



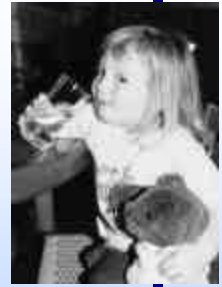
# Overview



- The Challenge
- EPA Drinking Water State Revolving Fund
- Rural Utilities Service
- Other Federal & State Programs
- Market-Oriented Solutions

- Meeting the revised MCL of 10  $\mu\text{g/L}$  will be a challenge for many systems. The costs some systems will face to meet the new arsenic standard are significant.
- Total capital costs for treatment technologies and infrastructure improvements are estimated to be almost \$900 million for those systems that need to modify or install treatment. For the 4,100 systems that need to install treatment, most of these capital costs will fall on the shoulders of a relatively small number of ground water systems.
- In addition, annual operation and maintenance (O & M) costs for systems and monitoring and administrative costs for States will top \$120 million.
- The estimated compliance costs per system are considerably lower for small systems than for large systems. However, the burden on small system households will be significantly higher because the costs must be absorbed by a much smaller customer base. EPA estimates that the average annual household water bill for systems out of compliance may increase by \$32 per year, but that the cost will be substantially higher (ranging from \$58-\$327) for systems serving fewer than 3,300 people.
- There are a number of avenues a system can utilize for an influx of capital including:
  - The DWSRF;
  - The USDA's RUS Water and Wastewater Loan and Grant Program;
  - Other Federal programs such as the Housing and Urban Development's (HUD's) Community Development Block Grants (CDBGs); and,
  - Market-oriented solutions such as CoBank, which specializes in cooperative, agribusiness, rural utility, and Farm Credit association financing.

# The Challenge



- Approximately 4,100 systems will need to take measures to comply with arsenic standard
- 95% of these systems serve fewer than 10,000 people
- Small systems face unique challenges.

- An overwhelming majority of the systems that will need to make improvements to their system because of the requirements of the Final Arsenic Rule are small systems (i.e., serve fewer than 10,000 people).
- Small systems face unique challenges including:
  - A lack of a large customer base, which may mean the system cannot benefit from economies of scale. Depending on how a small system designs its rates, fewer customers can mean less revenue for infrastructure improvements, repayment of debt, and operators and other staff with technical expertise.
    - In looking at total infrastructure needs, small systems have more than 3 times the per-household need of large systems. The small systems need has been estimated at \$3,300 from 1995 through 2015 (i.e., \$165 per year).
  - Most systems serving 500 or fewer people are ancillary (i.e., do not provide water as their primary business) or privately owned, while most larger systems are publicly owned.
    - More than 50% of systems serving 25 to 100 people do not keep separate income and expense statements.
  - Total water revenue, water sales revenue, and water-related revenue generally increase per connection as system size increases.
    - Median total water revenue per connection for systems serving 25-100 people is \$0, indicating that at least half of the smallest CWSs do not charge for water through rates or fees. Systems serving more than 10,000 persons report approximately \$313 per connection in median total water revenue.
- For additional information on small water system characteristics, see EPA's *National Characteristics of Drinking Water Systems Serving Populations Under 10,000* (EPA 816-R-99-010).

# Role of Federal Financial Assistance

- Access to Credit (e.g., Loans)
  - Reasonable rates
  - Terms
- Subsidy (e.g., Grants)
  - Reduce ultimate household cost
  - Lower interest rates
  - Grants or principal forgiveness



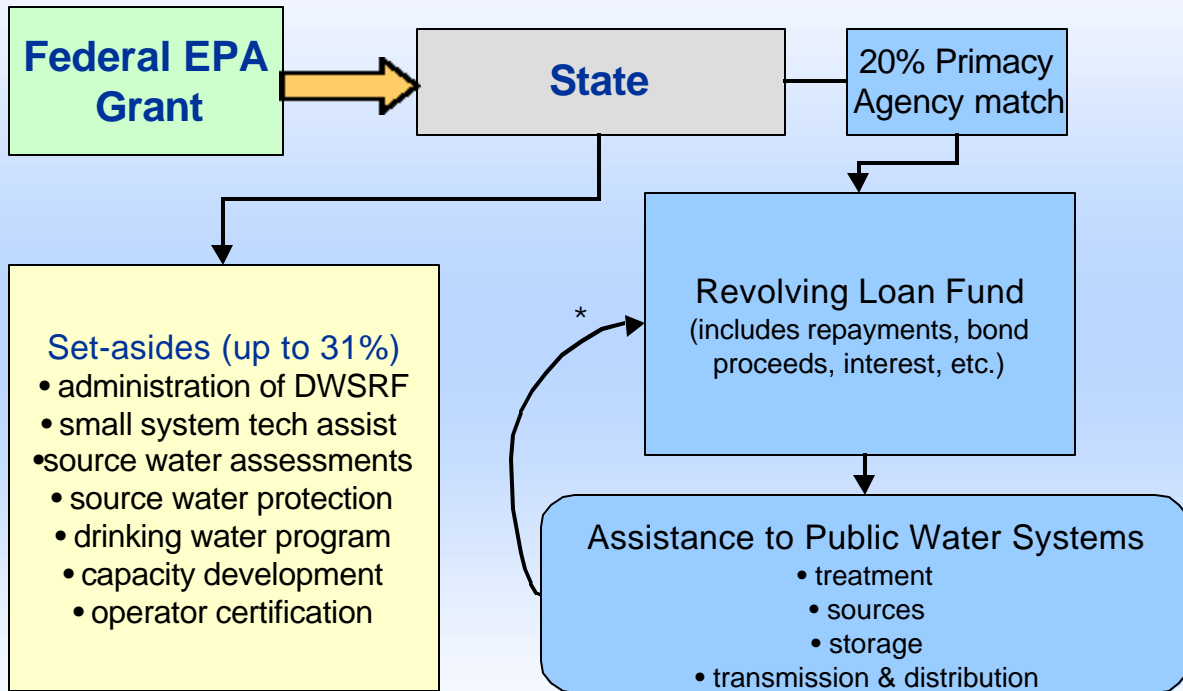
- Many PWSs serving small communities, particularly those serving fewer than 10,000 customers, often find it difficult to obtain access to private capital and favorable interest rates when applying for loans.
- Federal financial assistance, either in the form of loans or grants, can provide needed capital to these communities and provide it with terms of repayment and interest rates that are more realistic.
- For many communities, even the lower interest rate loans may not be affordable. Certain federal financial assistance programs provide for grant awards which can take the form of lower interest rates, principal forgiveness, or negative interest rate loans. In some instances, repayment terms may be extended.



## Existing Federal Financial Assistance Programs

- The two federal programs that are most likely to be able to help drinking water systems comply with the Arsenic Rule are:
  - DWSRF; and,
  - USDA's RUS Water and Wastewater Loan and Grant Program.

## Drinking Water State Revolving Fund (DWSRF): Flexible Finance Tools Promoting Results



\*Repayments return to Fund for future assistance

States have issued \$3.8 billion in loans through SFY 2001

- The goal of the DWSRF program is to provide States with a financing mechanism for ensuring the provision of safe drinking water to the public. The DWSRF assists PWSs in financing the costs of infrastructure repairs or replacements needed to achieve or maintain compliance with SDWA requirements and to meet public health goals.
- States can use federal capitalization grant money awarded to them by EPA to set up an infrastructure revolving loan fund from which assistance is made available to PWSs.
  - States are required to provide a 20% match to their capitalization grant.
- Loans made under the program can have interest rates between 0% and the prevailing market rate and repayment terms of up to 20 years. Repayments should provide a continuing source of infrastructure financing into the future.
- Under the DWSRF, States can “set aside” a percentage of the total capitalization grant for a specific purpose, including up to:
  - 4% for administration of the DWSRF and to provide TA;
  - 2% for small system technical assistance;
  - 15% for local assistance (source water protection, wellhead protection, capacity development assistance); and,
  - 10% for State program management [Public Water System Supervision (PWSS), capacity development, operator certification, source water protection].
    - States are required to match this management set-aside 1:1.
- Through fiscal year 2001, States have issued \$3.8 billion in loans to water systems.
- For more information, see [www.epa.gov/safewater/dwsrf.html](http://www.epa.gov/safewater/dwsrf.html), or call the Safe Drinking Water Hotline at 1-800-426-4791.

# DWSRF Status



- Appropriations through Fiscal Year (FY) 2002 - \$5.3 billion
- FY 2003 budget request - \$850 million
- Through State FY 2001 (ending June 30, 2001):
  - Federal Grants - \$3.6 billion
  - Total Funds Available \$5.2 billion
  - Loan Agreements - 1,776
  - Assistance Provided - \$3.8 billion

**DWSRF Loan Volume:**  
**Annual, typical ..... \$1 billion**  
**Range, average loan for a system**  
**serving <10,000.....\$410K - \$1.8 million**

- The DWSRF has received federal appropriations averaging \$880 million per year for the past six years (from fiscal year 1997 to fiscal year 2002).
- Through fiscal year 2002, a total of \$5.3 billion has been appropriated.
  - Through June 30, 2001, \$3.8 billion has been awarded to States through capitalization grants.
  - With the addition of State matching funds of \$773 million and other funds, including proceeds from issuance of bonds, the total funds available for projects have exceeded \$5 billion.
  - States have provided systems nearly 1,800 loans totaling over \$3.8 billion. This program should ensure a continuing source of funding for every State, because loan repayments can be used to finance additional projects.
- The SDWA requires that States direct a minimum of 15% of available funds to small systems serving fewer than 10,000 people.
  - To date, States have exceeded this target, providing 41% of funds to small systems.
  - Three out of every four loans have gone to small systems.
  - In fact, 22% of all funds have gone to very small systems that serve fewer than 3,300 people.

# DWSRF Loan Flexibility



- Interest rates
  - States set rates based on State’s cost of capital, State law, or recipient’s ability to repay
- Loan Repayment
  - Up to 20-year term
  - Begins up to 1 year after project start-up
- Loans for Disadvantaged Communities
  - State determines who is disadvantaged using affordability criteria
  - Extend repayment
  - Offer more variable interest rates and forgiveness

- The SDWA prescribed certain DWSRF limitations but provided States flexibility to develop programs to fit their specific needs. States set interest rates and determine repayment terms. States can set their rates based on the cost to administer the loan, the recipient’s ability to repay the loan, or other factors.
- States can make loans with interest rates that are less than or equal to the market interest rate, including 0% loans. A State may also provide “incremental” assistance to finance a multi-year construction activity (e.g., for particularly large, expensive projects).
- States must require loan recipients, through the loan agreement, to begin repayment of the loan within 1 year of project completion. Complete loan repayment must be within 20 years of completion of the project.
  - A project is considered complete when the system begins operating or is capable of commencing operation.
- A disadvantaged community is one in which the entire service area meets the affordability criteria established by the State. Disadvantaged communities may receive additional benefits from a DWSRF loan including:
  - Up to 30 years from the completion of the project to repay the loan (as long as the repayment term does not exceed the design life of the project); and,
  - Principal forgiveness, negative interest rates, or lower interest rates.
- States determine which systems to fund through the development of comprehensive priority lists of eligible systems. Higher priority systems are those that present the most serious risk to human health; those that require funds to ensure compliance with the requirements of the SDWA; and those that are most in need, on a per household basis, according to the State’s affordability criteria.

# Subsidy through DWSRF



***For a system that would otherwise have to borrow money at 6%, a DWSRF loan at 2.5% is equivalent to a 26% grant.***

		Market Borrowing Rate for Local Share				
		5%	6%	7%	8%	9%
SRF Interest Rate	1.5%	27%	33%	38%	43%	47%
	2.0%	24%	30%	35%	40%	44%
	2.5%	20%	<b>26%</b>	32%	37%	42%
	3.0%	16%	23%	29%	34%	39%
	3.5%	12%	19%	25%	31%	36%

- This table shows the percentage savings that water systems can enjoy by obtaining DWSRF loans at various reduced interest rates when compared with various market borrowing rates.
- For example, a system that borrows \$100,000 at 6% interest for 20 years would face monthly payments of \$716.43. The total amount that the system would pay would be \$171,943.20 (\$716.43 per payment \* 12 payments per year \* 20 years).
- Alternatively, if the system obtained a DWSRF loan of \$100,000 at 2.5% interest, the system would make monthly payments of \$529.90 and pay a total amount of \$127,176 (\$529.90 per payment \* 12 payments per year \* 20 years).
- By borrowing through the DWSRF, the system pays \$44,767.20 less.



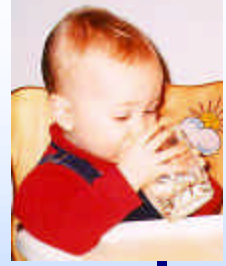
# Where are the dollars going?



- Treatment **43%**
  - Transmission & distribution **32%**
  - Source **5%**
  - Storage **9%**
  - Planning & design
  - Consolidation & restructuring
  - Other
- } **11%**

- Of the \$3.8 billion awarded through DWSRF loans by June 30, 2001:
  - Treatment projects accounted for 43%;
  - Transmission and distribution accounted for 32%;
  - Storage projects accounted for 9%;
  - Source water projects accounted for 5%; and,
  - Other projects such as planning, design, and restructuring accounted for 11%.

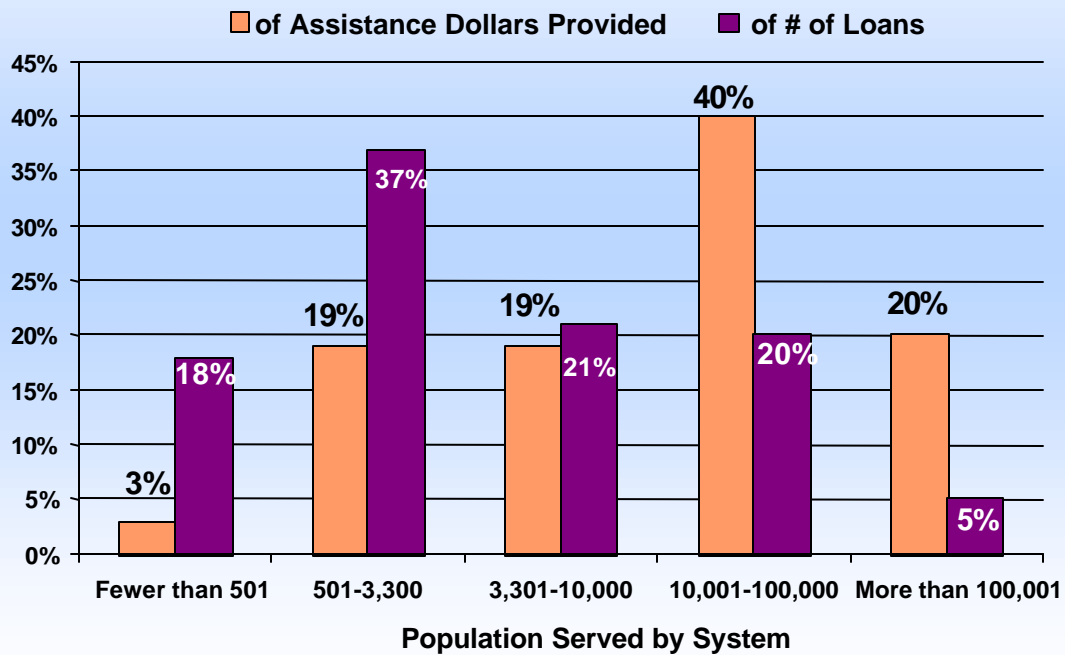
## Who can be funded?



- Community water systems
- Non-profit noncommunity water systems
- Publicly-owned water systems
- Privately-owned water systems

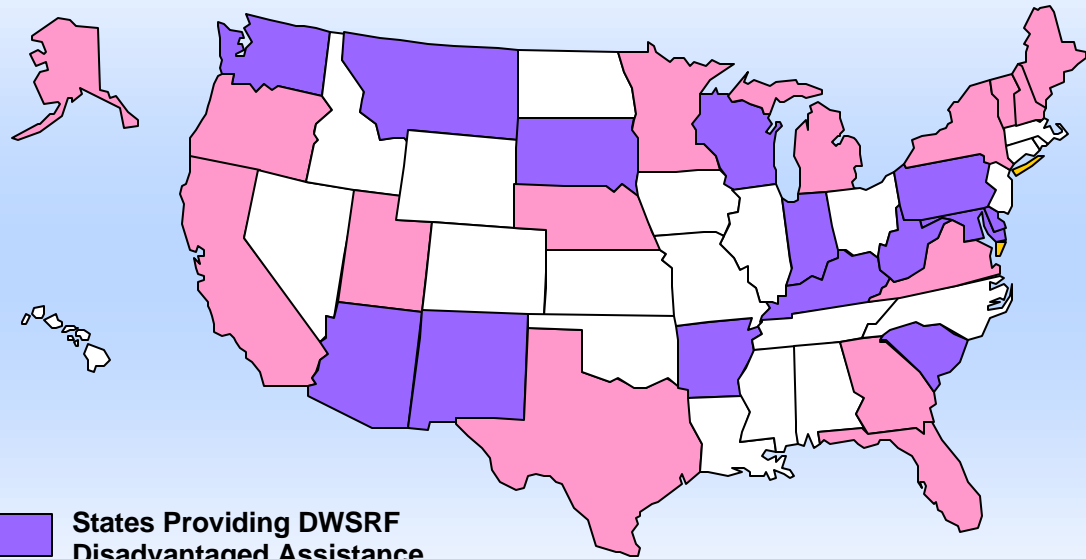
- The DWSRF was established to provide financial assistance to:
  - CWSs;
  - Non-profit non-community water systems;
  - Publicly-owned water systems; and,
  - Privately-owned water systems.
- States may not provide assistance to any system that does not have the technical, managerial, or financial capability to ensure compliance with the SDWA; is in significant non-compliance with any drinking water standard; or cannot comply with the conditions of a variance (SDWA 1452(a)(3)). However, if assistance will ensure compliance or if the system's owner or operator agrees to take appropriate measures to ensure that the system has the necessary capability, the State may provide assistance.
  - Water systems that have technical, managerial, and financial capacity will be able to provide safe drinking water in the future.

## Cumulative DWSRF Assistance by Community Size as a Percentage of Assistance Dollars and Loans Provided



- The SDWA requires that States direct a minimum of 15% of available funds to small systems serving fewer than 10,000 people.
- This chart shows that, over the last five years, States have exceeded this target, providing 76% of loans and 41% of funds to small systems, which serve fewer than 10,000 people.
- In fact, 55% of all loans and 22% of all funds have gone to very small systems that serve fewer than 3,300 people.

## 29 States Providing DWSRF Disadvantaged Assistance



- States Providing DWSRF Disadvantaged Assistance
- Disadvantaged Assistance with Principal Forgiveness

26% of agreements were provided to disadvantaged communities for \$619M, 16% of total assistance

- Currently, 29 States provide some type of disadvantaged assistance to small systems. Of these, 15 have provided principal forgiveness.
- 26% of DWSRF agreements signed by these States were provided to disadvantaged communities.
  - The total amount provided to disadvantaged communities was \$619 million.
  - 16% of all DWSRF funds (\$3.8 billion through June 30, 2001) have been provided to disadvantaged communities.

## DWSRF Set-Asides



- Up to 31% of a grant can be used for set-aside activities (the actual average percentage set-aside is 16%)
- Administration of the DWSRF program - 4% (actual 3.7%)
- Technical assistance to small systems - 2% (actual 1.5%)
- State program management - 10% (actual 4.0%)
  - Drinking water program (PWSS), capacity development, operator certification, source water protection
- Local assistance and other State programs -15% (actual 6.5%)
  - Loans to PWS for land acquisition and source water protection measures, conducting source water assessments, wellhead protection, capacity development technical/financial assistance to PWS

- States can set aside up to 31% of their capitalization grant including:
  - Up to 4% for DWSRF administration expenses and TA for PWSs.
  - Up to 2% for small systems TA, including supporting a TA team, contracting with outside TA providers, or helping small systems apply for DWSRF loans.
  - Up to 10% to administer the PWSS program, provide TA through source water protection programs, develop and implement a capacity development strategy, and develop and implement an operator certification program. The State must provide a dollar for dollar match for capitalization grant funds used for these purposes.
  - Up to 15%, but no more than 10%, for any one activity of local assistance and other State programs including acquisition of land or a conservation easement for source water protection purposes; implementation of voluntary, incentive-based source water quality protection measures; delineation and assessment of source water protection areas; establishment and implementation of wellhead protection programs; and technical or financial assistance under the capacity development strategy.
- Currently, States are setting aside:
  - 3.7% for DWSRF administration;
  - 1.5% for small systems TA;
  - 4% for program management; and,
  - An average of 6.5% for local assistance and other programs.

**Projects/Activities Eligible for DWSRF Funding To Comply With the Arsenic Rule**

Type of Project/Activity	Eligible Under Infrastructure Fund	Eligible Under Set-Asides
<b>Treatment</b>		
Precipitative Processes	Yes	No
Adsorption Processes	Yes	No
Ion Exchange Processes	Yes	No
Membrane Filtration	Yes	No
Point of Use Devices	Yes*	No
Planning & Design Activities	Yes	Yes**
System Consolidation	Yes	No
System Restructuring	Yes	Yes
<b>System Administrative Improvements</b>		
Hire Staff	No	No
Staff Training	No	Yes
Public Outreach	No	Yes
Monitoring	No	No
Rate Increase Process	No	Yes
<b>State Administrative Improvements</b>		
Hire Staff	No	Yes
Staff Training	No	Yes
Public Outreach	No	Yes
Monitoring Program	No	Yes
Enforcement	No	Yes
Pilot Studies	No	Yes

\*Must be owned and maintained by system

\*\*For small systems only

- This table provides examples of how DWSRF loans can be used to help systems comply with the Arsenic Rule. Funding is possible for:
  - Capital projects, such as installing new treatment or upgrading technologies.
  - Consolidation and restructuring, including situations where a supply has become contaminated or a system is unable to maintain compliance for technical, financial, or managerial reasons.
  - POU devices as long as the units are owned, controlled, and maintained by the water system.
- In addition, States may use set-aside funds to assist systems as well as to enhance their own program management activities.
  - DWSRF set-aside funds may be used to support systems with:
    - Staff training;
    - Public outreach; and,
    - Rate increase processes.
  - DWSRF set-aside funds may be used by States for:
    - Staff hiring;
    - Staff training;
    - Public outreach;
    - Compliance oversight;
    - Enforcement; and,
    - Pilot studies.

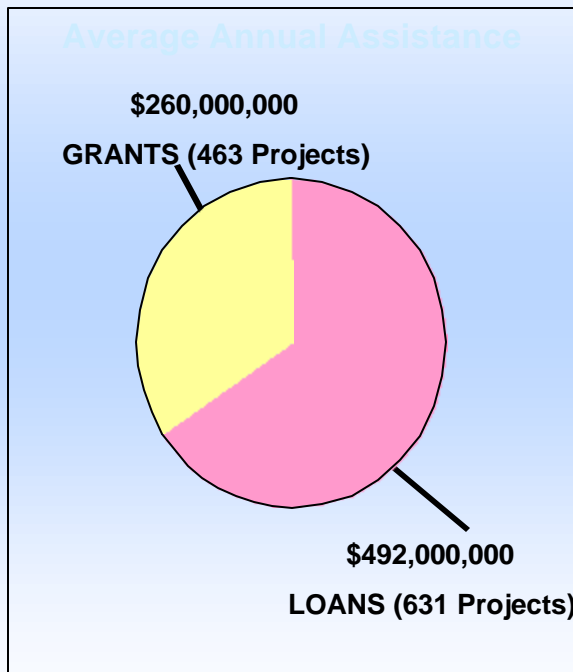
# USDA Rural Utilities Service



- Water and Wastewater Loan & Grant Program
  - Publicly-owned or not-for-profit public water systems serving 10,000 or fewer
- Interest Rate
  - Ranges from market of 5.25% to “poverty” rate of 4.5%
- Maximum grant
  - 75% of allowable project costs.

- USDA’s RUS assists water and wastewater systems through its Water and Wastewater Loan and Grant Program. This program provides funding to public entities, including publicly owned and not-for-profit water systems serving rural communities with a population of fewer than 10,000. Applicants must be unable to finance their needs through their own resources or with credit from commercial sources. State and local USDA RUS offices administer the programs. For more information, see the RUS Web page at [www.usda.gov/rus/water](http://www.usda.gov/rus/water).
- Loan and grant funds may be used to:
  - Construct, repair, modify, expand, or otherwise improve water supply and distribution systems;
  - Acquire needed land, water sources, and water rights; and,
  - Pay costs such as legal and engineering fees when necessary to develop the facilities.
- Loans must be paid back within 40 years or before the end of the useful life of the financed facilities, whichever is earlier.
- USDA uses three interest rates. They are set periodically based on an index of current market yields for municipal obligations.
  - The poverty interest rate is currently 4.5%. It is available to systems serving areas where the median household income (MHI) is below the poverty line for a family of four or below 80% of the Statewide Nonmetropolitan MHI (SNMHI).
  - The market rate (5.25%) applies to loans for projects where the MHI of the service area exceeds the SNMHI.
  - The intermediate rate (4.875%) applies to all other loans.
- Grants up to 75% of eligible facility development costs, may be provided when necessary to reduce user costs to a reasonable level.

# Annual USDA Rural Utilities Service Assistance



- Assistance for Drinking Water: ~ \$752 million/year
- About 60% of funding supports construction of new systems or expansion of existing systems.
- Remaining 40% of funding supports installation of additional treatment and repair or replacement of existing infrastructure.

- RUS provides an average of \$492 million per year in loans and \$260 million per year in grants for drinking water projects through its Water and Wastewater Loan and Grant Program. This amounts to a total of approximately \$752 million in annual support of drinking water projects, with 65% provided as loans and 35% provided as grants.
- About 60% of this funding supports construction of new systems or expansion of existing systems. The remaining 40%, or about \$300 million, supports installation of additional treatment and repair or replacement of existing infrastructure.
- In addition, RUS provides funding to non-profit TA organizations that offer direct training and one-on-one assistance to small rural water systems. TA providers receiving RUS support include:
  - National Rural Water Association (NRWA);
  - Rural Community Assistance Program (RCAP); and,
  - National Drinking Water Clearinghouse (NDWC) at West Virginia University.



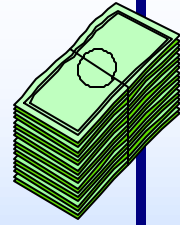
# Enhanced Leveraging of RUS Program



- New RUS and EPA Memorandum of Agreement (MOA) Addressing:
  - Eligibility and Priority of Arsenic Projects for RUS Funding
  - Priority of Arsenic Projects for Funding from National Reserve (10% of funding - about \$75 million for drinking water)
  - Coordination of funding by encouraging State DWSRF and RUS staff to meet
  - Cooperation between RUS and EPA Funded Technical Assistance Providers:
    - Provide operational and management assistance and training to systems
    - Assist in restructuring small, privately owned systems into stronger entities eligible for RUS or EPA funding.

- RUS and EPA share the objective of ensuring safe, reliable, and affordable drinking water for residents of rural America. On April 29, 2002, EPA and the RUS signed a memorandum of agreement (MOA) to coordinate activities to ensure that the maximum possible assistance is available to small systems needing help in achieving compliance with the arsenic standard. EPA and USDA are establishing this MOA to specifically address the arsenic standard, because this standard will require a large number of small systems to install treatment.
- EPA and RUS agreed to the following actions:
  - Consistent with its regulations, RUS will assign funding priority to projects needed for compliance with the arsenic standard.
  - RUS and EPA will each strongly encourage Rural Development State staff and States administering the DWSRF to coordinate funding decisions.
  - RUS and EPA will continue and expand efforts at the national level to coordinate programs and policies and will seek to identify other potential funding partners in both the public and private sectors. They will also encourage Rural Development State staff and States to meet at least semiannually to update each other on their programs.
  - RUS and EPA will prioritize TA to help systems comply with the revised arsenic MCL. Both RUS and EPA will coordinate their efforts with TA providers to ensure that systems identified as needing capital improvements for arsenic compliance will have access to information and assistance relative to compliance options and project funding.
  - RUS and EPA will encourage reorganization and consolidation that will strengthen a system's ability to finance capital improvements and operate complex technologies.
- The MOA will remain in effect until April 29, 2006, unless terminated earlier by either RUS or EPA.

# Other Federal and State Programs

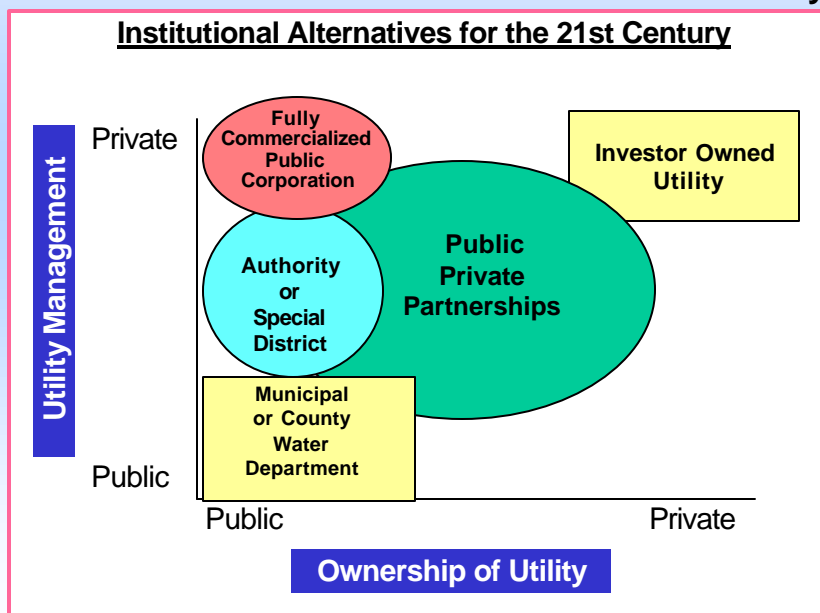


- Federal Programs
  - Community Development Block Grant (U.S. Department of Housing and Urban Development, HUD)
    - Drinking water is only one of many diverse possible uses for these funds.
    - Leveraging with DWSRF and RUS is high.
  - Numerous smaller, more narrowly focused programs.
- State Programs
  - 25 States reporting having Drinking Water Infrastructure Financing Programs (in addition to the DWSRF). These programs provided a cumulative total of nearly \$1.6 billion in funding from 1996-2001.
  - 27 States report coordination of funding for projects between the DWSRF and other sources.

- Other federal programs include:
  - CDBG from HUD.
    - This program provides funding for on-site sanitation systems in HUD housing and water and sewer projects.
    - For more information, see HUD's Web site: [www.hud.gov](http://www.hud.gov).
  - The Bureau of Indian Affairs and the Indian Health Services may be able to provide funding to tribal systems.
    - For more information, see their Web sites at, respectively, [www.doi.gov/bureau-indian-affairs.html](http://www.doi.gov/bureau-indian-affairs.html) and [www.ihs.gov](http://www.ihs.gov).
- 25 States have reported that they have infrastructure financing programs in addition to the DWSRF. These programs provided a cumulative total of nearly \$1.6 billion in funding through 2001.
- 27 States have reported that they coordinate funding for projects between the DWSRF and other sources, ensuring the efficient use of funding.

# Market-Oriented Solutions

- Fully Commercialized Public Corporations
- Public-Private Partnerships
- Investor Owned Utilities
- Tax Issues
  - Private Activity Bonds



- There is a wide spectrum in how utilities are owned and managed, ranging from fully private (such as investor-owned utilities) to fully public (such as municipal water departments).
- There are many opportunities for partnerships in both the public and the private sectors. Public-private partnerships provide a cost-effective solution to ensuring that all systems can comply with the Arsenic Rule.



## Making Exemptions Work

- Exemptions are one way to ensure that all systems are addressed and put on a path to compliance. Exemptions can be used to ensure that water systems will have enough time to meet the revised MCL while continuing to provide an acceptable level of public health protection.
- EPA encourages States to consider the use of exemptions as a means of providing additional time to eligible systems.
  - Exemptions were part of the original SDWA. Congress made changes to the exemptions provision in the 1986 and 1996 reauthorizations to make the provisions more workable. In EPA's 2002 appropriations, Congress again directed EPA to look at exemptions and other rule flexibilities.
- This part of this *Arsenic Rule Small Systems Implementation Strategy & Exemptions* presentation provides an explanation of what States must consider to grant an exemption; suggests a simple, straight-forward, and effective manner in which States could document their decisions regarding exemptions; and provides a workshop to illustrate these points. States may develop their own strategies for issuing and managing the exemption process.
- For more information, see Appendix G to the *Arsenic State Implementation Guidance*, available at [www.epa.gov/safewater/ars/implement.html](http://www.epa.gov/safewater/ars/implement.html), or call the Safe Drinking Water Hotline at 1-800-426-4791.

## Timing is everything...



- Bring all 4100 systems into compliance by 2006, or
- Put some systems on compliance schedule that runs past 2006
  - REACTIVE: Address through Administrative Orders after violation
  - PROACTIVE: Address through exemptions

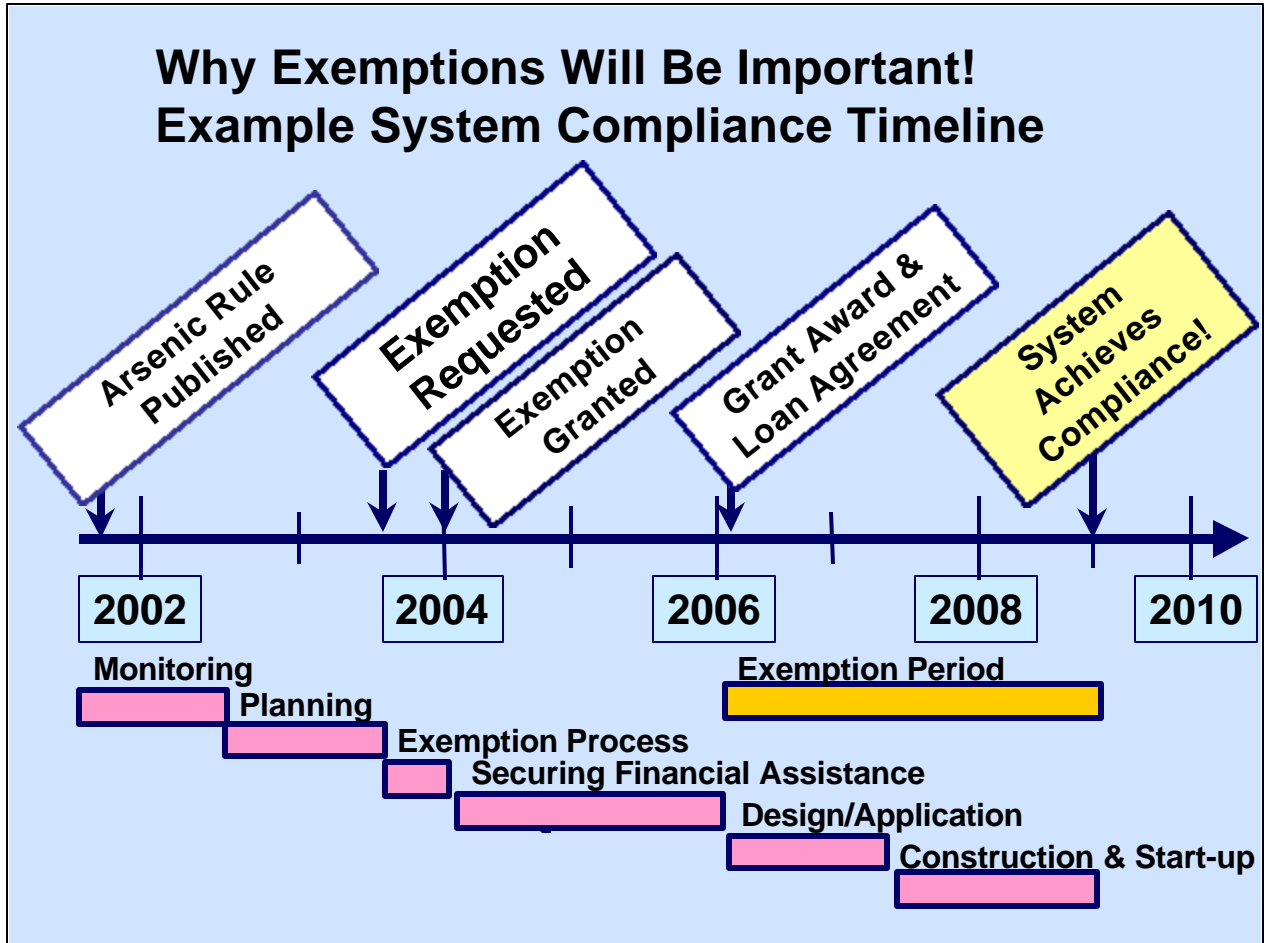
- EPA's goal is for all systems to comply with the revised arsenic MCL by 2006.
- EPA recognizes that it will be difficult for all systems to find the appropriate funding and complete the necessary modifications prior to January 23, 2006.
  - The next best option is to address all systems and get them on a compliance schedule to begin reducing the public health risk.
- States can address systems in two ways:
  - Reactively by waiting until after January 23, 2006 and then taking formal enforcement action for those systems that violate the revised MCL; or,
  - Proactively by recognizing that certain systems will need additional time to secure financing or complete necessary modifications, and provide these systems with a realistic compliance schedule issued through the exemption process.

# Goals of Exemptions



- Address Systems: Put Systems on Compliance Schedule
- Provide Additional Time to Systems to Come into Compliance
  - Obtain financial assistance
  - Restructure
  - Plan, construct & start-up treatment
- Ease Implementation & Enforcement Burden on States
  - State can be proactive
  - Avoid system non-compliance & enforcement

- Exemptions allow States to meet several goals including:
  - Setting appropriate and realistic compliance schedules.
    - Exemptions give eligible systems additional time to comply, thereby allowing States the flexibility to address those systems that present the greatest risk to public health (i.e., systems with the highest arsenic concentrations).
  - Providing systems with additional, and often necessary, time to come into compliance.
    - Systems that will not be able to meet the revised MCL may need to restructure, seek alternate sources, modify existing treatment, or install new treatment. These systems may need to plan and design an appropriate compliance strategy, pilot test treatment options, and start-up new treatment processes. Most systems will need to secure additional financing through financial assistance programs or rate increases. All of these activities are expensive and time-consuming.
  - Reducing the implementation and enforcement burden on States.
    - States can begin issuing exemptions now, well before the January 23, 2006 compliance date. By establishing compliance schedules now, States will give themselves a longer period of time to ensure that all systems will be in compliance with the Arsenic Rule.
  - Unlike compliance agreements, exemptions are in the SDWA and have a specific end date.
  - Through exemptions, systems and States work out a compliance schedule with interim steps that water systems must meet.



- This time line illustrates how an exemption can provide systems with additional time to come into compliance.
- Exemptions can assist States in achieving the end goal of bringing all systems into compliance with the revised arsenic MCL while preventing unreasonable risks to health (URTHs).
- The length of time necessary to design, pilot, and install treatment means systems need to start planning now.
- To grant exemptions, States need to adopt the Variances and Exemptions rule.

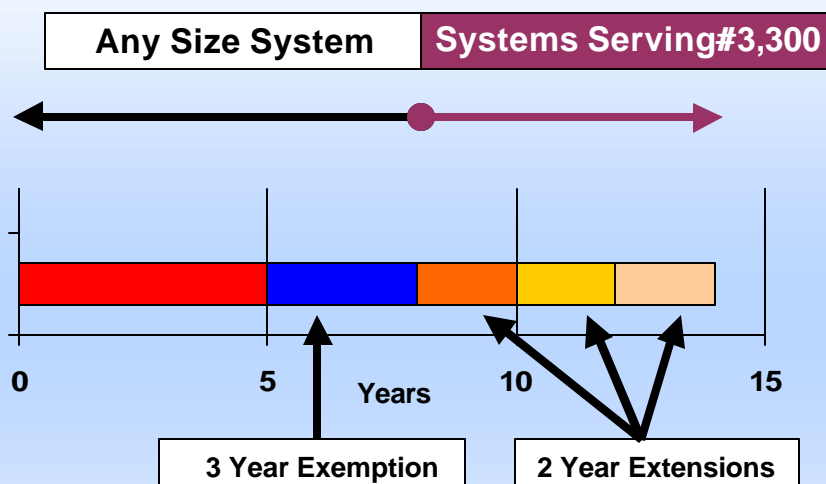
## **Systems Are Eligible for an Exemption If They Can't Comply by January 23, 2006:**

- Due to “compelling factors”
  - Economic Hardship (State Defined)
- Exemption will not result in an unreasonable risk to health
- System is unable to make management and/or restructuring changes
- System began operating by February 22, 2002

- Not all systems are eligible for an exemption. They must demonstrate a compelling need.
  - The system must also be looking for a solution.
- SDWA 1416(a) and 40 CFR 142.20(b) allow a State to grant an exemption to a water system if it meets all of the following criteria:
  - Due to compelling factors (which may include designation of the water system as serving a disadvantaged community), the system is unable to achieve compliance by January 23, 2006.
    - The State must consider whether the system can develop an alternative water source or partner with a another system for an additional source of supply.
  - The system was in operation by February 22, 2002. A system not in operation by that date can only be granted an exemption if no reasonable alternative source of drinking water is available to it.
  - The exemption will not result in an URTH.
  - The system cannot reasonably make management or restructuring changes (or both) that would result in compliance with the MCL or improve the quality of drinking water if compliance cannot be achieved.



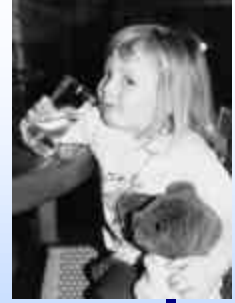
# Exemption Time Frames



- States can presumptively grant extensions up-front to simplify the process and to allow for realistic compliance schedules

- Eligible systems of any size can receive up to 3 additional years to comply (until 01/09).
- Systems serving fewer than 3,300 people may be eligible for up to three additional two-year exemptions.
  - Systems granted all three extensions would need to be in compliance with the revised arsenic MCL by January 23, 2015. (40 CFR 142.20(a)(2)).
  - Therefore, some small systems may be given exemptions allowing them 14 total years after the Rule was published to obtain their needed financial assistance and implement compliance strategies to comply with the revised arsenic MCL. EPA believes that these criteria can be met.
  - States can issue an exemption and any extensions at the same time.

# Exemptions Are Not a Way to Avoid Compliance



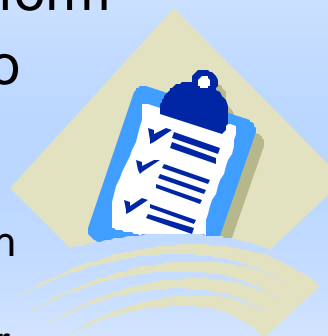
- Potential tool to help States address systems with greatest challenges
- Systems are put on a schedule to compliance by end of exemption period
- Public information is required
  - Consumer Confidence Report (CCR)
  - Public hearing

- Exemptions are not a free extension of time. During the exemption period, systems must take steps toward compliance.
- There are a number of mechanisms that help ensure that systems will not use an exemption as a means of avoiding the requirements of the Arsenic Rule.
  - All systems are required to be in compliance with the Rule. Only the date by which a system must comply can change.
  - The State will set a compliance schedule which will contain milestones. Non-compliance with a milestone may result in the revocation of the exemption and a requirement for immediate compliance.
  - Before granting an exemption, the State must provide an opportunity for a public hearing. The hearing should be in or near the affected community.
  - If a system is operating under the terms of an exemption, it must include the following in its annual Consumer Confidence Report (CCR) (40 CFR 141.153):
    - The definition of an exemption;
    - An explanation of the reasons for the exemption;
    - The date on which the exemption was issued;
    - A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the exemption; and,
    - A notice of any opportunity for public input in the review, or renewal, of the exemption.
- States may add requirements to reduce risk to health, such as providing bottled water.

# Minimizing Transaction Costs



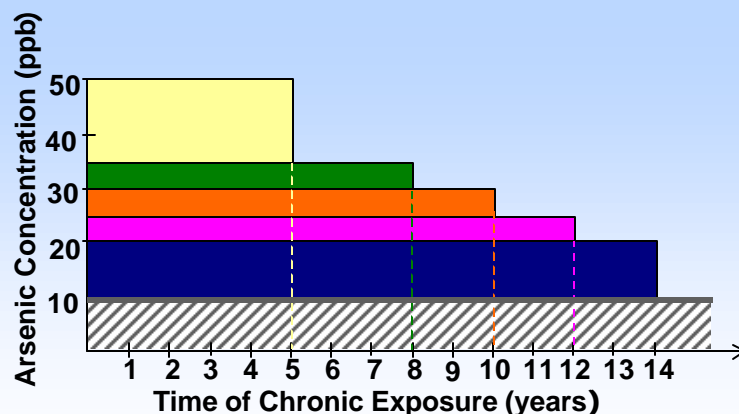
- Simple system application form
- Simple State review form to document findings
  - System eligibility
  - No unreasonable risk to health (URTH)
  - No reasonable restructuring or management changes
- Single public hearing for multiple systems



- Some States have not issued exemptions because of the administrative time and expense.
- However, States may be able to reduce the effort necessary to issue an exemption by:
  - Developing and distributing a simple system application form. Ideally, the form will ensure that the system provides all the necessary information and documentation to allow the State to make a determination.
  - Developing a simple review form that will assist a regulator in deciding whether to grant an exemption. The form should require the input of information, or a determination, on all four eligibility criteria (i.e., the system cannot comply by January 23, 2006 due to compelling circumstances; the system was in operation by February 22, 2002 or if not, there is no alternative source of supply; the exemption will not result in an URTH; and, restructuring and management changes will not help achieve compliance).
  - Holding one public hearing for several exemption applications. The location should be convenient for all affected communities.
- The workshop portion of this presentation provides a sample system application form and a sample State review form. The forms can be modified to fit local or regional circumstances.

## Determining What Does Not Pose An Unreasonable Risk To Health

- All water systems are allowed to continue to operate at levels between 10 and 50 ppb for up to a 5 years (200 ppb years)
- For purposes of using an exemption, this exposure (200 ppb) can be spread out over various time periods



- EPA is suggesting a simple, conservative, and common sense approach to determining what does **not** constitute an URTH with respect to arsenic. The Agency is explicitly not addressing the much more complex issue of what **does** constitute an URTH. This is an EPA-endorsed policy decision based on the science of the rule. EPA's definition of what does NOT pose an URTH is not prescriptive. States have the discretion to develop their own URTH definition. The following is one method of calculating URTH that EPA supports, saying that the length of an exemption can be based on the level of arsenic in the water.
- As a matter of regulation and policy, exposure at 50 ppb for the five years from January 23, 2001 to January 23, 2006 does **not** pose an URTH. This represents 40 ppb above the revised MCL of 10 ppb (50 ppb - 10 ppb = 40 ppb). The total exposure above the the revised MCL for those 5 years is 40 ppb \* 5 years = 200 ppb\*years. This 200 ppb\*years represents the "excess exposure" that, as a matter of law and policy, does not pose an URTH.
- EPA's policy is to assume a linear relationship between adverse health effects and exposure unless there is sufficient data to decide otherwise. In their review of the Arsenic Rule extending into Fall, 2001, the scientific community again endorsed EPA's decision to use a linear approach for estimating risks. Exemptions cannot be granted for more than 9 years and for concentrations higher than 50 ppb. Thus, for an exemption, the determination of what concentration level and duration does not pose an URTH can be conservatively determined by limiting excess compliance period exposure to #200ppb\*years for the total compliance period including the full duration of an exemption.
- A three-year exemption would result in a possible 8 years of exposure to increased arsenic levels. In determining what does not pose an URTH, a exemption should only be granted when the arsenic level in the finished water is less than or equal to 35 ppb (200 ppb-years / 8 years = 25 ppb over the MCL + the MCL of 10 ppb = 35 ppb).
- A three-year exemption and a 2-year extension would result in a possible 10 years of exposure to increased arsenic levels. This exemption and extension should therefore only be granted when the arsenic level in the finished water is less than or equal to 30 ppb (200 ppb-years / 10 years = 20 ppb over the MCL + the MCL of 10 ppb = 30 ppb).
- By similar calculations, a three-year exemption and two two-year extensions can be granted to systems with arsenic levels less than or equal to 25 ppb. A three-year exemption and 3 three-year extensions (which is the maximum number) can be granted to systems with arsenic levels less than or equal to 20 ppb.

## Will an Exemption Not Result in an Unreasonable Risk to Health?

Systems Serving	Total Compliance Time after Promulgation	Exemption Periods Available	>35 ppb	>30 ppb but ≤ 35 ppb	>25 ppb but ≤ 30 ppb	>20 ppb but ≤ 25 ppb	≤ 20 ppb
> 3,300 persons	8 years	3 years (2006-2009)	No	Yes	Yes	Yes	Yes
≤ 3,300 persons	8 years	3 years (2006-2009)	No	Yes	Yes	Yes	Yes
	10 years	5 years (2006-2011)	No	No	Yes	Yes	Yes
	12 years	7 years (2006-2013)	No	No	No	Yes	Yes
	14 years	9 years (2006-2015)	No	No	No	No	Yes

- Based upon the calculations presented in the notes to the previous slide, EPA believes this table offers a conservative and appropriate framework for determining the duration of an exemption that will not pose an URTH for systems with various historical arsenic concentrations. A “Yes” indicates that a given exemption period would be available for an otherwise eligible system with the stated arsenic concentration; a “No” indicates that a given exemption period would not be available.
- The table is broken down by system size since extensions are only allowed for systems serving fewer than 3,300 people.
- Note that in arriving at the arsenic concentrations allowed in small systems that receive second and third extensions, EPA has chosen to round down the allowable concentrations relative to the values produced by calculation. This rounding down provides an additional margin of safety, given the relatively long durations of elevated exposures that would be experienced by the individuals served by these systems.
- The total length of the exemption for which a system is eligible is determined by the historical concentration of arsenic in the system’s source water, 2001 levels. Exemptions are not contemplated for systems which have historically had arsenic concentrations above 35 ppb, even if those systems have recently taken steps to reduce their concentrations to 35 ppb or less.
- Exemptions are also not envisioned to offer a stair-step path to compliance. Systems could not obtain an exemption for 3 years with a concentration of 30 ppb, and then seek 2 two-year extensions to that exemption by blending or otherwise reducing their concentration to 20 ppb.
- It is recommended that, for systems with variable levels of arsenic in their finished water, the State use the highest reported value, because this will produce the most conservative estimate of risk.

# Setting Priorities



- Categorize systems into **LEVELS**
  - Arsenic concentration
    - Risk to public health
  - System size
  - Type of system (CWS vs. NTNCWS)
  - Potential significant non-complier (SNC) status after 1/23/06
- Take action as appropriate based on system **LEVEL**

- States should use exemptions in concert with a prioritization scheme. The State may wish to grant exemptions to the lowest priority systems, allowing the State to concentrate on bringing the highest priority systems into compliance first.
- Factors that the State may wish to consider while prioritizing systems include:
  - Arsenic concentration in the finished water. Systems with high levels of arsenic in the finished water are a greater risk to public health.
  - System size. Larger systems provide water to more consumers, which makes them a greater threat to public health if they are providing water that is out of compliance with the MCL. Also, systems serving more than 3,300 people are ineligible for exemption extensions.
  - Type of system. By definition, most people who consume water from a non-transient non-community water system (NTNCWS) are not year-round residents. Therefore, they are exposed to less water from this system than if they were residents.
  - Potential significant non-complier (SNC) status after January 23, 2006. Systems with high levels of arsenic in their finished water and systems that routinely fail to monitor are both risks to public health.
- After prioritizing systems, the State should take the appropriate actions, addressing the highest priority systems first.
- An example prioritization scheme appears later in this presentation.

# How to Issue an Exemption

The image displays two forms side-by-side. The form on the left is titled 'EXEMPTION REQUEST' and contains several sections for providing information about the system and the exemption request. The form on the right is titled 'STATE DOCUMENTATION' and is a more detailed evaluation form with multiple columns for different criteria and checkboxes for 'Yes', 'No', and 'N/A'.

- States may want to develop simple forms for use by the system and the State that will make it easier for systems to apply for an exemption and the State to determine whether to grant one.
- The forms presented here, which are available in Appendix G to the *State Arsenic Implementation Guide*, are a starting point for States trying to develop forms.
- The form on the left (which is 2 pages long) is a simple form that systems could use to apply for an exemption. States can modify the form to fit their needs. Systems needing exemptions may have limited technical, financial, and managerial capabilities. Therefore, States and TA providers may wish to make a special effort to alert systems to the potential availability of exemptions and to assist them in completing an application such as this one.
- The form on the right (which is 3 pages long) is a simple form the State can use to evaluate the exemption request and determine whether to grant it and any extensions.

# Primacy Agency Review Form



- 4 Steps
  - General system information
  - System eligibility
  - Approval
  - Compliance schedule
    - Including extensions

- There are four steps to completing the example State review form:
  - Fill in general system information, which is necessary to track the system and access past sanitary surveys and other records;
  - Determine system eligibility;
  - Decide whether to approve the system for an exemption; and,
  - Set a compliance schedule and the compliance date, including determining whether to grant the system any extensions.



## Step 1: General System Information

If after 2/22/02, additional requirements apply

Important for determining whether system is eligible for an extension

SYSTEM NAME				DATE BEGAN OPERATING	
POP. SERVED		PWSID		REQUEST DATE	
SYSTEM CONTACT				DATE GRANTED	
PHONE NUMBER				PUBLIC HEARING DATE	
CONTACT ADDRESS				EXEMPTION COMPLIANCE DATE	

The State must provide notice and opportunity for a public hearing on the compliance schedule (consider grouping hearings)

State must act within 90 days of request

Without an extension, this date cannot be later than 2009

- Using the system's exemption request and any other needed information, the State must determine:
  - The date the system began operation since a system that begins operation after January 22, 2002, may only receive an exemption if their no alternate source of water available;
  - The population served, because only systems that serve 3,300 or fewer people may qualify for one or more extensions;
  - The date the exemption was requested, because the State must approve or deny an exemption request within 90 days of when it is submitted;
  - The date of the associated public hearing, because the State must provide notice and opportunity for a public hearing on the compliance schedule; and,
  - The requested exemption compliance date, which can be no later than 2009 (if no extensions are granted) or 2015 (if 3 two-year extensions are granted).
- When a State grants an exemption to a water system, it "must document all findings required under SDWA section 1416" including the need for the exemption and for that it will not result in an URTH.
- The documentation process does not need to be onerous or time consuming. An approval form presented here, provides a streamlined and straightforward approach to providing documentation of findings.

## Step 2: Eligibility Determination

As defined by the State (e.g., serving a disadvantaged community) If "NO", system must meet criterion 2a to be eligible

Document your source of information

CRITERIA			INFORMATION SOURCE
11. Are there compelling factors that will prevent the system from complying by 1/23/06?	<input type="checkbox"/> YES	<input type="checkbox"/> NO*	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
12. Did the system begin operating before 2/22/02?	<input type="checkbox"/> YES	<input type="checkbox"/> NO (see 12a)	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
12a. If the system began operating after 2/22/02, does the system have a reasonable alternative source of drinking water?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
13. What is the system's high value for arsenic in finished water (in ppb)?			<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
How many years will it take the system to achieve compliance (from 1/23/06)?			<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
What is the product of the high arsenic value times 10 and the years until compliance (in ppb's years)?			<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
14. Can the system reasonably make any of the following changes** with the result being compliance or improved water quality?	<input type="checkbox"/> YES*	<input type="checkbox"/> NO	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other:
1. Rate Increases 2. Accounting Changes 3. Joint Operation 4. Appointment of State-certified Operator 5. Capacity Development Activities 6. Ownership Changes 7. Consolidation			
15. DETERMINATION	<input type="checkbox"/> YES - SYSTEM IS ELIGIBLE		<input type="checkbox"/> NO - SYSTEM IS NOT ELIGIBLE

Subtract 10 from the high arsenic concentration and multiply by the number of years to compliance to determine if exposure will be kept below 200 ppb-years

Take into account the potential availability of Federal and State financial assistance

**Only eligible if answered "Yes" to #1 & #2 (or "No" to #2a) AND "No" to #4**

- Step 2 requires answers to several questions, required under SDWA 1416(a), about the system's eligibility. The form also provides space for documenting the source of information.
  - Is there a compelling factor that prevents the system from complying with the revised MCL or implementing measures to develop an alternative source of water supply by January 23, 2006?
    - Compelling factors are determined by the State and may include economic factors, such as the qualification of the PWS as a system serving a disadvantaged community.
  - Was the system was in operation by February 22, 2002?
    - 2a. If not, is there a reasonable alternative source of drinking water available to the system?
  - Will the exemption result in an URTH? The form provides space to determine whether the system's arsenic concentrations will result in an URTH. Under EPA's definition, if the product of the amount by which the arsenic concentration exceeds 10 ppb multiplied by the number of years until compliance is greater than 200 ppb-years, the water presents an URTH and the system would not be eligible for an exemption.
  - Can the system reasonably make management or restructuring changes (or both) that will result in compliance with the MCL or, if compliance cannot be achieved, improve the quality of the drinking water? When determining whether a given change is reasonable, the State should consider the potential availability of financial assistance.
- A system is eligible if the State answered "Yes" to #1 & #2 (or "No" to #2a) AND "No" to #4 AND the result of the calculation from #3 is at or below 200 ppb-years

## Step 3: Approval Determination

Systems that have received a variance cannot also receive an exemption.

Systems must be making a good faith effort to comply but will not be able to meet the 1/23/06 compliance date

If system needs financial assistance to complete necessary capital improvements, then the system must meet criterion 4.

CRITERIA		INFORMATION SOURCE		
16	Has the system received a variance in the arsenic standard?	<input type="checkbox"/> YES*	<input type="checkbox"/> NO	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment
17	Is the system taking all practicable steps to meet the MCL?	<input type="checkbox"/> YES	<input type="checkbox"/> NO*	<input type="checkbox"/> Exemption Request <input type="checkbox"/> Other
18a	Does the system need to make capital improvements that cannot be completed before 1/23/06?	<input type="checkbox"/> YES	<input type="checkbox"/> NO*	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment
18b	Does the system need financial assistance for capital improvements?	<input type="checkbox"/> YES (see 18c) <input type="checkbox"/> YES (see 19)	<input type="checkbox"/> NO (skip to 20)	
18c	Is one of the following true: 1. The system agreed to become part of a regional PWS? 2. The system is reasonably likely to get financial assistance during the exemption?	<input type="checkbox"/> YES <input type="checkbox"/> YES (see 19)	<input type="checkbox"/> NO*	<input type="checkbox"/> Sanitary Survey <input type="checkbox"/> DWSRF Application <input type="checkbox"/> Capacity Assessment <input type="checkbox"/> Exemption Request <input type="checkbox"/> Other
19	Financial assistance information:	Source: <input type="checkbox"/> DWSRF <input type="checkbox"/> RUS <input type="checkbox"/> Other:	Date Applied:	Source Contact:
20	EXEMPTION DETERMINATION	<input type="checkbox"/> YES - EXEMPTION GRANTED		<input type="checkbox"/> NO - EXEMPTION DENIED

If "YES" review and document financial assistance information.

Approval may only be granted if you have checked "No" for #1 AND "Yes" for #2, #3, and #4.

- Step 3 requires answers to several questions about the system's eligibility required under SDWA 1416(b)(2). The form also provides space for documenting the source of information.
  - Is the system operating under the conditions of a variance issued in accordance with SDWA 1415(e)?
  - Is the system taking all practicable steps to meet the revised arsenic standard?
  - Does the system need to make capital improvements which cannot be completed prior to January 23, 2006?
  - Does the system need financial assistance for the necessary improvements? If yes, is AT LEAST ONE of the following conditions true:
    - a. The system has entered into an agreement to obtain the financial assistance or another federal or State program is reasonably likely to be available within the period of the exemption; or,
    - c. The system has entered into an enforceable agreement to become a part of a regional water system.
- Approval may only be granted if the State answers "No" for #1 AND "Yes" for #2, #3, and #4.

## Step 4: Compliance Schedule & Exemption Extension

Systems can only receive an extension if they have already received an exemption.

Extensions may only be given to systems serving fewer than 3,300 people.

CRITERIA			INFORMATION SOURCE
21	Has the system qualified for a 3 year exemption?	<input type="checkbox"/> YES <input type="checkbox"/> NO***	
22	Does the system serve fewer than 3,300 people?	<input type="checkbox"/> YES <input type="checkbox"/> NO***	
23	Does the system need financial assistance?	<input type="checkbox"/> YES <input type="checkbox"/> NO***	
24	Has the system agreed to become part of a regional PWS?	<input type="checkbox"/> YES*** <input type="checkbox"/> NO	
25	DETERMINATION	<input type="checkbox"/> YES - EXTENSION APPROVED	<input type="checkbox"/> NO - EXTENSION DENIED
	If, and how many, extensions and for how many total years (not to exceed 6):	Extensions	Years

Systems can only receive an extension if they need financial assistance to comply.

Systems may receive a maximum of 3 extensions. Each extension can be for a maximum of 2 years.

These 4 criteria are the minimum conditions a system must meet to be given an extension. States may establish additional requirements.

- In order to begin developing a compliance schedule, Step 4 requires answers to questions on whether the system may receive one or more extensions allowed under SDWA 1416(b)(2):
  - Has the system has been granted an exemption?
  - Does the system serve 3,300 people or fewer?
  - Does the system need financial assistance for the necessary improvements?
  - Has the system entered into an enforceable agreement to become a part of a regional public water system?
- Extensions may only be granted if the State answers “Yes” for #1, #2, and #3, and “NO” for #4.
- The State must ensure that the exemption and any extensions do not result in an URTH (SDWA 1416(a)(3)).
- When granting an exemption and any extensions, the State must at the same time set a compliance schedule for the system, including increments of progress or milestones, and control measures for arsenic (40 CFR 142.20(b) and SDWA 1416(b)(1)). The schedule should require compliance as “expeditiously as practicable.”
- Before these schedules for compliance and control measures take effect, the State must notify the public and hold a hearing on the schedules (40 CFR 142.20(b) and SDWA 1416(b)(1)).
  - States can hold joint hearings on groups of exemptions to minimize the administrative burden.

# Exemption Workshop

- This presentation is meant to be accompanied by a short workshop that allows regulators to use EPA's draft forms to decide whether to grant an exemption to an example small system. There are two goals associated with the workshop:
  1. Illustrate how exemptions request and documentation forms can minimize the administrative burden that exemptions place on States.
  2. Begin a dialogue among regulators about the necessary conditions for granting an exemption and what documentation the State should require systems to provide.

## Further Information Needed?



- Information on:
  - type of system (CWS, NTNCWS)
  - population served
  - service connections
  - number of sources
  - capacity of each source
  - number of entry points

- The simplified forms that EPA has developed for exemptions requests and documentation may not be appropriate for all States. EPA encourages States to adapt the forms to their own situations.
- In particular, States may wish to require systems to provide additional information in the system request form. For example, the State may wish to request additional basic system information, including:
  - Whether the system is a CWS or NTNCWS;
  - Population served;
  - Service connections;
  - Number of sources;
  - Capacity and arsenic concentration of each source; and,
  - Number of entry points.

## Further Information Needed? (cont.)



- Documentation (letters from lending agencies, engineering reports).
- Schematic drawing of the system showing the sources and their entry points, including the arsenic concentrations at each entry point or well.
- Explanation of how the proposed capital improvements would solve the problem.
- Explanation of how risk to public health will be reduced for the duration of the requested exemption.
- Proposed compliance schedule with interim compliance dates.

- The State may also wish to require systems to provide additional documentation, information, and explanation. For example, the State could require:
  - Documentation of claims about steps taken to meet the MCL; necessary capital improvements; why those improvements cannot be made before January 23, 2006; and financial assistance agreements or awards. This documentation may include letters from lending agencies and engineering reports.
  - A schematic drawing of the system showing the sources and their entry points, including the arsenic concentrations at each entry point or source.
  - An explanation of how the proposed capital improvements would allow the system to come into compliance with the revised MCL. Supporting documentation, such as an engineering report, could also be required.
  - An explanation of how risk to public health will be reduced for the duration of the requested exemption.
  - A proposed compliance schedule with interim compliance dates.



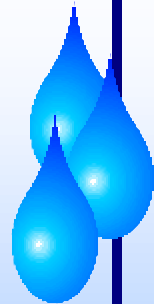
# Prioritization Scheme

## Moving Systems Towards Compliance

- In order to help systems come into compliance with the Arsenic Rule, it may be useful for States to classify them according to certain characteristics in order to enhance compliance assistance and enforcement efforts. The following scheme represents one way to classify systems based on population served and the concentration of arsenic in their finished water.
- This scheme is presented as an example; other methods of prioritization exist and may be more appropriate depending on specific circumstances.



## Two Steps



- Categorize systems into **LEVELS**
  - **Arsenic concentration**
    - Risk to public health
  - **System size**
  - **Type of system (CWS vs. NTNCWS)**
  - **SNC status**
- Take action as appropriate based on system **LEVEL**

- This prioritization scheme consists of two steps:
  1. Systems are categorized into levels. Higher level systems pose a relatively greater risk to public health. Factors that the State could use to categorize systems include:
    - Arsenic concentration in the finished water. Systems with high levels of arsenic in the finished water are a greater risk to public health.
    - System size. Larger systems are a public health risk to a greater number of people. Also, systems serving more than 3,300 are eligible for 3-year exemptions but not for the extensions allowed by the SDWA Section 1416(b)(2)(C).
    - Type of system. CWSs serve as a primary source of water and therefore present a greater risk to public health.
    - SNC status. Those systems that will become SNCs soon after January 23, 2006, present a greater risk to public health than those systems that have been issued an exemption.
  2. “Level appropriate” actions are taken. After prioritizing systems into levels, the State can begin to address the highest priority systems first.

# Categorizing Systems

## Level 1

- CWSs with > 35 µg/L
  - ✓ Not eligible for an exemption
  - ✓ Must comply by 1/23/06

## Level 2

- CWSs between 20 & 35 µg/L
  - ✓ Eligible for 3-yr exemption
  - ✓ Smalls may be eligible for extensions
  - ✓ SNC after 1/23/06

## Level 3

- CWSs serving > 3,300 & between 10 & 20 µg/L
  - ✓ Eligible for 3-yr exemption
  - ✓ Must comply by 2009

## Level 4

- CWSs serving < 3,300 & between 10 & 20 µg/L & NTNCWS
  - ✓ Eligible for 3-yr exemption
  - ✓ May be eligible for extensions to 2015

- In this example scheme:
  - **Level 1** systems are CWSs with arsenic levels above 35 µg/L.
    - These systems present the highest priority since they will not be eligible for an exemption under EPA's URTH definition and therefore must comply with the revised arsenic MCL by January 23, 2006.
  - **Level 2** systems are CWSs with arsenic levels above 20 µg/L.
    - These systems may be eligible for an exemption and extensions. However, with arsenic levels between 20 µg/L and 35 µg/L, these systems would be considered SNCs after the Arsenic Rule's January 23, 2006, compliance date.
  - **Level 3** systems are CWSs with arsenic levels between 10 µg/L and 20 µg/L that serve more than 3,300 people.
    - These systems may be eligible for an exemption thereby extending the compliance date to 2009.
  - **Level 4** systems are CWSs that serve less than 3,300 people and have arsenic concentrations between 10 µg/L and 20 µg/L.
    - These systems present the lowest risk (relative to the systems categorized in the other levels) because they are eligible for exemptions and extensions, and if their arsenic levels remain below 20 µg/L, they will not be considered SNCs after January 23, 2006.
    - All (NTNCWSs would also be considered Level 4; these systems do not pose as great a risk to public health because they do not serve year-round residents.

# Categorizing Systems

System Inventory	Population Served	Arsenic Level
Utopia Mobile Home Park	6,000	12 µg/L
Muddy River Water District	3,850	16 µg/L
Mirage	297	14 µg/L
Amity Ranch Mobile Home Park	200	53 µg/L
Living Stone Valley	168	31 µg/L
Red River Water Association	151	37 µg/L
Pleasantville Subdivision	87	15 µg/L
Horizon Water Works	75	19 µg/L
Moose Lake Living Center	38	21 µg/L
Trailer Town	27	11 µg/L

**System > 50 µg/L**

**Level 1  
> 35 µg/L**

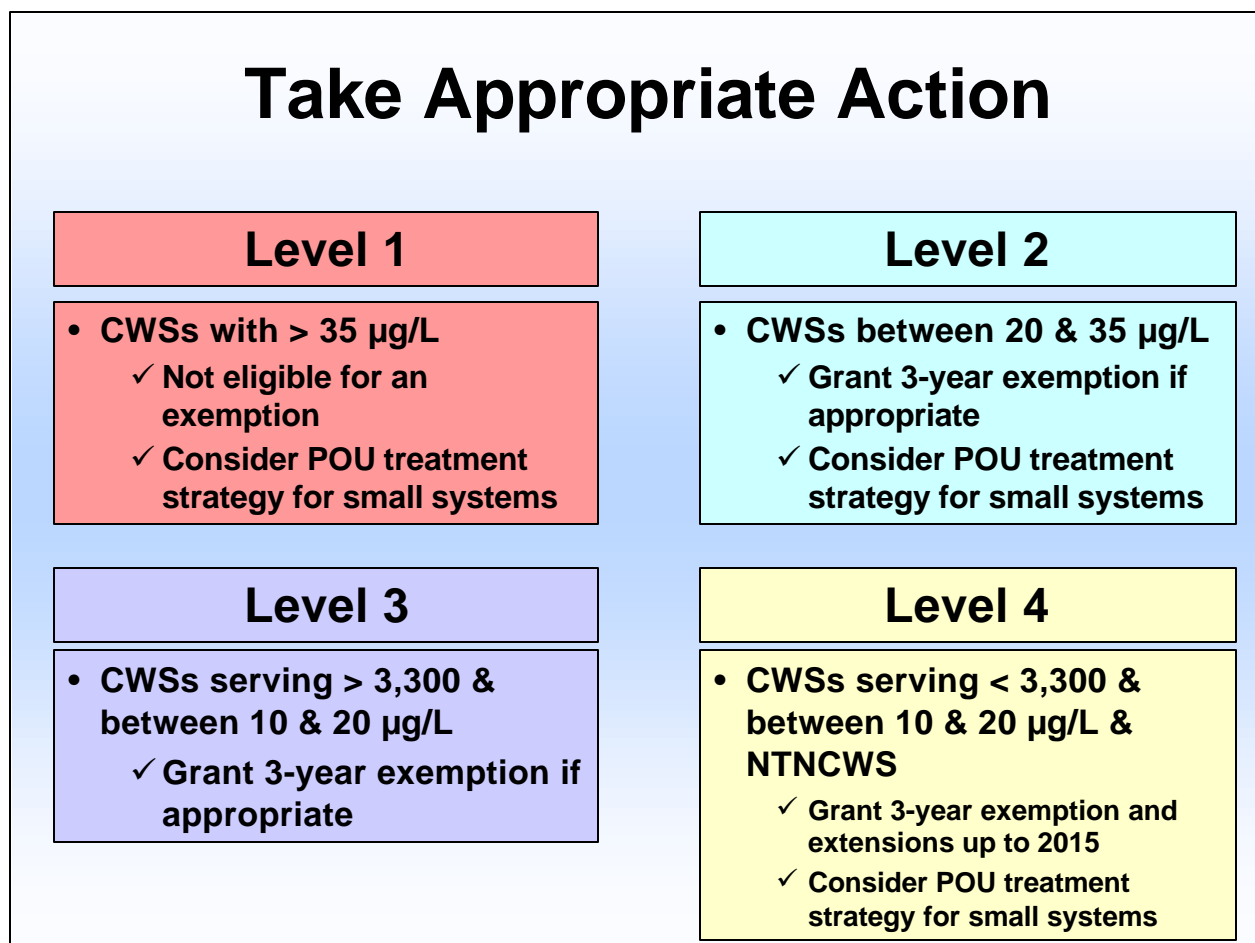
**Level 2  
> 20 µg/L & < 35 µg/L**

**Level 3  
> 3,300  
> 10 µg/L & < 20 µg/L**

**Level 4  
< 3,300  
>10 µg/L & < 20 µg/L  
NTNCWSs**

- This table shows several hypothetical systems that will have difficulty meeting the revised arsenic MCL.
- Using the same example prioritization scheme:
  - The highest priority is assigned to the system that is out of compliance with the current 50 µg/L MCL.
  - There is one Level 1 system. The system with an arsenic concentration above 35 µg/L will need to come into compliance by January 23, 2006.
  - There are two Level 2 systems. Their arsenic concentrations are between 20 µg/L and 35 µg/L arsenic.
  - There are two Level 3 systems. These systems supply water to more than 3,300 people with arsenic concentrations less than 20 µg/L.
  - The remainder of the systems are Level 4. Since these systems have arsenic concentrations less than 20 µg/L and serve fewer than 3,300 people, they may have the most time to come into compliance.
- Note that, in this prioritization scheme, the classification of systems as Level 1 or 2 is dependent solely on arsenic level and not population. Level 3 and 4 classifications depend on both population served and the arsenic level. Not all prioritization schemes will operate on this principle.

# Take Appropriate Action



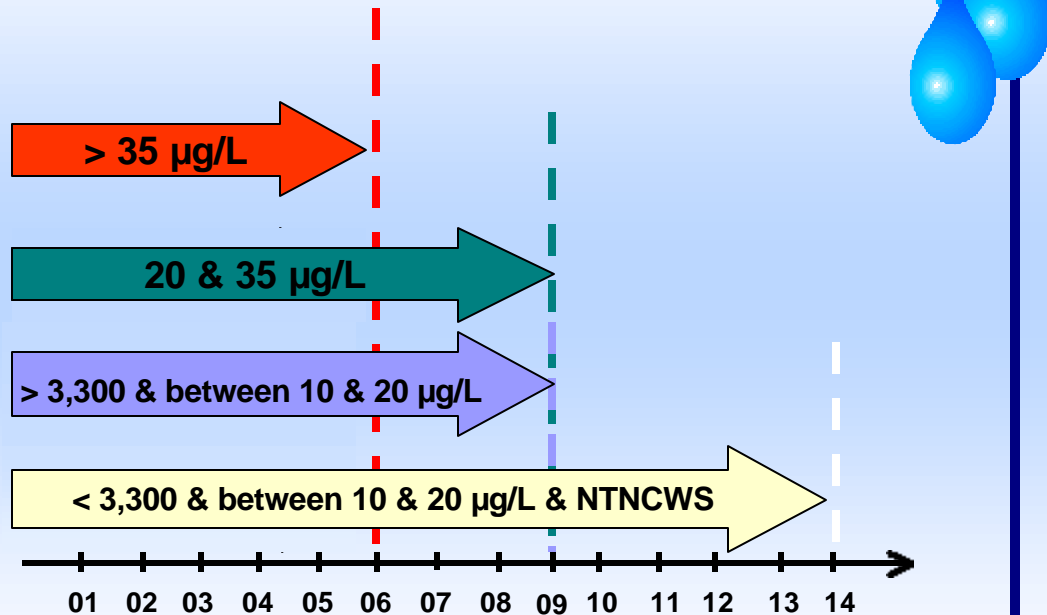
- Classifying systems into levels allows the State to prioritize efforts and define appropriate actions. In the example scheme, the State would:
  - Address Level 1 systems first (not taking into account on-going efforts with currently non-compliant systems) since these systems supply water with the highest levels of arsenic and therefore present the greatest risk to public health. In addition, these systems would not be eligible for an exemption since their arsenic concentrations present an URTH. Small Level 1 systems may wish to consider using a point-of-use (POU) treatment strategy.
  - Work with Level 2, 3, and 4 systems to identify an appropriate time-frame for compliance.
    - These systems may be eligible for an exemption, which would provide additional time for the system to come into compliance.
    - Since the Level 2 systems have higher arsenic levels, the State would focus initial efforts on these systems.
    - Since Level 4 systems may have the longest time to come into compliance (i.e., if the system is granted an exemption and any extensions) these system can be addressed last.
    - Small Level 2 and Level 4 systems can also consider using a POU treatment strategy.

# Example Compliance Options

	System Inventory	Population Served	Arsenic Level
Level 3: 3 year exemption	Utopia Mobile Home Park	6,000	12 µg/L
	Muddy River Water District	3,850	16 µg/L
Highest Priority	Mirage	297	14 µg/L
	Amity Ranch Mobile Home Park	200	53 µg/L
Level 2: 3 year exemption	Living Stone Valley	168	31 µg/L
	Red River Water Association	151	37 µg/L
Level 1: Compliance by January 23, 2006 or Enforcement	Pleasantville Subdivision	87	15 µg/L
	Horizon Water Works	75	19 µg/L
	Moose Lake Living Center	38	21 µg/L
	Trailer Town	27	11 µg/L
			Level 4: 3 year exemption + extensions
			Level 2: 3 year exemption + extensions
			Could cost effectively install POU devices

- This table shows the compliance options available to the State for the hypothetical systems presented in a previous slide.
  - The State's highest priority is to address the system supplying water with 53 mg/L of arsenic. This system is out of compliance with the current arsenic MCL.
  - The Level 1 system is ineligible for an exemption. In determining what does not constitute an URTH, systems with arsenic concentrations >35 ppb are not eligible for an exemption. The State should begin working with this system now to identify its needs and help the system meet the January 23, 2006, compliance date.
  - One Level 2 system (Moose Lake Living Center) is eligible for an exemption and an extension. In determining what does not constitute an URTH, systems with arsenic concentrations >20 ppb but ≤ 25 ppb are eligible for an exemption and two 2-year extensions.
  - Living Stone Valley, also a Level 2 system, is eligible for an exemption but not for an extension since it has arsenic concentrations above 30 ppb.
  - The State may wish to issue exemptions and possibly extensions to the Level 3 and Level 4 systems.
- Another compliance option for systems serving fewer than 250 consumers is to install, operate, and manage a POU compliance strategy.

## Exemptions Can Offer More Time



- Exemptions can be used in concert with a prioritization strategy so that States can concentrate on the systems that present the greatest risk to public health.
- Without exemptions, all systems must come into compliance with the revised arsenic MCL by January 23, 2006.
- If the State chooses to issue exemptions, however, some systems will receive additional time to come into compliance. This additional time will also help the State allocate staff and financial resources.

## Point of Use Devices: Compliance Alternative for Many Very Small Systems



There is a POU unit in the cabinet under this kitchen sink. This is the dedicated faucet used to dispense POU-treated water.

- The most protective compliance option is centralized treatment. For very small systems which have no other alternative, POU devices can be an effective compliance tool.
- POU devices are allowed under SDWA. They can be more economical for very small systems. EPA has not promulgated federal POU regulations. EPA has issued guidance for implementing a POU treatment strategy that can be found at <http://www.epa.gov/safewater/standard/pou.pdf>.
- POU and POE treatment strategies have been successfully demonstrated in the lab and used in communities to provide ongoing compliance with the arsenic MCL. Given the improving effectiveness and decreasing costs of POU treatment equipment, EPA believes that it is feasible for many small systems to utilize POU devices as part of their arsenic compliance strategies.
- This presentation shows how POU devices may be an affordable compliance option for many very small systems and discusses some of the associated implementation issues.
- Case studies of successful arsenic use by small communities include K. Fox, "Field Experience with Point-of-Use Treatment Systems for Arsenic Removal," *Journal AWWA*, February, 1989, and K. Rogers, *Point-of-Use Treatment of Drinking Water in San Ysidro, NM*, EPA CR-812499-01, November, 1988. See the Final Arsenic Rule (66 FR 6976 at 6984) for more information.

## Two SDWA Treatment Paths



Centralized Treatment



Point of Use

- SDWA lists both centralized treatment and POU as compliance options.
- Both centralized treatment and POU devices can help systems supply safe water for consumption by consumers.
- POU treatment devices rely on many of the same treatment technologies that have been used in central treatment plants. However, while central treatment plants treat all water distributed to consumers, POU devices treat only the water intended for direct consumption, typically at a single tap. POU devices are typically installed under the kitchen sink, where they treat a portion of the cold water flow and provide it for consumption through a dedicated faucet on the countertop.



## Point of Use Devices Are an Allowable Compliance Option



- The SDWA identifies POU as a compliance option
- Arsenic rule lists POU as a Small Systems Compliance Technology
- Banning POU is more stringent than Federal standard

**Question: How can we make POU provide the public health protections of the SDWA?**

- POU devices are an allowable compliance option that systems may use to meet the revised arsenic MCL.
- The 1996 Amendments to the SDWA specifically directed EPA to consider POU technologies when it “list[s] the technology, treatment techniques, and other means which the Administrator finds feasible for purposes of meeting [a] maximum contaminant level” (SDWA 1412(b)(4)(E)(i)&(ii)).
- After evaluating a variety of treatment technologies, EPA concluded that POU reverse osmosis (RO) and POU activated alumina (AA) devices are small system compliance technologies (SSCTs) for the Arsenic Rule (40 CFR 141.62(d)).
  - SDWA 1412(b)(4)(E)(ii) requires EPA to issue a list of technologies that achieve compliance with the MCLs established under the SDWA that are affordable and applicable to typical small drinking water systems. Systems may choose any technology or technique, listed or not, that best suits their conditions, as long as it is approved by the State and it allows the system to meet the revised arsenic MCL.
- POU devices present implementation challenges that States and water systems must address to ensure that the devices provide the public health protection required by the SDWA. Some challenges may include additional monitoring costs, the greater complexity associated with monitoring and maintenance of the units, and regulatory oversight.
  - States can determine whether POU compliance strategies are a workable option for their systems.

## Centralized Treatment Will Be a Challenge for Some Systems

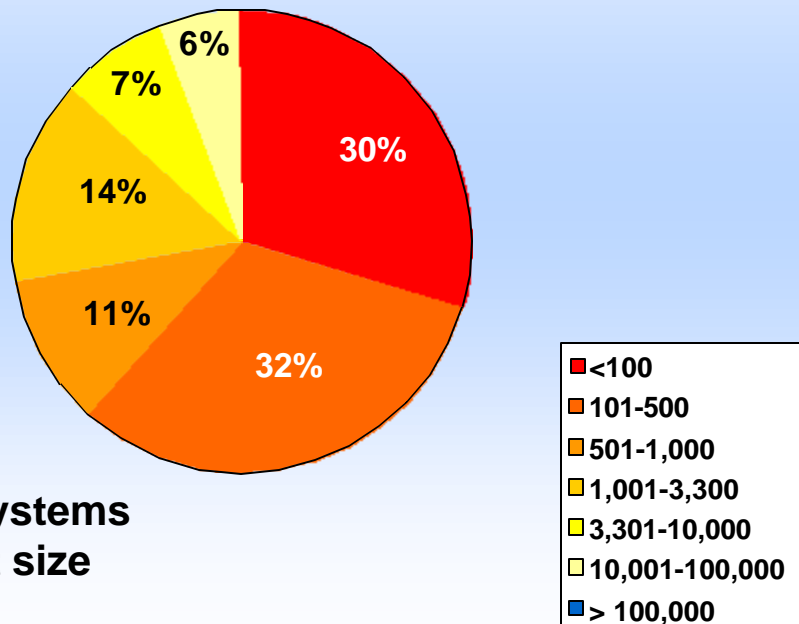


Of the systems expected to need treatment:

- 25% are NTNCWSs
- 30% of the CWSs serve fewer than 100 persons
  - Homeowners Associations
  - Mobile Home Parks

- Centralized treatment of drinking water offers many advantages to communities and the water systems that serve them:
  - All the water supplied by the water system is treated to the standards set forth in the National Primary Drinking Water Regulations (NPDWRs);
  - Significant economies of scale for both capital and operating costs exist for large treatment plants; and,
  - Central treatment permits comprehensive control of water quality through operation, maintenance, monitoring, and facilities regulatory oversight.
- However, the implementation of centralized treatment presents several problems, especially for small or financially disadvantaged water systems:
  - Capital costs may be prohibitive;
  - It may be difficult to retain a highly trained plant operator;
  - Disposal of waste brine or spent media may be extremely expensive; and,
  - Significantly more water will be treated to drinking water quality than may be necessary for drinking and cooking purposes.
- Most of the systems expected to be affected by the Arsenic Rule are either NTNCWSs, which tend to be small, or CWSs serving fewer than 100 people. These CWSs may be homeowners associations or mobile home parks.
- Very small systems (serving 300 consumers or fewer) that face these challenges may wish to consider a POU compliance strategy.

## Most of the ~3000 CWSs Affected by the Arsenic Rule Are Very Small



Percentage of systems serving different size populations

- Out of the 74,000 CWSs and NTNCWSs in the US, EPA estimates that approximately 4,100 will need to make improvements or take measures to meet the revised arsenic MCL.
- This diagram shows that a large percentage (62%) of the CWSs affected by the Arsenic Rule serve fewer than 500 people. 73% serve fewer than 1000 people.
- In addition, 25% of the water systems affected by the Arsenic Rule are NTNCWSs, which tend to be very small.

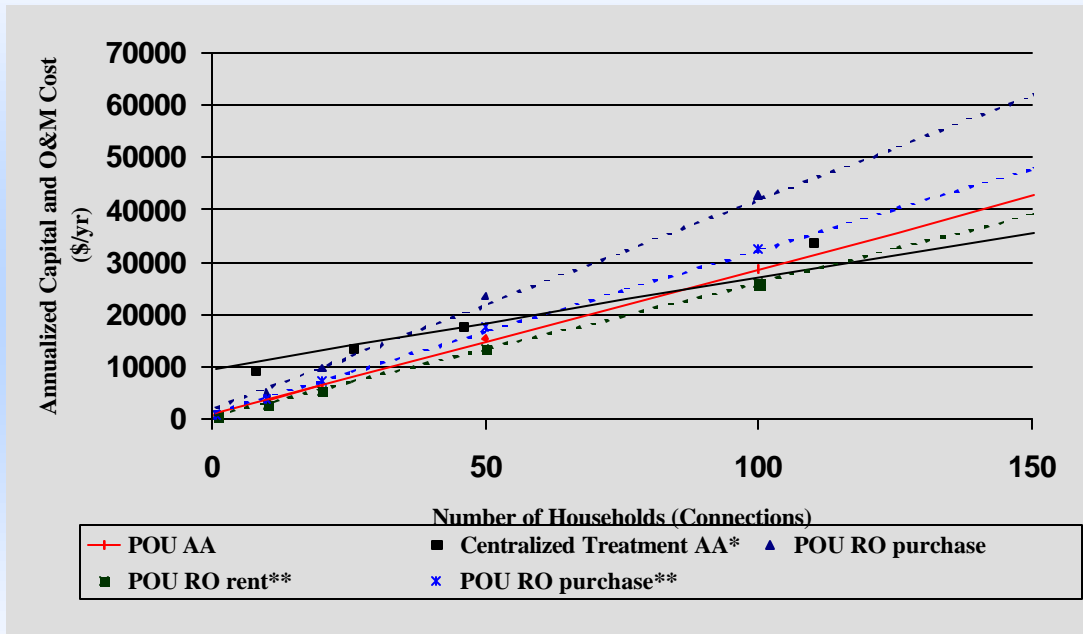
## POU Can Provide the Benefits of Centralized Treatment at a Lower Cost



- Often same technologies as centralized treatment
  - Activated Alumina and Reverse Osmosis
- Only treats portion of water used for direct human consumption
- Requires less technical expertise to operate and maintain
- Provides protection in the near-term, vs. larger capital costs for centralized treatment

- POU isn't centralized treatment. It doesn't treat all of the water at all of the taps. However, it does represent an affordable option for very small water systems.
- This affordability has some negatives. POU programs will be more complex and more of the compliance burden is on the homeowner.
- POU treatment devices rely on many of the same treatment technologies that have been used in central treatment plants. For example, systems may be able to use AA and RO to achieve compliance with the revised arsenic MCL on both the POU and centralized scale.
- POU devices, unlike centralized treatment, only treat to drinking water standards the portion of water used for direct human consumption. This selective treatment can result in significant cost savings.
- POU devices typically require less technical expertise to operate and maintain. Water systems therefore will not need a highly trained and experienced operator and may be able to contract out some services.
- Implementation of a POU compliance strategy can be much more rapid than installing centralized treatment, which may require systems to wait for both funding and construction. Therefore, with POU devices, consumers can begin receiving water with lower arsenic levels much more quickly.

## Comparison of Treatment Costs for Systems: POU vs. Centralized Treatment (All current POU options)

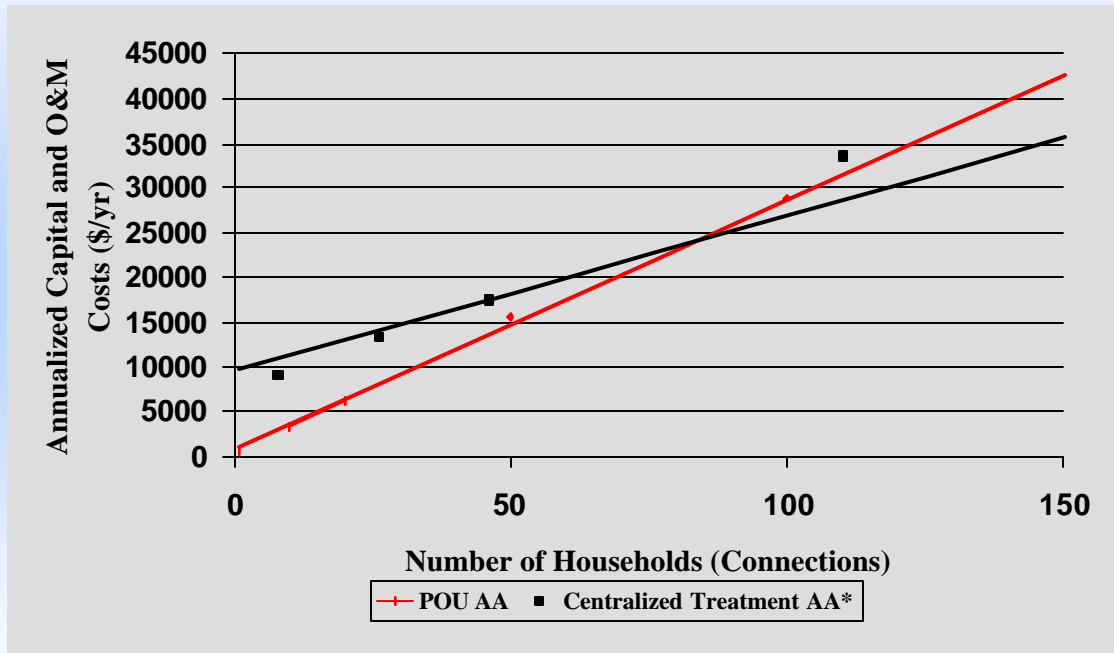


\*Centralized treatment cost based on likely activated alumina (AA) treatment facility for small systems [Natural pH 8-8.3; 5,200 BVs]

\*\*Costs based on membrane replacement annually

- This plot compares the total annual cost (including annualized capital cost and operations and maintenance costs) for the number of households served for various methods of treatment.
- The cost of centralized AA treatment is compared to the cost of various POU options: POU AA, POU RO in which the water system rents the units, POU RO in which the water system purchases the units and replaces the membrane every 2.5 years, and POU RO in which the water system purchases the units and replaces the membrane annually.
- Note that, for systems serving a small number of households, POU treatment may be less expensive than centralized treatment.

## Comparison of Treatment Costs for System: POU vs. Centralized Treatment



\*Centralized treatment cost based on likely AA treatment facility for small systems [Natural pH 8-8.3; 5,200 BVs]

- This plot compares the cost of centralized AA treatment with POU AA treatment.
- EPA estimates that implementation of a POU treatment strategy for arsenic can be less expensive than central treatment for communities with populations of up to 250 people (66 CFR 6976 at 6984), which would be approximately 100 households. EPA is currently evaluating and incorporating National Drinking Water Advisory Council (NDWAC) Arsenic Cost Working Group (ACWG) cost recommendations to determine if this number needs to be revised.
- The primary advantage of using a POU treatment strategy is that implementation may be less expensive than constructing, upgrading, or expanding a central treatment plant. The cost savings achieved through POU treatment may enable some systems to provide more protection to their consumers than they might otherwise be able to afford.

## SDWA Safeguards to Protect Public Health [1412(b)(4)(E)]



- POU prohibited for microbial contaminants
  - Acute effects from drinking at unprotected tap
- Units owned, maintained, and operated by PWS
  - Compliance rests with PWS, not homeowner
  - Maintenance can be contracted out by PWS
- POUs must be equipped with mechanical warnings
- Devices must be independently certified, if product standards exist

- To ensure that POU devices are as protective of public health as central treatment, SDWA 1412(b)(4)(E)(ii) requires that:
  - POU units are not used to achieve compliance with MCLs or treatment technique requirements for microbial contaminants (or indicators of microbial contaminants). EPA is interpreting this prohibition to apply to all contaminants which can produce acute health effects.
  - POU units must be owned, controlled, and maintained by the PWS or by a contractor hired by the PWS to ensure proper operation and maintenance of the devices and compliance with the MCLs. Homeowners may neither own nor maintain the units in their homes. This keeps the compliance burden on the PWS, not the homeowner.
  - POU units have mechanical warnings to automatically notify customers of operational problems. This gives customers an extra measure of confidence.
  - If the American National Standards Institute has issued product standards applicable to a specific POU treatment unit, POU units of that type are not accepted for compliance purposes unless they are independently certified in accordance with the product standard.

## Implementation of POU Option to Protect Public Health



- Protection of public health through POU treatment will involve:
  - Rigorous maintenance program
  - Consumer participation and education
  - Monitoring strategy
  - Pilot testing
- If these requirements are met, consumers should receive the protection envisioned by the SDWA

- The successful implementation of a POU treatment strategy will require a system to address several issues:
  - Implementing a POU treatment strategy will require a rigorous preventative maintenance program that may include more frequent sampling. Studies have shown that the units will work if maintained. Systems should ensure, prior to implementation, that they have available staff to perform the necessary maintenance, monitoring, and record keeping. Contracting out maintenance and monitoring duties is also an option.
  - Public education is also crucial to the success of a POU strategy. The system must be able to obtain regular access to the POU units to perform necessary maintenance and monitoring. Customers must support this effort in order for it to be successful.
  - As with any treatment technology, not all treatment devices are compatible with all sources of water. Pilot testing is crucial prior to the implementation of a POU compliance strategy.
- EPA based its costs on one POU device per household, presumably on the kitchen tap. States may require more than one unit per household if they chose to.



# Proper Maintenance is Essential To Ensure Health Protection



- What is an effective maintenance program?
  - Units owned, controlled, maintained by PWS or their contractor -- SDWA Requirement
  - Frequency of Maintenance
    - 100% factor of safety
    - Every 6 months for activated alumina
  - Components
    - Inspect unit
    - Replace filter
    - Qualified maintenance personnel



- For systems implementing POU treatment, proper maintenance is essential to achieving and maintaining compliance.
- The SDWA requires that POU treatment units are owned, controlled, and maintained by the water system or its contractor.
- Systems using POU treatment should establish and follow rigorous maintenance schedules. These schedules should be approved by the State and should be based on supervised pilot testing of the treatment units using the communities' source water and rate of water use, and other factors such as manufacturer's recommendations or experience in similar situations. Maintenance frequency should also include a substantial margin of safety (100% is recommended). In general, maintenance should be conducted at least every 6 months to ensure the continued effectiveness of the treatment units.
- Each maintenance visit should begin with a visual inspection of the treatment unit to identify leaks or any damage to the unit casing. Any scheduled compliance sampling should be done during the inspection, before membrane or filter replacement.
- Following this initial inspection, spent filters and membranes should be replaced (as mandated by the system's replacement schedule), the tap should be disinfected, joints should be inspected for leaks, and all valves should be exercised.
- Proper unit operation should be confirmed following the completion of all maintenance activities with a rapid field test for the contaminant(s) of concern or an appropriate surrogate (e.g., measuring total dissolved solids (TDS) reduction with a conductivity meter for RO systems). While these tests lack the precision necessary for use in compliance monitoring, they are valuable in identifying potential problems.
- Individuals responsible for maintaining POU units, whether they work for the water system or for a contractor, should be qualified to perform the necessary maintenance. Some States may require training in POU unit maintenance as appropriate under their operator certification programs. Other States may choose to establish specific requirements for individuals who install, maintain, and monitor POU devices. Equipment vendors frequently offer maintenance services for the units they sell or rent.

## Customer Participation and Education is Key to Success



- Homeowner buy-in essential
- 100 % participation required
  - To equate with universal coverage by centralized treatment
  - Early meeting with customers to promote
- Upfront notice to customers
  - Drink from the treated tap
  - Schedule of maintenance/home visits
  - Use CCR

- POU relies heavily on consumer participation, so community buy-in is an essential element of a successful POU compliance strategy.
- The system needs to install a POU device in each customer's home in order to provide comparable protection to centralized treatment, thereby complying with the Arsenic Rule.
- Before deciding to install POU treatment devices, systems should inform their customers about the need for treatment; the pros and cons of potential alternatives, including the costs of a POU strategy in comparison to centralized treatment; and the responsibilities of residents and of the water system under a POU treatment strategy.
  - It is also important for the system to inform customers that they should only drink from the tap where the POU unit is installed.
  - The system will need to maintain ongoing communication to reassure residents that the devices are functioning properly and to schedule necessary maintenance and monitoring. In addition to face-to-face contact and telephone calls, systems have relied on public meetings, brochures, public service announcements, and bill enclosures to convey necessary information to customers.
- A small number of customers may be reluctant to allow installation of, or access to, a household treatment unit.
  - Local ordinances and access agreements have been used by systems to help ensure that maintenance personnel can gain access to units located on private property in order to conduct the maintenance and monitoring necessary to ensure compliance.
- We recommend that systems include a description of their POU treatment strategy in the CCRs that they provide to their customers to further explain the purpose, function, and effectiveness of these devices.

## What Is an Acceptable Compliance Monitoring Framework?



- Must follow SDWA framework
  - Samples taken after treatment by the POU device
  - Not all units need to be sampled every year
    - National Drinking Water Advisory Council (NDWAC) cost group recommended that not all units need to be sampled every year
    - A comprehensive maintenance program and pilot testing can reduce the variability among same-type POU units.
- 
- Monitoring finished water (i.e., after treatment) is required of all PWSs to ensure ongoing compliance with the established MCLs.
  - The objective of monitoring under the SDWA is to evaluate the characteristics of water distributed by a system to ensure that it is safe for consumption. For arsenic, systems must monitor at each entry point to the distribution system or at an alternate location if conditions make such a location more representative and the State has approved the alternate location (40 CFR 141.23(a)(1)&(2)).
  - EPA believes that water systems implementing POU treatment strategies will not need to sample all of the units every year. The State will need to develop a monitoring scheme that is representative of water at all taps after POU treatment.
    - All sampling is based on the assumption of representative sampling. For centralized treatment, it is generally assumed that the quality of treated water is consistent. Therefore, a single sample taken at the treatment plant prior to distribution is representative of the quality of all treated water.
    - The Arsenic Cost Work Group (ACWG), an independent body composed of representatives from EPA Headquarters, EPA Regional Offices, States, and industry, was asked by the NDWAC to review the information and assumptions underlying the cost estimates for the Arsenic Rule. Based on professional experience, the conservative maintenance and replacement schedule proposed in the *Technologies and Costs for Removal of Arsenic from Drinking Water*, and the certification requirement for POU devices used for compliance (ANSI certification is required by SDWA 1412(b)(4)(E)(ii)), ACWG concluded that monitoring at every unit is not necessary to protect public health as long as each unit is inspected at least once a year.
    - In a water system implementing a POU treatment strategy, all households would be equipped with the same POU device and treat water from the same source; all units would be subject to the same ownership, maintenance, and operational controls; the system would have the benefit of thorough pilot testing for proper unit calibration and maintenance; and all units would be subject to the same aggressive maintenance schedule. Under these conditions, POU units produce water of similar quality.

## Monitoring Option: Utilize Standardized Monitoring Framework



- Sample 1/3 of units every year
- Logic:
  - 40 CFR 141.23 requires ground water systems to monitor every 3 years

- Neither the SDWA nor federal regulations dictate how to develop monitoring plans for systems utilizing POU devices. Therefore, States have the flexibility to develop appropriate monitoring schedules that will meet a system's needs while protecting public health.
- States may consider requiring systems to sample one third of their units every year. The standardized monitoring framework requires ground water systems to monitor for arsenic at each entry point to the distribution system at least once every 3 years (40 CFR 141.23(c)(1)). Therefore, the State could consider each POU unit to be a separate entry point to the distribution system and require monitoring at each unit once every three years (or monitoring one third of the units every year).

## Monitoring Option: Representative Sample



- Sample a number of units that will give confidence that they represent the entire community
- Logic:
  - Regulations allow for more representative sampling point
- Issue:
  - What data would be required to determine representative?

- Alternatively, the State can require compliance monitoring at a percentage of homes annually that will be statistically representative of the full community.
- Using the flexibility in 40 CFR 141.23(a), it is appropriate to modify the locations at which a system takes samples to ensure that the samples it takes are representative of the quality of water provided to customers after treatment.
- “Representativeness” will be based on the variability of the units - across units (spatial variability) and over time with individual units (temporal variability).
- The State needs to design a representative monitoring scheme based on their confidence in the variability of the units - the less variability, the fewer samples needed.
- EPA and AWWARF are conducting pilot studies which will improve our knowledge of temporal variability. The ANSI requirement in SDWA and pilot testing should improve confidence in spatial variability.
- EPA has not defined what data would be required to determine whether the units selected are truly representative of the whole community.

## Pilot Testing: A Necessary Starting Point



- Determine if the unit functions as intended in treating source water
- Helps determine monitoring frequency
- Helps determine maintenance schedule

- Pilot testing is essential prior to the final selection and installation of arsenic treatment:
  - System-specific water quality and other challenges can impact the suitability of treatment technologies. Systems should ensure that the POU unit(s) selected will be able to achieve sufficient arsenic removal prior to installing it in all households.
  - States should use supervised pilot testing of treatment units using the communities' source water and rate of water use to determine an appropriate monitoring frequency. If the effluent water quality is variable, then more frequent monitoring should be required.
  - Pilot testing can also determine how often components need to be replaced.

## Assumptions



- 1 Unit per household
- 2 maintenance visits per year
- Each unit sampled once every three years
- Unit cost \$315 per unit

- The cost curves developed by EPA to compare POU and centralized treatment rely on several assumptions, including:
  - The water system will conduct 2 maintenance visits to each unit per year; each visit will last 45 minutes;
  - Every unit will be sampled once every three years;
  - Each unit costs \$315 installed, including the appropriate media, plumbing, a sample tap, a flow meter, and a mechanical warning device; and,
- EPA assumed one unit per household. EPA believed that this is appropriate for a chronic contaminant, where an occasional drink from an untreated tap should not cause adverse health effects.
- One treated tap is not as good an option as centralized treatment, but for some very small water systems, it may be the only affordable and viable option.
- States may increase the number of units required per household if justified by public health protection.