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Options for the Office of Ground Water and Drinking Water Information Strategy (Working Draft)

Background Document for the
Information Strategy Stakeholders Meeting
March 8-9, 2001
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DISCLAIMER

The Options paper represents an effort by EPA staff to consolidate into a single working draft a number of suggestions and ideas generated by the Office of Ground Water and Drinking Water's Infrastructure Branch. This draft will be subject to extensive revision, development and qualification as the Agency proceeds through both external public and internal EPA deliberative processes. The information presented in this document is a discussion of possible options available to the EPA and should not be interpreted as EPA policy.

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EXECUTIVE SUMMARY

Information is critical to the management of major national programs and shapes responses to rapidly changing events in the public health arena. The Office of Ground Water and Drinking Water must bring its information management into strategic alignment with the needs of both its internal and external stakeholders to maintain credibility in a data-driven environment. Information management in the private sector provides examples of reduced costs and improved decision support systems using current technology that can be applied in the public sector. This Office of Ground Water and Drinking Water (OGWDW) Information Strategy is a first step in revising its Information Strategic Plan (ISP) to focus on essential data, reporting and analyses supporting decisions of the national ground water and drinking water programs to protect public health. The objective of the OGWDW Information Strategy is to identify a range of actions in the near term to modernize its information systems and to define achievable direction in the intermediate and longer terms that recognize evolving information needs and technology, and effective and efficient information management to support public health protection.

"Driving forces" to revise the OGWDW ISP include: (1) Current infrastructure systems are old and expensive to modify and maintain, with costs escalating; (2) Transaction costs for data entry and retrieval are high; (3) Current systems are not responsive to program requirements driven by the 1996 Amendments to the Safe Drinking Water Act, such as new regulations required by the Act; (4) Data are incomplete from an Office of Water perspective, only focusing on Public Water Supply Supervision program violations data without similar levels of coverage for Source Water Protection (e.g., essentially no regulated contaminant parametric data), Underground Injection Control (UIC) and State Revolving Fund programs; (5) Because information systems do not share common data elements, linkages to other significant data sources within the Office of Water and outside EPA are difficult or nonexistent; and (6) Office of Water information investment policy and Office of Environmental Information standards will guide future OGWDW information management decisions.

A "paradigm shift" in information management and associated decisions are fundamental to allow OGWDW to respond to internal and external data and analytical needs and to control costs. To address this needed shift, OGWDW will consider options relating to:

- Acquiring parametric data
- Implementing a new information requirements assessment as part of the regulation development process
- Reaching agreement with states to simplify multiple reporting options and therefore reduce complexity and cost
- Streamlining SDWIS-FED and STATE to reduce costs in long term after near term investment
- Integrating NCOD, ICR, SDWARS and other sealed up systems to reduce costs
- Web-enabling SDWIS-STATE to allow states to more easily report data (at initial cost to EPA, but a long-term savings to both EPA and states)
- Improving public access for ad hoc and PWS queries
- Continuing to work with states to implement data reliability plan
- Completing revision of Information Strategy Plan
- Integrating systems based on function and business need
- Implementing the EPA/OEI-ECOS data exchange network (SDWIS-FED data submission is very close to this network model)

PART I: OVERVIEW

Information is critical to the management of national programs and shapes responses to rapidly changing events in the public health arena. Sound science and the best available data are the foundation of decisions that the EPA's Office of Ground Water and Drinking Water (OGWDW) makes to protect public health and the environment. Information technology has improved, and the process for developing drinking water standards has changed significantly since OGWDW developed its most recent information strategy in 1992. EPA must implement a new strategy that responds to evolving technology and regulatory needs, maximizes efficiency and minimizes cost of data transactions, meets national water program needs, and links efficiently to relevant data sources. The strategy must be business-driven, incorporating the needs of stakeholders both inside and outside of EPA.

EPA encourages public input into questions that will allow OGWDW to make more informed decisions regarding its Information Strategy. Once implemented, the strategy will help OGWDW to better focus on essential business data, minimizing reporting burden for the necessary data, obtain early involvement in information requirements for regulations, streamline the federal Safe Drinking Water Information System (SDWIS-FED) to reduce reporting errors, continue to support the state Safe Drinking Water Information System (SDWIS-STATE), and provide an information framework for source water protection. Questions for discussion involve issues of data use and needs, reporting, system performance, data quality, data access and system economics.

PART II: VISION, MISSION, SCOPE and PRINCIPLES

A. National Water Program Management Vision:

The Information Management program supports the management and operations of the National Water Program's mission to protect public health and water resources by delivering useful information to decision makers and the public.

B. OGWDW Information Strategy Mission:

OGWDW's information systems will effectively and efficiently support the overall program needs to protect public health by providing support to the program designed to prevent contamination of source waters and protect drinking water supplied to consumers, through:

- Defining efficient and effective information requirements based on essential business needs
- Synthesizing data for OGWDW decision-makers to manage programs, including development of policies to prevent contamination of source waters
- Enabling scientists and analysts to better assess existing regulations as well as determining the need for new regulations
- Managing and tracking the use of State Revolving Fund resources
- Utilizing enforcement resources to return non-compliant water systems to compliance
- Providing information to the public in readily-accessible form.

C. Scope:

OGWDW's information systems will obtain drinking water and source water data relevant to public health protection through appropriate means from the regulated community, support measurement of program progress and decisions affecting compliance of the regulated community and program management and direction, including standards development and regulation review, and provide reliable information to the public, over the next five years.

D. Principles:

- Keep processes and systems simple
- Base systems development on essential business need
- Contain information system costs
- Minimize reporting burden for public water systems (PWS) and states who are key stakeholders in this process
- Maintain support for core requirements, including SDWIS/STATE and new rules
- Use data standards to provide consistency of data reporting and data sharing
- Improve data quality through documented procedures
- Involve stakeholders and identify their roles in data use within their business processes
- Ensure easy access to the system for internal stakeholders and the public at all skill levels
- Ensure tracking and reporting of GPRA measures
- Modernize in components to reflect funding available

PART III: REVISING OGWDW'S INFORMATION STRATEGY

A. Driving Forces for Change

The evolving philosophy of information management focuses on improving data quality and data sharing while utilizing new technology, minimizing costs associated with building onto older, less efficient systems. In OGWDW, implementation of the drinking water program changes on a continuing basis as new regulations are established. OGWDW's traditional response has been to make expensive, patchwork changes to an existing patch worked expensive system -- driving development and maintenance costs ever higher. OGWDW must change its approach, implementing a new strategy for meeting changing information needs and philosophies, taking advantage of new technology and keeping costs under control.

The previous information systems focus was to make reporting data extremely flexible, allowing for multiple reporting methods. This has resulted in overly complex and expensive software and excessive documentation and training. It has also contributed to significant errors in data submission and expensive maintenance costs to respond to errors, further complicating the system.

1. Age and Cost of Maintaining Existing System

- Current systems are old and expensive; transaction costs for data entry and retrieval are too high
- Patchwork fixes have neglected opportunities for comprehensive solutions, increasing

systems' costs in the long term and contributing to significant errors and reduced data quality.

- Opportunities for utilizing new, more efficient technologies exist to improve information system effectiveness and efficiency and reduce costs, but constrained resources have not allowed modernization.

2. Changing Information Needs and Focus

- Current information processes and systems are not responsive to program requirements driven by the 1996 SDWA amendments, which require new rules, regular review of regulations and standards, protecting source water, and an emphasis on the public's right to know about their drinking water. As a result, OGWDW cannot measure the success of its programs, or of states and public water systems that are linked in its information processes.
- Current data systems focus only on the Public Water System Supervision program, not Underground Injection Control and Source Water Protection, or relationships with the Drinking Water State Revolving Fund data.
- Emphasis is on compliance, with insufficient parametric (contaminant occurrence) data for reviewing existing regulations and policy development for source water protection
- Basic questions on the quality of drinking water need attention, in particular as they relate to complete reporting between states and EPA and credibility regarding the safety of the nation's drinking water.

3. Decisions Needed

Investing in new technology while maintaining the old technology temporarily will be necessary to improve systems while not interrupting information flow. This transformation requires management decisions at federal, regional and state levels, considering ground water and drinking water program costs, to address old business steps that drive up the potential for reporting error, data nonacceptance, and near-term and long-term federal database costs. These decisions include:

a. A determination to minimize federal database costs only, or total federal and State information system costs. This affects the alternate vision for information systems to be followed.

SDWIS/STATE Cost Comparison

	Option 1 ADOPTS SDWIS/STATE	Option 2 DEVELOPS NEW SYSTEM	Option 3 MAINTAINS EXISTING SYSTEM
Initial Development and Implementation	$ 230,400	$1,885,400	$75,400
Operating Costs over next 5 Years (Annual Average)	$1,332,500 ($266,500)	$1,732,500 ($346,500)	$1,732,500 ($346,500)
Other Costs over 5 Years (Including software development to meet future rule reporting)	$300,000	$1,900,000	$1,900,000

Notes: 1) These figures are estimates and are not based on actual state experiences.
2) Costs for Option 1 include the costs for staff, all new computers, and all software, and would be substantially reduced by utilizing existing resources.

b. Clarification of EPA Headquarters, Regional and State roles and responsibilities for data use. These include: Who owns the data and determines compliance? What level of State and Regional program tracking should exist? How to increase program tracking if it is currently insufficient? What actions/tools should be available to EPA when reporting requirements are not met? How should States and EPA partner in the reporting process? Should EPA provide compliance information at the system level, and if so, how complete should these data be?

c. Whether to offer single response versus multiple options in reporting to EPA (e.g., reporting compliance at either entry points or the system to EPA, but selecting only one way) and to make facility identification numbers permanent (or easily traceable to previous numbers - constantly changing facility numbers created by the information system or the state reduces data quality and usability and increases transaction costs of determining the correct data).

d. Related to (a) and (b), determining whether parametric data should replace, or augment violations data. Parametric data is essential to the 6-year review of regulations required under SDWA and to useful analysis to guide source water protection policy.

e. Transferring enforcement tracking to the Office of Enforcement and Compliance Assurance, while continuing to supply that office with system compliance results.

B. Challenges to Modernization and OGWDW' s Response

1. Challenge: Ensuring that decisions made today are not outdated when implemented, given the rapid pace of change in information technology.

Response: OGWDW undertook a review of the direction of technology on its own and participated in development an information strategy across the Office of Water. The OW strategy, which addressed the direction of technology, is linked to the Agency's "National Environmental Information Exchange Network" Blueprint.[1] These three technology reviews (across public and private sectors, across OW program offices and within OGWDW for its business needs) provide insight to potential technological directions and suggest how information systems might develop at the program office level. The reviews also point to areas within a future OGWDW plan that the office can address to reduce risk in its decision making for its information systems.

2. Challenge: General mistrust of change due to uncertainty of outcome.

Response: Although change can be difficult, especially for data users of information systems, they can often be made transparent to users because of improved technology. Some changes will hopefully be viewed by users as positive, enhancing use of the data. The driving forces above point to advantages of making these changes at this time.

3. Challenge: Conflicting findings resulting from use of data for purposes not originally intended.

Response: Some data suppliers are concerned that making data more accessible to the public will result in the data being used for purposes not originally intended. Such "secondary use" of data is commonplace -- anyone other than the data generator who uses the data is engaging in secondary use. Actually, some states with data online, available for public access, have found that such use promotes data quality. Users tend to point out problems in the data sets, thus encouraging the data generator to be more careful. These states also found that making the data public for secondary use reduced burden on state information system staff and resources because the public could find answers to many of its questions online. Therefore, allowing broader secondary use of the drinking water data may better inform the public and improve the data quality at the same time. This benefits PWS by promoting improvements in water quality and increasing consumer confidence.

4. Challenge: Ensuring that funding implementation of a system modernization plan does not constrain complete, comprehensive action.

Response: To address the concern about funding sufficiency, EPA will consider using a phased, prioritized approach to systems development. This approach will allow OGWDW to identify discrete aspects of the information system for improvement as funding allows the office to make the appropriate investments reflecting the priority across its programs.

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[1] U.S. Environmental Protection Agency, Office of Environmental Information. 2000. National Environmental Information Exchange Network Blueprint. This Blueprint describes activities that would need to occur to implement the arrangements being developed with the Environmental Council of the States for exchange of environmental information between States and EPA.

5. Challenge: The relation of rule development to the timing of implementation sometimes results in phased reporting requirements for which further coordination could improve the delivery of the benefits of the rulemaking process and database reengineering.

Response: OGWDW will examine the possibility of bundling rules for effective dates and reporting dates to bring consistent and coordinated management of the rulemaking process. This action may result in different implementation dates from those originally established. OGWDW believes that such an approach may result in a more rational and cost-effective program, especially for information management purposes, and protect public health at local and state levels. However, a more complete evaluation of this matter and its tradeoffs is essential first.

PART IV. AREAS FOR DISCUSSION

A. DEFINING DATA USES AND NEEDS

- **How will OGWDW ensure that it has the data it needs to implement its programs, address data gaps and coordinate with other EPA programs?**

OGWDW will conduct a comprehensive information requirements process in 2001. This process will consider existing reporting requirements that may need to be changed because the conduct of drinking water program business has changed since the early requirements were developed. It will also address future program information needs, relative to new rules and business information gaps in source water protection. The focus of this information requirements process will be on essential data necessary for program implementation. In developing its strategy, OGWDW is working with other entities, particularly the Office of Water, the Office of Environmental Information, and the Environmental Council of the States (ECCS).

Currently, OGWDW information systems do not support the Source Water Protection Program. To address this gap, the program has conducted its own information requirements process in the course of preparing its strategy. OGWDW will build on this and refine these information requirements units processes planned for 2001. A key objective and option is to build on data in existing information systems that States and the US Geological Survey already have for ambient source water data, rather than construct a new information reporting process. See Appendix A, "Draft Source Water Protection Measures of Progress."

- **What essential data does the primary enforcement authority need to track?**

The primary enforcement authority, either the states and tribes (if they are delegated primacy) or EPA for non-primacy states and tribes, must be able to ascertain whether the maximum contaminant level or treatment technique has been met to ensure protection of public health. Options include:

1. Public water systems only report non-attainment of maximum contaminant levels and treatment techniques.

2. Public water systems report all parametric data to states, tribes or EPA to allow determination as the regulation third party (i.e., not a water supplier or customer)

3. For treatment techniques, provide some related public water system operating data when determined appropriate (e.g., indication of sanitary survey completion)

4. For treatment techniques, provide all decision-related data to the primary enforcement agency. This option would have the highest cost at all levels of the reporting process.

Related questions are: What of this information should be sent to EPA by the state or tribal primary enforcement authority to allow EPA to carry out its role in a national enforcement capacity? Can criteria be established to determine this? How should the response to this question be addressed in the regulation development process?

- **What parametric and ancillary data should be reported to make them of greatest use?**

Options may include:

1. Use only concentration data associated with the appropriate ancillary data
2. Use requirements for unregulated contaminant monitoring reporting as a template
3. Adopt a modified unregulated contaminant monitoring regulation approach, since for regulated contaminants, the quality controls are incorporated in the methods which have been extensively applied. See Appendix B, "Unregulated Contaminant Monitoring Reporting Requirements."

- **How should EPA foster improved processes for identification and confirmation of data requested by primacy agencies?**

Option 1: Clarify of roles of EPA HQ (and its subdivisions), EPA regions (and their subdivisions), the states and other stakeholders. It may be necessary to revisit, revise and confirm roles and responsibilities of the various EPA headquarters offices responsible for SDWA, states and other stakeholders. This would allow parties to reach agreement and provide direction for rule reporting that is consistent from rule to rule, by establishing the kinds of data that EPA needs to fulfill its responsibilities.

Option 2: An alternative could be to utilize the requirements that exist in the current SDWIS/FED system. However, over time, several new regulations were enacted, each with different data requirements. For example, reporting for the Lead and Copper Rule required states to report milestone data so that EPA could evaluate rule implementation status from data other than violations. No other rule had reporting requirements this extensive. In addition, since that time it has been concluded that this data collection effort never afforded EPA the ability to perform such evaluations, as states did not report the complete set of information, as it was viewed as a large burden.

Option 3: EPA could conduct special surveys to determine occurrence of contaminants or compliance with the Safe Drinking Water Act.

- **What data does EPA need to judge and evaluate the success of its programs?**

Looking only at noncompliance and exception data does not tell us about how the quality of source and treated water has improved or declined. Parametric data would allow EPA to track progress, demonstrate the success of its efforts, and evaluate existing regulations. Reporting requirements for UCMR parametric data are identified in Appendix B. OGWDW's principal Government Performance and Results Act (GPRA) goals are identified in Appendix H. Data should

provide a basis for measuring these goals.

Are there other priority data uses EPA should consider?
EPA would like to make a number of other uses of drinking water data. Currently, because of limits in data requirements, EPA cannot do the following:

1. National analyses tailored to conditions that PWSs face , regardless of location. If we can associate PWSs to the range of watershed or aquifer features, for example, we can tailor rules to these conditions, or at least recognize that these conditions exist on a consistent basis.
2. Consistent national analyses of populations with special needs, sensitive subpopulations, low income, etc.
3. Associate nationally, intakes or well fields with land practices to do source water protection analyses and develop national policy.
4. Respond to cross-program requests for national source intake or well field locations to relate to other national programs' proposed actions and come to meaningful conclusions about whether these proposals would protect drinking water sources.
5. Include drinking water data in EPA's new geo-spatial initiatives, which would allow relation of water uses, water pollution sources, stream characterization (including 303(d) impaired waters), to natural, political, and economic parameters affecting drinking water. "Windows on the Environment" and the National Hydography Dataset are two existing agency-wide initiatives to enhance the public's right to know environmental and health information, for which drinking water data are necessary.
6. Provide linkage of data from unregulated contaminant monitoring to potential contaminant sources.
5. Link the source water assessments that EPA will receive from the states to the rest of the environment. Complete and reliable latitude and longitude data would allow us to relate water supplies to the resources managed and regulated by other national agencies.

B. REPORTING

- **What changes are necessary to ensure we obtain correct data, while minimizing reporting burden for existing and upcoming rules?**

Existing Requirements: As OGWDW evaluates the results of the information requirements process in 2001, it will determine whether any required reporting should be eliminated and propose these steps be taken at that time. OGWDW has completed an initial review of existing required data elements in SDWIS-FED to identify which are reported on and used. This review may result in the proposal of several data elements for elimination. See Appendix C, "DTF Attributes to be Analyzed for Reporting Reduction."
Options include:

1. No changes in reporting systems
2. Remove reporting requirements where no longer useful – this would involve changing all systems, but potentially making them more efficient.

Rules in the Pipeline (e.g., proposed or newly final rules with pending final reporting requirements): OGWDW has reviewed regulations recently proposed to identify opportunities for minimizing PWS and State reporting requirements. For example, this review has identified options,

such as certain data being kept by public water systems and made available to States during inspections or sanitary surveys, and, likewise, some data could be held by States and provided during program reviews or data verifications. Additionally, OGWDW is considering options for early involvement of information and implementation staff in regulation development to identify information requirements as soon as possible in rulemaking. This early involvement would potentially provide for a more complete description of data requested and information processes employed to allow more complete consideration in rule development by affected stakeholders.

Drinking Water Data Management Steering Committee Draft Work Plan

The following summarizes the draft 2001 Work Plan for the Data Management Steering Committee (DMSC). The DMSC, a joint project of the United States Environmental Protection Agency and the Association of State Drinking Water Administrators, is an advisory group that supports EPA and states in their cooperative efforts to enhance drinking water data management. The DMSC has identified the following issues as high priority issues that need to be addressed. Once the DMSC has taken final action on an issue, the Committee will reassess the current status of data management issues and revise this Work Plan to include additional issues as appropriate.

ISSUE #1: Develop a guideline for data management issues that EPA should consider when drafting a policy, developing a new rule, or revising an existing rule.

Proposed action: The DMSC has formed a work group to develop a set of guiding principles on information requirements and data management that EPA should consider when drafting a policy, developing a new rule, or revising an existing rule. These guiding principles will be included in a "white paper," which, upon completion and approval by the full Committee, will be sent to the states and EPA Regions for their review, and ultimately, formally submitted to the Director of the Office of Ground Water and Drinking Water. The Committee anticipates that these guidelines will be incorporated into the rule development process, and that all new rules include a detailed description of data management requirements and how the requirements were determined. See Appendix D.

ISSUE #2: Determine how to ensure the data in SDWIS/FED is reliable, complete, and timely.

Proposed action: The DMSC has formed a work group to develop recommendations, with supporting products where appropriate, to states, EPA Regions, and EPA Headquarters on ways to ensure that the data in SDWIS/FED is reliable, complete, and timely. These recommendations will be included in a "white paper," which, upon completion and approval by the Committee, will be sent to the states and EPA Regions for their review. Ultimately, it will be submitted formally to the Director of the Office of Ground Water and Drinking Water, the EPA Regional Administrators, and the primacy agency responsible for implementing the drinking water program in each state. As a result of these recommendations, the Committee anticipates improvement in data verification statistics over time on a state-by-state basis.

<u>Future Rules</u> (e.g., rules that come out of the Contaminant Candidate List and Unregulated Contaminant Monitoring Regulation): OGWDW is working with the Association of State Drinking Water Administrators (ASDWA)-EPA Data Management Steering Committee to propose a set of criteria for information requirements steps and reporting requirements to guide future regulation development. OGWDW is also considering the option of bundling effective dates and reporting requirements. Using this approach, OGWDW would pick an initial date to implement a regulation and a subsequent date for reporting to begin, allowing an appropriate readiness period for states and systems. If a regulation were not ready by that date (i.e., a final rule had not been promulgated), then it would not be effective until the next annual implementation date (e.g., Jan. 1 of each year), with the appropriate readiness period already considered. OGWDW will be evaluating the advantages and disadvantages of such an approach before making decisions about whether or not to implement it.

- **How should EPA obtain parametric drinking water data to address future information requirements?**

The information requirements process in 2001 will explore the business need to report parametric data in the future to support OGWDW's need to conduct the SDWA 6-year review of regulations. Currently, OGWDW does not have the data it needs to conduct this review on a routine basis. Options include:

- Changing the regulations to require all parametric data to be reported
- Requiring only a statistically randomly selected set of PWSs to report parametric data
- Arranging with the drinking water industry to have a representative sample of PWSs report voluntarily
- Arranging with the states voluntarily to allow EPA to retrieve data on a representative sample of PWSs from their information systems

- **What improvements to SDWIS should EPA make to allow for easier data entry by states?**

OGWDW proposes to bring the data models for SDWIS-FED and STATE into alignment and implement the two systems as one project. This step should reduce data submission errors for States using SDWIS-STATE software. OGWDW is also evaluating the option of making SDWIS-STATE web-enabled which should improve data submission capability and reduce errors. Additionally, OGWDW is considering the option of having the releases of SDWIS-FED and STATE coincide, to eliminate quarterly changes in SDWIS-FED and make the releases annual. Finally, OGWDW is evaluating the option that it set annual dates for all rules under development to aim at for implementation of reporting requirements, rather than allowing each regulation workgroup to decide independently when reporting requirements would be implemented. This step should smooth out the need to respond to constantly changing reporting requirements and make them more predictable for information systems planning and funding purposes for EPA and states.

C. IMPROVING SYSTEM PERFORMANCE

- **How can EPA improve the performance of its information systems, given that any improvements would require states to make near-term adjustments to achieve long-term reporting benefits?**

Currently, SDWIS-FED reporting requirements provide states options for reporting certain violation results. Providing for several reporting options in a database increases the complexity and cost of building and maintaining an information system considerably. It also increases the probability of modifications that will result in data rejection. Options for flexible reporting also encourage a range of potential interpretations of regulatory specifications, resulting in inconsistent determination of compliance and, thus, enforcement. To OGWDW, the simplest way to minimize this problem seems to be allowing only one way to report each violation or other requirement.

EPA's rationale for this approach: Today's data reporting characteristics of SDWIS/FED were derived from the 1980s. At that time, data management was much less automated, and primacy agencies developed capabilities in concert with their own unique requirements, especially after EPA withdrew support for the old Model States Information System. EPA created data reporting capabilities that are flexible, allowing multiple ways for the primacy agencies to report data. For example, although SDWIS/FED requires the use of unique record identification numbers in the database for virtually all data types, some primacy agencies did not, in their data systems. To accommodate them, EPA created the capability for SDWIS/FED to generate the record identification numbers. This very issue is currently providing a daunting challenge to SDWIS/FED participation in EPA's spatial data work, UCMR and the OEI Facilities Registry System, since records cannot easily be related to the same facility to look at the national level.

Another area of flexibility is that EPA supports four different methods for linking enforcement actions to their violations, and users have recently petitioned for a fifth. Such flexibility creates substantial costs in the information system. Rather than designing these capabilities into the system, OGWDW sees new data retrieval software technology (off-the-shelf) that could be set to allow such analyses to be done independently of the system and allow the system to be simpler and less costly.

There are several areas where similar reporting flexibility exists. The greatest problem with this flexibility, from EPA's perspective, is the cost of its maintenance. For every data element that can be reported in multiple ways, software has to exist to support its processing, in traditional and total replace processing (another area of flexibility being considered for elimination). Further, reporting, user, and training documentation all must address each of the methods for data entry. When changes are made to the data system, its impacts on each of these capabilities must be properly managed, or errors will occur.

EPA can certainly maintain reporting flexibility in the data system, but at a considerable expense. OGWDW has a limited budget for information systems. Thus, our ability to reduce escalation of costs is directly related to the amount of flexibility EPA allows in reporting. The greater the flexibility, the greater the costs. A recent study performed to assess the costs of combining the

SDWIS/FED and SDWIS/STATE projects concluded that a significant investment would be required for the conversion and software revision. However, a primary assumption associated with this investment is that the multiple options would be simplified to a single response, as in SDWIS/STATE. After such an investment, future system savings for the PWSS program reporting would be expected annually with a breakeven point between one and two years, reporting requirements held constant. These funds could then be applied to other priority data needs, such as source water protection. See Appendix E, "The Need for Single, Unique Data Identifiers."

SDWIS/FED Challenges

- Database in DB2 is not well supported software in EPA, and is EPA's more expensive operations cost platform. EPA does not possess the full extent of DBMS tools or knowledge.
- Data entry is with proprietary data entry format, used only for SDWIS/FED reporting, is antiquated, and has been found to be insufficient to process new UCMR data
- DTF Writer software, in use in many states and regions, is written in antiquated language; therefore, it is difficult to find software maintenance staff
- Data entry error reports are difficult to use, requiring development of additional tools for their users to ensure corrections are made (Error code database, Edit/Update Summary Reports)
- Existing standard reports (3, 7, 17, 18, 19 ,20, 24, 32a, 32b, 32c, 35, LCR, list screens) are inefficient in that they take long time to run, principally because they were converted from FRDS-II system, a less expensive alternative, rather than re-written with the SDWIS/FED data structure in mind
- Users must perform ad hoc retrievals from complicated data structure. This results in only the most knowledgeable and technically proficient users being able to perform their own queries
- There are 3 courses just for data retrievals, one for SNC/Exception Tracking System, one for Data Entry Troubleshooting and a new one for data entry. The difficult ad hoc retrieval system neccesitates 2 3-day training classes
- SDWIS/FED does not formally take advantage of newer communications/platform capabilities (Web browser), software capabilities such as COTS (ACCESS, EXCEL), nor report-writing tools (Cold Fusion, Crystal Reports)
- Current data dictionary design is based the upon incorrect assumption that all information needed for inclusion would be contained in a Central Encyclopedia. As a result, it is difficult and more expensive than necessary and awkward to maintain, and many data element definitions need to be improved.
- Data submission allows flexibility for reporting, requiring complex software. As a result, development, maintenance and enhancements are complex and expensive to perform, document and train users.

SDWIS/ONE Recommendations: Three Independent Approaches

1 - Organizational and management

- Include EPA and contractor IT professionals in rule and guidance development.
- Participate in the development of emerging EPA data standards.
- Merge the Federal and State components of SDWIS (SDWIS/FED and SDWIS/STATE) into a single project.
  - reduce administrative costs; assure better system consistency
- Streamline data entry software.
  - simplify data entry - more prescriptive approach
  - eliminate “total replace” function?
  - eliminate or reduce multiple methods for reporting same data
  - provide one set of permitted values
  - simplify data entry logic (e.g., eliminate need for c413 - seller id)
- Modernize production control, system user support, and User Documentation.
  - manual production control processes can be automated
  - automated user documentation increased and - made available on website
- Reduce redundant documentation.
  - have in a single media

2 - General system recommendations

- Move the edits, updates, and other processing that occurs when State data are posted to SDWIS/FED from the mainframe computer at the National Computer Center (NCC) to a server at a third party.
- Move the SDWIS/FED and SDWIS/STATE Central Encyclopedias (CE) from the mainframe at NCC to a server at a third party.
- Synchronize releases of SDWIS/FED and SDWIS/STATE (to an annual release)

3 - Medium to long term system development options

- Option 1—Modify the SDWIS/FED Data Structure
  - Remove extraneous tables and attributes from the SDWIS/FED data structure.
  - Synchronize the SDWIS/FED and SDWIS/STATE models where appropriate.

- Option 2—Merge SDWIS/FED and SDWIS/STATE Logical and Physical Data Models.
  - Combine the models into a single, comprehensive structure.
  - Use the existing Migration to SDWIS/STATE application as the basis for Migration to SDWIS/ONE, a comprehensive data validation and transfer program that updates both the SDWIS/ONE central database and SDWIS/ONE STATE instances of the database.
  - Replace the SDWIS/FED application Data Transfer Format Writer (DTF WRITER) with a web-based application that moves data into a more flexible format accepted by the SDWIS/ONE central database.
  - Position SDWIS/ONE for compliance with the Central Data Exchange component of the proposed National Environmental Information Exchange Network.

- Option 3—Comprehensive Redesign
  - the complete redevelopment of the SDWIS applications using an OO methodology

4 - Development would take approximately 18 months, with 6 months of parallel processing

D. IMPROVING DATA QUALITY

- **What steps should EPA take to improve data quality?**

OGWDW prepared a Data Reliability Analysis which included a plan for working with states to improve the quality of data in SDWIS-FED. The greatest problem in data quality is the under reporting of data to SDWIS-FED for violations and enforcement actions. OGWDW and the Association of State Drinking Water Administrators (ASDWA) are working together to set priorities for implementing the plan. Additionally, OGWDW has created a task group to obtain the complete set of latitude/longitude data for intakes and well fields of public water systems. This will to allow more comprehensive use of the drinking water data for national questions that have spatial considerations.

OGWDW's Infrastructure Branch created a data analysis team to routinely evaluate the data and ensure its use within the program. One recent related action was providing ad hoc query capabilities of SDWIS-FED data directly through OGWDW's web site. This allows drinking water data users to formulate their own queries and examine the data for their purposes.

OGWDW is also participating in Agency processes to encourage use of data reporting standards across information systems and programs through a common set of data elements. This action will enable programs to share data across systems and improve the usefulness of existing and future data, utilizing information systems funding more efficiently.

The following options are highly recommended and supported by earlier Stakeholder activities and Agency initiatives. (1) Continue data reliability recommendations and actions summarized in a report titled DATA Reliability Analysis of the EPA Safe Drinking Water Information System/Federal Version (SDWIS/FED) (EPA 816-R-00-020), September 2000; (2) continue to work with EPA's Office of Environmental Information to review the extent of compliance with Agency data standards to improve data quality and sharing. Specifically, continue to register data elements in the Data Registry and revise the data verification protocol to address current inventory requirements and electronic storage approaches; and (3) Reduce or eliminate flexibility in reporting options that contribute to varying interpretations of regulatory requirements and lead to under reporting.

Possible future platform for OGWDW data systems

Currently EPA is predominately a NOVELL shop – most of our LANs run on Novell software. Last September, Oracle Corporation issued a statement that it would start to phase out its support for Novell. EPA does use some Microsoft NT servers for applications but not for file servers. If an application needs to use a file server (i.e., when data is submitted to EPA and written directly to a file server) and Oracle does not support Novell in future releases, how will this effect our system?

SDWIS/STATE's network versions are NT and Novell. If SDWIS/FED adopts SDWIS/STATE as-is, two options are using NT and Novell. EPA supports the mainframe platforms, Novell, Unix, and some NT.

Option 1: Create a UNIX version of SDWIS/STATE. This would avert potential problems caused by the instability of NT networks (compared to UNIX), and the lack of support for NT servers. Developing a Unix system would also help many states that may also need to switch from Novell networks to run their Oracle applications.

Option 2: Encourage EPA central services to increase support for NT servers. Within the next 12 months, OGWDW will move from directly controlling it's LAN (i.e. servers) to the EPA shared services. The EPA IT Road Map and the Network Blueprint still do not allow for easy use of NT file servers. We would need to either push for NT file servers be included in the Network Blueprint (may be security issues) or purchase these products on our own through working capital or other contract vehicle.

Also, if SDWIS/FED adopts SDWIS/STATE it may chose one of three database platforms - Oracle, SQL/SERVER, or DB2. SDWIS/FED is currently a DB2 database on the mainframe. Recently on the SDWIS/STATE project we have learned many truths concerning migrating data between these three database platforms. Most problems tend to occur when moving data to DB2.

Platform	Use at EPA	Security	Strengths
Oracle	Original SDWIS/STATE platform. Long-term track record in the database industry	Strong security features	Applications may be ported to many platforms.
SQL/Server	No long-term track record at EPA	Questionable security; new version is said to have security improvements	Strong in the OLAP world
DB2	SDWIS/STATE just created a DB2 version.		Used primarily for large amounts of data; known as a "transaction" database.

E. DATA ACCESS

- **How should EPA improve retrieval and dissemination of data contained in SDWIS/FED?**

Option 1: Create a data warehouse as our primary means of the retrieval and dissemination of SDWIS/FED data. Data warehouse technology is improving at a tremendous rate. Properly designed data warehouses directly incorporate user needs in an iterative process to provide the users with the tools they need to use the information easily, quickly and effectively. Thus, users will not be faced with difficult data structures for ad hoc retrievals. New, more integrated structures would be developed in the data warehouse, designed to meet specific retrieval needs. Further, warehouses could more easily incorporate the newer data analysis tools of On Line Analytical Processing (OLAP).

Option 2: Continue the current SDWIS/FED retrieval system. The current system is composed of a set of canned reports, and an ad hoc reporting capability. The canned reports are expensive to develop. The ad hoc reporting capabilities are terribly complex because their use requires detailed knowledge of traversing highly normalized relational databases. In fact, there are 3 separate SDWIS/FED training classes for use of these capabilities. Only a limited number of highly trained and technical staff have the capability to effectively perform ad hoc retrievals on the existing system. By staying with the this system, this condition will continue to exist. Appendix I provides summaries of drinking water data warehousing results and processes.

Benefits of Data Warehousing

On-Line Analytical Processing (OLAP) tools are multidimensional databases (MDBs) that enable users to quickly summarize, cross-tabulate, and analyze large amounts of data. Users can pivot, or rotate, rows and columns to see different summaries of the source data, filter the data, and drill-down to the details in the underlying source data.

Meeting current needs more easily and economically:
(Numbers are estimates – input is welcome.)

Activity	**Savings**
• Yearly summary inventory, compliance and GPRA statistics can be updated in two days, with improved data quality, for free. Saves tens of thousands of dollars in working capital funds and hundreds of hours of personnel time. A report that used to take 8.5 months is printed in one week.	$30K/year*2
• Trends Report	80K
• Data pulls	20K/yr*2
• Statistical analysis for data quality report	100K
• continued verification of data verification findings	20K/yr
• Analysis of Surface Water Treatment Rule reporting	30K
• Decrease in Working Capital for EPA mainframe data retrievals	80K/yr*2

Enhanced capabilities

• Build a number of SDWIS/FED data retrieval products at no cost	150K
• NCOD front-end	200K
	$840K

In addition to cost savings:

- OGWDW is able to conduct additional data quality analyses
- OGWDW is "closer to" the data and need not rely on contractors to retrieve it
- OGWGW website allows users to retrieve data themselves, without relying on an IT expert
- Higher data quality -- OGWDW is using data more than ever and able to identify and correct data quality problems. Quality of summary statistics increased from roughly 70 to 100 percent.
- Continual innovation and refining of products, adding new products to meet user needs.

Future benefits

- Modernization allows OGWDW to do more work in-house and to improve direction of contractors.
- Warehousing approach will help OGWDW unify data systems at the retrieval end.

- **How should public access to drinking water data be improved?**

As noted previously, OGWDW has provided on-line capability to conduct ad hoc queries of SDWIS-FED data from the OGWDW web site. Similar capability will be provided for contaminant occurrence data in the National Contaminant Occurrence Database. OGWDW will continue to consider options for enhancing public access to its data, including capability to do online ad hoc queries.

- **What does OGWDW need to do to ensure accessibility of electronic information and computer systems for people with disabilities, in compliance with Section 508 of the Rehabilitation Act Amendments of 1998?**

The Access Board is an independent Federal agency devoted to accessibility for people with disabilities. On December 21, 2000, the Board issued accessibility standards for electronic and information technology under section 508 of the Rehabilitation Act, as amended. The Board also develops and maintains accessibility guidelines for the built environment, transit vehicles, and telecommunications equipment under other laws and enforces design standards for federally funded facilities. See Appendix F, "Questions and Answers About Section 508 of the Rehabilitation Act Amendments of 1998."

F. SYSTEM ECONOMICS

- **What steps should EPA take to make OGWDW information systems more economically efficient?**

OGWDW recently conducted two reviews of its information systems for compliance data. Controlling costs are important alone; however, OGWDW is concerned that it be able to respond to gaps in data for major programs in source water protection and underground injection control, for which no national information systems exist to conduct national policy analysis. One option is to reduce costs in existing information systems to provide for resources to support the unmet needs. The reviews indicated that:

1. OGWDW can take near-term steps to reduce costs by integrating certain components of SDWIS-FED and STATE
2. SDWIS-FED can be modernized at a near-term additional expense that provides a long-term savings that can be applied to (a) gaps in data for source water protection and UIC; (b) the analyses that OGWDW is now conducting and would need to do in the future for more effective program management; and (c) providing links to other data sets in EPA and with the states for national source water protection analyses and targeted special studies.
3. OGWDW will focus on linking to existing data sets for source water protection and UIC rather than the alternative of new information reporting processes to the maximum extent possible.
4. SDWIS-FED may move from its current platform to a third-party site to reduce operation and maintenance costs, depending on the direction of mainframe costs.
5. Using the same architecture for SDWIS-FED and STATE could also minimize future development costs for new rules.

PART V: ALTERNATE VISIONS OF FUTURE INFORMATION MANAGEMENT

Multiple visions of future information management in OGWDW are possible. (See attached figures.) These visions are driven by the principles derived from the Office of Water ISP Performance Assessment[2]:

A. Common functions should share information business systems.
B. Replicate storage of data should be minimized.
C. Common data element definitions will enhance data sharing.
D. Data should be stored in databases and retrieved and analyzed using separate state-of-the-art analytical software.
E. Data should be easily accessible for analysis.

With these principles in mind, at least four visions of OGWDW's information future can be described. These visions are depicted in Table 1. The first is an extension of the Safe Drinking Water Access and Retrieval System (SDWARS) for unregulated contaminants. In this vision, all users share a common electronic space for drinking water data, with access through EPA's Central Data Exchange. Such a vision potentially reduces transaction costs among senders and receivers of data, as well as reduces capital expenditures for equipment, especially for pubic water systems and State drinking water programs. Inventory data for public water systems could be updated directly by the PWS. Source water protection and underground injection control data could also be maintained in this electronic space. Data sharing agreements must be arranged between all levels of users to avoid conflicting actions being taken by different levels, thereby using information and actions stemming from them inefficiently. In this vision, all levels of users (e.g., local, state or federal governments) use the same basic data for all decisions, only using the data needed at the appropriate level for decisions at that level. Thus, one information system exists, rather than being replicated in every state or public water system. The information system could even be maintained by a separate third party agreed to by all principal participants in the system.

A second vision is the "post and exchange" or "come and get it" approach of the Environmental Council of the states.[3] This approach is consistent with the EPA "Blueprint for a National Environmental Information Exchange Network" (October 9, 2000).[4] In this vision, states place their PWSS, source water and UIC data in an electronic space outside their firewall, which the state maintains. EPA retrieves the data at the appropriate time. If all states used SDWIS/STATE or SDWIS/STATE-like systems - or all states used the same format for reporting, OGWDW retrieval could be reasonably smooth. A "UIC/STATE" software capability would need to be established. If States used different formats, this could be much more complicated, with unsuccessful data acquisition possible, and thus an increase in transaction costs. OGWDW could place the data in SDWIS/FED or in

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[2] U.S. Environmental Protection Agency, Office of Water. 2000. Information Strategy Plan Performance Assessment.

[3] Environmental Council of the States. 2000. E-commerce today - e-environmental protection tomorrow.

[4] Environmental Protection Agency. Office of Environmental Information. 2000. Blueprint for a National Environmental Information Exchange Network.

an EPA data warehouse through its Central Data Exchange. Under this vision, data could be replicated as many as five times, with transfers of data providing the potential for data errors. Two of these data replications could be within state programs, since each state would maintain data behind its firewall and outside its firewall in a separate electronic space within which the state and EPA would exchange drinking water data. Development and maintenance of these five or more replicates of these data suggest that collective resources for information management may not be efficient at a national level, but if concerns about use of data by different levels of users creates transaction rationale for holding data not to be used by other levels, the additional costs may be warranted. Trading partner agreements will be necessary to ensure that the data needed at each level is readily available to minimize transactions costs.

The third vision combines several features. In this vision, states would use SDWIS/STATE or at least SDWIS/STATE-like reporting formats. SDWIS/STATE becomes web-enabled, providing single entry of data to States directly from laboratories. A "UIC/STATE" software capability would also be developed and web-enabled. States submit the data over the Internet to EPA, as currently happens. EPA accepts the data through its Central Data Exchange, including security clearance. The data is stored in SDWIS-FED residing in the EPA data warehouse. Data users can query drinking water data along with data from other databases that have used common data elements for reporting. This vision minimizes burden for PWSs and States, especially in database capital investment, and makes a range of data at the national level available for various analyses, similar to the first vision.

A fourth vision is to continue the "status quo" and maintain the reporting process to SDWIS/FED and not consider other information needs. Under this vision, costs to maintain the database would continue to rise without any benefit of new technology. No effort would be taken to establish links to other databases to set up a source water protection national data set. Transaction costs are high at State and federal levels, since no changes would in the system that would improve its operation and acceptance of transmitted data. Modification costs for each new rule or other change would be high because of the high cost of making changes to old technology. SDWIS/FED could be part of data warehouse, such as envisioned in EPA's Network Blueprint, but would not be improved with technological advances.

The visions described above relate to systems built for the purpose of obtaining and storing data. Each includes a "data warehouse" approach to facilitate the retrieval and analysis of these data. The data warehouse is a separate system that periodically extracts data from OGWDW information systems and other data sources; transforms the data, organizing them by subject matter; and provides information in several forms including standards reports, On-Line Analytical Processing (OLAP) results, and GIS outputs. Users can easily retrieve, organize, and analyze data with little training. A warehousing approach also facilitates unifying data from several information sources, an interest of the Source Water Protection Program.

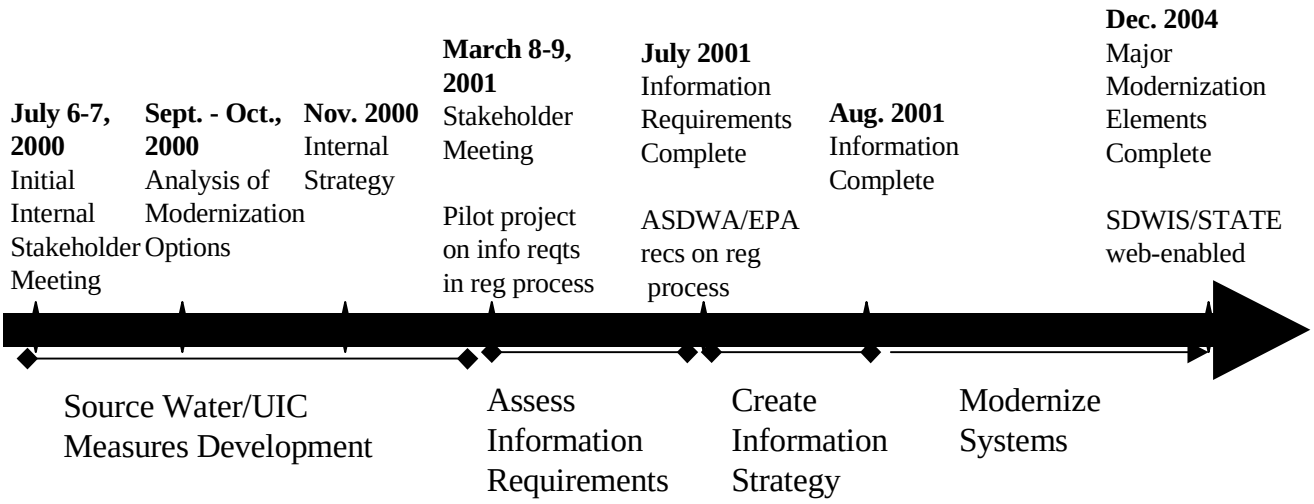
OGWDW seeks input from stakeholders on these visions of a future drinking water information system and the advantages and disadvantages of them and other system approaches.

Table 1. Comparison of Visions for Drinking Water Data

Vision	Description	Advantages	Disadvantages
Single Shared Electronic Space	- Labs report directly electronically - All users have access to all data - Users arrange data sharing agreements to specify each users role	- Lower overall costs - All decision makers use same data - Data quality likely to increase with more attention on same data	- Lack of data management at various levels of implementation
Post and Exchange	- EPA design to common template - States post data outside firewall at state-maintained site	Current management of data does not change	- Data duplication at each reporting level. May increase costs.
Specified SDWIS-STATE Format	- All states use SDWIS/STATE template - States send data to EPA site	- All states use the same template - Data quality improves	- Non-SDWIS/STATE states would need to modify systems.
Status Quo Using SDWIS-FED	- Continue using old software - SDWIS/FED on mainframe	- Data managers understand current process	- Costs continue to rise - Data submission may still be a challenge

VI. TIME LINE

The time line of strategy development and implementation below begins with the OGWDW Internal Stakeholder Meeting in July 2000 and progresses through SDWIS/STATE web enablement completion. OGWDW seeks stakeholder input on the relationship and timing of the activities on the time line.



VII. NEXT STEPS

The next steps outlined below describe major actions contemplated by OGWDW as one approach to its information processes and systems modernization. OGWDW seeks stakeholder input on these steps and options to them..

Near Term (6-18 months)

1 - Stakeholder Information Requirements

- Protection Branch / OECA for compliance/violations data
    - Prevention Branch for parametric (ambient) data and other data (states, etc.)
    - SRMD for parametric data
        - Management for routine tracking and reporting "up the chain"
        - SRMD for new rules
        - Public through stakeholder meetings

2 - Program Modernization

- Implement new information requirements process as part of the regulation development process
- Reach agreement with states to simplify multiple reporting options and therefore reduce complexity and cost

- Move SDWIS-FED off mainframe to reduce costs
- Change regulations, if necessary, to provide for parametric data reporting

3 - Integration of Information Systems

- Streamline SDWIS-FED and STATE to reduce costs in long term after near term investment
- Integrate NCOD, ICR, SDWARS and other national and regional sealed up systems to reduce costs
- Participate with OW on data element harmonization for all major systems to allow data sharing
- Web-enable SDWIS-STATE to allow states to more easily report data (at initial cost to EPA, but a long-term savings to both EPA and states)

4 - System User Support

- Maintain support for SDWIS-STATE and expand user support with more states
- Address early identification of specific PWS and state reporting requirements new rules
- Improve public access for ad hoc and PWS queries
- Update training for staff to allow in-house response to database changes in future

5 - Data Quality

- Continue to work with states to implement data reliability plan, including internal task group for obtaining updated facility inventory data
- Register data elements in EPA's Environmental Data Registry to facilitate data sharing

6 - Information Strategy Plan

- Complete revision of Information Strategy Plan after information requirements process is completed in Summer 2000

Intermediate Term (18mos. - 3 years)

- Obtain parametric data through new reporting or access process
- Link directly to other databases based on information requirements, especially for source water protection and UIC national program data needs

Long Term (3-5 years)

- Integrate systems based on function and business need
- Implement the EPA/OEI-ECOS data exchange network (SDWIS-FED data submission is very close to this network model)
- Receive all data using the Central Data Exchange (CDX) to ensure secure transmission

DRAFT SOURCE WATER PROTECTION MEASURES OF PROGRESS FEBRUARY 2001

Ultimate Goal of Source Water Contamination Prevention: Decreased public health risk by keeping contaminants *out of the sources* of drinking water.

Vision of the Source Water Program: For every public water supply, all interested stakeholders are involved in identifying and establishing barriers that significantly lower the risk of contaminants of concern entering drinking water resources.

Intended Outcome: Public Water Systems are at decreased risk from contamination due to management actions taken.

Measuring Progress Towards this Outcome

The measures presented in the accompanying chart try to show a tiered approach to looking at the progress of source water protection over time. For the first period of time, the highest level of expected completeness would be on "the foundation" Tier 1 pieces: source water assessments, UIC inventorying and ambient water quality standards. Tier 2 would be to focus on the relation of those foundation pieces to reducing the risks to existing drinking water sources. Tier 3 provides the basis for addressing potential threats to drinking water sources.

The intent **is not** to focus on any one tier at the exclusion of the others at a given moment in time. However, it is the expectation that the level of completeness would shift with time. For example in 2002, we would expect that Tier 1 would show much progress, but there would be less completeness in Tiers 2 and 3 three. It is understood that management actions will be taken and UIC management will be ongoing at the same time as necessary, but in the short term, these tiers would be less complete.

Finally, in the longer term, the ultimate measure of progress would be the results of re-examining the susceptibility of water systems and determining if management actions were having any impact on the degree of risk posed to the system, as well as looking at the trends in ambient water quality.
This Tier 4 would be further in the future. However, if the actions are not taking place as described in Tiers 2 and 3 two and three, then it will be difficult see changes in susceptibility and water quality as related to preventative management actions.

Source Water Contamination Prevention: Measures of Progress, February 2001 Draft

Tier One: Are the state and tribal source water assessments and UIC Inventories getting completed and what is their quality? Are the CWA Water Quality Standards in Place to Support SWP?					
National Locational Data Layer of the source water protection areas	# of State and Tribal source water assessments completed (delineations, inventories, susceptibility, made available to public)	50-state and tribe Analysis of source water assessment quality	Locate Class IV wells and gather lat/long for Class I-III	Increase # of inventoried class V Wells	# of States with water quality standards and designated uses ***protective of source water***
Tier Two: What is the extent of risks to source waters?					
% of source waters ***of most concern*** to states and tribes	Reporting of the most prevalent potential contaminant sources *of concern* identified in source water protection areas		Conduct analysis of Class I-III wells in SWPAs and other high priority areas	Conduct analysis of class V wells in SWPAs and other high priority areas	Ambient Source Water Quality Monitoring Baseline
Tier Three: How are Drinking Water Supplies being protected?					
# of local management actions taken to protect source waters (including wellhead protection plans/SWP plans implemented)	# of source water policies adopted by other state programs (and # of national policies adopted by federal programs)	Analysis of SSA MOUs and actions by federal agencies that have led to wider GW protections	# of Class IV wells closed. Maintain low risk of contamination from Class I-III wells (see detailed chart)	Reduce risk from inventoried class V wells through ***adequate management*** (see detailed chart)	# of existing drinking water supply source water reaches with ***adequate water quality standards*** in place

Longest Term Tier Four: Are Source Water Contamination Prevention Actions Making a Difference to Public Health Protection?	
# of water systems with lower susceptibility due to combinations of management actions (incl. Sub-set of UIC actions)	Trends in ambient source water quality

DRAFT SUMMARY CHART
Specifics to the UIC "Maintaining Adequate Management"

Are Source Water Contamination Prevention Measures Making A Difference to Public Health?			
1. Maintain low risk of contamination to USDWs from Class I – III injection wells through adequate management		**2. Maintain low risk of contamination to USDWs from Class IV wells**	**3. Reduce risk of contamination from currently inventoried Class V wells through adequate management, and from non-inventoried Class V wells by locating them and then adequately managing them**
Tier Three	1.2 Percentage of Class I – III wells properly permitted and/or ruled authorized 1.3 Percentage of Class I hazardous waste wells with approved no-migration petitions 1.4 Percentage (# ?) of Class I – III wells that pass MIT & is witnessed by regulatory authorities 1.5 # of properly abandoned wells in the AOR of Class I – III wells 1.6 # of injection wells in hydrocarbon/mineral bearing aquifers **[Enforcement and Compliance (???)]** 1.7 # Class I – III wells addressed by enforcement & returned to compliance (includes SNC data) 1.8 # of civil & criminal actions against Class I – III wells 1.9 # of administrative orders issued by States/Tribes/DI Programs to Class I -- III wells o/o (includes SNC) 1.10 # of contamination investigations linked to Class I -- III wells	2.2 Close all Class IV wells after location	3.3 # of large capacity cesspools closed 3.4 # of MVWDW wells closed and/or permitted in GWPAs & other sensitive areas 3.5 # of field inspections of Class V wells in SWPAs & other high-priority areas of States and Tribal lands **[Enforcement and Compliance (???)**] 3.6 # Class V wells addressed by enforcement & returned to compliance (includes SNC data) 3.7 # of civil & criminal actions against Class V well o/o 3.8 # of administrative orders issued by States/Tribes/DI Programs to Class V o/o (includes SNC) 3.9 # of contamination investigations linked to Class V wells

PRELIMINARY - Do not cite or quote

Table 1
Unregulated Contaminant Monitoring Reporting Requirements

Data Element	***Definition***
1. Public Water System (PWS) Identification Number	The code used to identify each PWS. The code begins with the standard two-character postal State abbreviation; the remaining seven characters are unique to each PWS.
2. Public Water System Facility Identification Number - Sampling Point Identification Number and Sampling Point Type Identification	The Sampling point identification number and sampling point type identification must either be static or traceable to previous numbers and type identifications throughout the period of unregulated contaminant monitoring. The Sampling point identification number is a three-part alphanumeric designation, made up of: a. The Public Water System Facility Identification Number is an identification number established by the State, or at the State's discretion the PWS, that is unique to the PWS for an intake for each source of water, a treatment plant, a distribution system, or any other facility associated with water treatment or delivery and provides for the relationship of facilities to each other to be maintained; b. The Sampling Point Identification Number is an identification number established by the State, or at the State's discretion the PWS, that is unique to each PWS facility that identifies the specific sampling point and allows the relationship of the sampling point to other facilities to be maintained; and c. Sampling Point Type Identification is one of following: SR - Untreated water collected at the source of the water system facility. EP - Entry point to the distribution system. MD - midpoint in the distribution system where the chlorine residual would be expected to be typical for the system such as the location for sampling coliform indicator bacteria as described in 40 CFR 141.21. MR - point of maximum retention is the point located the furthest from the entry point to the distribution system which is approved by the State for trihalomethane (THM) (disinfectant byproducts (DBP)) and/or total coliform sampling. LD - location in the distribution system where the disinfectant residual is the lowest which is approved by the State for THM (DBP) and/or total coliform sampling.
3. Sample Collection Date	The date the sample is collected reported as 4-digit year, 2-digit month, and 2-digit day.
4. Sample Identification Number	An alphanumeric value of up to 15 characters assigned by the laboratory to uniquely identify containers or groups of containers containing water samples collected at the same time and sampling point.
5. Contaminant/Parameter	The unregulated contaminant or water quality parameter for which the sample is being analyzed.

6. Analytical Results - Sign	An alphanumeric value indicating whether the sample analysis result was: a. (<) “less than” means the contaminant was not detected or was detected at a level “less than” the MRL. b. (=) “equal to” means the contaminant was detected at a level “equal to” the value reported in “Analytical Result - Value.”
7. Analytical Result - Value	The actual numeric value of the analysis for chemical and microbiological results, or the minimum reporting level (MRL) if the analytical result is less than the contaminant’s MRL
8. Analytical Result - Unit of Measure	The unit of measurement for the analytical results reported. [e.g., micrograms per liter, (Fg/L); colony-forming units per milliliter, (CFU/mL), etc.]
9. Analytical Method Number	The identification number of the analytical method used.
10. Sample Analysis Type	The type of sample collected. Permitted values include: a. RFS - Raw field sample - untreated sample collected and submitted for analysis under this rule. b. RDS - Raw duplicate field sample - untreated field sample duplicate collected at the same time and place as the raw field sample and submitted for analysis under this rule. c. TFS - Treated field sample - treated sample collected and submitted for analysis under this rule. d. TDS - Treated duplicate field sample - treated field sample duplicate collected at the same time and place as the treated field sample and submitted for analysis under this rule.
11. Sample Batch Identification Number	The sample batch identification number consists of three parts: a. Up to a 10-character laboratory identification code assigned by EPA; b. Up to a 15-character code assigned by the laboratory to uniquely identify each extraction or analysis batch. c. The date that the samples contained in each extraction batch extracted or in an analysis batch were analyzed, reported as an 8-digit number in the form 4-digit year, 2-digit month, and 2-digit day.
12. Minimum Reporting Level	Minimum Reporting Level (MRL) refers to the lowest concentration of an analyte that may be reported. Unregulated contaminant monitoring (UCM) MRLs are established in §141.40 monitoring requirements for unregulated contaminants.
13. Minimum Reporting Level Unit of Measure	The unit of measure to express the concentration, count, or other value of a contaminant level for the Minimum Reporting Level reported. (e.g., Fg/L, colony forming units/mL (CFU/mL), etc.).

14. Analytical Precision	Precision is the degree of agreement between two repeated measurements and is monitored through the use of duplicate spiked samples. For purposes of the Unregulated Contaminant Monitoring Regulation (UCMR), Analytical Precision is defined as the relative percent difference (RPD) between spiked matrix duplicates. The RPD for the spiked matrix duplicates analyzed in the same batch of samples as the analytical result being reported is to be entered in this field. Precision is calculated as Relative Percent Difference (RPD) of spiked matrix duplicates from the mean using: RPD = absolute value of $[(X_1 - X_2) /(X_1 + X_2)/2] \times 100\%$ where: X_1 is the concentration observed in spiked field sample minus the concentration observed in unspiked field sample X_2 is the concentration observed in duplicate spiked field sample minus the concentration observed in unspiked field sample
15. Analytical Accuracy	Accuracy describes how close a result is to the true value measured through the use of spiked field samples. For purposes of unregulated contaminant monitoring, accuracy is defined as the percent recovery of the contaminant in the spiked matrix sample analyzed in the same analytical batch as the sample result being reported and calculated using: % recovery = [(amt. found in spiked sample - amt. found in sample) / amt. spiked] x 100%
16. Spiking Concentration	The concentration of method analytes added to a sample to be analyzed for calculating analytical precision and accuracy where the value reported use the same unit of measure reported for Analytical Results
17. Presence/Absence	Reserved

SDWIS/FED DTF Attributes

DTF NUMBER	*ATTRIBUTE NAME*	*DEFINITION*
C101	PWS-ID	A unique value used to identify a PWS
C105	PWS-TYPE	Describes the type of water system, i.e., CWS, TNCWS, NTNCWS, NP
C107	PWS-ACTIVITY-FLAG	A value that categorizes the activity of the water system
C1101	VIO-ID	Code used to identify the violation incurred by a PWS
C1103	VIO-CONTAMINANT	Contaminant for which a PWS incurred a violation
C1105	VIO-TYPE	The type of violation, i.e. MCL, M/R, TT
C1107	VIO-COMP-PERIOD-BEGIN-DATE	The beginning data of a monitoring period in which a PWS was in violation
C1109	VIO-COMP-PERIOD-END-DATE	The end date of a monitoring period in which a PWS was in violation
C1111	VIO-COMP-PERIOD-MONTHS	Duration of compliance period in Months
C1115	VIO-AWARE-DATE	Date state became aware of a PWS violation
C1123	VIO-ANALYSIS-RESULT	Analytical result(s) that caused the MCL violation
C1125	VIO-MCL-VIOLATED	The maximum contaminant level which was exceeded that led to the issuance of an MCL violation
C1127	VIO-SAMPLES-REQUIRED	The number of samples that were required to be collected, analyzed and reported by a PWS for a specific monitoring period
C1129	VIO-SAMPLES-TAKEN	The number of samples that were actually collected, analyzed and reported by a PWS for a specific monitoring period
C113	PWS-DEACT-YYYYMM	Year and month the system was deactivated
C1131	VIO-MAJOR-VIOLATION-FLAG	A code that indicates the severity of an M&R violation, major or minor
C1143	VIO-SE-ID	Source/entity ID at which the violation was incurred
C117	PWS-RETAIL-POP-SERVED	The estimated average daily population count for a given type of population served
C1201	ENF-ID	Code used to uniquely identify a specific enforcement action
C1203	ENF-ACTION-DATE	Date on which enforcement action was taken
C1205	ENF-FOLLOW-UP-ACTION	Code used to represent an enforcement action taken by the State, EPA Region, or EPA headquarters

DTF NUMBER	ATTRIBUTE NAME	DEFINITION
C121	PWS-PCT-SURFACE	Annual percentage of water from non-purchased, permanently available surface water sources
C1215	ENF-COMMENT	Description or attribute applicable to the associated enforcement action
C123	PWS-PCT-GROUND	Annual percentage of water from non-purchased, permanently available ground water sources
C125	PWS-PCT-PUR-SURFACE	Annual percentage of water from purchased, permanently available surface water sources
C127	PWS-PCT-PUR-GROUND	Annual percentage of water obtained from purchased, permanently available ground water sources
C1281	ENF-LINK-VIO-ID	ID that represents a specific violation that is related to unique enforcement action
C1283	ENF-LINK-RANGE-BEGIN	Start period covered by violation(s) which are associated w/ enforcement action
C1285	ENF-LINK-RANGE-END	End of monitoring period Covered by violation(s) which are associated w/ enforcement action
C1287	ENF-LINK-PERIOD-BEGIN	Start of monitoring period in which a violation that is related to the enforcement action was incurred
C1289	ENF-LINK-VIO-TYPE	Violation type that is related to the enforcement action
C1291	ENF-LINK-CONTAMINANT	Contaminant ID for a violation that is related to the enforcement action
C131	PWS-SYSTEM-NAME	The formal, legal, or common name used most generally referring to the PWS
C132	PWS-SYSTEM-RESPONSIBLE PARTY - NAME	The name of a legal entity associated with a water system
C133	PWS-SYSTEM-ADDR-LINE-1	The first line of an address applicable to a legal entity
C135	PWS-SYSTEM-ADDR-LINE-2	Address data for the primary facility location of the PWS
C137	PWS-SYSTEM-CITY	City name of the primary facility location of the PWS
C139	PWS-SYSTEM-STATE	State abbreviation of the primary facility location of the PWS
C141	PWS-SYSTEM-ZIP	Zip Code +4 of the primary facility location of the PWS
C143	PWS-TEL-NUM	Telephone number of the PWS
C147	PWS-SERVICE- CONNECTIONS	Number of retail service connections for a PWS
C149	PWS-AVG-DAILY-PROD	The average daily gallons of water produced by a PWS

DTF NUMBER	ATTRIBUTE NAME	DEFINITION
C151	PWS-DESIGN-CAP	The total gallons per day of water a PWS was designed and approved to produce
C153	PWS-EMERGENCY-PROD	The gallons per day of water that can be produced by a PWS using emergency power generation under its control
C155	PWS-STORAGE-CAP	Number of gallons of water that can be stored by a PWS
C159	PWS-NON-COMM-SE-BEGIN	The month and day a NC or NTNC water system's season of operation normally begins
C161	PWS-NON-COMM-SE-END	The month and day a NC or NTNC water system's season of operation normally ends
C163	PWS-OWNER-TYPE	The type of owner of a PWS
C2101	SAMPLE-ID	Code used to uniquely identify a specific sampling occurrence
C2103	SAMPLE-BEGIN-DATE	The first day of the monitoring period in which sample data was acquired
C2105	SAMPLE-END-DATE	The last day of the monitoring period in which sample data was acquired
C2107	SAMPLE-CONTAMINANT	Code indicating the contaminant for which sample data has been reported
C2109	SAMPLE-RESULT-SIGN	Code indicating whether a result was below the method detection limit or detected
C2111	SAMPLE-ANALYSIS- RESULT	Value representing the results obtained from a samples analysis
C2112	SAMPLE-RESULT-UM	Units of measurement for the analytical result
C2113	SAMPLE-ANALYSIS- METHOD	EPA method used to analyze the sample
C2115	SAMPLE-SOURCE-TYPE	The source type represented by the sample
C2119	SAMPLE-SE-ID	Unique ID for each sampling point
C2125	SAMPLE-QTY-COMPOSITED	Number of sampling sites included in composite sample
C2137	SAMPLE-TYPE	The water type represented by the sample
C2139	SAMPLE-RECONCIL-ID	Comment field for Primacy Agencies to store information that uniquely identifies a sample
C3001	VE-ID	Code used to uniquely identify a specific variance, exemption, or other event related to a PWS
C3003	VE-CONTAMINANT	Code used to denote the contaminant for which a variance, exemption, or other event has been granted

DTF NUMBER	*ATTRIBUTE NAME*	*DEFINITION*
C3005	VE-RECORD-TYPE	Code indicating whether the variance exemption data record is a variance, exemption, or other event
C3007	VE-EFFECTIVE-DATE	Date on which variance, exemption, or other event has or will become effective
C3009	VE-EXPIRATION-DATE	Date on which variance, exemption, or other event has or will expire
C301	PWS- AD-ID	Unique code identifying an owner address, treatment facility address or other address related to the PWS
C3011	VE-STATUS-CODE	Code used to denote current status of variance, exemption, or other event
C3013	VE-MODIFIED-MCL	Value used to represent a modified MCL that has been approved as a condition of a variance or exemption
C3015	VE-TREAT-PROCESS	Code representing the treatment process
C3017	VE-ALT-PROCESS	Indicates whether an alternative treatment process has been approved as a condition of a V/E
C3019	VE-REASON-CODE	Code representing the reason for which a variance, exemption, or other event is being granted to a PWS
C3027	VE-VULNER-FLAG	Code indicating (Y)es or (N)o, the associated source-entity is vulnerable for contaminant specified
C3029	VE-ALT-MON-FREQUENCY	Number of months representing an alternative monitoring frequency for the given contaminant
C303	PWS-AD-TYPE	The type of addressee or facility of a PWS
C3031	VE-SE-ID	Code uniquely identifying a specific source of water utilized by, or an entity associated with V/E or other related data
C305	PWS-AD-NAME	The name of a legal entity associated with a PWS
C307	PWS-AD-ADDR-LINE-1	First line of an address applicable to a PWS adressee or facility
C309	PWS-AD-ADDR-LINE-2	Second line of an address applicable to a treatment plant
C3101	VE-SCHEDULE-ID	Code uniquely identifying a specific V/E schedule related to the variance, exemption or other event
C3103	VE-ACTION	Code representing an event or action to be taken by relating to a variance, exemption or other event
C3105	VE-SCHEDULE-DATE	Calendar date on which a schedule event or action relating to V/E record is or was scheduled to occur
C3107	VE-ACCOM-DATE	Calendar date on which a schedule event or action relating to a V/E record was accomplished, if completed

DTF NUMBER	ATTRIBUTE NAME	DEFINITION
C311	PWS-AD-CITY	The city in which a treatment plant is located
C313	PWS-AD-STATE	The state abbreviation in which a treatment plant is located
C315	PWS-AD-ZIP	The zip code in which a treatment plant is located
C355	PWS-SE-TREATMENT-AD-NAME	The name of a treatment plant
C356	PWS-AD-ADDR-LINE-1	First line of an address applicable to a PWS adressee or facility
C357	PWS-AD-ADDR-LINE-2	Second line of an address applicable to a treatment plant
C358	PWS-AD-CITY	The city in which a treatment plant is located
C359	PWS-AD-STATE	The state abbreviation in which a treatment plant is located
C360	PWS-AD-ZIP	The zip code in which a treatment plant is located
C401	PWS-SE-ID	Code which uniquely identifies the water system facility or source of water
C403	PWS-SE-NAME	Water system facility name or water source
C405	PWS-SE-RECORD-TYPE	Code which categorizes the water facility or source
C407	PWS-SE-WATER-TYPE-CODE	Code that represents the source of water or facility type
C409	PWS-SE-AVAILABILITY	The circumstances under which a source of water or facility is utilized by a PWS
C411	PWS-SE-SELLER ID	Seller's PWS ID
C415	PWS-SE-LATITUDE (as degrees, minutes, and seconds)	Degrees, minutes and seconds of Latitude for the location of the entity being reported
C417	PWS-SE-LONGITUDE (as degrees, minutes, and seconds	Degrees, minutes and seconds of Longitude for the location of the entity being recorded
C418	PWS-SE-MERIDIAN-NAME	The name of a North-South line used to locate a specific township
C419	PWS-SE-TOWNSHIP	The location of a township in relationship to a known base line
C421	PWS-SE-RANGE	A number representing a range in relationship to a known principle Meridian
C423	PWS-SE-SECTION	Numerical value representing one of 36 sections of a township
C425	PWS-SE-QTR-SECTION	A code representing a particular quadrant of a section
C426	PWS-QUARTER-QUA-SEC	A code representing one of four quadrants of a particular quadrant section.

DTF NUMBER	ATTRIBUTE NAME	DEFINITION
C427	PWS-RIVER-REACH	The hydrologic unit code and the segment number for the location of the source or entity being reported
C429	PWS-ON-REACH	Value representing whether a source of water is on or off a defined river reach
C431	PWS-REACH-MILES	The distance of a surface intake in relationship to the downstream end of the river reach
C433	PWS-SOURCE-TRE-CODE	Code specifying whether or not a source facility is being treated
C435	PWS-SE-SELLER-TREATED	Code representing whether or not the seller of a purchased source is treating the source
C441	LATITUDE (as a decimal number)	Latitude entered in decimal degrees for the location of the entity being reported
C443	LONGITUDE (as a decimal number)	Longitude entered in decimal degrees for the location of the entity being reported
C445	METHOD OF COLLECTION	The method used to determine the Lat/Long coordinates of the water system facility
C447	ACCURACY VALUE AND UNIT	The amount of deviation from the value in a measurement for Lat/Long
C449	DESCRIPTION CATEGORY	The feature referenced by the Lat/Long coordinates or the water system facility
C451	HORIZONTAL DATUM	The horizontal control datum for the Lat/Long coordinates of the water system facility
C453	SOURCE SCALE	The scale of map used to determine the Lat/Long of the water system facility
C455	POINT LINE AREA	Code indicating whether the Lat/Long of the water system facility represent a point, multiple points or an area
C457	DATE OF COLLECTION	Date when the Lat/Long coordinates of the water system facility were determined
C459	SOURCE	Responsible party code for collecting, or providing the Lat/Long coordinates of the water system facility
C461	DESCRIPTION COMMENTS	A text field relating to the location or vertical measure of the water system facility
C463	VERIFICATION	Code indicating the process by which the Lat/Long coordinates of the water system facility have been verified
C465	VERTICAL MEASURE	Vertical distance from the vertical datum to the land surface or other measuring point
C467	VERTICAL MEASURE METHOD OF COLLECTION	The method used to determine the vertical measure of the water system facility

DTF NUMBER	ATTRIBUTE NAME	DEFINITION
C469	VERTICAL MEASURE ACCURACY	Quantitative measure of the amount of deviation from true value in the vertical measure (estimate of error)
C471	VERTICAL DATUM	Code representing the vertical control datum for the vertical measure of the water system facility
C481	PWS-SE-TREATMENT-ID	Unique value representing a treatment record for a source of
C483	PWS-SE-TREATMENT-OBJECTIVE 5	Identifies specific objective to be obtain through treatment
C485	PWS-SE- TREATMENT-PROCESS	Identifies the specific treatment process used at a source or plant
C487	PWS-SE-TREATMENT-INNOVATIVE-FLAG	Code identifying whether a treatment objective and process is innovative
C489	PWS-INNOVATIVE-TREATMENT-DESCRIPTION	A text field describing an innovative treatment process
C501	PWS-GA-ID	Code uniquely identifying a specific geographic area served
C503	PWS-ADMIN-REGION	Code representing the state administrative region being served by a PWS
C505	PWS-ADMIN-DISTRICT	Code representing the state administrative district being served by a PWS
C507	PWS-FED-CON-DISTRICT	Code representing the federal congressional district being served by a PWS
C508	PWS-STATE-COUNTY	A state county code representing the county being served by the PWS
C509	PWS-GA-FIPS-COUNTY-CODE	FIPS county code, representing the county being served by the PWS
C513	PWS-GA-CITY-SERVED	Name of the city, community or jurisdiction being served by the PWS
C515	PWS-INDIAN-RES	Code representing the Indian reservation or Alaska remote village being served by a PWS
C601	PWS-SERV-ID	A code uniquely identifying a specific service area
C603	PWS-SERV-CATEGORY	Code characterizing the type of area serviced by the PWS
C605	PWS-SERV-PRIMARY-FLAG	Primary, most prevalent type of area served by the PWS
C701	PWS-VISIT-ID	A code used to uniquely identify a specific on-site visit made to a PWS
C703	PWS-VISIT-DATE	Calendar date on which a visit was made to a PWS
C705	PWS-VISIT-REASON	Code representing the reason a visit was made to a PWS

DTF NUMBER	*ATTRIBUTE NAME*	*DEFINITION*
C801	PWS-MILESTONE-ID	Code used to uniquely identify a specific milestone
C803	PWS-MILESTONE-DATE	Date associated with the milestone occurrence
C805	PWS-MILESTONE-CODE	Code that represents a specific milestone occurrence
C813	PWS-MILESTONE-COMMENT	Commentary use/field uesd by State or EPA region
C815	PWS-MILESTONE-VALUE	The Copper Level Exceedance or Lead Service Line Replacement rates
C817	PWS-MILESTONE-REASON	Reason code for DEEM and DONE milestones

SDWIS/FED DTF Attributes
Being Analyzed for Reporting Reduction

DTFNUM *C105*

ATTRIBUTE NAME *PWS-TYPE*

DEFINITION *Describes the type of water system, i.e., CWS, TNCWS, NTNCWS, NP*

DATA ELEMENT NAME	***TableName***
D_PWS_ST_TYPE_CD	TINWSYS
TYPE_CODE	TINPOPSV

DTFNUM *C107*

ATTRIBUTE NAME *PWS-ACTIVITY-FLAG*

DEFINITION *A value that categorizes the activity of the water system*

DATA ELEMENT NAME	***TableName***
ACTIVITY_STATUS_CD	TINWSF

DTFNUM *C117*

ATTRIBUTE NAME *PWS-RETAIL-POP-SERVED*

DEFINITION *The estimated average daily population count for a given type of population served*

DATA ELEMENT NAME	***TableName***
AVG_DAILY_CNT	TINPOPSV

DTFNUM *C121*

ATTRIBUTE NAME *PWS-PCT-SURFACE*

DEFINITION *Annual percentage of water from non-purchased, permanently available surface water sources*

DATA ELEMENT NAME	***TableName***
SURF_WTR_RATIO	TINWSYS

DTFNUM *C123*

ATTRIBUTE NAME *PWS-PCT-GROUND*

DEFINITION *Annual percentage of water from non-purchased, permanently available ground water sources*

DATA ELEMENT NAME	***TableName***

GRND_WTR_RATIO	TINWSYS

DTFNUM *C125*

ATTRIBUTE NAME *PWS-PCT-PUR-SURFACE*

DEFINITION *Annual percentage of water from purchased, permanently available surface water sources*

DATA ELEMENT NAME	***TableName***
SURF_WTR_PUR_RATIO	TINWSYS

DTFNUM *C127*

ATTRIBUTE NAME *PWS-PCT-PUR-GROUND*

DEFINITION *Annual percentage of water obtained from purchased, permanently available ground water sources*

DATA ELEMENT NAME	***TableName***
GRND_WTR_PUR_RATIO	TINWSYS

DTFNUM *C149*

ATTRIBUTE NAME *PWS-AVG-DAILY-PROD*

DEFINITION *The average daily gallons of water produced by a PWS*

DATA ELEMENT NAME	***TableName***
AVG_DAILY_PROD_MSR	TINWSYS

DTFNUM *C151*

ATTRIBUTE NAME *PWS-DESIGN-CAP*

DEFINITION *The total gallons per day of water a PWS was designed and approved to produce*

DATA ELEMENT NAME	***TableName***
TOTAL_DSGN_CAP_MSR	TINWSYS

DTFNUM *C153*

ATTRIBUTE NAME *PWS-EMERGENCY-PROD*

DEFINITION *The gallons per day of water that can be produced by a PWS using emergency power generation under its control*

DATA ELEMENT NAME	***TableName***
TTL_EMERG_CAP_MSR	TINWSYS

DTFNUM *C155*

ATTRIBUTE NAME *PWS-STORAGE-CAP*

DEFINITION *Number of gallons of water that can be stored by a PWS*

DATA ELEMENT NAME	***TableName***
D_TTL_STOR_CAP_MSR	TINWSYS

DTFNUM *C3001*

ATTRIBUTE NAME *VE-ID*

DEFINITION *Code used to uniquely identify a specific variance, exemption, or other event related to a PWS*

DATA ELEMENT NAME	***TableName***
D_GEN_ID_SRC_CD	TFRDEVIA
FED_FISCAL_YR_NUM	TFRDEVIA
ST_ASGN_IDENT_NUM	TFRDEVIA

DTFNUM *C3005*

ATTRIBUTE NAME *VE-RECORD-TYPE*

DEFINITION *Code indicating whether the variance exemption data record is a variance, exemption, or other event*

DATA ELEMENT NAME	***TableName***
TYPE_CODE	TFRDEVIA

DTFNUM *C3007*

ATTRIBUTE NAME *VE-EFFECTIVE-DATE*

DEFINITION *Date on which variance, exemption, or other event has or will become effective*

DATA ELEMENT NAME	***TableName***
EFFECTIVE_DATE	TFRDEVIA

DTFNUM *C3009*

ATTRIBUTE NAME *VE-EXPIRATION-DATE*

DEFINITION *Date on which variance, exemption, or other event has or will expire*

DATA ELEMENT NAME	***TableName***
EXPIRATION_DATE	TFRDEVIA

DTFNUM *C3011*

ATTRIBUTE NAME *VE-STATUS-CODE*

DEFINITION *Code used to denote current status of variance, exemption, or other*

DATA ELEMENT NAME	***TableName***
STATUS_CODE	TFRDEVIA

DTFNUM *C3013*

ATTRIBUTE NAME *VE-MODIFIED-MCL*

DEFINITION *Value used to represent a modified MCL that has been approved as a condition of a variance or exemption*

DATA ELEMENT NAME	***TableName***
MODIFIED_MCL_MSR	TFRDEVIA

DTFNUM *C3019*

ATTRIBUTE NAME *VE-REASON-CODE*

DEFINITION *Code representing the reason for which a variance, exemption, or other event is being granted to a PWS*

DATA ELEMENT NAME	***TableName***
REASON_CODE	TFRDEVIA

DTFNUM *C3029*

ATTRIBUTE NAME *VE-ALT-MON-FREQUENCY*

DEFINITION *Number of months representing an alternative monitoring frequency for the given contaminant*

DATA ELEMENT NAME	***TableName***
ALT_MONITORING_RT	TFRDEVIA

DTFNUM *C3101*

ATTRIBUTE NAME *VE-SCHEDULE-ID*

DEFINITION *Code uniquely identifying a specific V/E schedule related to the variance, exemption or other event*

DATA ELEMENT NAME	***TableName***
ST_ASGN_IDENT_NUM	TFRDSCHD

DTFNUM *C3103*

ATTRIBUTE NAME *VE-ACTION*

DEFINITION *Code representing an event or action to be taken by relating to a variance, exemption or other event*

DATA ELEMENT NAME	***TableName***
ACTION_CODE	TFRDSCHD

DTFNUM *C3105*

ATTRIBUTE NAME *VE-SCHEDULE-DATE*

DEFINITION *Calendar date on which a schedule event or action relating to V/E record is or was scheduled to occur*

DATA ELEMENT NAME	***TableName***
PLANNED_DATE	TFRDSCHD

DTFNUM *C3107*

ATTRIBUTE NAME *VE-ACCOM-DATE*

DEFINITION *Calendar date on which a schedule event or action relating to a V/E record was accomplished, if completed*

DATA ELEMENT NAME	***TableName***
ACTUAL_DATE	TFRDSCHD

DTFNUM *C409*

ATTRIBUTE NAME *PWS-SE-AVAILABILITY*

DEFINITION *The circumstances under which a source of water or facility is utilized by a PWS*

DATA ELEMENT NAME	***TableName***
AVAILABILITY_CODE	TINWSF

DTFNUM *C427*

ATTRIBUTE NAME *PWS-RIVER-REACH*

DEFINITION *The hydrologic unit code and the segment number for the location of the source or entity being reported*

DATA ELEMENT NAME	***TableName***
USGS_HYDRO_UNIT_CD	TINWSF

DTFNUM *C429*

ATTRIBUTE NAME *PWS-ON-REACH*

DEFINITION *Value representing whether a source of water is on or off a defined river reach*

DATA ELEMENT NAME	***TableName***
ON_RVR_RCH_IND_CD	TINWSF

DTFNUM *C431*

ATTRIBUTE NAME *PWS-REACH-MILES*

DEFINITION *The distance of a surface intake in relationship to the downstream end of the river reach*

DATA ELEMENT NAME	***TableName***
RVR_RCH_MILES_QTY	TINWSF

DTFNUM *C483*

ATTRIBUTE NAME *PWS-SE-TREATMENT-OBJECTIVE 5*

DEFINITION *Identifies specific objective to be obtain through treatment*

DATA ELEMENT NAME	***TableName***
TYPE_CODE	TFRDEVIA

DTFNUM *C485*

ATTRIBUTE NAME *PWS-SE- TREATMENT-PROCESS*

DEFINITION *Identifies the specific treatment process used at a source or plant*

DATA ELEMENT NAME	***TableName***
TYPE_CODE	TFRDEVIA

DTFNUM *C513*

ATTRIBUTE NAME *PWS-GA-CITY-SERVED*

DEFINITION *Name of the city, community or jurisdiction being served by the PWS*

DATA ELEMENT NAME	***TableName***
FIPS_CODE	TINGEOAR

Proposed Draft Guiding Principles for
Information Requirements in the Rule Development Process

The ASDWA/EPA Data Management Steering Committee is developing a proposal for criteria that EPA could consider in the development of information requirements for new rules. An early draft of these principles includes the following concepts for these criteria:

1. Focus on essential data at local, State and Federal levels for public health protection;
2. Not all data needs to be reported at all levels;
3. Include data management representatives and consider information requirements early in the rule process;
4. Describe reporting burden in sufficient detail;
5. Have rule managers be accountable for making sure that reporting requirements and burden are adequately considered and clearly defined;
6. Be consistent across rules to reduce overlap of reporting;
7. Keep an outcome-based focus during the rule development process.
8. Improve communication throughout the development process with states to better determine the impact the changes will have on data management.
9. Standardize data elements and definitions, including Significant Non-Compliance (SNC) and Return to Compliance (RTC)
10. Improve the process for determining the start date for monitoring and reporting for more effective and efficient implementation, such as: consolidate all dates for monitoring and reporting to a single date each year.
11. Incorporate reporting timetables into the standard monitoring framework of 3/6/9 years, where applicable, to reduce “scattered” deadlines.
12. Evaluate or understand how other programs in the Agency may be using or gathering data that could be used to meet drinking water data needs.
13. Recognize shifts in information technology that could benefit system development, maintenance and use.

The Need for Single, Unique Data Identifiers

EPA does not have a policy concerning the reporting of Facility Identification Numbers and associated data, except that they be updated annually. Therefore, the agency cannot consistently and confidently identify facilities over time. Therefore, users cannot reliably refer to "points of interest" within Public Water Systems (PWSs) in SDWIS/FED, EPA's drinking water compliance database of record.

EPA and its repository of PWS information, SDWIS\FED, has almost totally depended on primacy agencies to provide information on the inventory of PWSs under their purview. The SDWA requires primacy agencies to provide the EPA with updates to their inventory or PWSs on an annual basis. Most primacy agencies comply with this requirement, some providing this information more frequently. A small percentage of states update EPA less frequently. PWSs are uniquely identified by a 9 character PWS Identification Numbers (PWS-IDs) assigned by primacy agencies. Generally, they have been assigned under a range of numbering conventions and reqorting with varying frequencies. In cases where primacy agencies needed to re-number one or more PWSs, the primacy agencies have typically provided EPA with a table identifying old PWS-IDs and new PWS-IDs. While not perfect, this informal process has worked sufficiently well to preclude most problems relating to PWS Identification. However, the process allows considerable variety and inconsistency from state to state.

The PWS inventory information that states are required to report includes both general characteristics of PWSs (e.g., Retail Population Served, PWS type, Active or Inactive) as well a significant amount of data describing the points of interest within a PWS of concern to US EPA. These points of interest include all sources of water for the PWS, all treatment plants associated with a PWS, all places where sampling occurs in support of EPA studies. Points of interest are generally referred to as "PWS-Facilities" and generally can be described as having some spatial characteristic and must be reported according to US EPA's Locational Data Policy. PWS-Facilities are uniquely identified within a PWS by a PWS Facility Identification Number. These numbers **may** be assigned by either the primacy agency or by EPA.

Since no EPA policy has existed concerning the reporting of Facility Identification Numbers EPA cannot consistently and confidently identify facilities over time. Contributing to this problem are, at a minimum, the following:

1. EPA will "generate" a PWS Facility Identification Number if the primacy agency instructs EPA to do so.
2. EPA will "generate" a Treatment Plant for a source of water and a PWS Facility Identification Number for that treatment plant if the primacy agency instructs EPA to do so.
3. EPA's maximum length for a PWS Facility Identification Number is 5 numbers, and this is frequently of insufficient length (e.g., the primacy agency assigns a longer PWS Facility Identification Number because the longer ID number meets primacy agency requirements, however, a shorter number, 5 digits, is assigned when the data is reported to the US EPA).
4. Since no policy exists, primacy agencies may re-number their facilities at states' discretion.
5. In its production database (SDWIS\FED) does not keep track of previously reported facilities.
6. Data related to PWS facilities, and gathered by organizations other than the primacy agency, cannot be consistently and reliably associated with the facilities in SDWIS\FED.

What are options for long- and short-term solutions? Note that short-term options must be attainable in a reasonably short time, enforceable, and consistently usable while minimizing burden and cost. Also, short-term solutions may be constrained by limitations in SDWIS/FED design and/or current data transfer metheds, but long-term solutions would not.

FY2000 IB SDWIS/FED Factoids

FY2000 Inventory data

Active, current systems, from SDWIS/FED 00Q4 frozen inventory table

System size

by population served

		Very Small 500 or less	Small 501-3,300	Medium 3,301-10,000	Large 10,001-100,000	Very Large >100,000	Total
CWS	# systems	31,688	14,149	4,458	3,416	353	54,064
	Pop. served	5,148,696	19,931,399	25,854,061	96,709,145	116,282,810	263,926,111
	% of systems	59%	26%	8%	6%	1%	100%
	% of pop	2%	8%	10%	37%	44%	100%
NTNCWS	# systems	17,598	2,839	96	23	3	20,559
	Pop. served	2,440,352	2,795,510	480,243	620,719	579,937	6,916,761
	% of systems	86%	14%	0%	0%	0%	100%
	% of pop	35%	40%	7%	9%	8%	100%
TNCWS	# systems	90,391	2,632	130	54	3	93,210
	Pop. served	7,521,276	2,617,526	731,889	1,329,043	735,001	12,934,735
	% of systems	97%	3%	0%	0%	0%	100%
	% of pop	58%	20%	6%	10%	6%	100%
	Total # systems	139,677	19,620	4,684	3,493	359	167,833

CWS Community Water System
NTNCWS Non-Transient Non-Community Water System
TNCWS Transient Non-Community Water System

System source

Type		Ground Water	Surface Water	Totals
CWS	# systems	42,661	11,403	54,064
	Pop. served	85,868,456	178,057,655	263,926,111
	% of systems	79%	21%	100%
	% of pop	33%	67%	100%
NTNCWS	# systems	19,738	821	20,559
	Pop. served	5,984,416	932,345	6,916,761
	% of systems	96%	4%	100%
	% of pop	87%	13%	100%
TNCWS	# systems	91,298	1,912	93,210
	Pop. served	12,017,370	917,365	12,934,735
	% of systems	98%	2%	100%
	% of pop	93%	7%	100%
	Total # systems	153,697	14,136	167,833
		103,870,242	179,907,365	

Ground water systems = ground water (GW), purchased ground water (GWP)
Surface water systems = surface water (SW), purchased surface water (SWP),
ground water under the direct influence of surface water (GU),
purchased ground water under the direct influence of surface water (GUP).

SDWIS/FED 00Q4 tables are "frozen" in early January 2001

Additional drinking water data tables are available at the website listed below

FY2000 data--by State

Active, current systems, from SDWIS/FED 00Q4 frozen inventory table
Health-based (TT & MCL) violations, from 00Q4 frozen violations table

Key: **# systems**
Pop served

	CWS	NTNCWS	TNCWS	Total	Ground	Surface	CWSs w/ reported health-based violations	
AK	442	208	995	1,645	1,395	250	77	17%
	445,954	45,579	105,725	597,258	294,842	302,416	62,040	14%
AL	575	38	89	702	455	247	21	4%
	4,934,311	25,090	8,500	4,967,901	1,455,370	3,512,531	120,996	2%
AR	726	114	359	1,199	850	349	104	14%
	2,258,368	12,597	17,789	2,288,754	909,925	1,378,829	179,370	8%
AZ	799	216	672	1,687	1,573	114	68	9%
	4,356,171	149,965	158,447	4,664,583	1,491,970	3,172,613	387,396	9%
CA	3,283	1,290	3,573	8,146	7,030	1,116	181	6%
	34,084,987	584,333	1,111,711	35,781,031	9,386,226	26,394,805	1,939,618	6%
CO	830	166	1,105	2,101	1,636	465	43	5%
	3,835,139	54,404	221,455	4,110,998	564,841	3,546,157	375,303	10%
CT	599	627	2,479	3,705	3,636	69	67	11%
	2,648,571	125,787	80,540	2,854,898	508,833	2,346,065	53,286	2%
DC	2			2		2		0%
	595,000			595,000		595,000		0%
DE	240	96	215	551	546	5	18	8%
	605,342	24,192	53,476	683,010	225,785	457,225	101,907	17%
FL	2,009	1,083	3,515	6,607	6,545	62	83	4%
	15,655,773	285,318	297,517	16,238,608	14,009,538	2,229,070	568,565	4%
GA	1,673	276	623	2,572	2,361	211	52	3%
	6,560,186	79,736	116,078	6,756,000	1,639,424	5,116,576	62,308	1%
HI	121	14	6	141	122	19	8	7%
	1,262,878	7,307	2,450	1,272,635	1,183,658	88,977	68,494	5%
IA	1,153	167	612	1,932	1,776	156	64	6%
	2,575,716	46,942	80,213	2,702,871	1,448,927	1,253,944	126,386	5%
ID	747	258	1,075	2,080	1,991	89	114	15%
	907,653	55,155	125,908	1,088,716	832,503	256,213	155,469	17%
IL	1,801	438	3,562	5,801	5,118	683	258	14%
	10,947,281	157,030	395,476	11,499,787	3,252,037	8,247,750	1,032,236	9%
IN	916	759	3,162	4,837	4,715	122	124	14%
	4,119,623	492,393	364,396	4,976,412	2,705,505	2,270,907	301,173	7%
KS	917	35	127	1,079	748	331	93	10%
	2,418,352	14,364	14,287	2,447,003	773,298	1,673,705	121,863	5%
KY	467	89	156	712	322	390	18	4%
	4,294,353	31,569	11,494	4,337,416	329,847	4,007,569	131,715	3%
LA	1,207	213	400	1,820	1,737	83	108	9%
	5,162,586	82,274	95,925	5,340,785	3,267,000	2,073,785	321,738	6%
MA	513	224	891	1,628	1,446	182	125	24%
	8,640,236	70,774	160,019	8,871,029	2,017,089	6,853,940	4,997,224	58%
MD	511	572	2,732	3,815	3,738	77	35	7%
	4,614,127	160,236	141,310	4,915,673	818,033	4,097,640	60,854	1%
ME	399	455	1,249	2,103	2,027	76	86	22%
	611,531	72,718	203,762	888,011	469,260	418,751	215,096	35%
MI	1,472	1,826	9,052	12,350	12,047	303	89	6%
	7,044,085	504,705	1,108,745	8,657,535	3,328,383	5,329,152	114,019	2%
MN	953	646	6,753	8,352	8,239	113	24	3%
	3,798,571	100,705	393,760	4,293,036	2,878,930	1,414,106	33,252	1%
MO	1,439	235	1,027	2,701	2,454	247	133	9%
	4,715,214	79,873	149,546	4,944,633	1,796,583	3,148,050	88,592	2%
MS	1,228	117	140	1,485	1,477	8	51	4%
	2,876,508	87,810	26,393	2,990,711	2,880,102	110,609	257,681	9%

FY2000 data--by State, cont.

Active, current systems, from SDWIS/FED 00Q4 frozen inventory table
Health-based (TT & MCL) violations, from 00Q4 frozen violations table

Key: **# systems**
Pop served

	CWS	NTNCWS	TNCWS	Total	Ground	Surface	CWSs w/ reported health-based violations	
MT	645	225	1,153	2,023	1,801	222	45	7%
	2,716,262	44,769	165,756	2,926,787	2,064,878	861,909	103,982	4%
NC	2,374	658	4,479	7,511	6,955	556	166	7%
	5,794,107	193,761	412,002	6,399,870	1,942,355	4,457,515	188,836	3%
ND	321	29	200	550	469	81	31	10%
	555,123	3,958	17,152	576,233	222,900	353,333	22,058	4%
NE	619	178	532	1,329	1,300	29	197	32%
	1,392,476	43,190	66,639	1,502,305	946,096	556,209	267,605	19%
NH	674	446	1,036	2,156	2,102	54	125	19%
	766,072	88,587	207,906	1,062,565	567,170	495,395	59,799	8%
NJ	602	940	2,737	4,279	4,182	97	41	7%
	7,678,147	279,033	351,179	8,308,359	3,028,425	5,279,934	1,172,024	15%
NM	616	155	503	1,274	1,222	52	85	14%
	1,489,113	34,508	208,412	1,732,033	1,523,385	208,648	96,959	7%
NV	292	100	283	675	614	61	17	6%
	1,579,690	40,380	59,527	1,679,597	271,798	1,407,799	19,579	1%
NY	2,868	761	7,001	10,630	9,554	1,076	63	2%
	17,690,198	358,726	856,655	18,905,579	5,488,212	13,417,367	2,076,220	12%
OH	1,429	1,106	3,404	5,939	5,595	344	33	2%
	10,142,141	275,606	543,094	10,960,841	4,128,314	6,832,527	83,733	1%
OK	1,171	123	438	1,732	1,016	716	44	4%
	3,434,926	18,645	43,495	3,497,066	714,820	2,782,246	195,553	6%
OR	884	331	1,430	2,645	2,361	284	177	20%
	3,095,044	69,529	220,176	3,384,749	905,085	2,479,664	186,658	6%
PA	2,200	1,266	6,923	10,389	9,825	564	105	5%
	10,518,120	509,453	864,529	11,892,102	2,870,279	9,021,823	417,400	4%
RI	83	71	325	479	454	25	6	7%
	950,151	24,566	53,135	1,027,852	203,572	824,280	60,118	6%
SC	692	221	614	1,527	1,282	245	81	12%
	3,303,073	75,407	55,421	3,433,901	785,769	2,648,132	751,300	23%
SD	474	30	214	718	584	134	45	9%
	631,186	3,924	36,049	671,159	288,745	382,414	15,012	2%
TN	633	60	480	1,173	719	454	29	5%
	5,082,640	30,592	54,130	5,167,362	1,388,694	3,778,668	142,167	3%
TX	4,574	862	1,429	6,865	5,700	1,165	182	4%
	20,920,423	339,537	288,783	21,548,743	7,253,194	14,295,549	439,618	2%
UT	430	64	459	953	847	106	41	10%
	2,471,221	47,314	82,361	2,600,896	960,145	1,640,751	148,073	6%
VA	1,326	623	1,827	3,776	3,416	360	188	14%
	6,496,739	285,368	944,111	7,726,218	1,616,680	6,109,538	122,363	2%
VT	438	215	694	1,347	1,214	133	56	13%
	502,741	39,473	716,196	1,258,410	747,583	510,827	35,640	7%
WA	2,300	316	1,595	4,211	3,923	288	272	12%
	5,060,995	263,654	301,376	5,626,025	2,708,630	2,917,395	1,240,497	25%
WI	1,140	1,020	9,564	11,724	11,679	45	96	8%
	3,645,732	210,193	725,062	4,580,987	2,919,649	1,661,338	551,949	15%
WV	583	196	635	1,414	1,036	378	37	6%
	1,810,721	101,298	42,424	1,954,443	340,038	1,614,405	103,956	6%
WY	272	86	378	736	621	115	15	6%
	410,396	16,240	75,279	501,915	182,251	319,664	13,317	3%
	52,662	20,244	92,902	165,808	152,455	13,353	4,221	
	258,105,953	6,748,567	12,835,771		102,536,576	175,153,715	20,390,997	

FY2000 data--Tribal systems

Active, current systems, from SDWIS/FED 00Q4 frozen inventory table
Health-based (TT & MCL) violations, from 00Q4 frozen violations table

Key: **# systems** / **Pop served**

Region	CWS	NTNCWS	TNCWS	Total	Ground	Surface	CWSs w/ reported health-based violations	
01	1	2	3	6	6			0%
	120	60	670	850	850			0%
02	4		1	5	4	1		0%
	2,929		300	3,229	1,229	2,000		0%
04	14	3	23	40	37	3		0%
	15,893	1,225	3,360	20,478	15,957	4,521		0%
05	80	34	11	125	123	2	7	9%
	34,762	28,762	646	64,170	63,681	489	417	1%
06	41	8	20	69	67	2	14	34%
	63,536	966	1,329	65,831	57,305	8,526	24,768	39%
07	9		4	13	12	1	2	22%
	6,173		525	6,698	6,200	498	3,298	53%
08	107	9	1	117	100	17	10	9%
	66,660	4,511	26	71,197	50,609	20,588	4,493	7%
09	406	21	71	498	462	36	11	3%
	222,190	10,557	65,184	297,931	259,853	38,078	5,428	2%
10	86	13	5	104	99	5	11	13%
	24,586	4,525	485	29,596	25,340	4,256	3,866	16%
	748	90	139	977	910	67	55	
	436,849	50,606	72,525		481,024	78,956	42,270	

FY2000 data--Commonwealths and Territories

Active, current systems, from SDWIS/FED 00Q4 frozen inventory table
Health-based (TT & MCL) violations, from 00Q4 frozen violations table

Key: **# systems** / **Pop served**

	CWS	NTNCWS	TNCWS	Total	Ground	Surface	CWSs w/ reported health-based violations	
Amer. Samoa	22			22	12	10	14	64%
	52,458			52,458	49,618	2,840	6,045	12%
Guam	10	2		12	8	4		0%
	109,070	770		109,840	20,990	88,850		0%
N. Marianas Islands	30	6	7	43	43			0%
	50,769	3,039	620	54,428	54,428			0%
Puerto Rico	438	46	6	490	263	227	313	71%
	5,059,931	38,836	2,215	5,100,982	722,633	4,378,349	4,197,044	83%
Palau	16	2		18	2	16		0%
	12,060	1,163		13,223	400	12,823		0%
Virgin Islands	138	169	156	463	4	459	9	7%
	99,021	73,780	23,604	196,405	4,573	191,832	1,009	1%
	654	225	169	1,048	332	716	336	
	5,383,309	117,588	26,439		852,642	4,674,694	4,204,098	

GPRA

% of population served by CWSs without any reported health-based violations

Nationally

2000	91%
1999	91%
1998	89%
1997	87%
1996	86%
1995	84%
1994	83%
1993	79%

By region

	I	II	III	IV	V	VI	VII	VIII	IX	X
2000	62%	76%	97%	95%	95%	96%	95%	94%	94%	83%
1999	75%	61%	98%	95%	95%	95%	95%	94%	97%	94%
1998	64%	60%	97%	95%	95%	95%	94%	93%	95%	89%
1997	62%	55%	97%	93%	92%	93%	95%	91%	95%	74%
1996	60%	53%	92%	93%	92%	94%	95%	92%	91%	74%
1995	57%	52%	91%	92%	92%	89%	95%	90%	88%	75%
1994	57%	55%	87%	90%	88%	87%	94%	91%	90%	87%
1993	60%	56%	85%	90%	77%	92%	93%	92%	69%	85%
	CT	NJ	DE	AL	IL	AR	IA	CO	AZ	AK
	ME	NY	DC	FL	IN	LA	KS	MT	CA	ID
	MA	PR	MD	GA	MI	NM	MO	ND	HI	OR
	NH	VI	PA	KY	MN	OK	NE	SD	NV	WA
	RI		VA	MS	OH	TX		UT	AS	
	VT		WV	NC	WI			WY	GU	
				SC					MP	
				TN					PW	

Health-based violations include Maximum Contaminant Level (MCL) and Treatment Technique (TT) violations.
Population data are based on active, current water systems
For FY2000, population and violation data are from SDWIS/FED 00Q4 frozen tables.
For FY1999, population and violation data are from SDWIS/FED 99Q4 frozen tables.
For FY1998, population and violation data are from SDWIS/FED 98Q4 frozen tables.
For FY1997 and earlier, population and violation data are from SDWIS/FED 98Q1 frozen tables.

CWS violations reported

by FY

FY2000 data from SDWIS/FED 00Q4 frozen tables, except for Chem M/Rs which will be from 01Q1

FY1999 data from SDWIS/FED 99Q4 frozen tables, except for Chem M/Rs which are from 00Q1

FY1998 data from SDWIS/FED 98Q4 frozen tables, except for Chem M/Rs which are from 99Q1

FY1997 and earlier data from SDWIS 98Q1 frozen tables

Number of violations

FY	MCL	TT	M/R	Other*	Total
2000	4,753	3,045		10,650	
1999	5,528	2,246	58,384	1,038	67,196
1998	6,340	2,520	54,440	1,614	64,914
1997	5,804	2,743	64,385	1,471	74,403
1996	7,391	3,078	121,253	1,151	132,873
1995	7,147	3,766	139,072	1,983	151,968

Number of systems in violation

FY	MCL	TT	M/R	Other*	Total **
2000	3,160	1,677		8,948	
1999	3,321	1,057	9,447	627	12,151
1998	3,746	1,105	10,002	899	13,024
1997	3,721	1,109	10,949	860	14,016
1996	4,411	1,329	13,039	738	16,418
1995	4,652	1,795	14,584	959	18,230

Population affected

FY	MCL	TT	M/R	Other*	Total **
2000	11,946,983	15,391,464		13,882,763	
1999	11,079,343	15,854,722	19,868,126	2,529,718	38,161,938
1998	10,393,015	18,485,545	28,313,863	2,369,301	48,945,871
1997	13,848,094	22,059,698	27,224,547	3,879,160	58,086,370
1996	16,040,225	22,683,315	32,529,745	4,671,792	63,686,726
1995	23,547,689	26,409,050	40,672,345	8,707,791	73,201,326

by system size

Number of violations

	MCL	TT	M/R	Other	Total
Very small	3,046	1,604		7,973	
Small	1,122	850		1,996	
Medium	318	249		447	
Large	251	294		219	
Very large	16	48		15	

Number of systems in violation

	MCL	TT	M/R	Other	Total **
Very small	2,001	944		6,592	
Small	710	435		1,738	
Medium	251	124		412	
Large	186	152		193	
Very large	12	22		13	

Population affected

	MCL	TT	M/R	Other	Total **
Very small	324,588	161,408		949,875	
Small	999,776	600,020		2,309,815	
Medium	1,574,032	740,753		2,350,790	
Large	4,449,100	4,790,097		4,693,943	
Very large	4,599,487	9,099,186		3,578,340	

* Jump in FY2000 due to new violations for failing to issue, or issuing an insufficient, Consumer Confidence report

****** Totals for the number of systems in violation, and for population affected, should be lower than the sum in each row. This is because some systems will have incurred more than one type of violation.

NTNCWS violations reported

FY2000 data from SDWIS/FED 00Q4 frozen tables, except for Chem M/Rs, which will be from 01Q1
FY1999 data from SDWIS/FED 99Q4 frozen tables, except for Chem M/Rs which are from 00Q1
FY1998 data from SDWIS/FED 98Q4 frozen tables, except for Chem M/Rs which are from 99Q1
FY1997 and earlier data from SDWIS/FED 98Q1 frozen tables

Number of violations

FY	MCL	TT	M/R	Other	Total
2000	1,245	837		201	
1999	1,349	225	25,796	120	27,490
1998	1,322	165	26,043	255	27,785
1997	1,349	202	28,249	159	29,959
1996	1,792	405	53,345	189	55,731
1995	1,672	659	54,543	255	57,129

Number of systems in violation

FY	MCL	TT	M/R	Other	Total *
2000	924	580		162	
1999	958	178	3,629	88	4,398
1998	945	103	3,942	157	4,672
1997	985	98	4,623	105	5,355
1996	1,281	252	6,066	134	6,945
1995	1,244	416	6,275	166	7,272

Population affected

FY	MCL	TT	M/R	Other	Total *
2000	276,448	217,596		36,519	
1999	292,367	53,500	848,516	34,947	1,112,853
1998	232,755	23,963	994,786	47,772	1,187,783
1997	280,021	32,041	1,241,807	33,877	1,483,754
1996	380,187	93,138	1,435,181	30,201	1,736,465
1995	392,311	150,148	1,684,183	49,236	2,010,395

TNCWS violations reported

Number of violations

FY	MCL	TT	M/R	Other	Total
2000	4,407	314		908	
1999	4,956	226	36,266	752	42,200
1998	5,201	284	28,116	2,159	35,760
1997	5,408	379	32,581	1,794	40,162
1996	5,934	564	55,420	1,810	63,728
1995	4,879	492	48,843	2,082	56,296

Number of systems in violation

FY	MCL	TT	M/R	Other	Total *
2000	3,634	182		652	
1999	3,876	140	19,694	498	22,233
1998	3,799	90	15,997	1,115	18,771
1997	4,070	128	17,497	975	20,532
1996	4,539	150	25,614	1,064	28,520
1995	3,857	153	25,075	1,161	27,689

Population affected

FY	MCL	TT	M/R	Other	Total *
2000	507,741	46,201		78,494	
1999	646,469	42,582	2,217,212	63,264	2,706,984
1998	481,642	58,801	2,102,061	143,464	2,458,001
1997	539,292	62,557	2,230,009	128,471	2,651,801
1996	625,342	48,098	3,411,919	115,250	3,731,987
1995	671,739	65,295	3,219,663	128,290	3,622,946

***** Totals for the number of systems in violation, and for population affected, should be lower than the sum in each row. This is because some systems will have incurred more than one type of violation.

FY2000 MCL and TT violations reported

From SDWIS/FED 00Q4 frozen violations table

Key: **# violations**
 # systems
Pop. affected

	Very small 25-500	Small 501-3,300	Medium 3,301-10,000	Large 10,001-100,000	Very Large >100,000	Total
	Applies to all water systems					
TCR/T	7,481	1,066	284	197	11	9,039
	5,824	766	234	155	9	6,988
	640,751	1,008,878	1,480,350	3,712,812	3,726,152	10,568,943
Organics:	Applies to CWS and NTNCWS					
TTHM (VOC)	2	6		20		28
	2	3		10		15
	146	2,890		206,809		209,845
Other VOC	47	8	4	5	2	66
	28	8	3	4	1	44
	3,632	16,647	23,579	94,325	535,335	673,518
SOC	8	5		1	2	16
	5	4		1	1	11
	790	4,579		14,390	180,000	199,759
Inorganics:	Applies to CWS and NTNCWS					
Nitrates	624	157	13	9	1	804
	377	67	7	5	1	457
	44,431	87,287	30,444	142,829	158,000	462,991
Other IOC	67	15	8	2		92
	43	8	7	2		60
	8,615	10,549	35,924	42,058		97,146
	Applies to CWS					
Radionuclides	166	130	25	25		346
	89	72	18	16		195
	18,685	100,322	98,611	356,727		574,345
	Applies to surface water systems					
SWTR	1,236	588	180	197	33	2,234
	518	235	84	97	11	945
	91,012	328,257	508,909	3,163,152	6,729,982	10,821,312
	Applies to CWS and NTNCWS					
Lead & Copper	1,381	390	76	100	15	1,962
	1,078	320	51	84	15	1,548
	158,200	388,147	285,072	2,666,466	4,577,567	8,075,452

FY2000 M/R violations reported

From SDWIS/FED 00Q4 frozen violations table (except for Chem M/Rs)
Chem M/R data will be from SDWIS/FED 01Q1 frozen violations table (April 2001)

Key: **# violations**
 # systems
Pop. affected

	Very small 25-500	Small 501-3,300	Medium 3,301-10,000	Large 10,001-100,000	Very Large >100,000	Total
	Applies to all water systems					
TCR/T	33,842	2,661	458	220	20	37,201
	19,739	1,723	324	172	10	21,968
	1,991,992	2,127,499	1,868,571	4,965,205	3,556,204	14,509,471
Organics:	Applies to CWS and NTNCWS					
TTHM (VOC)						
Other VOC						
SOC						
Inorganics:	Applies to CWS and NTNCWS					
Nitrates						
Other IOC						
	Applies to CWS					
Radionuclides	33,842	2,661	458	220	20	37,201
	19,739	1,723	324	172	10	21,968
	1,991,992	2,127,499	1,868,571	4,965,205	3,556,204	14,509,471
	Applies to surface water systems					
SWTR	1,868	439	110	70	33	2,520
	445	144	50	40	11	690
	71,431	191,121	270,656	1,380,844	3,419,872	5,333,924
	Applies to CWS and NTNCWS					
Lead & Copper	11,281	1,794	414	272	25	13,786
	8,424	1,396	326	209	20	10,375
	1,099,127	1,692,760	1,857,371	6,448,697	4,796,504	15,894,459

Appendix G

Questions & Answers about Section 508 of the Rehabilitation Act Amendments of 1998

Source: The Access Board web site, http://www.access-board.gov/news/508-final.htm

1) What is Section 508?

Section 508 is a part of the Rehabilitation Act of 1973 which requires that electronic and information technology developed, procured, maintained, or used by the Federal government be accessible to people with disabilities. On August 7, 1998, the President signed into law the Workforce Investment Act of 1998, which includes the Rehabilitation Act Amendments of 1998. Section 508 was originally added to the Rehabilitation Act in 1986; the 1998 amendments significantly expand and strengthen the technology access requirements in Section 508.

2) How do these changes to Section 508 improve upon the earlier version?

The 1986 version of Section 508 established non-binding guidelines for technology accessibility, while the 1998 version creates binding, enforceable standards and will incorporate these standards into Federal procurement regulations. Federal agencies will use these standards in all their electronic and information technology acquisitions. Consistent government-wide standards will make it easier for Federal agencies to meet their existing obligations to make their technology systems accessible to people with disabilities, and will promote competition in the technology industry by clarifying the Federal market's requirement for accessibility in products intended for general use. The new version of Section 508 also establishes a complaint procedure and reporting requirements, which further strengthen the law.

3) To whom does Section 508 apply?

Section 508 applies to Federal departments and agencies.

4) Does Section 508 apply to the private sector?

No, it does not regulate the private sector and does not apply to recipients of Federal funds.

5) What does Section 508 require of Federal agencies and departments?

Section 508 requires that when Federal agencies develop, procure, maintain, or use electronic and information technology, they must ensure that it is accessible to people with disabilities, unless it would pose an undue burden to do so. Federal employees and members of the public who have disabilities must have access to and use of information and services that is comparable to the access and use available to non-disabled Federal employees and members of the public.

6) How will Federal agencies and departments know whether the electronic and information technology is accessible?

New standards have been established to help Federal agencies determine whether or not a technology product or system is accessible. Federal agencies must comply with these technology accessibility standards for all electronic and information technology acquired on or after six months from the date the Access Board issued

its final standards (December 21, 2000). Technology developed or acquired for a Federal agency by a contractor must also comply with the standards. If a Federal agency determines that it would pose an undue burden to comply with the standards, it must still provide information and data to individuals with disabilities through an alternative means of access that can be used by the individuals.

7) How will these technology accessibility standards be developed?

The Board was required to issue standards that define which electronic and information technology is covered by Section 508, and describe what is meant by `accessible technology' by setting forth the technical and functional performance criteria necessary to implement the accessibility requirements. The Board was required to consult with the Departments of Education, Commerce, and Defense, the General Services Administration, the Federal Communications Commission, the electronic and information technology industry, and disability organizations in developing its standards. The Access Board created an Electronic and Information Technology Access Advisory Committee (EITAAC) to advise it on the standards. The Committee's final report was delivered to the Board on May 11, 1999. On March 31, 2000, the Board published a Notice of Proposed Rulemaking based on the Committee's recommendations.

8) How will the standards be applied to federal procurement?

Six months after the Access Board published the final standards, the Federal Acquisition Regulatory Council is required to revise the Federal Acquisition Regulation and each Federal department or agency shall revise the Federal procurement policies and directives under their control to incorporate the standards. The Access Board will periodically review and update the standards as necessary.

9) What are Federal agencies required to do in the short term to comply with Section 508?

Agencies must evaluate their current electronic and information technology systems for accessibility to individuals with disabilities, and submit a report to the Attorney General containing the results of the evaluation.

10) What reporting requirements does Section 508 create?

The Attorney General must submit a report to the President on the extent to which the electronic and information technology of the Federal Government is accessible to individuals with disabilities. The Department of Justice issued its report April 19, 2000. In addition, every two years thereafter the Attorney General must report to the President and the Congress on Federal agency compliance with the requirements of the law, and on any actions on individual complaints.

11) Where can Federal agencies go for technical assistance?

The General Services Administration and the Access Board will provide technical assistance on the requirements of Section 508. Agencies and individuals may also seek information from the many public, non-profit, educational, or private institutions and organizations that specialize in making technology accessible to people with disabilities. These organizations, along with companies in the electronic and information technology industry, can assist agencies in identifying innovative technology or in developing accessible technology solutions.

12) Are there any exemptions to the technology accessibility standards?

A Federal agency does not have to comply with the technology accessibility standards if it would impose an undue burden to do so. This is consistent with language used in the Americans with Disabilities Act (ADA) and other civil rights legislation, where the term `undue burden' has been defined as "significant difficulty or expense." However, the agency must explain why meeting the standards would pose an undue burden for a given procurement action, and must still provide people with disabilities access to the information or data that is affected.

Section 508 contains a limited exemption for national security systems as defined by the Clinger-Cohen Act of 1996. These are systems used for military command, weaponry, intelligence, and cryptologic activities. The exemption does not apply to routine business and administrative systems used for other defense-related purposes or by defense agencies or personnel.

13) How will Section 508 be enforced?

Because the Section 508 standards will be incorporated into the Federal Acquisition Regulation (FAR), agencies' procurement of accessible technology will be subject to the same stringent compliance and enforcement mechanisms as other parts of the FAR.

There is an administrative complaint process which becomes effective six months after the Board issued its final standards. It enables any individual with a disability to file a complaint alleging that a Federal department or agency has not complied with the accessible technology standards in a procurement made after that date. The complaint process is the same as that used for Section 504 of the Rehabilitation Act, for complaints alleging discrimination on the basis of disability in Federally-conducted programs or activities. It provides injunctive relief and attorney's fees to the prevailing party, but does not include compensatory or punitive damages.

Individuals may also file a civil action against an agency.

14) What is meant by "electronic and information technology"?

The Access Board defined "electronic and information technology" consistent with the Clinger-Cohen Act of 1996. That Act defines "information technology" to include "any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information." It includes computer hardware, software, networks, and peripherals as well as many electronic and communications devices commonly used in offices.

15) Does Section 508 apply to Web sites of federal agencies?

Yes. Federal agencies which provide information to the public or to their employees through Web sites must ensure that such sites are available to all persons with Internet or Intranet access, including persons with disabilities.

16) Does this requirement also apply to commercial or private sector Web sites?

No. Section 508 does not apply to a private sector Web site unless such site is provided under contract to a covered entity. For example, a Federal agency might contract with a consulting firm to collect and analyze some demographic data and make that information available to the public on a Web site. In that case, the Web site or portion devoted to fulfilling the contractual obligation would be subject to Section 508. The

firm's general Web site, or the portion not devoted to the contracted study, would not be subject to Section 508.

17) Does this mean Web sites can't have graphics?

Not at all. Actually, designing an accessible Web site is not as difficult as most people believe. Often it is a matter of identifying graphics, elements, frames, etc. For example, HTML code already provides the "AltText" tag for graphics which some designers simply forget or ignore.

18) Won't accessible Web sites be less appealing?

On the contrary, accessible sites have several advantages. For one thing, some people turn off graphics so sites will load faster. Without "alt" tags, graphics-intense sites may be unusable. Also, with the growth of PDAs, and even Web site content delivered to cell phones, having text-based content is becoming more important. Because the screens on such devices are so small, graphics will probably never be a viable option. So the busy executive, waiting in an airport, who wants to check her stock portfolio on her cell phone isn't going to turn to the graphics-only site. Furthermore, with the growth of voice technology the harried commuter can have the headlines from his favorite news site read to him, but only if there is a text-based content. Finally, if a digitized video has synchronized captions, the text can be searched.

19) What does the law mean by "accessible'?

The standards developed by the Access Board explain the detailed technical and functional performance criteria that will determine whether a technology product or system is `accessible.'

In general, an information technology system is accessible to people with disabilities if it can be used in a variety of ways that do not depend on a single sense or ability. For example, a system that provides output only in audio format would not be accessible to people with hearing impairments, and a system that requires mouse actions to navigate would not be accessible to people who cannot use a mouse because of a dexterity or visual impairment. Section 508 focuses on the overall accessibility of electronic and information technology systems, not on providing accommodations at individual work sites. Section 501 of the Rehabilitation Act requires Federal agencies to provide reasonable accommodations for individuals with disabilities; it generally covers individual work sites but not overall technology systems. Even with an accessible system, individuals with disabilities may still need specific accessibility-related software or peripheral devices as an accommodation to be able to use it. For example, in order to use an accessible word-processing program, a person who is blind may need add-on software that reads text aloud; if the word-processing program could not be made compatible with a screen-reading program, it might not be accessible.

20) How does Section 508 apply to other Federal laws?

Section 508 in no way replaces or otherwise limits the rights or remedies available under any other existing Federal law that protects the rights of people with disabilities. As part of the Rehabilitation Act, it clarifies and strengthens the Federal government's existing obligation to ensure that technology is accessible to people with disabilities.

Appendix H

Geospatial Data and Geographic Information System Technology

1. National GIS Program

EPA's use of GIS technology first started in the mid-1980's in the development of a GIS application to assist state permit writers to effectively evaluate landfill permits submitted to EPA. This project with its innovative and unanticipated uses for spatially-referenced data led to the development of an Agency-wide GIS management structure that was established in 1987 (OAGL0489). During that time the Agency funded support for regional GIS support teams and promoted standardization for acquiring GIS software, hardware and supporting relational databases. Further developments in GIS fell to individual program offices subsequent to Agency office reorganizations.

The Office of Environmental Information (OEI), formed in 1999, is beginning to frame a *blueprint* for an Agency Geospatial Program from an *enterprise* (as opposed to program) perspective and link other major activities (such as Central Data Exchange, Facility Registry System and others) to this initiative. This document is also intended as the foundation for setting the Agency's involvement in interagency geospatial efforts. The blueprint will present EPA's "vision" for an Agency-wide geospatial program. The blueprint will lay out program needs and the direction and priorities for the Agency Geospatial Program over the next five years in the data, technology infrastructure, applications/tools, access, and partnerships arenas. This includes, but is not limited to GIS, remote sensing, visualization and georeferencing activities. This blueprint effort will build on the Baseline Report on Agency Geospatial Activities to be completed in Fall 2000. The purpose of the Baseline Report on Agency Geospatial Activities is to document key geospatial activities and associated resources across EPA. OEI has conducted a series of structured interviews with headquarters, regional, and laboratory programs as well as geospatially oriented initiatives. OEI will also review the results of the baseline assessment and, to the extent possible, identify needs requirements and convene a series of users requirements meetings. Once completed, the Baseline Report will be provided to key EPA offices and officials, and OEI's external stakeholders.

In addition, the Office of Water (OW) is currently developing a (separate) information strategic plan (ISP) that will likely incorporate a coordinated geospatial effort across OW. The OW plan will describe future business needs, document the current inventory of geospatial activities and technologies, and provide plans for spatial integration across the office.

2. Agency Locational Data Policy

The basis for all locational data in EPA is the Locational Data Policy (LDP) issued in 1991. The Agency LDP applies a standard to all programs which record locational information. This standard issued in April 1991 (LDP, 1991) lists five mandatory and nine optional data elements in addition to the required latitude and longitude coordinates. The business rules for the data standard was issued on February 1, 2000 (EPA, 2000). It provides the roles and responsibilities for implementing the standard. It is noted that the LDP applies to (single) point locations and that the documentation requirements for linear or polygonal

locations are established by the Federal Geographic Data Committee (FGDC). OGWDW provided guidance on the locational data requirements for SDWIS in August 1998 (OGWDW, 1998) which specifically addresses public water supplies (PWS) that require locational coordinates and sets the information coding standards and collection schedule for obtaining this data.

Fortunately, EPA has established GIS software and telecommunications standards to track the guiding principles outlined in the 1991 policy. These standards allow for an "open system architecture" that promotes the sharing of information both within and outside EPA. The Agency has adopted the Environmental Systems Research Institute Inc. (ESRI) architecture as the standard geographic information system (EPA, 1993). ARCINFO® and ArcView® are the primary ESRI GIS applications.

ARCINFO®, which runs primarily on Intel-based workstations and servers, provides GIS staff with a large array of tools for developing GIS applications and managing large databases. ArcView® in contrast is an easier to use application with fewer "whistles and bells." However, the needs of users have driven the technology so rapidly that many more advanced application tools are being added to "simpler" software packages making distinctions quite minimal for the average user.

GIS tools allow for map automation, data conversion, map overlay, and spatial analysis. The database defines map elements and their relationship to other elements, and it binds data to each element. The application includes: command line interface, application programming language, relational database analysis, and extensive peripheral support.

3. OGWDW Locational Data Review

The importance of conducting a user needs assessment or requirements analysis of OGWDW programs should be part of the ISP. A user needs assessment refers to the *identification, evaluation, prioritization and communication of mapping, surveying, geographic and related spatial data requirements to fulfill the mission of the Agency* (SDMP, 1992). It is indeed necessary for the user and management to develop its own specific guidance and models on how GIS will be used in the office before any decisions are made on the selection of the technology. In addition, up-to-date comparisons of available technologies are required to assess these needs. A GIS capability must be built around the needs of EPA, and specifically, OGWDW programs. The needs of the programs need to be identified from the beginning as these lay the basis and priorities for implementing a GIS. GIS is a tool that will be used to assist the program managers in the mission of the office.

US EPA's Safe Drinking Water Goals for 2005

As required by the Government Performance and Results Act (GPRA) of 1993, US EPA has, in conjunction with states, tribes , and other stakeholders, established performance-based goals for 2005 which are objective, quantifiable, and measurable.

OVERALL GOAL: By 2005, protect human health so that 95% of population served by community water systems will receive water that meets health-based drinking water standards ... for

Watersheds

By 2005, 50% of the population served by community water systems will receive their water from systems with source water protection programs in place.

By 2005, increase protection of ground water resources by managing all Class I, II and III injection wells and by managing identified, high-risk Class V wells in 100% of high priority protection areas (e.g., wellhead , source water, sole source aquifer, etc.).

By 2005, protect drinking water sources by increasing by 50% the waters that meet the drinking water use that States designate under the Clean Water Act.

Treatment

By 2003, provide a stronger scientific basis for future implementation of Safe Drinking Water Act.

By 2005, standards that establish protective levels for an additional 10 high-risk contaminants (disinfection byproducts, arsenic, radon) will be issued.

Users

By 2001, every customer served by a community water system will have access to a consumer confidence report that contains information about the systems's source water and the quality of the drinking water.

By 2005,

- the population served by community water systems providing drinking water that meets all 1994 health-based standards will increase to 95% from a baseline of 83% in 1994.
- 95% compliance will be achieved for any new standards within 5 years after the effective date of each rule.