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Technical Fact Sheet: Proposed Rule for Arsenic in Drinking Water and Clarifications to Compliance and New Source Contaminants Monitoring

1. What are we announcing?

EPA is proposing a new drinking water standard of 5 μg/L for arsenic and taking comment on regulatory options of 3 μg/L (the feasible level), 10 μg/L and 20 μg/L. EPA is proposing a Maximum Contaminant Level Goal (MCLG) of zero for arsenic. This proposal also clarifies how compliance is demonstrated for many inorganic and organic contaminants in drinking water.

2. What are the requirements of this proposed rule?

Community water systems (CWSs), which are public water systems that serve at least 15 locations or 25 residents regularly year round, will be required to reduce the arsenic concentration from the current standard of 50 μg/L to 5 μg/L.

At the same time, EPA is proposing that non-transient, non-community water systems (NTNCWSs) be required to notify people served by these systems when arsenic exceeds the drinking water standard. NTNCWSs are public water systems that are not a CWS and serve at least 25 of the same people more than 6 months per year (e.g. schools and nursing homes).

The proposal will also reduce the ambiguities in some existing regulations. Compliance averages will be based on actual number of samples collected. New systems and new sources must demonstrate compliance within the State-specified time and sampling frequencies.

3. How soon after publishing the final rule will the changes take effect?

- For CWSs serving > 10,000 people - compliance 3 years after the final rule.
- For CWSs serving 25 to 10,000 people - compliance 5 years after the final rule.
- For NTNCWSs - required to monitor and notify within 3 years after the final rule.
- Before the effective date, all CWSs will begin providing health information and arsenic concentrations in their annual consumer confidence report for water that exceeds the new standard.

4. Why is this rule significant?

In the 1996 amendments to the Safe Drinking Water Act, Congress directed EPA to propose a new arsenic regulation by January 1, 2000 and to issue the final rule by January 1, 2001. The 1996 amendments also added discretionary authority to adjust the maximum contaminant level (MCL) if the benefits would not justify the costs (§1412(b)(6)). This is the first drinking water regulation which will set a standard higher than technically feasible (3 ug/L) because EPA determined that costs would not justify the benefits. This rule would also only require NTNCWS to monitor and report (as opposed to treating) because of cost-benefit considerations and because of the relatively low occurrence for these water systems.

The implementation clarifications will more consistently identify exceedances of many drinking water standards and codify existing State requirements for new system and new source compliance.

5. What health effects are associated with exposure to arsenic from drinking water?

In most drinking water sources, the inorganic form of arsenic tends to be more predominant than organic forms. Inorganic arsenic in drinking water can exert toxic effects after acute (short-term) or chronic (long-term) exposure. Although acute exposures to high doses of inorganic arsenic can cause adverse effects, such exposures do not occur from public water supplies in the U.S. at the current MCL of 50 μg/L. EPA's proposed drinking water regulation addresses the long-term, chronic effects of exposure to low concentrations of inorganic arsenic in drinking water. Chronic effects at low concentrations include:

- Cancer Effects: skin, bladder, lung, and prostate cancer.

- Non-cancer effects: skin pigmentation and keratosis (callus-like skin growths seen earliest and most often), gastrointestinal, cardiovascular, hormonal (e.g., diabetes), hematological (e.g., anemia), pulmonary, neurological, immunological, reproductive/developmental functions.

6. What are the sources of arsenic contamination in water?

The contamination of a drinking water source by arsenic can result from either natural or human activities. Arsenic is an element that occurs naturally in rocks and soil, water, air, plants, and animals. Volcanic activity, the erosion of rocks and minerals, and forest fires are natural sources that can release arsenic into the environment. Although about 90 percent of the arsenic used by industry in the United States is used for wood preservative purposes, arsenic is also used in paints, drugs, dyes, soaps, metals and semi-conductors. Burning fossil fuels and wastes, paper production, glass manufacturing, cement manufacturing, mining and smelting can also release arsenic. While arsenic can no longer be used in making pesticides, weed killers and embalming fluids, the Agency is aware that prior to this ban these substances have contributed to drinking

water contamination.

7. How many people and how many systems will be affected by this rule?

Higher levels of arsenic tend to be found more in ground water sources than in surface water sources (i.e., lakes and rivers). Compared to the rest of the United States, the Western states have more systems with arsenic levels greater than 10 μg/L. Parts of the Midwest and New England have systems with 2-10 μg/L of arsenic. While many systems may not have any detected arsenic in their drinking water, there may be "hot spots" with systems higher than the predicted occurrence for an area. About 12 percent of the nation's 54,000 CWSs will need to take measures to lower arsenic in their drinking water. Of the affected systems, 94 percent serve less than 10,000 people. Tables 1 and 2 below show the estimated number of CWSs and NTNCWSs that would be affected by this rule and the estimated population served by these public water systems.

Table 1. Estimates of the Community Water Systems That Would Need to Treat and the Population Served by These CWSs

Regulatory Action	Number of CWSs Affected	Total Population Served
Proposal of 5 μg/L	~ 6,600	~ 22.5 million
Option of 3 μg/L	~ 10,500	~ 35.7 million
Option of 10 μg/L	~ 3,000	~ 10.7 million
Option of 20 μg/L	~ 1,200	~ 4.4 million

Table 2. Estimates of the Non-Transient, Non-Community Water Systems That Would Need to Notify and the Population Served by These NTNCWSs

Regulatory Action	Number of NTNCWSs Affected	Population to Notify
Proposal of 5 μg/L	~ 2,400	~ 2.4 million
Option of 3 μg/L	~ 3,970	~ 3.9 million
Option of 10 μg/L	~ 1,060	~ 1.1 million
Option of 20 μg/L	~ 400	~ 0.387 million

Soon after the final rule is published, EPA will release a health advisory with suggestions on how the public can reduce infant exposure to arsenic before the effective date of the final rule. Infant formula can be reconstituted using water containing low levels of arsenic.

8. How much will this rule cost?

Over 98% of the cost of the arsenic rule comes from adding treatment equipment, chemicals, and oversight of the new treatment. Table 3 below shows the total annualized costs of treatment, monitoring, reporting, recordkeeping, and administration for this rule at three and seven percent discount rates.

Table 3. Total National Annualized Costs of the Arsenic Rule (Includes cost of treatment, monitoring, reporting, recordkeeping, and administration)

Regulatory Action	Three Percent Discount Rate	Seven Percent Discount Rate
Proposal of 5 μg/L	~ $ 379 million	~ $ 445 million
Option of 3 μg/L	~ $ 645 million	~ $ 756 million
Option of 10 μg/L	~ $ 166 million	~ $ 195 million
Option of 20 μg/L	~ $ 65 million	~ $ 77 million

- For systems that need to take corrective action to comply with the new rule, the annual costs per system will range from $7,000 per year for the smallest community water systems to over $100,000 for systems serving 3,300 to 10,000, and over $0.5 million for larger systems.

- For households served by systems that need to take corrective action with the new rule, average annual household costs are estimated to increase by $28 for Americans served by large systems (serving over 10,000 people) and $85 for those served by small systems (systems serving less than 10,000 people). Costs will vary depending on the system size.

9. What are the benefits of this rule?

- Reducing arsenic from 50 μg/L to 5 μg/L - protects an additional 22.5 million Americans and will prevent about 20 cases of bladder cancer per year and approximately 5 bladder cancer deaths per year.

- At a regulatory option of 3 μg/L, reducing arsenic from 50 μg/L to 3 μg/L - protects an additional 35.7 million Americans and will prevent about 25 cases of bladder cancer and approximately 7 bladder cancer deaths per year.

- At a regulatory option of 10 μg/L, reducing arsenic from 50 μg/L to 10 μg/L - protects an additional 10.7 million Americans and will prevent about 13 cases of bladder and approximately 3 bladder cancer deaths per year.

- Under a regulatory option of 20 μg/L, reducing arsenic from 50 μg/L to 20 μg/L - protects an additional 4.4 million Americans and will prevent about 7 cases of bladder cancer and approximately 2 bladder cancer deaths per year

- EPA expects that arsenic-related lung cancers (that could number as many as two to five times the number of bladder cancers) and cardiovascular diseases will be reduced with a lower standard as well.

- The estimated values of the benefits of this rule range from as high as $90 million for bladder cancer to $384 million for lung cancer.

10. Is there funding associated with this rule?

Since 1996, the Drinking Water State Revolving Loan Fund has made over $3.6. billion available for loans to help water systems improve their infrastructure. This program has now made over 1000 loans. EPA also provides funding to States that have primary enforcement responsibility for their drinking water programs through the Public Water Systems Supervision (PWSS) grants program. Other federal funds are available through Housing and Urban Development's Community Development Block Grant Program, and the Rural Utilities Service of the U.S. Department of Agriculture.

11. How did EPA consult with stakeholders?

From 1996-1999, EPA conducted a number of Agency workgroup meetings on arsenic and advertised five stakeholder meetings in the *Federal Register*. Five States also provided written comments on implementation issues during the workgroup process. Representatives of eight Federal agencies, 19 state offices, 16 associations, 13 corporations, 14 consulting engineering companies, two environmental organizations, three members of the press, 37 public utilities and cities, four universities, and one Indian tribe attended the stakeholder meetings on arsenic. The Office of Water staff presented an overview of the arsenic rulemaking to over 900 Tribal attendees in 1998 and provided more detailed information in 1999 to 25 Tribal council members and water utility operators from 12 Indian tribes. In addition, EPA provided updates on our rulemaking activities at national and regional meetings of various groups and trade associations. Furthermore, we participated in AWWA's technical workgroup meetings. As part of the Small Business Regulatory and Enforcement Flexibility Act (SBREFA), EPA also received valuable input from discussions with small entity representatives during SBREFA consultations for the arsenic rule. EPA obtained recommendations from the National Drinking Water Advisory Council (NDWAC) on the rule as a whole as well as on benefits analysis and small systems affordability. We also posted discussion papers produced for our stakeholder interactions on the Office of Ground Water and Drinking Water (OGWDW) Internet site and sent them directly to participants at stakeholder meetings and others who expressed interest.

12. Where can the public get more information about this proposed rule?

For general information on arsenic in drinking water, contact the Safe Drinking Water Hotline, at (800) 426-4791, or visit the EPA Safewater website at http://www.epa.gov/safewater or the arsenic website at http://www.epa.gov/safewater/arsenic.html.

In addition to this technical fact sheet, the following documents and fact sheets will be available to the public at EPA's web site on arsenic in drinking water:

1. *Federal Register* notice of the proposed arsenic regulation
2. More detailed discussion documents on Arsenic in Drinking Water
3. Consumer Fact Sheet on Arsenic in Drinking Water

A copy of the *Federal Register* notice of the proposed regulation or any of the technical and consumer facts sheets can be obtained by contacting the Safe Drinking Water Hotline at (800) 426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding Federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Time.

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