



OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Audit Report

Stronger Leadership Needed to Develop Environmental Measures for Clean Water State Revolving Fund

Report No. 2004-P-00022

June 23, 2004



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Abbreviations

BOD	Biochemical Oxygen Demand
CWSRF	Clean Water State Revolving Fund
DO	Dissolved Oxygen
EPA	U.S. Environmental Protection Agency
GAO	General Accounting Office
OMB	Office of Management and Budget

Cover photo: Sable Falls, Grand Marais, Michigan (from EPA web site)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
INSPECTOR GENERAL

June 23, 2004

MEMORANDUM

SUBJECT: Final Report: 2004-P-00022
Stronger Leadership Needed to Develop Environmental Measures for
Clean Water State Revolving Fund

FROM: *Michael A. Rickey*
Michael A. Rickey
Director for Assistance Agreement Audits

TO: Benjamin Grumbles
Acting Assistant Administrator for Water

This is our final report on the subject audit conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). This report contains a finding that describes problems the OIG has identified and corrective actions the OIG recommends. We discussed our finding with your staff and issued a draft report. We have summarized your comments in this final report and included your complete response in Appendix D. This report represents the opinion of the OIG and the findings do not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

Action Required

In accordance with EPA Manual 2750, you are required to provide a written response to this report within 90 calendar days of the date of this report. Please e-mail an electronic version of your response to holthaus.randy@epa.gov. You should include a corrective actions plan for agreed upon actions, including milestone dates. We have no objections to the further release of this report to the public. For your convenience, this report will be available at <http://www.epa.gov/oig>.

We want to express our appreciation for the cooperation and support from your staff during this audit. If you or your staff have any questions about this report, please contact me at (312) 886-3037, or Randy Holthaus, Assignment Manager, at (214) 665-6620.

Executive Summary

Purpose

As of 2003, the Clean Water State Revolving Fund (CWSRF) had \$47 billion available for projects. Given the dollars involved and the current need to show the public the environmental benefits achieved from dollars invested, we reviewed U.S. Environmental Protection Agency (EPA) and State efforts to measure the environmental results of the CWSRF. Our specific audit objectives were to answer the following questions:

- What plan does EPA have to ensure that the environmental value of the CWSRF can be measured?
- What efforts has EPA made to measure the environmental results of CWSRF projects?
- What actions have States taken to measure CWSRF results?

Results in Brief

EPA needs to increase its leadership role in measuring the environmental benefits of the CWSRF. EPA has been working on developing environmental measures since 1998. However, EPA and the States have not established a uniform set of measures to assess the environmental impact of the program. Further, EPA has not developed a comprehensive plan for measuring the results of the CWSRF. As a result, EPA: (1) did not know the actual environmental impact of the CWSRF and will not know unless it develops measures; and (2) cannot compare the impact of individual water quality programs and make informed resource allocations. Also, some States questioned the value of measuring and, therefore, did not place emphasis on doing it.

Recommendation

We recommend that the Assistant Administrator for Water develop a plan, with milestone dates, that (a) establishes the value of measuring environmental benefits, (b) seeks input from other stakeholders about measuring options, (c) identifies and evaluates measuring options, and (d) selects an option and establishes an implementation plan.

Agency Comments and OIG Evaluation

The Office of Water generally concurred with our finding and recommendation. The Office of Water plans to pursue the ideas in the recommendation through various workshops and workgroups. The main goal is to have a suite of proposed indicators developed by February 2005. The Office of Water will develop a performance measurement plan that will include activities with appropriate milestone dates.

We agree with the Agency's proposed action. However, in its response to our draft report, the Office of Water did not provide a specific milestone date for when it will finalize its performance measurement plan. As a result, we are requesting that the Office of Water provide a specific milestone date within 90 days of the final report, or a copy of that implementation plan if it is completed.

Table of Contents

Executive Summary	i
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Chapters

1	Introduction	1
	Purpose	1
	Background	1
	Scope and Methodology	4
2	CWSRF Leadership Needed	5
	Importance of Measuring for Results	5
	EPA Has Financial But Not Environmental Measures	6
	EPA Needs a Comprehensive Plan for Measuring Environmental Results of the CWSRF	7
	Conclusion	8
	Recommendation	9
	Agency Comments	10
	OIG Evaluation	10

Appendices

A	Details on Scope, Methodology, and Prior Audit Coverage	11
B	EPA's Efforts to Measure the CWSRF	13
C	Summary of Measurement Activities for Selected States	17
D	EPA Response	19
E	Distribution	23

Chapter 1

Introduction

Purpose

Since 1988, the U.S. Environmental Protection Agency (EPA) has provided States about \$21 billion to capitalize the Clean Water State Revolving Fund (CWSRF). State funds, interest income, principal repayments, and bond revenue provided another \$27 billion. As of 2003, the CWSRF had about \$47 billion available for projects.¹

Success of the CWSRF program has been measured almost entirely based on financial indicators. Given the dollars involved and the need to show the public the environmental benefits achieved from dollars invested, we reviewed EPA's and States' efforts to measure the environmental results of the CWSRF. Our specific audit objectives were to answer the following questions:

- What plan does EPA have to ensure that the environmental value of the CWSRF can be measured?
- What efforts has EPA made to measure the environmental results of CWSRF projects?
- What actions have States taken to measure CWSRF results?

Background

Clean Water Act and Creation of the CWSRF

During the 1970s and 1980s, the Construction Grants Program was a major source of Federal funds, providing more than \$60 billion for the construction and rehabilitation of publicly-owned wastewater treatment facilities. Despite the success of the Construction Grants Program, Congress sought to establish a more sustainable method of financing the construction of wastewater treatment plants.

In 1987, Congress passed amendments to the Clean Water Act designed to phase out the Construction Grants Program and shift municipal financial assistance from grants to loans. As a result, the CWSRF began operating in fiscal year 1989, and Congress designated 1990 as the last year that grant funds would be appropriated for the Construction Grants Program. This new approach to funding water

¹As of 2003, the CWSRF was valued at \$48 billion, but about \$1 billion was not available for projects because \$800 million was used to administer the Fund and another \$300 million was transferred to the Drinking Water State Revolving Fund.

pollution abatement projects was designed to be a permanent, State-operated financial assistance program. The CWSRF was charged with funding a wide variety of water quality projects, including all types of non-point source, watershed protection or restoration, and estuary management projects, as well as more traditional municipal wastewater treatment projects (point sources).

How the CWSRF Program Works

Through the CWSRF program, all 50 States have a revolving loan fund that provides independent and permanent sources of low-cost financing for a wide range of water quality projects. Initially, EPA provides grants to States to establish and further fund States' CWSRF programs; States are required to provide matching funds (equal to 20 percent of the Federal grant amount). Subsequently, the States run their CWSRF programs and make CWSRF loans, primarily to communities. Loan repayments are recycled back into each individual State's CWSRF program to fund new water quality projects within the State.

Federal funds for the CWSRF are allocated to each State based on a formula in the Clean Water Act. From 1989 to 2004, States received Federal funds ranging from about \$110 million to \$2.48 billion. Using fund assets as collateral, some States issue bonds to leverage their CWSRF programs (secure additional funding). Such leveraging has added \$14 billion to the CWSRF for water quality projects. Loan repayments and interest earnings have added \$9.1 billion.

As of the end of fiscal 2003, the total CWSRF funds available for projects was about \$47 billion. In 2003, Congress appropriated about \$1.34 billion to EPA – about one-sixth of its budget – so that the Agency could provide additional CWSRF capitalization grants to States.

EPA's Role Under the CWSRF

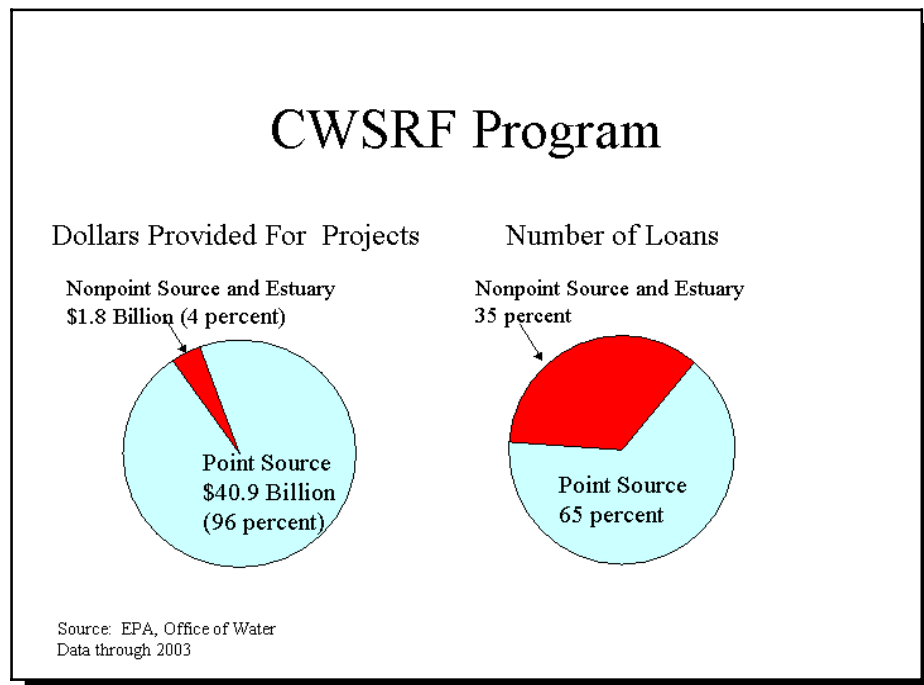
EPA's Office of Wastewater Management, within the Office of Water, is responsible for overseeing the CWSRF program on a broad level. The Office of Wastewater Management establishes oversight policies for the CWSRF and annually reviews how well the EPA regions monitor the program. Each of EPA's 10 regional offices has the responsibility of awarding, monitoring, and closing out capitalization grants. Further, the regions are to:

- Work with States to improve their CWSRF programs.
- Ensure that States comply with eligibility requirements.
- Encourage States to fund the highest priority problems.
- Ensure that its States' CWSRF programs are financially stable and viable.
- Promote the implementation of national priorities.

States' Roles Under the CWSRF

Under the Clean Water Act, the CWSRF program is State-managed and directed. The States are ultimately responsible for selecting projects to receive loans. Each State annually outlines how it plans to use all available funds during the year. Each State also has its own specific procedures for reviewing potential projects, such as financial hardship, relative water quality benefits, location within high-priority watersheds, or other relevant factors. In addition, States are responsible for setting the terms of the loans.

After States receive the capitalization grants from EPA, States make the loans to communities, individuals, and other high-priority recipients. States can also form partnerships with other funding sources – such as banks, local governments, and State agencies – to extend credit for promoting water quality. In recent years, States have begun to devote an increasing number of loans to non-point source (e.g., development of stream bank buffer zones) and estuary management (e.g., restocking fish) projects. However, as of the end of fiscal 2003, 65 percent of the total loans and 96 percent of the total dollars went toward point source projects (see box). These point source projects were for replacement, upgrade, or modification of inadequate or failing wastewater treatment systems, as well as installation of new systems. The remaining 4 percent of the dollars went for non-point source and estuary projects.



Recent Federal Emphasis on Results

The Government Performance and Results Act of 1993 stresses that agencies should identify program goals and performance measures and link them with the budget process. In August 2001, the President announced an aggressive strategy for improving management and performance of the Federal government. The President's Management Agenda is guided by three principles, one being that government should be "results-oriented." A current initiative flowing from this principle is the integration of budget and performance.

The Office of Management and Budget (OMB), using an analytical tool called the Program Assessment Rating Tool, is currently assessing the performance and achievements of Federal agencies. OMB's review consists of a series of questions that focus on four key areas. The rating tool provides a common, transparent approach to assessing programs. In 2004, OMB's overall weighted score for the CWSRF was 52 out of 100, with an overall rating of "Results Not Demonstrated." EPA's individual raw scores for each of the four key areas were:

	Score
Program Purpose and Design	80
Strategic Planning	25
Program Management	100
Program Results	27

OMB is allowing EPA time to improve its performance in this area, and expects substantial progress by the next review cycle. OMB expects EPA to tie environmental outcomes, such as number of stream miles no longer impaired, directly to the CWSRF program.

Scope and Methodology

We performed our audit in accordance with the *Government Auditing Standards*, issued by the Comptroller General of the United States. We conducted our audit field work from June 2003 to January 2004. We conducted much of our field work at EPA Headquarters, and gathered information on the CWSRF program from 8 of EPA's 10 regions and from 11 States. See Appendix A for details on the scope and methodology.

Chapter 2

CWSRF Leadership Needed

EPA needs to increase its leadership role in measuring the environmental benefits of the CWSRF. EPA has been working on developing environmental measures since 1998. However, EPA and the States have not established a uniform set of measures to assess the environmental impact of the program. Further, EPA has not developed a comprehensive plan for measuring the results of the CWSRF. As a result, EPA: (1) did not know the actual environmental impact of the CWSRF, and will not know unless it develops measures; and (2) cannot compare the impact of individual water quality programs and make informed resource allocations. Also, some States questioned the value of measuring and, therefore, did not place emphasis on doing it.

Importance of Measuring for Results

Ultimately, EPA must be able to answer four key questions (see box) to ensure that environmental results are achieved in a cost-effective manner. EPA has built a framework that aligns planning, budgeting, analysis, and accountability into an integrated system. By planning strategically, measuring performance, analyzing data, and using what was learned, EPA can make sound decisions about how to use its resources. Measuring for results is a key process within this system that involves assessing progress and linking actual resources used to the actual results achieved.

EPA must be able to answer the following questions:

- **Did we accomplish what we planned?**
- **Did we keep within our budget?**
- **Did we achieve the environmental results we desired?**
- **What did the Agency spend to achieve those results?**

“Managing for Results,” Office of the Chief Financial Officer web site

The General Accounting Office (GAO), in its January 30, 2004, report, *Performance Budgeting: Observations on the Use of OMB’s Program Assessment Rating Tool for the Fiscal Year 2004 Budget*, noted that how grants are structured plays a role in whether Federal agencies are able to hold third parties responsible for results. Programs such as the CWSRF present implementation challenges, especially in those instances in which national goals are not compatible with State and local priorities. Many of the outcomes for which Federal programs are responsible are part of a broader effort involving Federal, State, and local partners. Therefore, it is often difficult to isolate a particular program’s contribution to an outcome. Further, evaluation data may be limited because of constraints on Federal agencies’ ability to influence program outcomes and reliance on States.

In another GAO report, *Managing for Results: Measuring Program Results that are Under Limited Federal Control*, dated December 11, 1998, GAO found that Federal agencies should select a mix of performance goals that include intermediate and end outcomes. This allows agencies to minimize the risk due to limited control over external factors. In addition, because Federal agencies sometimes find it difficult to confidently attribute a causal connection between one of its programs and desired outcomes, GAO found that stakeholder involvement is vitally important in the process of developing practical and broadly-accepted performance measures.

EPA Has Financial But Not Environmental Measures

EPA has for years had some good indicators to measure the financial stability and success of the CWSRF. EPA collects and reports annually on the financial aspects of the CWSRF, including figures on loans made, projects started, interest payments, and loan repayments. One financial performance indicator is return on Federal investment, which shows how many dollars of assistance were disbursed to eligible borrowers for each Federal dollar spent. Another indicator – fund utilization rate – is designed to show how many dollars of assistance were in use for each Federal dollar that could be loaned out.

EPA's Strategic Plan defines key goals in environmental and public health terms, including the expected improvements in key measures by 2008. For the CWSRF, the Strategic Plan states that, over the next 5 years, EPA will work to "link projects to environmental results through the use of scientifically sound water quality and public health data."

While the EPA Office of Water is making an effort to address environmental results through its strategic planning process, EPA has not developed outcome measures for the CWSRF. EPA has been working the last several years to develop environmental measures. Specifically, EPA has:

- Formed a workgroup with States to discuss how to measure benefits.
- Reported on the national improvement to water quality since passage of the Clean Water Act.
- Initiated a pilot study on environmental measures.
- Hired a contractor to help define environmental benefits.
- Made grant funds available to demonstrate environmental benefits.
- Encouraged States to report on environmental benefits in their annual reports to EPA.

Details on each of these efforts are in Appendix B.

EPA officials noted that they need to find a cost effective way to gather project level data. However, EPA does not have specific milestone dates for doing so.

In spite of the efforts undertaken, EPA and the States have not established a uniform set of environmental measures to assess the program's environmental impact. Some possible measures have been identified but need to be further researched and developed. For example, in the March 2001 pilot study, EPA and States tested six potential environmental measures for CWSRF projects. Other efforts have identified other possible measures, such as increased compliance with National Pollutant Discharge Elimination System permits, and estimated reduction in biochemical oxygen demand and increase in dissolved oxygen within waterbodies. (See Appendix C for a summary of the measurement activities conducted by States.)

Other efforts within EPA and the government can provide alternatives for measuring CWSRF results. To date, most of the suggested measures have focused on point source projects. There are other efforts within EPA and throughout the government to measure the impact of non-point source projects. For example, in 2002, EPA began requiring recipients of Section 319 grants (non-point source projects) to report loading reductions for nutrients and sediments. Grant recipients must also report on acres of wetlands restored or created, and number of feet of streambank protected and stabilized.

EPA Needs a Comprehensive Plan for Measuring Environmental Results of the CWSRF

Although EPA's 2004 to 2008 Strategic Plan indicates that outcome measures will be in place for improving water quality at the watershed level, EPA does not have a clear plan as to how it will develop measures for the CWSRF. EPA's current approach has been a reaction to criticism by OMB and others, and does not appear to be part of a comprehensive, organized process.

EPA officials have identified activities that they believe will link CWSRF projects to environmental results. However, EPA has not identified how or when the activities will be implemented, or determined whether these activities will lead to environmental measures for the CWSRF. To date, the Office of Water has not answered questions such as:

- How will CWSRF environmental results be integrated into planning and budgeting decisions by EPA, the States, and Congress?
- What measures are feasible?
- How will the measurements be conducted and funded?
- Who will be responsible for collecting, organizing, and analyzing the data?

The Office of Water needs to identify and evaluate alternatives for measuring environmental benefits of the CWSRF program. GAO, in its report *Managing for Results: Measuring Program Results that are Under Limited Federal Control*,

suggests that, in situations where agencies believe they have limited control over outcomes, agencies can: (1) select a mix of outcome goals over which the agency has varying levels of control; (2) redefine the scope of a strategic goal to focus on the more narrow range of their actual activities; (3) disaggregate goals for distinct large populations for which the agency has different expectations; or (4) use data on external factors to statistically adjust for their effect on the desired outcome. Adopting a strategy that incorporates some or all of these methods should help agencies minimize the risk, due to their limited control over external factors. According to GAO, if unexpected events prevent agencies from achieving their end outcome, they may be able to demonstrate their effectiveness through an intermediate outcome.

Another key step in developing environmental measures for the CWSRF is to establish the value of the measures for State partners and define how the measurement data will be integrated into planning and budgeting decisions. A December 2003 report by the IBM Center for the Business of Government – *Strategies for Using State Information: Measuring and Improving Program Performance* – emphasized that, when creating measures, it is vitally important to identify how data supporting those measures will ultimately be used. This report states that Federal agencies had greater success in establishing performance measures when they emphasized the value of the information in making decisions. Federal agencies should strive to collect, organize, and make performance information available for use by others.

Because EPA has not identified how results will be integrated in planning and budgeting decisions, the States have raised concerns about investing in measuring results for the CWSRF program. According to the IBM Center report, to lessen the chances that States will attempt to dismantle the measurement system, Federal agencies should make it a priority to build measurement systems that serve the needs of all stakeholders whose actions contribute to improved outcomes and who face choices among options that might be influenced by the performance information.

Conclusion

EPA has used a short-term, reactive approach for identifying ways to measure environmental benefits of the CWSRF. EPA has some general knowledge of the impact that wastewater infrastructure projects have had on water quality. However, EPA does not specifically know what contribution the CWSRF has played in this improvement. Consequently, EPA does not know what the actual environmental impact of the CWSRF is, and will not know in the future unless it develops measures. Further, EPA cannot compare the impact of individual water quality programs and make informed resource allocations.

The CWSRF is just one of six strategies (see box) that EPA is using to achieve improved water quality. EPA needs to be able to identify the contribution that each of its strategies is making towards improving water quality. If EPA is unable to do this, EPA has no way of analyzing the effectiveness of the program in improving water quality as compared to other strategies or tools. Analyzing results information is an important component of EPA's planning, budgeting, analysis, and accountability framework.

Strategies for Water Quality

- **Strengthen the Water Quality Standards Program**
- **Improve Water Quality Monitoring**
- **Develop Effective Watershed Plans and TMDLs**
- **Control Nonpoint Source Pollution**
- **Strengthen NPDES Permit Program and Implement National Industrial Regulation Strategy**
- **Support Sustainable Wastewater Infrastructure**

EPA must lead States in developing measures for the CWSRF. EPA needs to decide how measures will be used in decision making by all stakeholders – EPA, States, OMB, and Congress. EPA needs to seek out information from other Federal agencies, research communities, and academia on methods for measuring environmental results of CWSRF activities. EPA needs to identify what information is currently available – within EPA, at the State level, and at the local level. Further, EPA needs to analyze options for uniformly measuring results and then select the option that will best meet the needs of all stakeholders. Throughout this process, EPA needs to work closely with the States, which will be the primary sources and beneficiaries of the measurement information.

Recommendation

2-1 We recommend that the Assistant Administrator for Water develop a plan, with milestone dates, that:

- Establishes the value of measuring environmental benefits by identifying how this information would be used by EPA and States in making future decisions about the CWSRF program.
- Seeks input from other EPA offices, Federal agencies, States, and other stakeholders on options for measuring environmental contributions of the CWSRF program.
- Identifies and evaluates options for measuring environmental benefits and considers for each option: strengths and weaknesses; feasibility of implementation by all States; cost; and validity of available data.
- Selects an option and establishes an implementation plan.

Agency Comments

Office of Water stated it generally agreed with the finding and recommendation, and that our report reflects activities the office has already initiated, or is planning to initiate, in the next 12 months. The Office of Water plans to pursue the ideas in the recommendation through various workshops and workgroups. The main goal is to have a suite of proposed indicators developed by February 2005. To address the recommendation, the Office of Water will develop a performance measurement plan that will include activities with appropriate milestone dates. They believe the prospects for success are significantly improved by collaborating with the States directly in the process of developing measures.

Office of Water officials believe the environmental impact of the program is known, although they agreed that more precise and targeted measures are necessary. The CWSRF program and the previous wastewater construction grants program have played and continue to play a vital role in achieving and maintaining compliance with water permits. Office of Water officials are confident that because State priority systems help direct funding to environmentally worthy projects, projects funded by the CWSRF are appropriately results-oriented.

OIG Evaluation

We agree with the Office of Water's decision to develop a performance measurement plan. However, in responding to the draft report, Office of Water did not provide a specific date for when it would finalize the implementation plan. Therefore, when responding to the final report, the Office of Water needs to provide a specific date for completing the plan, or a copy of the plan if it is completed.

Details on Scope, Methodology, and Prior Audit Coverage

Scope and Methodology

We conducted our work primarily at EPA Headquarters in Washington, DC. We interviewed EPA Office of Water officials, including management and staff of the CWSRF program, regarding efforts to establish environmental measures. We discussed with officials their plans for future actions to improve their ability to measure results in the future. We also reviewed EPA's Strategic Plan, in particular the section on Goal 2 for Clean and Safe Water. We reviewed several key EPA reports issued within the last 4 years related to water quality and the CWSRF. We also reviewed minutes of 13 meetings that the State/EPA State Revolving Fund Workgroup held from 1998 through 2003.

We reviewed 8 of EPA's 10 regions; we did not review Region 7 or Region 9. The 8 regions we reviewed oversee environmental programs in 42 States. We interviewed the CWSRF coordinators in those eight regions to determine (1) what the regions were doing to encourage or assist States in measuring environmental results, and (2) whether the regions were aware of what their States were doing or had done in this area. We reviewed the State evaluation reports prepared by seven of the eight regions to determine whether EPA regions discussed measuring CWSRF for environmental results.

We interviewed State officials from Colorado, Delaware, Georgia, Illinois, Massachusetts, New Jersey, Ohio, Oklahoma, Texas, Utah, and Washington. We also visited the Ohio Environmental Protection Agency in Columbus, Ohio; and the Delaware Department of Natural Resources and Environmental Control in Dover, Delaware. For each of the 11 States, we asked CWSRF program managers to describe their efforts to measure the impact of CWSRF projects. We also inquired if there was a plan to measure results in the future and, if so, how and when it would be implemented.

We chose the 11 States for several reasons. EPA identified Delaware as being on the forefront of the measuring issue. We selected New Jersey, Ohio, Texas, and Utah primarily because they took part in the 2001 EPA/State pilot study. We interviewed officials from the remaining six States because they generally included more environmental benefits information in their annual reports. We intentionally selected States from different EPA regions to obtain a broad perspective of State experiences and water quality challenges.

We reviewed the most recent CWSRF annual reports for 49 of the 50 States – 30 from 2002 and 19 from 2003 – to determine what States reported on environmental benefits. (We were unable to obtain the annual report for Kentucky.)

We also spoke with officials at the National Academy of Public Administration and GAO to determine whether any studies had been conducted on the cost of measuring the benefits of Federal programs. We also reviewed several GAO reports related to performance measurement in the Federal government, including:

- *Performance Budgeting: Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget*, GAO-04-174, January 30, 2004
- *Management for Results: Measuring Program Results that are Under Limited Federal Control*, GAO/GGD-99-16, December 11, 1998

We spoke with OMB officials throughout the course of the audit to obtain their perspectives on EPA's management of the CWSRF. We also reviewed the results of OMB's application of the Program Assessment Rating Tool to CWSRF.

We conducted our work from June 2003 to January 2004. We performed the audit in accordance with *Government Auditing Standards*, issued by the Comptroller General of the United States.

We issued the draft report to the Acting Assistant Administrator for Water on April 26, 2004. The Acting Assistant Administrator responded on May 27, 2004. An exit conference was held on June 22, 2004. In its response, Office of Water provided comments to clarify portions of the report, and we incorporated that information as appropriate. At the end of Chapter 2 we summarized Office of Water's comments, and provided our evaluation of the comments. The full text of the response is in Appendix D.

Prior Audit Coverage

We have not issued any other audit reports on programmatic or performance issues related to EPA's measurement of CWSRF environmental benefits.

EPA's Efforts to Measure the CWSRF

EPA has been working the last several years to try and develop environmental benefit measures for the CWSRF but has made little progress. The following paragraphs describe the details on each of the six bullets noted in Chapter 2.

Workgroup Activities

In 1998, EPA and the States formed a workgroup that meets twice a year to discuss CWSRF regulations and issues, including environmental measures. In November 2002, the workgroup formed a subgroup to address how to measure environmental benefits of the CWSRF. Subgroup discussions have found the following obstacles to measuring benefits:

- Technical difficulties in attributing benefits specifically to the CWSRF, especially when many other projects are affecting the same watershed.
- Costliness of measuring.
- Lack of data.
- Differences among States – data from one State does not mean the same to another.
- Lack of uniform, widely-accepted environmental measures.
- Questions about what use any data would have, other than to generate statistics that would be meaningless to other States.
- States' desire to invest funds in other projects rather than measuring.
- Belief among several States that the up-front review process for loan applications ensures their projects provide environmental benefits.

Despite these obstacles, the subgroup has succeeded in getting States to share ideas and work together on a solution for measuring benefits. Some States have cited the subgroup as a good forum for discussion, brainstorming, and networking.

Water Quality Report

In June 2000, EPA published a report, *Progress in Water Quality – An Evaluation of the National Investment in Municipal Wastewater Treatment*. This report stated that two key water quality indicators – biochemical oxygen demand (BOD) and dissolved oxygen (DO) – improved significantly from 1968 to 1996 in some key, large water basins. The importance of BOD and DO are:

- BOD is a measure of the oxygen-consuming organic matter and ammonia-nitrogen in wastewater. The higher the BOD loading, the greater the depletion of oxygen in the waterway, and the worse the water quality. When oxygen becomes depleted from the waterway, the water becomes unhealthy to support aquatic life.
- DO is critical in the decomposition of organic carbon and organic nitrogen and ammonia from wastewater discharges. Historical DO records provide an excellent environmental measure for characterizing water quality responses to long-term changes in wastewater loading. The higher the DO levels, the higher the water quality.

According to this EPA study, despite a 35-percent increase in pollutant loadings, the amount of BOD actually declined by 23 percent. This illustrates that the investments in municipal wastewater treatment have resulted in dramatic improvements in restoring water quality and biological resources while creating thriving water-based recreational uses.

In a July 2003 report to Congress, *Paying for Water Quality: Managing Funding Programs to Achieve the Greatest Environmental Benefit*, EPA noted that the study on BOD and DO helps illustrate that modeling can be used to demonstrate the benefits of clean water investments and successful projects, and for determining compliance outcomes on a national basis. This report further stated that EPA is working to enhance its available water quality modeling capabilities.

Pilot Study

In March 2001, EPA published a study, *Development, Selection, and Pilot Demonstration of Preliminary Environmental Indicators for the CWSRF Program*. In this study, six States – California, Michigan, New Jersey, Ohio, Texas, and Utah – evaluated a preliminary set of environmental indicators developed for the CWSRF. Each State reviewed a subset of their CWSRF projects to determine whether it could measure, or otherwise reflect, environmental improvement as a result of the projects. The study evaluated the following six environmental measures:

- Number of pounds of pollutants removed from the environment.
- Number of pounds of pollutants prevented from entering the environment.
- Physical changes to the terrestrial, riparian, or aquatic habitat and hydrology.
- Waterbodies previously impaired, now improved or meeting designated uses.
- Waterbodies protected.
- Reduced health risks and/or increased recreational use.

In addition, the study identified barriers to using the aforementioned measures:

- C Identifying and accessing environmental data related to CWSRF projects ranged from problematic to difficult.
- C Applying environmental measures to projects other than wastewater treatment upgrades or expansions was difficult.
- C Substantial modeling would be necessary to determine pounds of pollution prevented from entering the environment; this modeling would be costly, controversial, time-consuming, and only reflect estimated improvements.
- C Currently, project level environmental data is not tracked by most States.
- C States do not have procedures in place to collect information on environmental outcomes.

Based on the findings of pilot testing, the study recommended how to proceed with the development and application of environmental measures for the CWSRF. Among other things, the report concluded that implementation of the measures be at State's discretion, and that guidance material be developed to assist with implementation.

Contract to Define Environmental Benefits

Beginning in January 2004, EPA authorized a contractor to perform a study on how to measure the environmental benefits of the CWSRF. EPA and the contractor will visit Georgia, Oklahoma, Texas, New York, Massachusetts, Arizona, California, Hawaii, and Nevada. The purpose of these visits is to determine if these States can measure the environmental benefits of the CWSRF, and if anything being done in these States can be adopted by other States.

Grant to Demonstrate Environmental Benefits

In December 2003, EPA announced that grants funds were available under the Clean Water Act, Section 104(b)(3), to demonstrate environmental benefits from CWSRF projects. According to the EPA CWSRF Branch Chief, two applicants have applied for grants. One applicant proposed to expand its project tracking system to include benefits-related measures and information. The second applicant proposed to hold workshops with interested States to develop voluntary metrics.

States to Report on Environmental Benefits

Although there is no requirement for States to include CWSRF environmental benefits in their annual report, EPA has encouraged States to do so. CWSRF

coordinators in four of the eight EPA regions we spoke with encouraged their respective States to report on environmental benefits.

About 70 percent of the State annual reports did not include environmental information. The reports essentially included only financial data. Further, 20 percent expressed environmental benefits in very general terms. Only about 10 percent of the reports provided a somewhat detailed description of environmental benefits, including some numerical data, generated by projects, groups of projects, or the program. For those States that did report some environmental information, most of the information was based on pre-construction estimates of future benefits rather than actual benefits.

Summary of Measurement Activities for Selected States

Most States were not measuring the environmental results of CWSRF projects. States generally were not measuring because: (1) EPA does not provide States any additional funding to measure results, (2) it is extremely difficult to distinguish the benefits of the CWSRF from other projects affecting a watershed, and (3) some States believe that the CWSRF is a financial program and measuring for environmental impact does not fall within the scope of the program.

The following descriptions offer “snapshots” of what three States said they are doing to measure the environmental impact of the CWSRF program. This appendix is not meant to be an inclusive list. To identify what States were doing, we interviewed officials from 11 States, and reviewed annual reports from 49 of 50 States (we were unable to obtain the annual report for Kentucky). Because we did not interview all 50 States and annual reports can vary in content, it is possible that there are other States that are performing environmental measurement efforts.

Colorado

Colorado arranged its projects by watershed in its 2002 Annual Report and listed potential environmental measures of projects as well as examples of benefits. The State believes that there is potential in the future to effectively measure the environmental benefits of the CWSRF. Colorado identifies the potential environmental benefits of CWSRF projects by coordinating efforts with other program staff, including program staff that develops the Clean Water Act 303(d) list. In 2004, Colorado is requiring systems to identify the potential environmental benefits of the proposed projects in its annual Intended Use Plan Survey. State staff are in the process of revising the loan application to request information from applicants about the potential environmental impacts.

Delaware

Delaware engineers use a mathematical formula to determine how much phosphorous is prevented from entering the environment by eliminating septic systems and building wastewater collection systems (point-source issue). For example, Delaware’s Annual Report for 2003 states that Sussex County’s project for the Miller Creek Sanitary Sewer District will “eliminate 483 septic systems and prevent the installation of 684 septic systems,” resulting in the prevention of “an estimated 20,837 pounds of nitrogen and 1,592 pounds of phosphorous from reaching groundwater annually.” Delaware also uses a formula to determine how

much nitrogen is prevented from entering the environment by building roofed poultry storage sheds (non-point-source issue).

Georgia

Georgia developed a process to capture project benefits – human health, environmental, economic, and financial – resulting from all projects (Federal and State) funded in 2003 and beyond. The benefits are captured for each project funded and loaded into a web-based database, and are to be analyzed for reporting within the 2004 CWSRF annual report to EPA and Georgia’s State legislature. It is Georgia’s intention to report on the performance benefits of those projects funded with CWSRF funds in 2003 and 2004. In addition, Georgia officials established a forum to discuss new performance measures that are identified, how those new measures could be added into the process, and how to continue to improve the measures that are currently being captured.

EPA Response

May 27, 2004

MEMORANDUM

SUBJECT: Draft OIG Audit Report: Stronger Leadership Needed to Develop Environmental Measures for Clean Water State Revolving Fund, Assignment No. 2003-1002

FROM: Benjamin H. Grumbles /s/
Acting Assistant Administrator

TO: Michael A. Rickey, Director
Assistance Agreement Audits

Thank you for the opportunity to review and comment on the draft report of the Office of Inspector General, entitled: "Stronger Leadership Needed to Develop Environmental Measures for the Clean Water State Revolving Fund."

The report makes the following recommendation (p.9):

We recommend that the Assistant Administrator for Water develop a plan, with milestone dates, that:

- Establishes the value of measuring environmental benefits by identifying how this information would be used by EPA and States in making future decisions about the CWSRF program.
- Seeks input from other EPA offices, Federal agencies, States, and other stakeholders on options for measuring environmental contributions of the CWSRF program.
- Identifies and evaluates options for measuring environmental benefits and considers for each option: strengths and weaknesses; feasibility of implementation by all States; cost; and validity of available data.
- Selects an option and establishes an implementation plan.

We generally concur with these points and believe that for the most part they fairly reflect the steps that we have already initiated or are planning to do within the next 12 months. Thus far, my staff has visited with seven States (GA, TX, OK, CA, HI, NV, and AZ) and will soon initiate a series of workgroup meetings under the aegis of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). We have found from our initial visits that the States share our interest in the importance in improving the documentation of environmental

results of the CWSRF program. We have already gained useful insights into how this might be accomplished within existing resource and data constraints. We will pursue these and other ideas through the ASIWPCA workshops, the State/EPA SRF Workgroup, and the annual SRF Training Workshop in November 2004. Our main milestone is to have a suite of proposed indicators developed by January-February 2005.

In an effort to address the recommendation in the draft report, we will develop a performance measurement plan that will include the above activities with the appropriate milestones. As with any plan, it will be modified to accommodate changed circumstance and take advantage of new ideas and opportunities. The prospects for success are significantly improved with the collaboration of the States directly in the process of developing the measures. Their buy-in is essential to our collective success.

Specifically, I would like to clarify several matters raised in the draft report.

1) At page 5, first paragraph, the draft report states that: “EPA and the States have not been able to agree upon specific measures to determine the environmental impact of the program.” This statement leaves the misleading impression that we are in disagreement with the States over measures. This is not the case, and for the sake of clarity, I would urge that the final report reflect that fact. In 2001, EPA and several States formed an innovative task force that produced a suite of seven environmental indicators. The recommendation of the group was that they be considered optional essentially because of resource and monitoring issues. This initial effort was an important collaborative step.

2) Same paragraph, the draft report states that: “EPA did not know that the actual environmental impact of the CWSRF.” While we agree that more precise and targeted measures are necessary, at the same time, we disagree that the environmental impact of the program is unknown. Over 94 percent of CWSRF funding assistance goes to publicly-owned treatment works that are permitted under the National Pollutant Discharge Elimination System (NPDES) program. These permits are based on water quality standards established by the States for receiving waters. The standards define beneficial uses for the receiving waters which the permitted discharges are intended to protect or restore. We know that the CWSRF program and its predecessor wastewater construction grants program have played and continue to play a vital role in achieving and maintaining compliance with enforceable requirements of the Act embodied in water quality standards and NPDES permits.

Congress established the CWSRF program as a financing mechanism to: (1) replace the construction grants program and (2) operate in perpetuity delivering subsidies once federal capitalization ceased. The financial performance of the CWSRF is nothing short of stunning. Performance measures of special significance include a pace of lending of 93 percent, a federal return on investment of nearly 2:1, and cumulative available funds that have grown to over \$50 billion in 15 years of operation, all without a single default. Measured by what it was intended to accomplish as a financing mechanism, the CWSRF has been an unique, unqualified, and extraordinary success.

The benefits of the projects financed by the CWSRF are assessed through state priority setting systems that rank them based primarily on environmental and public health criteria. These systems have been in place since 1972 and served essentially the same function for the construction grants program. We believe that the state priority systems are sound in directing funding to environmental worthy projects. Since the dominant emphasis is on environmental and public health benefits, we are confident that the pipeline of projects feeding into the CWSRF is appropriately results-oriented.

We are focusing our attention, in collaboration with the States, on the actual environmental results achieved following initiation of operation. A pragmatic and cost-effective way to approach this challenge is to consider the system of which the CWSRF financed projects are a part, whether they be pipe or plant or some other eligible construction activity. Projects will be linked to systems through their NPDES permit. With the permit number other agency databases can be accessed such as PCS, STORET and water quality standards, using our WATERS architecture. The opportunities and challenges of this approach and other options will be topics for discussion at the upcoming ASIWPCA workgroup meetings noted earlier.

I appreciate receiving the report and find it to be informative and supportive of our efforts. I look forward to the final version. If you have any questions, please contact Sheila Frace at (202) 564-0749 or George Ames at (202) 564-0661.

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