

Water Quality

May 2001

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STATE OF TENNESSEE
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John G. Morgan
Comptroller

May 24, 2001

Members of the General Assembly
and
The Honorable Don Sundquist, Governor
State Capitol
Nashville, Tennessee 37243
and
The Honorable Milton Hamilton, Commissioner
Department of Environment and Conservation
401 Church Street
Nashville, Tennessee 37243

Ladies and Gentlemen:

Transmitted herewith is the performance audit on Water Quality. This audit was performed in conjunction with the National State Auditors Association Joint Audit on Water Quality.

Sincerely,

John G. Morgan
Comptroller of the Treasury

JGM/dww
00-023

State of Tennessee

Audit Highlights

Comptroller of the Treasury

Division of State Audit

Performance Audit

Water Quality

May 2001

AUDIT OBJECTIVES

This audit was conducted in conjunction with the National State Auditors Association Joint Audit on Water Quality. The objectives of the audit were to determine whether the state's regulatory programs meet minimum Environmental Protection Agency standards for drinking water and surface water; to determine whether the state has effective monitoring and enforcement programs for drinking and surface water; and to make recommendations that might result in more efficient and effective operation of the drinking and surface water programs.

CONCLUSIONS

Standards and Regulations

The requirements and standards for surface and drinking water appear to comply with requirements listed in federal regulations. The EPA has approved Tennessee's most recent revision of its surface water standards and has awarded Tennessee primary regulation and enforcement responsibility for drinking water standards (page 5).

Surface Water Quality Monitoring

The objectives for surface water monitoring included a review of progress in developing Total Maximum Daily Loads (TMDLs), permit issuance, adequacy of information systems, and monitoring nonpoint source pollution.

Tennessee has a prioritized schedule to complete TMDLs for impaired water bodies by 2009. A TMDL is the maximum amount of a contaminant that a water body can carry and

still meet water quality standards. The department expected that it would not be able to develop all the TMDLs it had planned, but the EPA agreed to complete the remaining ones.

The department also monitors surface water by issuing permits under the National Pollutant Discharge Elimination System. The department has had a backlog of permits to issue (35% in December 1999 and 23% in June 2000). However, the backlog had dropped to 10% in January 2001.

The department is planning to use a new version of an EPA database (STORET) to store water quality monitoring data. This new database will allow direct entry of data. Also, the department hopes to develop the capability for laboratories testing water to enter data directly into this database. With these changes, the department may need to develop new procedures to ensure the integrity of the water quality data.

Monitoring and measuring nonpoint source pollution is difficult because this pollution enters waters in a number of ways and from a number of sources, including urban runoff, agricultural practices, and forestry activities. Programs to address nonpoint source pollution are located in the Department of Agriculture. Funds from a portion of the Real Estate Transfer Tax and funds from the federal Water Pollution Control Act Section 319 are used for programs to abate and prevent forestry and agricultural nonpoint source pollution, provide information and education relating to nonpoint source pollution, and provide technical assistance for animal waste disposal systems. However, there is no formal ranking system for awarding funds to these projects. Other states have such a ranking system based on cost, impact, and projected effectiveness. The awarding of nonpoint source pollution funds without any competitive or ranking process could prevent the most needy areas from getting grant funds (page 6).

Drinking Water Quality Monitoring

In order to monitor drinking water adequately, the department needs accurate and reliable data from water systems and must ensure that accurate data is maintained in its information systems. At the state level, the controls over and reviews of self-reported data and laboratory results appeared adequate, and the EPA has found few discrepancies when comparing the state data to the data in the federal information system. A new state version of the federal system (SDWIS) is expected to be operating by summer 2001 (page 22).

Surface Water Quality Enforcement Improvements are needed in the Division of Water Pollution Control's enforcement program

Reviews of enforcement files revealed record-keeping problems: central office files were not always updated as cases progressed, the resolution of cases was not included in case files, and some files did not contain all required documentation. These problems could result in the inability to properly track enforcement actions by the central office; cases "falling through the cracks" without adequate, timely enforcement action or follow-up; documents having to be sent from the Environmental Assistance Centers to the central office multiple times; and difficulty for citizens and other stakeholders in determining how an enforcement case was resolved (page 28).

Drinking Water Quality Enforcement Some files reviewed lacked evidence of public notification

Monitoring, reporting, and maximum contaminant level violations require that the water system notify the people served by the system of the violation. A review of the files for 30 water systems with violations in calendar year 1999 (out of a total of 309) showed that in 13 cases (43%) there was no evidence of public notice in the files. Without public notification, water system customers may not get information they need to determine how well their system is operating and any potential health effects caused by a violation (page 36).

"Audit Highlights" is a summary of the audit report. To obtain the complete audit report, which contains all findings, recommendations, and management comments, please contact

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Performance Audit Water Quality

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Performance Audit Water Quality

INTRODUCTION

PURPOSE AND AUTHORITY FOR THE AUDIT

This performance audit of the Department of Environment and Conservation's Divisions of Water Supply and Water Pollution is part of the National State Auditors Association (NSAA) 2000 Joint Audit on Water Quality. Each year, the NSAA sponsors joint projects to improve audit efforts through the sharing of information and expertise, and to give states access to a national audience for those issues that need to be addressed from a federal or national perspective. Eleven other states participated in the project. The results of all these audits will be compared and shared among the participating states, and Tennessee, as the coordinating state, will prepare a comprehensive report presenting a summary of findings and recommendations of all the participating states.

OBJECTIVES OF THE AUDIT

The objectives of the audit were

1. to determine whether the state's regulatory programs meet or exceed minimum Environmental Protection Agency (EPA) standards for drinking water and surface water;
2. to determine whether the state has an effective monitoring program for drinking water and surface water;
3. to determine whether the state applies corrective action effectively; and
4. to recommend possible alternatives for legislative or administrative action that may result in more efficient and effective operation of the Divisions of Water Pollution Control and Water Supply.

SCOPE AND METHODOLOGY OF THE AUDIT

The audit studied the quality of surface and drinking water in the state focusing on activities and procedures in effect during calendar years 1999 and 2000. The audit was conducted in accordance with generally accepted government auditing standards for performance audits. The methods used included

1. interviews with staff of the Department of Environment and Conservation's Divisions of Water Supply, Ground Water Protection, and Water Pollution Control; the Department of Agriculture's Water Resources Division; the Department of Health's Division of Laboratory Services; the Tennessee Wildlife Resources Agency's Environmental Services Division; and the EPA;
2. interviews with stakeholder groups and other individuals with concerns related to surface and drinking water quality;
3. review of audit reports from other states and federal agencies;
4. review of reports and other information compiled by the Divisions of Water Pollution Control and Water Supply;
5. observations and field trips to observe the work of division employees and the EPA;
6. observation of the operation of selected information systems used by the divisions;
7. review of federal and state statutes and rules and regulations; and
8. examination of files at Tennessee's Divisions of Water Supply and Water Pollution Control.

ORGANIZATION AND RESPONSIBILITIES

Division of Water Pollution Control

The Division of Water Pollution Control is responsible for the administration of the Tennessee Water Quality Control Act of 1977 (*Tennessee Code Annotated*, Section 69-3-101). In conjunction with the Tennessee Water Quality Control Board, the division regulates the discharge of pollutants into surface waters through permitting and enforcement activities, monitors and reports on the condition of those waters, adopts and periodically revises water quality standards, sets water quality goals, and uses available resources to try to achieve those goals. Specifically, the division and board conduct the following activities in their efforts to protect water quality in Tennessee.

Through some 400 sampling stations, the division monitors, analyzes, and reports on the quality of Tennessee's water. In addition, the division conducts a number of specific surveys, including studies of in-stream biological communities and documentation of contaminant levels in sediment and fish flesh. The department uses the fish and bacteriological data generated by the division to issue advisories to the public when levels of contaminants exceed those thought to be protective of public health. The division also investigates and responds to many complaints and inquiries each year.

The division works cooperatively with other divisions in the Department of Environment and Conservation. It also interacts with local governments, environmental groups, industries, the Tennessee Valley Authority, the Tennessee Wildlife Resources Agency, the Tennessee Department of Health, the U.S. Army Corps of Engineers' Office of Surface Mining, and the Environmental Protection Agency.

The federal Clean Water Act governs the state's Water Pollution Control activities. Enacted in 1972, the act is the primary federal law that protects the nation's waters. Its primary objectives are to restore and maintain the integrity of the nation's waters, translating into two fundamental national goals: (1) to eliminate the discharge of pollutants into the nation's waters and (2) to achieve water quality levels that are fishable and swimmable. The act provides a comprehensive framework of standards, technical tools, and financial assistance to address the many causes of pollution and poor water quality, including municipal and industrial wastewater discharges, polluted runoff from urban and rural areas, and habitat destruction. Some of the provisions of the act include requiring major industries to meet performance standards to ensure pollution control, charging states and tribes with setting specific water quality criteria appropriate for their waters and developing pollution control programs to meet them, providing funding to states and communities to help them meet their clean water infrastructure needs, and protecting valuable wetlands and other aquatic habitats through the permitting process that ensures development and other activities are conducted in an environmentally sound manner.

Division of Water Supply

The Division of Water Supply is the administrative agent for carrying out the provisions of the Tennessee Safe Drinking Water Act, which regulates the quality and quantity of drinking water in the state; the Safe Dams Act, which regulates the construction of nonfederal dams; the Water Withdrawal Registration Act, which requires the registration of water withdrawal; and the Water Wells Act, which regulates the licensing of well drillers and pump setters. The division has been assigned the responsibility for ground water protection strategy development, well-head protection, underground injection of waste, and some pesticide management activity under the Water Quality Control Act.

The division is charged with general supervision over construction and operation of public water supplies including design, construction, and operation of public water works systems. Engineering reports and plan documents are submitted to the division for review, and written approval is to be obtained before construction is started. The division is authorized to adopt and enforce rules and regulations governing the location, design, construction, continuous operation, and maintenance of these facilities. It also conducts an enforcement program, which requires water suppliers to meet requirements of the Safe Drinking Water Act with respect to water quality and information reporting.

The federal Safe Drinking Water Act governs the Division of Water Supply's activities. Enacted in 1974, the act is the main federal law that ensures the quality of the nation's drinking water. Under the act, the U.S. Environmental Protection Agency (EPA) sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The act was amended in 1996 to emphasize sound science and risk-based

standard setting, small water supply system flexibility and technical assistance, community-empowered source water assessment and protection, public right to know, and water system infrastructure assistance through a state revolving loan fund. The drinking water standards set by the EPA are a part of a “multiple barrier” approach, which includes assessing and protecting drinking water sources, protecting wells and collection systems, ensuring that water is treated by qualified operators, ensuring the integrity of distribution systems, and making information available to the public on the quality of their drinking water.

Division of Ground Water Protection

The Division of Ground Water Protection regulates underground sewage from septic and sewer systems. The division issues some 26,000 new permits each year, mainly outside of cities and municipalities; conducts testing; and investigates complaints related to groundwater that has become contaminated due to failing septic and sewer systems. Because its responsibilities relate solely to groundwater and not surface or drinking water, the Division of Ground Water Protection was not included in this performance audit.

FUNDING

The Division of Water Pollution Control had expenditures of \$11,174,813 in fiscal year 2000. Most of the division’s revenues came from state appropriations (44%), interdepartmental sources (32%), and the federal government (24%). The remaining revenue came from current services (less than 1%).

The Division of Water Supply had total expenditures of \$4,229,786 for fiscal year 2000. Most of the division’s revenues came from the federal government (44%) and interdepartmental sources (42%). The remaining revenue came from state appropriations (12%) and current services (less than 2%).

CONCLUSIONS

Objective 1: Do the State's Regulatory Programs Meet or Exceed EPA Standards?

Surface Water Quality Standards

Based on the auditor review of selected federal regulations and *Rules of the State of Tennessee*, the requirements and standards found in state water quality control rules appear to comply with requirements in federal regulations. One exception is that the federal list of toxic pollutants includes three substances that do not appear to be listed in state rules. The EPA does not require states to adopt criteria for these substances because either criteria for all designated uses does not exist or an approved laboratory method to test for the substance does not exist. The EPA approved Tennessee's most recent revision of its standards in March 2000.

Drinking Water Quality Standards

The EPA's *National Primary Drinking Water Regulations* are legally enforceable standards that apply to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems. Tennessee's primary drinking water standards for public water systems are found in the Department of Environment and Conservation's rules (Chapter 1200-5-1).

Tennessee's primary standards are the same as the EPA's, except that Tennessee also includes a standard for nickel. According to the Division of Water Supply, Tennessee did not know until recently that the EPA had dropped the standard for nickel. The division plans to inform the Water Quality Control Board of this fact and seek to propose a rule change dropping the maximum contaminant level for nickel.

The EPA also promulgates National Secondary Drinking Water Regulations that are nonenforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The EPA recommends secondary standards to water systems but does not require systems to comply. The states may, however, choose to adopt them as enforceable standards.

Tennessee has adopted the same secondary regulations as the EPA. Department rule 1200-5-1-.12 states that these standards will apply to all community water systems and to those noncommunity water systems as may be deemed necessary by the department. Tennessee enforces the standards if exceeding the standard causes an aesthetic problem.

Tennessee was awarded primary regulation/enforcement responsibility for drinking water by the EPA in 1977, which was reconfirmed pursuant to 40 CFR 142.10 in May 1994 when Phase VI Rule revisions were required regarding organic and inorganic chemicals.

Objective 2: Does the State Have an Effective Monitoring Program for Drinking and Surface Water?

Surface Water Quality Monitoring

Tennessee's water quality monitoring program is intended to provide a measure of the state's progress toward meeting the goals of the federal Clean Water Act and the Tennessee Water Quality Control Act. Under the program, data are collected and interpreted in order to identify areas that exceed state numeric/narrative water quality standards, assess the degree of loss of designated uses, document areas with potential human health threats from fish contamination or elevated bacteria levels, establish trends in water quality, gauge compliance with NPDES (National Pollutant Discharge Elimination System) permits, document baseline conditions prior to potential impact or as a reference stream, assess water quality improvements based on remediation, and identify proper stream use classification, including antidegradation statement implementation.

In 1996, the Division of Water Pollution Control adopted a rotating watershed approach to monitoring. (A watershed is the land area that drains into a stream.) Using this approach, the division designates watersheds to be placed in one of five groups, with activities in each group of watersheds scheduled according to the five-year cycle described below. Each group includes watersheds in all geographic areas of the state so that monitoring activities are not concentrated in any one area in any given year. Groups are designated based on a number of factors, one of which is the need to spread intense monitoring activities somewhat equally among all eight environmental assistance centers (regional offices that function as the center of department activities within each of the department's designated geographical regions of the state). This newer approach encourages coordination with all water users in each watershed and with other agencies of the federal, state, and local governments. Primary goals of this approach are to

- improve water quality assessments;
- ensure equitable distribution of pollutant limits for permitted dischargers;
- develop watershed-specific water quality management strategies that integrate point and nonpoint sources of pollution; and
- increase public awareness of water quality issues and provide opportunities for public involvement.

The four major objectives below are intended to achieve the above goals:

- monitor water quality intensively within each watershed at the appropriate time in the five-year cycle;

- establish Total Maximum Daily Loads (TMDLs) based on the best available monitoring data and sound science (a TMDL is the maximum amount of a contaminant that a water body can carry and still meet water quality standards);
- develop a water quality management plan specific to each watershed; and
- attain a good representation of local interest at public meetings.

The rotating watershed monitoring approach adopted by the division is a five-year cycle featuring a monitoring strategy intended to result in accurate water quality assessments, synchronizing the issuance of permits to coincide with the development of TMDLs, establishing TMDLs that integrate point and nonpoint source pollution, committing to three public meetings per watershed within the five-year cycle, and partnering with other agencies to obtain the most current water quality data. Generally, the five-year cycle includes

Year 1—hold stakeholder meetings and develop a monitoring strategy

Year 2—collect water quality data

Year 3—collect water quality data, perform modeling and TMDL development, hold public meetings to review the water quality assessment

Year 4—water quality assessment activities

Year 5—publish a watershed plan, issue draft NPDES permits, hold public hearings

Year 6—issue final NPDES permits after comments are addressed, and begin the cycle again.

In addition to intense watershed monitoring described above, Water Pollution Control maintains approximately 450 fixed-station monitoring sites statewide. Most of these are sampled quarterly, with some monitored monthly and others less frequently. Most large streams in the state have at least one of these stations. Data from these, as well as data collected under the rotating watershed approach, are entered into EPA's STORET (Water Quality Storage and Retrieval System) data management system. The division also collects fish tissue samples from 13 continuous stations (those that do not change from year to year) and multiple other sites each year. However, due to staff limitations and resources demanded by the watershed project, it did not conduct any fish tissue sampling in fiscal year 2000. The division also uses fish tissue data from the Tennessee Wildlife Resources Agency (TWRA) gathered under a contract with Wright State University (in Dayton, Ohio) but TWRA planned to use the contract for fiscal year 2000 year to test fish and mussel samples collected prior to June 30, 1999. The division also collected a number of sediment samples from 1984-1994, but analysis of sediment data has been hampered by a lack of sediment criteria. As criteria are developed, the division intends to make sediment sampling a more widely used component of ambient monitoring.

States participating in the NSAA Joint Audit were also concerned about whether or not regional bias plays any role in water quality monitoring among different areas within a state. Since the central office, in conjunction with all regional environmental assistance centers, develops monitoring plans and since monitoring in each watershed is scheduled based on a rotating cycle, regional bias appears to have no effect on water quality monitoring in Tennessee.

Reporting: The 305(b) Report

The federal Clean Water Act requires that states compile two lists that describe to some extent the known condition of waterbodies within the state's borders. The first is the 305(b) Report, the goals of which are to

- assess the general water quality conditions of rivers, streams, lakes and wetlands;
- identify the causes of water pollution and the sources of pollutants;
- specify waters which have been found to pose human health risks due to elevated bacteria levels or contamination of fish; and
- highlight areas of improved water quality.

The process for assessing water quality in Tennessee involves setting water quality goals for each body of water, then monitoring to see whether or not these goals are met. Quality is judged acceptable and unimpacted by pollution if it is good enough to support the uses that people want to make of it, such as drinking water supply, swimming, fishing, wildlife observation, etc. Water bodies should also be free of toxic materials, activities that remove or degrade stream habitat, or conditions that might impact aquatic life. Water quality standards establish clean water goals, assigning a set of beneficial uses to each water body, and establish narrative or numerical criteria that are used to identify the level of quality necessary to protect each designated use.

The 305(b) Report lists each water body in the state, its designated use or uses, whether or not the water body is impacted by pollution, the cause of that pollution in the form of pollutants or pollution, and the known or possible sources of pollutants or pollution. Water bodies are listed as fully supporting, partially supporting, or not supporting their designated uses, depending on the level of pollution compared with the criteria contained in the standards for the water bodies' designated use(s). Approximately 88% of stream miles and almost all lake acres in the state were assessed for the 1998 305(b) Report for existing water quality. Assessed waters may have either been "monitored" or "evaluated." (Waters that have been monitored were assessed using data less than five years old, including fixed-station ambient sampling, intensive surveys, NPDES compliance sampling, and/or biological monitoring. Waters that were evaluated were assessed using data more than five years old or special data, such as land use, watershed information, and predictive models.) Of the assessed waters, about 83% of the river miles were monitored, while the remaining 17% were evaluated. Almost all Tennessee's lake acres have been monitored. Approximately 7,568 of Tennessee's more than 60,000 stream miles

were not assessed at all due to lack of data, small size, or inaccessibility. However, the percentage of monitored assessments conducted by the Water Pollution Control Division has increased from 37% in 1990, to 83% for the 1998 Report. Water quality data used to develop these assessments come from several sources (see Table 1).

Table 1
Water Quality Data Categories and Sources

CHEMICAL DATA	BIOLOGICAL DATA	PHYSICAL DATA	SEDIMENT AND FISH TISSUE DATA
Compliance monitoring performed at the nearly 2,000 permitted dischargers in Tennessee. Also includes data collected as a result of complaint investigations, fish kills, spills, and in support of enforcement activities.	Rapid bioassessment surveys completed in support of the watershed approach. (These surveys are “rapid” because they are not quantitative and general identification of organisms takes place in the field rather than in the lab.) Rapid bioassessments were performed primarily in tributary streams as a means of monitoring biological integrity.	Temperature and flow data collected at various sites in Tennessee.	Division sediment and fish tissue data collected at various sites across Tennessee.
Ambient data collected quarterly at the division’s fixed-station monitoring network. Contains over 100 sites. Also, stations established to support the watershed approach.	Division ecoregion semi-annual biological monitoring. Benthic and fish IBI score calculated at many sites. (An Index of Biotic Integrity score is a mathematical calculation of the quality of a biological community.)	Quantitative assessments of physical habitat made in conjunction with biological surveys.	EPA’s report <i>The Incidence and Severity of Sediment Contamination in Surface Waters of the United States</i> .
Chemical data collected quarterly at the division’s 100 ecoregion reference sites. (These stations provide a baseline to which other sites within that ecoregion can be compared.)	Bioassay studies of effluent toxicity at most major dischargers. Many minor facilities also do this type of testing.	Time-of-travel studies of flow, oxygen sags, and BOD (biological oxygen demand) decay rates. (During time-of-travel studies, a harmless dye is put into a stream to measure flow rates and dissolved oxygen levels.)	Locations of existing fishing advisories in Tennessee.
Chemical data collected by other agencies.*	Biological data collected by other agencies.*	Physical data collected by other agencies.*	Data collected by other agencies.*

*The Division of Water Pollution Control uses monitoring data and reports from the following agencies:

- **U.S. Environmental Protection Agency** (STORET, sediment report, and *Index of Watershed Integrity*);
- **Tennessee Valley Authority** (River Action Teams biological data, Reservoir Vital Signs Monitoring, NPDES discharge self-monitoring data, recreation area fecal coliform sampling, and tailwater monitoring);
- **Tennessee Wildlife Resources Agency** (biological surveys and fish tissue monitoring data);
- **U.S. Geological Survey** (gauging station data);
- **U.S. Army Corps of Engineers** (water, sediment, and tailwater monitoring); and
- **U.S. Fish and Wildlife Service** (species databases).

How Clean Is Tennessee’s Surface Water?

The 1998 305(b) Report summarizes the overall condition of Tennessee’s surface water by comparing the total number of river miles and lake acres assessed for the report to the number that fully support, partially support, or do not support their designated uses. The following tables reflect these assessments, including numbers and percentages of river miles and lake acres that fall into each category:

Table 2
Summary of Statewide River Assessments

Assessment	Miles	% of Total Assessed Miles
Fully Supporting Designated Uses	38,480	71.9%
Partially Supporting Designated Uses	11,417	21.3%
Not Supporting Designated Uses	3,610	6.8%
Not Assessed	7,568	-
Total	61,075	-

Table 3
Summary of Statewide Lake Assessments

Assessment	Acres	% of Total Assessed Acres
Fully Supporting Designated Uses	417,338	77.7%
Partially Supporting Designated Uses	29,293	5.4%
Not Supporting Designated Uses	90,630	16.9%
Not Assessed	799	-
Total	538,060	-

The 305(b) Report also lists the number and percentage of river miles and lake acres and their level of support of each individual designated use classification, as represented in the tables below:

Table 4
Individual Classified Use Support – Rivers and Streams

Designated Uses	Miles of Streams Classified	Miles Meeting Use	% of Miles Meeting Use*
Fish and Aquatic Life	61,075	46,964	76.9%
Recreation	61,075	58,202	95.3%
Domestic Water Supply	3,940	3,910	99.2%
Irrigation	60,988	60,988	100%
Livestock Watering & Wildlife	61,069	61,069	100%
Navigation	844	844	100%

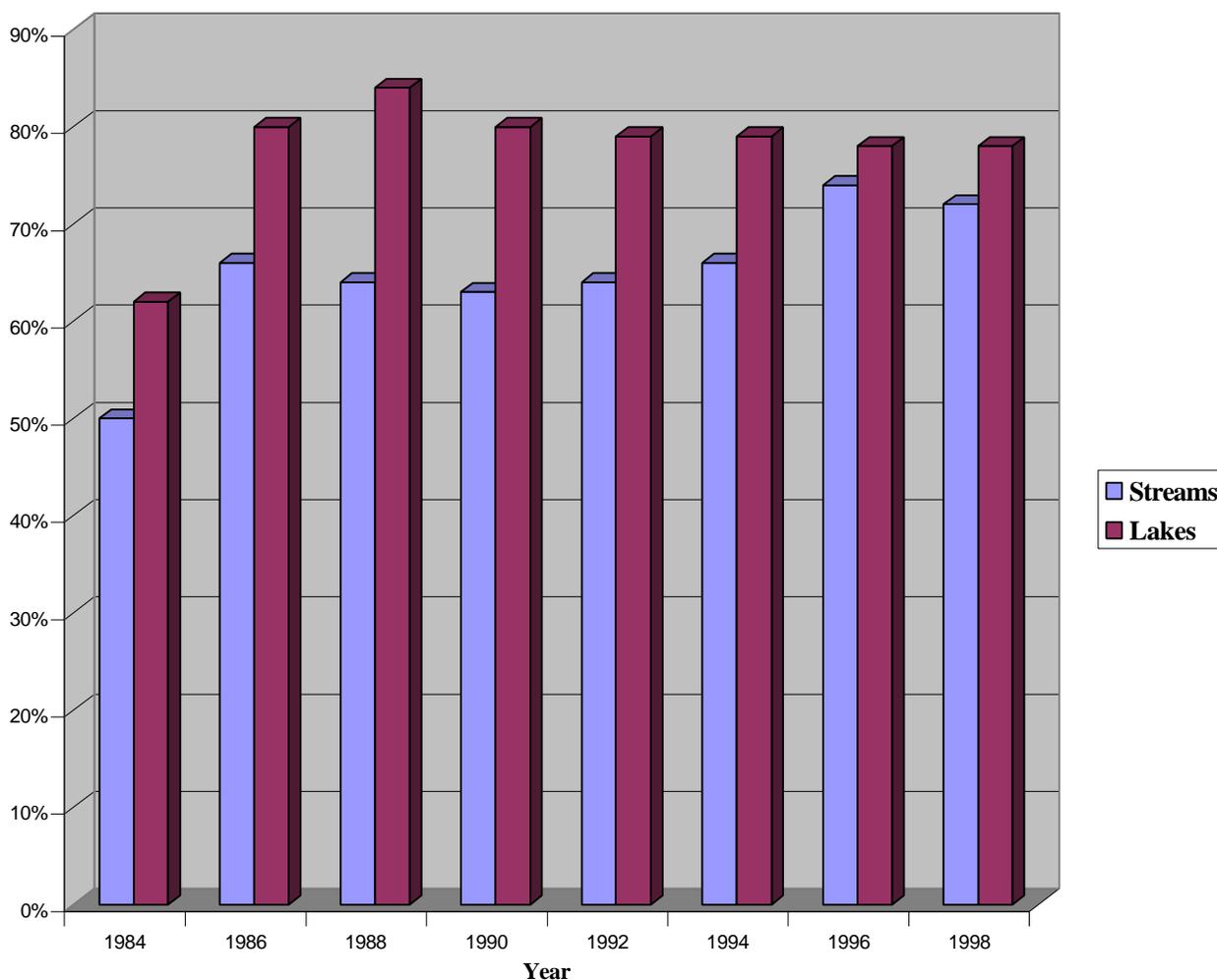
*Note: Some streams are classified for more than one use. Therefore, this table cannot be used to derive percentages for overall use support in Tennessee.

Table 5
Individual Classified Use Support – Lakes

Designated Uses	Acres of Lakes Classified	Acres Meeting Use	% of Acres Meeting Use*
Fish and Aquatic Life	538,060	487,941	90.7%
Recreation	538,060	436,676	81.2%
Domestic Water Supply	511,876	511,876	100%
Irrigation	538,060	538,060	100%
Livestock Watering & Wildlife	538,060	538,060	100%
Navigation	260,664	260,664	100%

*Note: Some lakes are classified for more than one use. Therefore, this table cannot be used to derive percentages for overall use support in Tennessee.

Percent of Assessed Waters Fully Supporting Designated Uses



Assessments in Tennessee vs. Nation

For the 1998 305(b) Report, the Water Pollution Control Division assessed 87.6% of Tennessee's rivers and streams (53,507 river miles out of 61,075) and 99.9% of Tennessee's lake acres (537,261 lake acres out of 538,060). Based on the EPA's National Water Quality Inventory, however, only 23% of river and stream miles and 42% of lake, reservoir, and pond acreage have been assessed nationwide. Based on this report, then, Tennessee is well ahead of the nation in the number of assessments of the quality of its water in rivers, streams, lakes, reservoirs, and ponds.

Water Quality Trends

While it is important to determine whether efforts to improve water quality in Tennessee have actually resulted in cleaner water, it is also important to understand that the data that could indicate trends in water quality have certain limitations. The chart above indicates the changes in

the percentage of assessed stream miles and lake acres considered fully supporting designated uses during the period from 1984 through 1998 as reported in 305(b) Reports.

Some of the above numbers appear to show trends indicating increasing or decreasing water quality, when they actually do not represent such trends. For example, the appearance of a significant improvement in water quality from 1994 to 1996 was due to Tennessee's Ecoregion project that led to the assessment of clean streams that were not assessed in previous reports. The appearance of a decline in water quality between 1996 and 1998 is due mainly to more intensive scrutiny given to Group 1 watersheds. The appearance of a decline in lake water quality is due to the posting of large lakes such as Melton Hill, Watts Bar, and Nickajack because of documentation of elevated levels of contaminants in fish. It is important to note that contamination levels were no doubt elevated before documentation and posting took place. Several inherent problems make trend analysis difficult. These problems, as discussed in the state's 305b report, include

- ▶ **Changes in Water Quality Standards** – The 305(b) Report is based on whether or not waters meet standards, which are subject to review and possible revision every three years. Even if quality in a water body stays the same, more stringent standards could cause it to go from a fully supporting to a polluted status.
- ▶ **Changes in Assessed Mileages** – In the past, the division only assessed larger streams, which included about 19,000 miles within the state. With improvements in software, such as EPA's ReachFile 3, the division now has the capability to map over 60,000 miles of streams. Most of these miles are very small and generally are less impacted headwater streams. By adding these streams to the 1996 305(b) Report, and assessing many of them, the percentage of fully supporting streams jumped from 66% to 74%.
- ▶ **Changes in Laboratory Capabilities** – Twenty years ago, many substances could not be detected at criteria levels. With new equipment and techniques, labs can now quantify substances at or below criteria levels, making it much easier to detect problems.
- ▶ **Inability to Correct for Other Factors** – It is especially difficult to make trend assessments concerning nonpoint source pollution. For example, precipitation amounts and intensity affect the impacts of nonpoint source pollution since it is directly related to runoff. Also, urbanization to accommodate growth in Tennessee has offset some of the potential water quality improvements of the past 20 years.

Reporting: The 303(d) List

The 303(d) List is a compilation of streams and lakes in Tennessee that are “water quality limited” or are expected to exceed acceptable water quality standards in the next two years, and need additional pollution controls. Water quality limited streams are those that have one or more properties that violate standards and therefore are considered impacted by pollution so as to not

fully meet designated uses. Also, the 303(d) List prioritizes water quality limited streams with regard to how quickly a specialized study called a Total Maximum Daily Load (TMDL) should be performed on each. Waters listed on the 303(d) List are considered a priority for water quality improvement efforts, including regulatory approaches such as permit issuance, and efforts to control pollution sources that have historically been exempted from regulation such as certain agricultural and forestry practices. On the regulatory side, if a stream is on the 303(d) List, the Division of Water Pollution Control may not allow additional sources of the same pollutant(s) using their permitting authority. Streams that are considered unpolluted and those that have not been assessed will not appear on the list. Also, those where a control strategy is already in the process of being implemented will not appear unless the water quality standard is not expected to be met before the next listing cycle. Thus, waters not on the list can either be unpolluted, not assessed, or have a successful control strategy in place.

TMDLs (Total Maximum Daily Load)

A Total Maximum Daily Load is a study that (1) quantifies the amount of a pollutant in a stream, (2) identifies the sources of the pollutant, and (3) recommends regulatory or other actions that may be needed in order to clean up the stream. In essence, a TMDL calculates the amount of a pollutant that can be assimilated by a waterbody without adverse impacts, then recommends either regulatory or voluntary actions to reduce or reallocate the amount of that pollutant being released into the water body to reduce or eliminate impacts caused by that pollutant. These actions could involve reducing the amounts of pollutants being discharged under NPDES (National Pollutant Discharge Elimination System) permits or requiring installation of other control measures; or these actions could involve cooperating with other state and federal agencies on plans to achieve water quality standards through techniques such as installation of appropriate Best Management Practices. TMDL development is not considered appropriate for all water bodies on the 303(d) List. If enforcement action has already been taken and a compliance schedule developed or if Best Management Practices have already been installed for nonregulated activities, TMDL development is considered not applicable. For cases in which pollution flows from sources outside Tennessee's borders, the recommendation may be that another state or the EPA develop the TMDL.

Progress on TMDLs. Under the rotating watershed approach, the Division of Water Pollution Control has established the following prioritized schedule for completing TMDLs, using the five groups of watersheds described above:

Group 1: 14 high priority by 2000, 47 low priority by 2005

Group 2: 19 high priority by 2001, 42 low priority by 2006

Group 3: 12 high priority by 2002, 34 low priority by 2007

Group 4: 7 high priority by 2003, 46 low priority by 2008

Group 5: 18 high priority by 2004, 44 low priority by 2009

To fully understand this schedule, however, one must consider that the 303(d) List includes 352 waterbodies, each impacted by two or three pollutants. This translates into 799 “pollutant-specific” TMDLs under current regulations, rather than the 283 listed above. So, the above-listed 14 high priority TMDLs set to be completed by the end of 2000 actually include 34 “pollutant-specific” TMDLs. Of these, the EPA has agreed to develop about one-third (14), leaving Tennessee committed to develop the other 20. As of November 15, 2000, division management believed that Tennessee’s portion would almost be completed by the end of the year but were unsure about those to be developed by the EPA. They pointed out that under the federal Clean Water Act, the EPA is ultimately responsible for TMDL development, and various lawsuits across the nation relating to slow development of TMDLs could require the EPA to take action. As of October 31, 2000, the division had one TMDL approved by the EPA and had submitted 13 other TMDLs in draft form to the EPA for approval. Division management has projected that it will submit three more draft TMDLs to the EPA by December 31, 2000. The division will be three TMDLs short of its goal, and the EPA has agreed to complete those in addition to the 14 it had already agreed to complete. The division has prioritized TMDL development based on the rotating watershed approach, targeting seriously impacted streams in the order that they come up during the watershed cycle. Also, as a practical matter, the TMDLs which the division has the tools (such as predictive models, fluvial geomorphology studies, and testing equipment) to accomplish will be addressed first.

Proposed Revisions to the 303(d) List

Proposed revisions to federal regulations introduced in July 2000 may change the numbers of TMDLs to be completed by each deadline listed above. Under the proposed revisions, the structure of the 303(d) List will change somewhat, allowing states more flexibility in deciding where TMDLs are needed and where they are not. The current structure of the list simply calls for states to list impaired waters, the cause(s) of impairment, and the source(s) of impairment. The new list, once revisions are enacted, would structure the 303(d) List into four parts. The first part of the list would include impaired water bodies for which TMDLs would be required within 15 years (high priority). The second part would include water bodies impaired by pollution not caused by a pollutant, and therefore not appropriate for TMDL development (i.e., habitat alteration, channelization, impoundment, etc.). The third part would include water bodies for which TMDLs have been developed but for which water quality standards have not yet been attained. Part 4 would include water bodies for which technology-based controls or other enforceable controls would attain water quality standards by the next listing cycle, and which therefore may not require TMDL development.

The idea behind Tennessee’s rotating watershed approach to monitoring is to establish regular, continuous monitoring of Tennessee waters so that impacts can be studied over time and all waters can be monitored. Once TMDL regulations were enacted and states found out that they would have to develop them for all appropriate impaired waters, Water Pollution Control staff realized that this approach prepared them well for planning and developing TMDLs, as well as for the five-year, federal permitting process. The permitting process works well because the provisions of discharge permits and effluent limits on impaired waters will be based on TMDLs, and according to division staff, it is simply practical that all waters be assessed every five years so that permits can be issued based on the latest available information.

Permitting

The Division of Water Pollution Control issues various types of permits relating to water pollution, including individual National Pollutant Discharge Elimination System (NPDES) permits to both major (discharging more than one million gallons per day) and minor (less than one million gallons per day) industrial and municipal permits, state operating permits, and general permits. As of October 17, 2000, Tennessee had issued 99 major municipal and 410 minor municipal NPDES permits, 54 major industrial and 356 minor industrial permits, 301 state operating permits, and had approximately 3,090 active general permits statewide. General permits include those issued for the release of hydrostatic test waters, filter backwash water, ready mix concrete waste, underground storage tank process and groundwater remediation waters, construction stormwater, concentrated animal feeding operations, and construction stormwater runoff.

The EPA's regional office in Atlanta keeps track of the number of permits issued compared to the number of expired permits to be issued. In April 2000, Tennessee ranked 21st out of 55 states and U.S. territories in the percentage of backlogged major permits. As of June 15, 2000, the division's backlog of major NPDES permits to be issued was 23% (35 of 152), down from 34% in December 1999. For minor permits, Tennessee's backlog was 13% (165 out of 1285); however, the EPA does not count minor permits against a state's backlog. When permits are not issued timely, the state essentially puts itself behind in meeting its water quality goals as permit holders continue to operate under the provisions of old permits, which are not based on the latest available information.

From the EPA's evaluations, it appears that the backlog was caused by a shortage of experienced permit writers, combined with the complexity of the permits that need to be issued. Permit applications must be evaluated based on ambient water quality monitoring, projected volume and types of discharges, the size of facilities, public notification, and comments. The EPA's last annual audit of the Division of Water Pollution Control (July 1999) reported inadequate staffing levels as its main concern in the permitting area. EPA staff also reported that the regulated community is more active in Tennessee than in the past, stakeholder groups are more active and vocal, and the division has been allowing more time for public comment than in the past to ensure that all opinions are heard before a permit is issued. They feel that the program directors in Tennessee have done a very good job and appear to be improving all the time.

EPA staff provided training to Tennessee's permit writers in July 2000 to help the state meet its goal of reducing the backlog to under 10% by the end of calendar year 2000. The division has improved from the 23% backlog in June 2000. In January 2001, the backlog for inspections of major facilities had dropped to 10%.

Data Management

General water quality monitoring data collected for purposes other than enforcement are collected by the Division of Water Pollution Control in addition to various other agencies (listed

under Table 1 above) and entered into a database housed at the central office. Up until December 31, 1998, data arriving at the central office from state labs and other sources were entered directly into the EPA's STORET (Water Quality Storage and Retrieval System) database, which originated in 1995. (The system is administered by the EPA out of the Research Triangle in North Carolina.) A new STORET database was supposed to go on-line on January 1, 1999, but as of November 2000, the new system was still not able to accept state-entered data. Currently, the division stores this data on an in-house Access database. Once the new STORET is operable, the division will conduct a mass upload of data received since the old STORET went off-line in December 1998.

Water Pollution Control accepts water quality data from any group or organization that EPA accepts as having data gathering capabilities (see list under Table 1 above). Others submitting data must have a background in data collection, sampling, testing, data storage, interpretation, etc. The EPA will not accept data from private citizens because they typically do not have the background mentioned above. Data originating from testing conducted by staff at the department's eight environmental assistance centers is received in hard copy, then entered manually by staff at the central office. Assistance center staff also receive hard copies and are networked with the central office so that they can conduct quality checks to make sure data were entered correctly at the central office. Test results include identifying tags, indicating the date and time of collection, and the name of the collector.

Once data is entered, hard copies of test results are sent to the division's Manager of Planning and Standards, who looks for anomalies and other indicators of bad data and compares data entered to hard copies. Questionable data are resolved through follow-up with the laboratory that conducted the testing and the environmental assistance center. Data entry staff also reconcile lab reports received at the central office to those received at the assistance centers monthly to ensure that results are consistent. Auditors observed staff members' data entry and reconciliation activities to ensure that procedures are adequate and are being followed, and noted no concerns. To ensure quality and integrity, there is a quality assurance/quality control program for both the laboratories and field personnel that requires sample duplication so that results may be compared, as well as analysis of blank samples sent by EPA to test the laboratories' accuracy. The Water Pollution Control Division's procedures for sampling contain specific guidelines regarding sample collection methods, quality control procedures, chain of custody requirements, and a description of legal ramifications of sampling. Also, the EPA performs an annual review of the state division's monitoring program to check laboratory records and equipment. Feedback from EPA to the Division of Water Pollution Control about these reviews has consisted mainly of staffing concerns.

The new STORET database is an Oracle-based system that will automatically digitize water quality data on a Geographic Information System (GIS) based on Global Positioning System coordinates entered with each test result. Division of Water Pollution Control management report that data will take more time to enter on the new system and will require more information to be entered manually. With the old system, for instance, standard codes were entered in many of the data fields; the new system will require staff to enter parameters that indicate standardized testing methods, sampling methods, testing mediums, etc., involving more complicated data entry. However, management feels that data will be more easily retrieved.

Also, while the old system had a 99.4% accuracy level and listed outlying results that did not fit the specified type of results, the new system will require staff to check actual records more closely to ensure accurate data entry. Management indicated that they are working on automating data entry from labs, so that once it is entered at the labs, it will go automatically to the STORET database, where it will be available to the public. Because the labs are covered by a quality assurance program, division staff think automation would not adversely affect the quality assurance under the current system, in which several people must handle the data.

Data-Related Concerns

A federal GAO (General Accounting Office) report released in March 2000 indicates that key EPA and state decisions are limited by inconsistent and incomplete water quality data. The report asserts that the EPA's *National Water Quality Inventory*, based on states' 305(b) Reports, does not accurately portray water quality conditions nationwide. GAO's report was based on the 1996 *Inventory* and indicates that only a small percentage of the nation's waters were assessed for the report. While the GAO concedes that the cost of monitoring has prohibited many states from assessing much of their water, states have also not monitored in a way that allows statistically valid assessments of water quality conditions in unmonitored waters. The report stated that meaningful comparisons of data across states are nearly impossible because of differences in the ways states select their monitoring sites; the kinds of tests they perform and how they interpret the results; and the methods they use to determine the causes and sources of pollution. Because the EPA uses the *Inventory* as a basis for a number of decisions such as federal funding allocations and measuring states' implementation of the Clean Water Act, some of these decisions could be called into question. The limitations of this data also affect state-level activities such as identifying water quality problems and setting priorities.

Water Pollution Control officials commented on the conclusions drawn in the GAO report, asserting that data on which the 1996 *Inventory* is based is not only a picture of what states know about their water quality at that time, but also of the tools available to states at the time data were compiled. Improvements in GIS software have increased states' ability to digitize streams on maps, also increasing the number of miles of streams that could be digitized and including bends and curves, where older software indicated only straight lines. With the older system, EPA administrators knew that the scale and structure of these maps was incorrect, but they instructed states to assess as much water as possible using the available tools and their "best professional judgment" (BPJ). Using said tools, states assessed many entire watersheds based on monitoring at the mouth of the watershed and BPJ relating to staff knowledge of the watershed. As software improved further, more curves were added back to the stream maps, and more miles of tributaries became visible. In cases where assessments were made based on limited monitoring and BPJ, and watersheds were listed as impaired, the additional miles of tributaries now showed up on maps as impaired although intense, detailed assessments had not been completed. EPA now requires detailed assessments that indicate these streams are not impacted in order for states to remove them from the 303(d) List. Also, testing methods have improved over time, and better detection limits are achievable for many pollutants.

In years past, laboratories may only have been able to detect pollutants in less than 10% of a sample; now they can detect some pollutants down to parts-per-billion. The increased

sensitivity of laboratory testing, once new data are gathered, will allow much more precise assessments of water quality. Problems arise, though, because regulators may know that a substance is bad if it is in the water and may be able to detect the substance in minute traces; but they may not yet know how much of that substance is required for it to cause problems. For example, if scientists have proven that a particular substance is toxic to aquatic life at detection levels contemporary to the research (say, one milligram per liter), and then the detection levels improved to parts-per-billion with new and better technology, they may not be able to yet determine how many parts-per-billion are a threat to aquatic life. Without sound science with which to defend more precise criteria, regulated entities could sue states or the EPA successfully for lack of scientific support for the criteria, or for labeling water bodies “impaired” based on new test results. For these reasons, states’ water quality programs and the EPA continue to require new scientific data on which to base standards, criteria, use designations, and decisions regarding water bodies’ levels of use support.

Nonpoint Source Pollution

Nonpoint source pollution can enter waters in a number of ways and from a number of sources, including urban runoff, agricultural practices, and forestry activities. Division management point to nonpoint source pollution (including land use problems and lack of planning for land use) as the biggest current problem impacting water quality in Tennessee. The state has had good tools (i.e., permitting and enforcement) for dealing with point source dischargers for several years, but the federal Clean Water Act does not establish regulatory tools to deal with nonpoint source pollution, mainly because it is difficult to blame any one person, property owner, or company. Tennessee’s approach to monitoring for nonpoint source pollution was at one time based on “high flow,” or heavy rainfall events, which required monitoring staff to “chase storms.” The division has since realized that such an approach has several drawbacks and that accuracy comes from regular samplings at lower to mid-range flows. Management concedes that some people disagree with this approach, but the division determined that it was probably not a good use of staff time to chase storms. Combining this data with compliance monitoring within watersheds and “reference streams” (streams chosen by the division within a watershed that are as close to unimpacted by pollution as possible) monitoring data, regulators can make an educated guess about the impact of nonpoint source pollution in a particular body of water. Such data are essential in developing TMDLs for waters impacted by nonpoint source pollution. The division uses Watershed Characterization System software to pull data from various databases and place them into one report to present an overall character of the watershed, making it easier for regulators to estimate impacts from nonpoint source pollution. Still, there are very few proven methods of measuring and minimizing nonpoint source pollution.

Addressing Nonpoint Source Pollution

Programs in Tennessee to address nonpoint source pollution are located in the Department of Agriculture’s Water Resources Division rather than in the Department of Environment and Conservation’s Division of Water Pollution Control. Measures to address nonpoint source pollution, however, are strictly voluntary, causing Department of Agriculture

and Department of Environment and Conservation officials to address nonpoint source pollution differently than they address point source problems.

The Department of Agriculture receives a portion of Tennessee's Real Estate Transfer Tax (approximately \$3 million) to help with nonpoint source pollution projects, in addition to federal Water Pollution Control Act Section 319 funds. The federal funds are split into a base grant of approximately \$1.6 million annually (a portion of which is to be used for administrative purposes); and incremental funding, also approximately \$1.6 million, which was recently made available as a result of Clean Water Action Plan legislation contained in the federal Watershed Protection and Flood Prevention Act. Under this legislation, the Division of Water Pollution Control, the Department of Agriculture, and the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) are required to assess Category 1 watersheds (defined as those that are determined to be at least 15% impaired under the Unified Watershed Assessment Plan) and select priority watersheds in which to use the incremental funds. The portion of the base grant not used for administrative purposes is intended to be used to fund a well-rounded program to address all sources of pollution, from urban runoff to agricultural practices. The base grant may also be used to fund demonstration projects and get the word out to local officials about the availability of funds and the purposes for which they may be used.

Funds from the Real Estate Transfer Tax earmarked for nonpoint source pollution purposes are deposited into the Agricultural Resources Conservation Fund and, by statute, may only be used for very specific purposes. These include installing best management practices to abate and prevent forestry and agricultural nonpoint source pollution, providing information and education relating to nonpoint source pollution, and providing technical assistance for animal waste disposal systems. For the most part, these funds are contracted out to the 95 Soil Conservation Districts. These districts' boards of supervisors (composed of five members—two appointed and three elected locally) hold signups either continuously or periodically to accept applications for state funding for installing agricultural best management practices. The boards use these applications to apply to the Department of Agriculture for funds. The goal of the program is to eliminate sources of nonpoint source pollution and promote the installation of best management practices. These best management practices are developed by the NRCS, which provides technical guides describing each in detail. Water Resources Division and Water Pollution Control Division management would like for the Soil Conservation Districts to award funds based on 303(d) listing. Projects that prevent future nonpoint source pollution are also very important to the Water Resources Division and may help prevent the Water Pollution Control Division from having to develop TMDLs for bodies of water if the impact has been reduced before monitoring is conducted.

The Water Resources Division can also provide technical guidelines for some best management practices, such as those directly beside a stream bank (riparian zone), that they will fund without requiring a site visit to prove that they are needed. For example, any farmer who decides to install a riparian filter strip may apply for funding and receive it without visits from Water Resources Division staff. Division management explained that they want to fund as many of these projects as possible, because they are one of the least expensive and most effective measures to limit nonpoint source pollution. Site visits are required for projects that are not in

close proximity to a body of water. The division would likely fund one of these projects if it would provide demonstrable improvements to water quality.

There is no formal ranking system for awarding funds for specific projects; division staff make judgment calls in the field regarding how much a project might help nonpoint source pollution problems. Other states have such a ranking process for awarding Section 319 funds, based on cost, impact, and projected effectiveness. Tennessee has not needed such a process because it has generally had enough funds to meet everyone's needs. Management report that they plan to develop such a competitive system, including some sort of advisory committee to help make funding decisions. The Water Resources Division not only funds agricultural nonpoint source projects, but also funds projects to correct such problems as failing septic tanks, urban runoff, and forestry practices. The division tries to award funding, especially for demonstration projects, on 303(d) listed waters.

Federal funding permits the Water Resources Division to fund projects by creating partnerships with other agencies that have similar goals. The division can only award grants to local governments, other public agencies, and nonprofit organizations. The EPA set up a wide array of goals for the program, and the division tries to maintain active working groups in all sectors of the state that create projects when no voluntary applications are received. These working groups have representatives from city and county governments, public agencies, and nonprofit organizations, as well as industry representatives and concerned citizens, and often work together to inform one another about new projects, technologies, regulations, and methods for controlling nonpoint source pollution. Some projects are ongoing throughout the state, such as coordinating with the Water Pollution Control Division on land reclamation projects to restore lands impacted by acid leachate from abandoned mines.

Water Pollution Control management report that states need to prove to Congress that the voluntary approach to correcting nonpoint source pollution problems really works or they fear that the voluntary program will be discontinued and replaced with some sort of regulatory approach, which the Farm Bureau opposes.

Conclusions on the Monitoring of Surface Water

- **TMDLs** - Though it appears that Tennessee is ahead of many states in developing TMDLs (Total Maximum Daily Loads), and its planning process and the rotating watershed approach to monitoring prepares the Division of Water Pollution Control well for both TMDL development and permit issuance, it has not met its goal for developing TMDLs for calendar year 2000. It must be stated, however, that the EPA is ultimately responsible for TMDL development.
- **Permit backlog** - Tennessee has had a backlog of NPDES permits to issue, greater than the "less than 10%" goal set by the EPA. A lack of experienced permit writers, other staffing inadequacies, and inadequate resources all appear to have contributed to the backlog. In January 2001, the backlog had dropped to 10%. The Division of

Water Pollution Control needs to ensure that it has the resources to prevent the backlog from exceeding 10%.

- **Data Management/Integrity** – The division should ensure that direct data entry into STORET and automated entry of lab results do not compromise quality control/quality assurance measures. The division should develop and implement new procedures to ensure the quality and integrity of water quality data.
- **Awarding Nonpoint Source Pollution (NPS) Grants** – The awarding of NPS funds without any competitive or ranking process could prevent the most needy areas from receiving grant funds.

Drinking Water Quality Monitoring

Drinking water monitoring standards are set by the U.S. Environmental Protection Agency (EPA) and are reflected in state rules and regulations. Tennessee was awarded primary enforcement responsibility by the EPA in 1977, with it being reconfirmed as recently as 1994. By being given primacy, the state has proven to the EPA that it has

- adopted drinking water regulations no less stringent than the national primary drinking water regulations;
- adopted and implemented adequate procedures for the enforcement of such state regulations including (1) maintenance of an inventory of public water systems, (2) a systematic program for conducting sanitary surveys of these water systems, (3) the establishment and maintenance of a program for the certification of labs conducting measurements of drinking water contaminants, (4) assurance of the availability to the state of certified labs capable of performing analytical measurement of all contaminants specified in the state primary drinking water regulations, (5) establishment and maintenance of an activity to assure that the design and construction of new or substantially modified public water system facilities will be capable of compliance with the state primary drinking water regulations, and (6) statutory or regulatory enforcement authority adequate to compel compliance with the state primary drinking water regulations;
- established and will maintain record keeping and reporting of its activities;
- adopted and can implement an adequate plan for the provision of safe drinking water under emergency circumstances; and
- adopted authority for assessing administrative penalties.

Sanitary Surveys

The Division of Water Supply conducts sanitary surveys of public community water systems about every two years. These surveys evaluate and document the capabilities of a water system's sources, treatment, distribution network, and overall management to continually provide safe drinking water and to identify any deficiencies. They also serve as a quality assurance measure, checking the calibrations of sampling instruments and certifications of laboratories. Spot checks are conducted on a case-by-case basis. If a field visit is made, division staff may take microbiological samples, particularly if there have been reported illnesses, complaints, or other problems identified.

Consistency of Monitoring

Each community public water system has a monitoring program established describing the sampling requirements along with any waivers that have been granted. Monitoring requirements are based on the type of system, treatment, water source, population served, pipe materials, and whether a system had previously detected a particular contaminant or is vulnerable to a contaminant. Using these criteria, systems are addressed the same way no matter where they are located in the state. Through issuance of a monitoring/waiver letter, systems are informed by the Division of Water Supply of contaminants for which they must monitor and those for which they do not have to monitor. The central office tracks compliance with the conditions set in the monitoring/waiver letters and confirms exceptions with the environmental assistance centers.

Results of Water System Monitoring

In order to monitor adequately, the Division of Water Supply needs accurate and reliable data from water systems and must ensure that accurate data are maintained in its information system.

Self-Reported Data

The drinking water program is set up as a self-monitoring program. Water suppliers are required to take certain samples at a scheduled frequency and report the results to the state. All analyses are required to be performed by a state-certified laboratory except for those parameters for which the state grants the supplier approval to perform the analysis. Laboratory officials enter field sample data information on a form and forward this information to the Division of Water Supply. According to EPA and Department of Health officials, the samples collected and the sample analysis information that is reported by the laboratories to the Division of Water Supply are accurate and consistent. The Department of Health certifies laboratories. (See "Laboratory Certification" below.)

Data received from the water suppliers and labs are keyed in by Division of Water Supply staff before the end of each monitoring period. The staff run data verification or error reports that reject discrepancies. Five different error reports verify that sample dates precede

analysis dates, contaminant identification numbers agree with the division's table, the system is a public water system in the division's inventory, lab certification is current, and the sample was taken at the correct location within the system. Other data verification reports check for violations on chemicals with enforceable Maximum Contaminant Levels (MCLs) and for detection limit violations on chemicals without an MCL but which the federal government wants to track. If a discrepancy or violation is identified by these error reports, the division contacts the department's Environmental Assistance Center, lab, or water supplier to verify information. Data from labs may be thrown out for a variety of reasons—for example, an entire batch of data is faulty; a decimal is out of place; the lab is not currently certified; operator accurateness is questionable; or a lab made an error on the holding time between the time the sample was collected and the time allowed to test the sample. A review of error reports for January through July 2000 showed 5% of the reports had errors.

Controls Over Laboratory Results

According to EPA and Department of Health officials, Tennessee's Laboratory Certification Program requires adequate controls to prevent laboratories from falsifying and/or altering test results from the samples, which are collected or sent in from the water systems. According to the EPA official, certification audits conducted by the EPA are quite extensive. The EPA looks at the state's quality controls required for laboratories; the state's quality assurance program; the books that contain lab sample data; and the state's ability to carry out lab certifications. Both the EPA and Department of Health officials indicated that there do not appear to be any problems with the accuracy or timeliness of self-reported data.

The Department of Health, following EPA guidelines, conducts audits on microbiology laboratories every three years and on chemical laboratories once a year. Laboratories know in advance about upcoming audits primarily because a lab analyst must be present while the audit is being conducted. Audits include the following:

- lab observations to see what methods are being used for water samples;
- observation of the overall lab functions; and
- reviews of lab internal paperwork, for example, field sample forms which denote the time, date, etc., a sample was collected (this is done to ensure that the sample was conducted and analyzed within the required time frame).

Based on auditor review of most recent audit reports by the Department of Health and the EPA and interviews with these officials, there do not appear to be any major concerns about sampling controls, quality assurance, self-reported data, or flow of sample data information from local labs to the Department of Environment and Conservation. According to the EPA and Department of Health officials, the following controls are in place to prevent laboratories from falsifying and/or altering test results from the samples taken by or sent in from the water systems:

1. Twelve providers located across the country send blind samples of unknown composition to laboratories for testing when requested by a state's Laboratory

Certification Program as a part of their quality control and quality assurance program. Once the providers receive proficiency tests on the blind sample results from the labs, the information is forwarded to the Lab Certification Program for review. Once reviewed by state officials, this information is forwarded to the EPA for review. These providers are certified through the National Environmental Laboratory Accreditation Conference (NELAC), of which EPA is a member.

2. Chemical labs have their own Internal Quality Control Program consisting of routine checks on known and unknown contaminant samples which are reviewed by the Department of Health during the audit process as a part of the lab certification requirement.
3. In addition, the Department of Health has a program in which half of a sample is tested by the state and the other half is tested by a lab. This process is known as a split sample test and tells whether the sample was tested correctly.

The Department of Health official indicated that misreported microbiological sample data could be a risk to citizens. Microbiology laboratories that submit misleading sample test information face the risks of ruining their reputation, being penalized, losing their certification, and defending potential lawsuits. Such labs could potentially get away with falsifying sample data information for a while. However, the Department of Health would eventually find out about it (for example, through reports of sickness).

Laboratory Certification. The Department of Environment and Conservation's Division of Water Supply appears to maintain valid and current certification information on laboratories conducting drinking water tests, based on a review by the auditors. That review consisted of comparing lab certification information maintained separately by the Department of Health's Division of Laboratory Services and the Department of Environment and Conservation's Division of Water Supply since the Department of Health oversees the Laboratory Certification Program and provides pertinent lab certification information to the Division of Water Supply.

The Tennessee Laboratory Certification Program was established to evaluate laboratories to determine technical capability to analyze for contaminants. Guidelines also stipulate that the designation of Department Laboratory Certification Officers will be from those experienced professional staff members assigned to the Bureau of Laboratory Services, which is the Department of Health's Division of Laboratory Services. The Environmental Protection Agency approved Tennessee's Laboratory Certification Program in March 1999, pursuant to the requirements set forth in Chapter 40, *Code of Federal Regulations*, Parts 141-National Primary Drinking Water Regulations and 142-National Primary Drinking Water Regulations Implementation, Subpart B—Primary Enforcement Responsibility.

According to a Department of Health Division of Laboratory Services official, as of August 2000, there were a total of 165 non-state-operated labs certified by Tennessee, which break down as follows:

68 Out-of-State Labs:

- 66 chemistry labs
- 2 microbiological labs

97 In-State Labs:

- 32 chemistry labs
- 65 microbiological labs

Also, four labs operated by the Tennessee Department of Health test both for microbiological and chemical contaminants.

Operator Certification. The Department of Environment and Conservation's Operator Certification Program for public water systems appears to adequately ensure that all water systems operators maintain valid certification and qualifications based on a review conducted by auditors. *Tennessee Code Annotated*, Section 68-221-905, authorizes the Board of Certification to administer the certification program. Certification of operators is required under Section 68-221-909. There are a total of 3,155 operators certified in Tennessee. (Some operators may have certificates for both water and wastewater systems.) The department tracks 2,735 water and distribution certificates.

The Environmental Protection Agency's (EPA) proposed guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems are set forth in the Federal Register under FRL-6230-8. Final guidelines were published February 5, 1999, as required by the Safe Drinking Water Act Amendments of 1996. These guidelines provide states with the minimum standards for the development, implementation, and enforcement of operator certification programs for public water systems. States were required to submit a draft copy of their guidelines to the EPA by August 5, 2000. Tennessee met this deadline. State Operator Certification programs were to be in full compliance with EPA guidelines by February 5, 2001. States that failed to comply would lose 20% of their Drinking Water Revolving Grant funds provided by the EPA.

Information Systems

The Division of Water Supply information system is a collection of different FoxPro databases. The staff manipulate the data maintained in the different database files to obtain the needed information for reports. Various reports can be generated from these databases, with staff able to tailor most reports to their specific needs. Reports are generated through R&R software (a report generation software which can relate database files into a single report). Some of the capabilities will change once Tennessee has its version of the federal Safe Drinking Water Information System (SDWIS) operating, which should be by the summer of 2001.

Division management believe the current system is good because there are no limits (as found in "off the shelf" systems) to what information can be maintained in the databases. The databases can be created and combined to meet any need. When an off-the-shelf system is used, the user must alter operations to fit the system. This will be the case when SDWIS goes on-line in Tennessee. However, the current system does operate under some disadvantages. The different databases are not easily linked; are not user friendly; and to work with this type of system, one must know the particular databases in which to locate the needed data.

However, SDWIS will not calculate noncompliance status for the majority of drinking water rules. Staff will still have to use a combination of FoxPro databases and R&R reports to calculate compliance status for many rules until the EPA releases another version of SDWIS for the states.

In 1994 and 1999, the EPA conducted data verifications to detect discrepancies between the public water systems data in the Division of Water Supply files and the data reported to EPA's information system to ensure that the division was determining compliance in accordance with federal regulations. In each data verification study, the EPA has found only a very small percentage of discrepancies. In 1999, the EPA commended Tennessee's drinking water program for general excellence and reported that the state program is well run and business processes work well. Still, although the state does a good job internally tracking and addressing monitoring, reporting, and MCL (maximum contaminant level) violations, the EPA noted isolated examples where information was not reflected in either the state data system or the federal system.

Planning and Coordination

Some states participating in the joint audit were concerned about planning and coordinating between different governmental entities because some states have multiple oversight agencies. In Tennessee, however, the Department of Environment and Conservation (with its regional offices) is the main regulatory agency reporting to the EPA. According to a Division of Water Supply official, there are no policies or procedures requiring coordination and planning between offices, regions, states, and local agencies. The division did provide the following plans, which describe, among other things, how the division will meet EPA requirements, meet its goal to ensure safe drinking water, and work with the department's environmental assistance centers:

1. "Public Water System Supervision FY '00, 01, and 02 Workplan":
This is a three-year plan that is developed jointly with the Environmental Protection Agency (EPA). According to a division official, this plan is an EPA requirement since the division receives funding for the Public Water Systems grant. This plan provides information regarding federal requirements and the division's commitment regarding those requirements, and deadlines for federal/state requirements.
2. "Annual Performance Plan for FY 1999-2000, Division of Water Supply":
This plan details the division's mission statement; purpose and functions; annual goals, objectives, performance measures, and activities; and the Annual Performance Plan Matrix.
3. "Division of Water Supply Program Plan Goals and Objectives, October 1, 1999, to September 30, 2000":
The purpose of this plan is to define the roles and expectations of the central office and environmental assistance centers in addressing compliance issues dictated by the

mission of the division. According to a division official, the division is in the process of completing another plan for October 1, 2000, through September 30, 2001.

Monitoring Emergency Preparedness

The Tennessee Emergency Management Agency (TEMA) is responsible for monitoring local areas for emergency preparedness since it serves as the leader in emergency response. However, the Department of Environment and Conservation's role is to provide support to TEMA through the use of the department's Emergency Service Coordinators.

Although there are no regulations that require public water systems to update their emergency plans, the department continues its efforts to ensure that the following types of information in the emergency plans are kept up-to-date: points of contact, phone numbers, equipment lists, locations of equipment, etc. According to Division of Water Supply officials, emergency plans are checked against current situations when sanitary surveys are conducted at water system plants, and currently no emergency plans need major overhauls.

Objective 3: Does the State Apply Corrective Actions Effectively?

Surface Water Quality Enforcement

Finding: Improvements are needed in the Division of Water Pollution Control's enforcement program

Reviews of enforcement files revealed record-keeping problems: central office files were not always updated as cases progressed, the resolution of cases was not included in case files, and some files did not contain all required documentation. These problems could result in the inability to properly track enforcement actions by the central office; cases "falling through the cracks" without adequate, timely enforcement action or follow-up; documents having to be sent from the environmental assistance centers to the central office multiple times; and difficulty for citizens and other stakeholders in determining how an enforcement case was resolved.

Case Tracking

The enforcement section of the Division of Water Pollution Control maintains paper files on all water pollution cases at the central office in Nashville, in addition to maintaining a database that currently includes only cases opened in approximately the past three years. According to enforcement section management, files should include a Notice of Violation; an Enforcement Action Request; and any resulting orders, penalty calculations, and appeal information. New violations that occur while a case is ongoing should be noted in the file as well. Enforcement Action Requests generally consist of all the evidence gathered for the case, as well as any correspondence with the alleged violator, including laboratory results, discharge monitoring reports, photos, inspection reports, etc., to be used by the division and the Office of

General Counsel in drafting enforcement orders. Files opened since 1998 should also include a tracking sheet listing items in the files and the dates they were added.

A review of 25 of 135 open enforcement files and 15 of 49 cases that were closed in calendar year 1999 revealed some concerns. One of the open files was filed under Knox County rather than the violator's actual location in Shelby County (a distance of approximately 400 miles). Because these two counties are at opposite ends of the state and served by different environmental assistance centers, updates from assistance center staff and other case documentation would not likely be placed in the file, and tracking the case would be difficult. (In essence, the file was lost.) A second file from the sample included two folders, each containing an Enforcement Action Request dated March 19, 1999. Further inquiry revealed that one of the folders was to be kept at the central office, while the other should have been sent to the Office of General Counsel for their review and processing. This case had been in limbo, essentially, for 16 months and would probably have stayed there if auditors had not discovered it, unless environmental assistance center staff had inquired about its status.

Several paper files were missing one or more of the required documents, although some of these items were documented in the database. All files that should have included final orders did. Paper files, however, were difficult to follow in cases where violators had previous enforcement orders, had committed violations subsequent to the initiation of previous enforcement actions, or the case included some other factor that deviated from a "classic" case. Documents were in files in no particular order, and tracking sheets were not always updated. Also, there were a number of paper files missing documents (some were noted in the database), so a person could not independently review paper files and get the whole story on a case. Though it is not required by any law or regulation, no files included any documentation of the resolution of the case. The Division of Water Pollution Control considers cases closed when orders have been complied with and civil penalties have been paid. In some cases, compliance schedules are extended or agreements reached that alter how compliance must be achieved. In all cases, it may be helpful to include some description of how final resolution was achieved.

Case Resolution

The closed cases were also reviewed to determine how long it takes for enforcement orders to be finalized and how long it takes to reach final resolution or case closure. The time to get a final order averaged about 35 months (nearly three years from Notice of Violation to final order). The time for cases to reach final resolution averaged about 52 months (over four years) from Notice of Violation to closure. (A case is closed when the terms of the order have been met.) The shortest time period recorded from Notice of Violation to final order was one month, and from Notice of Violation to closure was two months (both time periods are from the same case, which was initiated and settled in 2000). The longest time period recorded from Notice of Violation to final order was 99 months (over eight years), and from Notice of Violation to closure was 115 months (over nine and a half years). However, analysis of cases initiated since 1997, when some procedures were changed, revealed that the newer cases were active for a much shorter period of time. These cases (both open and closed) averaged only 13 months from Notice of Violation to final order (as compared to about 35 months for all cases in the closed

case file sample), indicating that new procedures (i.e., tracking sheets) and the new enforcement coordinator have had a positive effect on the length of time cases are open before orders are finalized.

New Database

Water Pollution Control management reported that they had finished rebuilding their enforcement database in June 2000 but that it only included cases opened since 1997. Some of the older cases had been entered, but not all. Unlike the old database, the new database is capable of tracking cases from the Notice of Violation stage to final resolution, whether the resolution consists of payment of penalties or compliance with terms of an order. Terms and milestones for each case are entered into the system, which tracks compliance with orders based on these conditions and dates. Management will run monthly reports indicating any milestones applicable to all enforcement cases in the system. As requested items are received or milestones are achieved, the applicable environmental assistance center will send notification to the enforcement section (central office) of information to be entered into the system. The system can then compare the dates items were received with the dates they were due under orders and list any items not received timely, milestones not achieved, or information not yet entered into the database. Auditors observed the first monthly report generated by the system, which will be used to notify the environmental assistance centers of items to follow up on. This report should improve the division's case tracking. Management reported that the system has been working well.

Prior to the database being rebuilt, the paper files were not always adequately maintained because of staff shortages (there was only one employee in the enforcement section) and staff turnover. The database was not considered adequate to track cases. When the new enforcement coordinator took over in late 1999, he inherited the files as they existed and the inadequate database. Since the new coordinator took over, the database has been rebuilt, and an employee has been assigned to track cases and manage the database. Our file review found that most of the files opened since the new enforcement coordinator took over appeared to be complete.

Recommendation

Problems with record keeping, especially with reference to older cases, appear to hinder the division's ability to properly enforce water pollution control laws and regulations. However, these problems are being addressed to some extent. The new database should help management to better track enforcement cases without relying on paper files to be updated as items are received from the Environmental Assistance Centers. However, to ensure that cases don't fall through the cracks, the division should review all enforcement case files. Staff should examine the files for proper documentation of the enforcement process, including follow-up procedures, whether milestones contained in compliance schedules were met, and collection of civil penalties. In addition, the division may wish to consider including a memo in each case file noting how the case was resolved, whether by compliance with orders, payment of penalties, submission of reports, etc.

Management's Comment

We concur in part that during the audit period there were problems associated with case tracking. While a few older cases have yet to be entered into our tracking database, we believe most case tracking problems have now been eliminated as a result of revising and maintaining the tracking database. The situation of a "lost file" cited in the report should not happen today because of the monthly review of active cases that is now conducted. Discrepancies noted in that review would now trigger recognition that the file was not present and result in a search for the missing file. We agree that the few remaining cases should be entered in the database, and we will continue efforts to do so.

The division agrees with the recommendation that a memo documenting resolution of enforcement cases be included in the files prior to closing the case, and has implemented this as a procedure in closing out a case.

Additional Enforcement Information

Permit Holder Inspections

The enforcement section conducts compliance inspections on permitted facilities in Tennessee. Under the state's workplan agreement with the EPA (which is renegotiated each year) the state was to inspect 156 major facilities during fiscal year 2000. The EPA only requires minor facilities to report their monitoring results; there is no requirement for inspections. The Division of Water Pollution Control inspected all but five major facilities, while it inspected 232 minor facilities though this was not required. The division had negotiated with the EPA to trade minor facility inspections for majors at a ratio of three-to-one. Division management feels that inspecting 232 minor facilities more than makes up for the four major facilities that were not inspected, though the EPA did not approve this for 2000. Management also explained that because of strict oversight, major facilities rarely have big problems and would probably not have problems even without this level of oversight. However, a number of minor facilities keep their discharge volumes just below the level that would bump them up to major facility status, but experience regular effluent violations and frequent other problems. (One such situation is described below in the "EPA Reviews" section.)

Tennessee has been trying to negotiate with the EPA to only inspect major facilities with a good compliance record every two to three years, while increasing the number of minor facility inspections. The EPA agreed to such an arrangement for FY 2001, allowing the division to inspect only half of the major facilities, trading minor facility inspections at a two-to-one ratio for the other half of the majors. This arrangement commits the state to inspect 78 major facilities and 162 minors in fiscal year 2001. Management believe that this arrangement better helps them to achieve their clean water goals by directing resources toward more problem facilities and allowing staff the time to work on planned monitoring activities.

PCS (Permit Compliance System) Data Management

Auditors tested the Water Pollution Control Division enforcement section's data integrity by tracing violations listed on Quarterly Non-Compliance Reports through the PCS database to the EPA's Active Exceptions List, where the violations should have placed facilities into Significant Non-Compliance (SNC). All the facilities which should have appeared on the Active Exceptions List as SNCs did, so auditors concluded that PCS data appears to be properly entered by division staff and properly processed by PCS, indicating no data accuracy problems.

Controls Over Lab Results, Self-Reported Data

NPDES (National Pollutant Discharge Elimination System) permit holders in Tennessee report their own discharge monitoring data to the enforcement section of the division at frequencies stated in their discharge permits. The frequency is determined by the volume and types of pollutants discharged and varies by permit. Larger permit holders do much of their analyses on site and report directly to the division, while smaller permit holders generally send effluent samples to contract labs for analysis and then report the results to the division. Enforcement section management stated that there is nothing to prevent permit holders from submitting false information. However, there are quality assurance measures to discourage it. The division conducts inspections on both permit holders and wastewater labs, a part of which is taking effluent samples and splitting them with the permit holder's lab to see if both get the same results. The EPA also does a Quality Assurance study annually in which it sends blind samples of unknown composition to a sample of permit holder labs. The permit holders' labs must properly analyze the samples and report the results to the EPA. Also, Water Pollution Control enforcement staff look for certain clues that might indicate that a lab has a problem or may be misrepresenting results, such as very consistent results, frequent outliers, or bad data. Field staff reported that other indicators of misrepresentation include results that appear better than expected and reported sampling events that would have been difficult or impossible to achieve based on recorded times and distances between stations.

Division management may wish to examine controls over self-reported data to ensure they are sufficient to discourage false reporting and to catch inaccurate reporting by permit holders. All division staff that review monitoring data should be trained in how to spot questionable test results.

EPA Reviews

The EPA's regional office in Atlanta conducts an annual mid-year review of the Water Pollution Control Division's enforcement program, examining all facets of the program for adequacy and compliance with EPA requirements. Several significant accomplishments were noted in the Fiscal Year 2000 review, in addition to a number of concerns.

EPA Concerns

Concerns noted in the 2000 review included delays in entering inspection, enforcement action, and discharge monitoring report data into the federal PCS (Permit Compliance System) database; the division not issuing “timely” enforcement actions for discharge monitoring report violations; not documenting in enforcement files the rationale for significant penalty reductions; many deficiencies repeated on every inspection report for one particular permit holder; and the inability to transfer stormwater enforcement data to PCS.

The division has made changes to address some but not all of the EPA’s concerns. Regarding delays in PCS data entry, the enforcement coordinator reported that at the time of the review, only one person was entering Tennessee data to PCS. Some time before this review, the division began to enter data directly into PCS rather than batch loading from the state’s Access database. Division staff report that about a month after the EPA review, data entry was current because two full-time and two part-time employees were assigned to enter PCS data.

Regarding a lack of timely enforcement actions for discharge monitoring report violations, management reported that the enforcement section has made it a priority to address the Significant Non-Complier List and get permit holders into compliance with regard to pollutants discharged. Management states that the EPA wants an enforcement order even for reporting violations, but it does not see the point in tying up resources to draft enforcement actions that address reporting violations that have already been corrected.

Regarding the lack of documentation for significant penalty reductions, division management state that the EPA was referring to cases that were settled with agreed orders after commissioner’s orders had been drafted and placed in files. They report that the rationale behind penalty reductions in these settlements is that settling the cases before orders are finalized saves the state the cost of litigation, and because this is the rationale behind settling any case, the division sees no reason to document this case. They also state that the division would not settle any case unless the violator makes an effort to correct the problems.

The EPA’s review also listed concerns about one particular permittee repeating the same violations over and over again without adequate enforcement action from the division. Management reported that the facility is classified as a minor facility, though its discharge volume is just under the volume that would classify it as major. The facility’s problem is an old, leaky collection system that overloads its treatment plant by allowing rain and groundwater into the sewer lines, making treatment more difficult and increasing volume beyond plant capacity. While it is currently under a follow-up order that assesses civil penalties for some, but not all, of the reported violations, the city (Mountain City) has revenue problems that prevent it from upgrading and fixing the collection system. The division has not assessed all the penalties it could have against the city because the city would never be able to pay them. Management emphasized that it is trying to get the city’s problems fixed without shutting the treatment plant down, allowing the plant to continue to operate and commit effluent violations so that the sewage will still receive some treatment, although it may be inadequate. The division referred the city to the “Southern Rural Community Resource Group,” a part of “The Community Resource Group, Inc.” The organization offers free technical assistance and low-interest loans of up to \$150,000

to rural communities to help them with their water treatment problems. The division hopes that the city will take advantage of this help.

Regarding the division's inability to upload stormwater enforcement data to PCS, management stated that it has no plans to enter stormwater data into PCS because there are no enforceable limits in a stormwater permit, only target levels; and the division does not have the manpower to enter data that will only be used for permitting decisions. The only enforcement provision in federal stormwater regulations is that the state can require permit holders to "reevaluate" their stormwater pollution control plan if they exceed target levels for two consecutive quarters. None of the stormwater standards are enforceable, no limits exist, there is little in the way of treatment technologies for stormwater, and limits would be difficult to enforce because conditions differ significantly with each rainfall event relating to volume, time between rainfall events, duration, activities between rainfall, etc. Managers stated that there are too many variables associated with stormwater to try to hold permit holders to inflexible standards.

EPA Significant Accomplishments

In its fiscal year 2000 mid-year review of Tennessee's water quality enforcement program, the EPA noted several significant accomplishments of the Water Pollution Control Division enforcement section. Descriptions of these accomplishments are below:

- Water Pollution Control has significantly increased its enforcement presence in fiscal year 2000, issuing 25 Director's Orders in just over 2.5 months, compared to 43 Director's Orders issued during the first six months in fiscal year 1999. Orders were issued on average within 68 days after they were requested. [In 2000, the division issued 151 orders and assessed \$3,090,578 in civil penalties.]
- Water Pollution Control issued a Commissioner's Order to a company with a civil penalty of \$232,500 for logging activity on 1,600 acres, which resulted in sedimentation and pollution to several streams. This enforcement action required the successful coordination between two state agencies: Water Pollution Control and the Tennessee Department of Agriculture's Forestry Division. This was the first such case in Tennessee.
- Water Pollution Control has doubled many of its minimum civil penalties for Commissioner's Orders after a review of the penalty policy determined that base penalties had remained static for approximately ten years.
- The State Storm Water Program has addressed FY 99's mid-year concern of discharge monitoring report review by being responsive to nonsubmittal of industrial stormwater discharge monitoring reports. Approximately 350 Notices of Violation have been issued to facilities failing to submit these reports.

Enforcement Cooperation With Other Agencies

The Department of Environment and Conservation works with the Department of Agriculture and the Tennessee Wildlife Resources Agency to prevent and control water quality problems.

Department of Agriculture

Though it has no enforcement authority, the Department of Agriculture's Water Resources Division has a Memorandum of Understanding with the Water Pollution Control Division regarding agricultural nonpoint source pollution. The agreement states that in the case of a serious pollution problem, the Water Resources Division will try to work out a voluntary solution by informing landowners of their rights, providing technical assistance, and advising them of available funding to help correct their problem. If a voluntary solution cannot be worked out, Water Pollution Control staff make a visual inspection and conduct sampling at the site. Then, in order to take enforcement action under the Clean Water Act, Water Pollution Control staff only have to document with lab analysis results and photos a point source discharge through which contaminants enter surface water. Water Resources Division management stated that in most cases where there is a serious problem, Water Pollution Control staff can find some sort of point source, such as a drainage ditch at the edge of a cultivated field or a gully worn out where cows have repeatedly entered a stream. Water Pollution Control determines whether an animal feeding operation is a concentrated animal feeding operation based on the number of animals.

Tennessee Wildlife Resources Agency

For enforcement cases in which a fish kill has occurred, the Tennessee Wildlife Resources Agency (TWRA) Environmental Services Division conducts the damage assessment and places a dollar value on the damage to be included as a portion of civil penalties assessed in commissioner's orders. This amount is subtracted from penalties collected by the Department of Environment and Conservation and credited to TWRA. Another area of cooperation is in Natural Resource Damage Assessments under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which looks at long-term damage assessments caused by contamination over a long period of time. Under this program, any damage penalties assessed must be used to restore the damaged resource. For example, the department is seeking damages for environmental damage done to Watts Bar Lake caused by U.S. Department of Energy activities at Oak Ridge.

Another area of enforcement cooperation between TWRA and the Department of Environment and Conservation has to do with the fact that TWRA has its own law in the criminal code that makes polluting the waters of the state a Class A misdemeanor. Because TWRA's four Habitat Protection Officers are commissioned, they can make arrests relating to water pollution pursuant to this law. The water pollution laws applicable to Environment and Conservation, on the other hand, are under the civil code, which does not give department staff

much authority to take immediate action. Nothing in the law prevents the Water Pollution Control Division and TWRA from pursuing water pollution cases through both the civil and criminal codes, so they often work together on cases. Often, the department can pursue an enforcement order requiring violators to clean up waters they have already polluted but cannot immediately stop the activities causing pollution.

TWRA's authority to arrest violators accomplishes a couple of things. First, making an arrest can have the effect of stopping polluting activities immediately to prevent further damage. Second, if making an arrest does not halt the activities, TWRA can get an injunction to stop activities that cause water pollution until the case is heard in court or until commissioner's orders are finalized. While TWRA does not always pursue criminal cases against polluters, it works with the Division of Water Pollution Control to determine the most effective strategy to halt polluting activities. It may also pursue criminal charges until orders are finalized, then drop criminal charges after the violator agrees to an order that cannot be appealed to the Water Quality Control Board. TWRA generally does not pursue criminal charges against NPDES permit holders, because it is difficult to win a criminal case when the violator has a permit approved by the EPA.

Drinking Water Quality Enforcement

Finding: Some files reviewed lacked evidence of public notification

The federal Safe Drinking Water Act allows states and territories to seek EPA approval to administer their own Public Water System Supervision Programs. The authority to operate such a program is called "primacy." In order to receive primacy, states must meet certain requirements specified in the Safe Drinking Water Act and the regulations, including adoption of drinking water regulations that are at least as stringent as the federal regulations and demonstration that they can enforce program requirements. Tennessee received primacy in 1977 and assumed primary enforcement responsibility for the public water systems operating under the Tennessee Safe Drinking Water Act. Tennessee's Division of Water Supply possesses regulatory responsibility for over 1,100 public water systems, serving a population in excess of 5 million.

The division gives priority to resolving problems, whether the problem is first brought to the attention of the division by a complaint, routine inspection, or sanitary survey. Where problems or issues cannot be resolved through technical assistance, training, and/or a Notice of Violation, the division employs a strategy of escalating enforcement responses. The enforcement process begins with the issuance of a Notice of Noncompliance, unless noncompliance involves fraud or other criminal action.

A violation is discovered or validated through reporting or monitoring data, an inspection, sanitary survey, complaint investigation, or other type of investigation. Then a Notice of Violation is sent to the water system citing the violations found and specifying a reasonable compliance deadline. If the violation is corrected, no further action is required of the violator. The division may still assess civil penalties and damages. If a violation is not

corrected, a second Notice of Violation may be issued with an abbreviated compliance deadline. Depending on the situation, a Notice of Noncompliance may be sent via registered mail and a Compliance Review Meeting scheduled. A Letter of Agreement is normally offered to a violator during the Compliance Review Meeting as a method to address compliance issues. The Letter of Agreement sets forth specific terms and dates for compliance. Subsequently, if the violation is corrected, no further action is required of the violator. If the violation is not corrected or the violator fails to attend the scheduled Compliance Review Meeting or comply with the Letter of Agreement, an Enforcement Action Request file is prepared and submitted to the Enforcement Section. The Enforcement Section then presents the Enforcement Action Request file and penalty proposal to either the division director or commissioner for an administrative order against the violator. A Show Cause Meeting may precede issuance of an order, when applicable. If the violator remains in noncompliance, the Enforcement Section submits the case to the Office of General Counsel for legal action.

In 1998, there were a total of 629 violations, 68% of which were monitoring violations. In 1999, there were 971 violations, 80% of which were monitoring violations. Violations were resolved in the following ways:

1998	Violation Outcome	1999
285	Notice of Violation	498
163	Public Notice	201
29	Notice of Noncompliance	15
16	Letter of Agreement	25
4	Compliance Review Meeting	15
125	Order	209
7	Follow-up Order	7
0	Office of General Counsel	0

According to division staff, the increase in violations from 1998 to 1999 was because the EPA required more chemical monitoring in that year of the compliance monitoring cycle. The division issued 45 orders and assessed \$50,650 in civil penalties in 1999. (In 2000, the division issued 38 orders and assessed \$224,999 in civil penalties.)

The Division of Water Supply submits public water system inventory statistics; the incidence of MCL (maximum contaminant level), major monitoring, and treatment technique violations; and enforcement actions initiated against violators to the EPA on a quarterly basis. In addition, since 1996, states with primacy must also prepare and submit an annual report to the EPA regarding public water system violations and publish and distribute summaries of their reports to their citizens.

Monitoring, reporting, and MCL violations require that the water system notify the people served by the system of the violation. A review of the files for 30 water systems with violations in calendar year 1999 (out of a total of 309) showed that in 13 cases (43%) there was no evidence of public notice in the files. Without public notification, water system customers

may not get information they need to determine how well their system is operating and any potential health effects caused by a violation.

Recommendation

The Division of Water Supply should ensure that the public is notified of monitoring, reporting, and MCL violations, as required by state rules.

Management's Comment

We concur that maintaining appropriate documents in water system files could be improved. The Division of Water Supply will make efforts to ensure that files contain all relevant documents concerning a particular water system's violations. We will also improve efforts to ensure that water systems meet public notification requirements as required. We note that over the last several years the compliance rate for public notification has improved.

It should be noted that the Environmental Protection Agency (EPA) has promulgated new public notification regulations that will go into effect on May 6, 2002. In addition to changing the time frame to give public notice and modifying the mandatory language, the new rules make the failure to provide public notice a reportable violation to the EPA. The division will ensure that public water systems that incur a violation give the appropriate public notice and take appropriate enforcement action when systems fail to provide public notice.

RECOMMENDATIONS

ADMINISTRATIVE

The Department of Environment and Conservation should address the following areas to improve the effectiveness of the surface and drinking water programs.

1. The Division of Water Pollution Control should review all enforcement case files to ensure no cases have been lost. Staff should examine the files for proper documentation of the enforcement process, including follow-up procedures, whether milestones contained in compliance schedules were met, and collection of civil penalties. In addition, the division may wish to consider including a memo in each case file noting how the case was resolved, whether by compliance with orders, payment of penalties, submission of reports, etc.
2. The Division of Water Supply should ensure that the public is notified of monitoring, reporting, and MCL violations, as required by state rules.