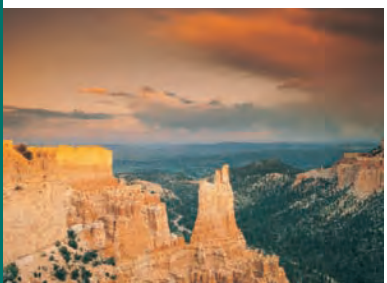
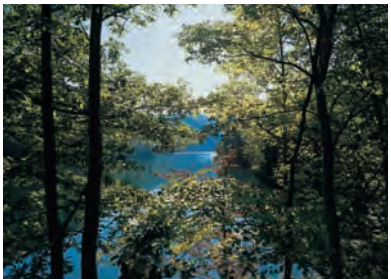
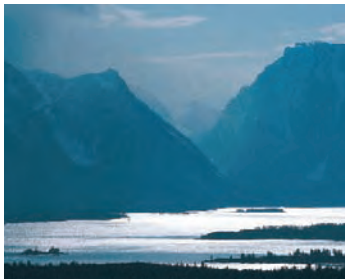
U.S. Environmental Protection Agency

Environmental Finance Program

2007-2008 Report







EFCN
environmental finance center network

Helping to answer the
EFAB
"How to Pay" question.

U.S. Environmental Protection Agency

Environmental Finance Program
2007-2008 Report

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

U.S. Environmental Protection Agency
Office of the Chief Financial Officer
Office of Enterprise Technology and Innovation
Environmental Finance Program

December 2008

Acknowledgments

The Agency would like to express appreciation to, and acknowledge the contribution of, the following individuals. EPA is extremely fortunate to be the recipient of such great efforts and dedication and is proud to utilize the expertise and recommendations of this diverse group to help yield far-reaching results for the nation.

First, we want to thank all the current members of the Environmental Financial Advisory Board (EFAB). In particular, we wish to acknowledge the leadership of A. James Barnes, Professor of Public and Environmental Affairs, Indiana University, who has served as chairman of EFAB since 2006, following Chairman Lyons Gray, who went on to become EPA's Chief Financial Officer. In addition, we wish to express our appreciation for A. Stanley Meiburg, who is the EFAB Designated Federal Official and has kept EFAB in his portfolio of responsibilities even while on detail as EPA's National Liaison to the Centers for Disease Control and Prevention.

We also want to recognize those EFAB members who have made substantial contributions during their tenure but who, after long-term service, have rotated off the board: Julie Belaga, Co-Chair, Connecticut League of Conservation Voters; Steven Grossman, Executive Director, Ohio Water Development Authority; Stephen Mahfood, President, Mahfood Associates LLC; James Smith, Environmental Finance Consultant; Billy Turner, President, Columbus Water Works; and John Wise, Environmental Finance Consultant. Further, as he prepares to retire from the United State Senate, we wish to honor the long-standing commitment of Senator Pete Dominici (New Mexico) for his long and generous service to and support for EFAB. Finally, we want to recognize and commemorate the excellent contributions of the Honorable Vincent Girardy, Mayor of Peapack and Gladstone, New Jersey, who passed away December 2006.

In addition, we want to thank the directors of the nine university-based Environmental Finance Centers (EFCs), who strive diligently to reach underserved communities with environmental tools and training tailored to specific needs. We are also grateful for the contributions of two EFC directors who have moved on to other opportunities after serving as expert witnesses to EFAB and delivering much needed financial outreach to the public sector: Dan Nees, University of Maryland, and Peter Meyer, University of Louisville.

Many thanks also to the expert leadership of senior management and staff in the Headquarters program offices, all of whom have helped advance the work of EFAB, such as: Ben Grumbles and Michael Deane in the Office of Water, and Susan Bodine, Matt Hal, and Bob Hall in the Office of Solid Waste and Emergency Response. We also want to include Margo Oge and Mitch Greenberg, Office of Air and Radiation; Marcia Mulkey and Susan Bromm, Office of Enforcement and Compliance Assurance; and Brian Mannix, Charles Kent, and Shana Harbour, Office of Policy, Economics and Innovation.

Additionally, we want to recognize and thank EPA regional senior management such as John Askew and Bill Rice, EPA Region 7, and Laura Yoshii, EPA Region 9, as well as all the regional staff who have generously provided their skills and time in managing the cooperative agreements with each of the EFCs. The EFC Network would not exist without the regions' superb cooperation, guidance, and support.

We extend grateful thanks and appreciation also to the staff of the Environmental Finance Program, who work day-in and day-out to keep the program running: Vanessa Bowie, Environmental Finance Program Director; Vera Hannigan, EFC Network National Coordinator; Sandra Keys, EFAB Meeting Coordinator; Timothy McProuty, EFAB Projects Coordinator; Pamela Scott, Analyst; Alecia Crichlow, Analyst; and Susan Emerson, Analyst.

And finally, the Agency would like to salute Lyons Gray, EPA's Chief Financial Officer, for his support and recognition of the value of the Environmental Finance Program, and for his vision in supporting the program as it provides the regulated community — especially small communities — with essential tools to achieve compliance with the environmental regulations and mandates the Agency establishes.

Message From the Chief Financial Officer

I am pleased to present the *2007-2008 Environmental Finance Program Report,* highlighting the successes of the U.S. Environmental Protection Agency's (EPA's) Environmental Financial Advisory Board (EFAB) and the Environmental Finance Center (EFC) Network.

The EFAB and EFC Network, key elements of the Agency's Environmental Finance Program, help individual communities, small businesses, and government agencies find ways to pay for and comply with environmental regulations. For some in the regulated community, these two entities are the "shot in the arm" that shows them the way to compliance, teaches them how to reach new goals, and ensures that they meet standards necessary to protect human health and the environment. Without this assistance, some of these regulated entities would continue to operate out of compliance, putting the community and environment at risk, simply because no other options were available or affordable.

I want to call attention specifically to the extremely valued volunteer time of those who serve on EFAB. These experts bring vast knowledge and experience from their professional lives and share it with the Agency for the benefit of the public. The level of our appreciation for this dedication and commitment is immeasurable.

I also wish to acknowledge the value of the EFCs. Because each EFC is university based, we — and the nation — benefit from the innovative and cutting-edge environment that a university community fosters. In addition to the expertise of each EFC's director, staff, and participating professors, we also reap the benefits of student participation, enthusiasm, and motivation; at the same time, students gain real-world experience solving the problems of paying for environmental programs. I congratulate each EFC for its leadership and facilitation of the next generation of leaders and problem-solvers.

EPA is grateful for the very important work that EFAB and the EFC Network accomplish year after year. This report, which provides a snapshot of the remarkable contributions of EFAB and each EFC, also provides a measure of inspiration and confidence for the future. I believe it shows the quality of environmental results that a small, dedicated group of people with a specific mission can achieve. Although much work remains to address environmental challenges, the Environmental Finance Program — along with many other Agency programs designed to address different needs — is a solid and ever more necessary service that will continue to advance environmental protection.

Lyons Gray, Chief Financial Officer
U.S. Environmental Protection Agency

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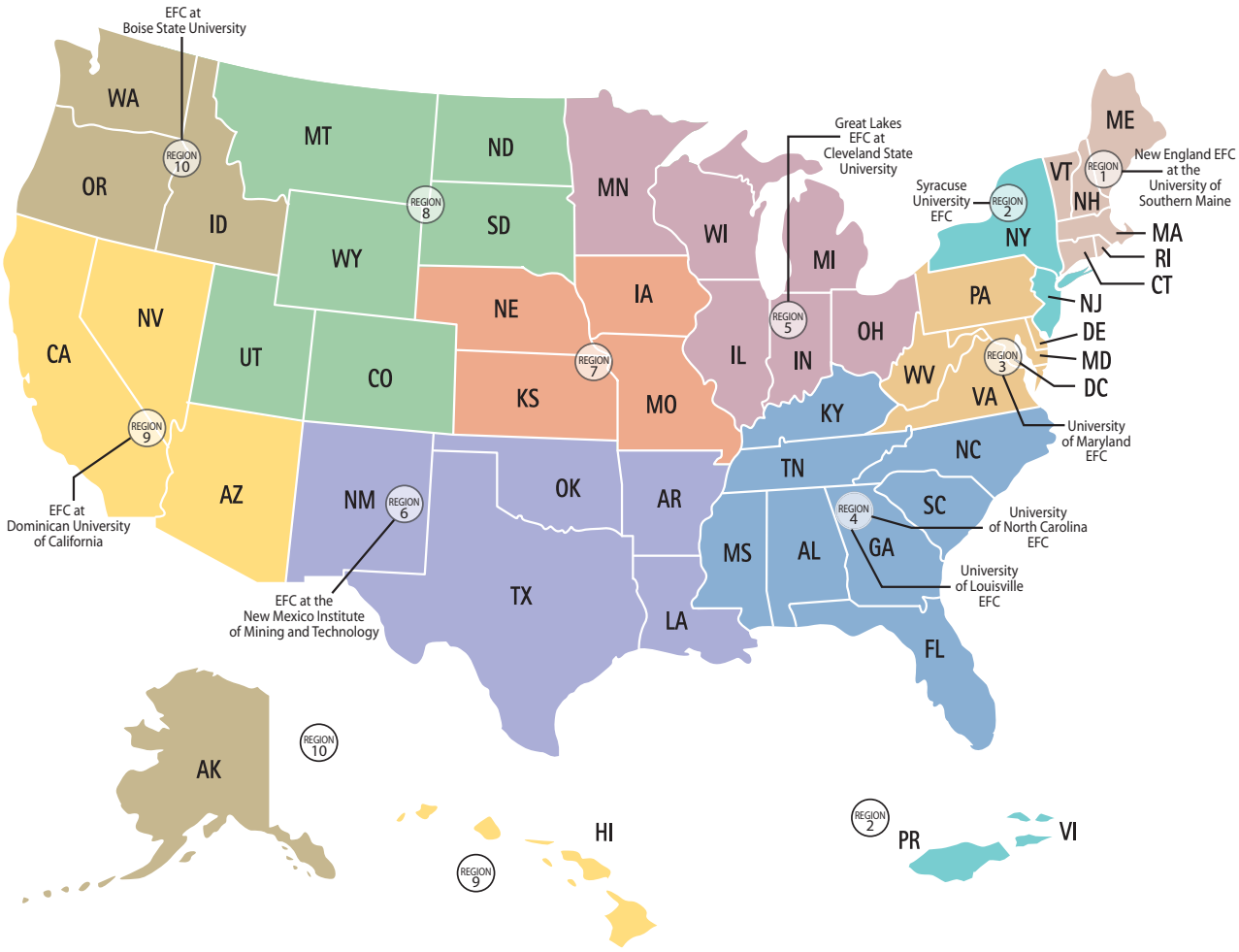

Introduction

The *2007-2008 Environmental Finance Program Report*, compiled by the U.S. Environmental Protection Agency (EPA)/Office of the Chief Financial Officer, reports on the work of the Environmental Finance Program, including the activities and initiatives of the Environmental Financial Advisory Board (EFAB) and the Environmental Finance Center (EFC) Network.

Both EFAB and the EFC Network provide unique services to the nation in terms of helping communities find ways to pay for environmental programs and creating incentives that promote environmental stewardship. Together, within the Environmental Finance Program, these entities seek to lower costs, increase investment, and build capacity by creating partnerships with state and local governments and the private sector to fund environmental needs.

EFAB is an independent advisory committee established to advise EPA on environmental financing challenges facing the nation. Chartered in 1989 and operating under the authority of the Federal Advisory Committee Act (FACA), it provides advice and recommendations to the EPA Administrator and program offices on environmental finance issues, options, proposals, and trends.

The board is composed of approximately 30 members appointed by the Agency's Deputy Administrator that represent federal, state, and local governments; the banking, finance, and legal communities; business and industry; academia; and nonprofit environmental organizations. It produces policy and technical reports on a wide range of environmental finance matters of interest to EPA, particularly with regard to the impact of these finance issues on local governments and small communities.

The EFC Network, composed of nine centers located throughout the nation, is the only university-based organization in the country that provides innovative solutions to communities to help manage the cost of environmental protection. The network works with both the public and private sectors to promote a sustainable environment by addressing the difficult issue of how to pay. The network is supported by EPA's Environmental Finance Program in the Agency's Office of the Chief Financial Officer, as well as by additional funding from other federal, public, and private entities. The centers are located at the following universities:

- New England EFC at the University of Southern Maine
- Syracuse University EFC
- University of Maryland EFC
- University of North Carolina at Chapel Hill EFC
- University of Louisville EFC
- Great Lakes EFC at Cleveland State University
- EFC at the New Mexico Institute of Mining and Technology
- EFC at Dominican University of California
- EFC at Boise State University

The input of EFAB and the EFC Network provides state-of-the-art expertise in an area outside of EPA's core competency of developing and implementing environmental programs. In addition, while the EFCs provide services and advice directly to communities on how to finance environmental protection, they also advise EFAB about what works and what does not work from in-the-field experience. EFAB then combines the real-life scenarios of the EFCs with its members' professional experience and provides valuable guidance and advice to the Agency for moving forward in the future.

Highlights — Environmental Financial Advisory Board (EFAB)

EFAB provides expert advice to the EPA Administrator on environmental financing issues, options, proposals, and trends. In 2007-2008, the board issued reports to the Administrator, making recommendations to EPA's Office of Water; Office of Policy, Economics and Innovation; Office of Air and Radiation; Office of Solid Waste and Emergency Response; and Office of Enforcement and Compliance Assurance. The following is a list of the reports issued to the Administrator and the questions posed by EPA that each addressed:

Relative Benefits of Direct and Leveraged Loans in State Revolving Fund (SRF) Programs. To address national infrastructure needs, should EPA support the use of leveraging by clean water and drinking water state SRFs?

Public-Private Partnerships in Water and Wastewater Services. How could public–private partnerships help address wastewater and drinking water infrastructure needs over the next five to 10 years?

Environmental Management Systems and the Use of Corporate Environmental Information by the Financial Community. Which members of the financial and business communities have an interest in Environmental Management Systems? What are the current financial services industry beliefs, practices, conventions, and challenges regarding the consideration of environmental performance and systems?

Innovative Finance Programs for Air Pollution Reduction. Could innovative financing options help make the diesel truck retrofit kits developed by EPA's SmartWay Program more attractive?

Combined Sewer Overflows Financial Capability Guidance. Should EPA update and improve the 1997 document *Combined Sewer Overflows — Guidance for Financial Capability Assessment and Schedule Development*, given its age and importance?

The Use of Captive Insurance as a Financial Assurance Tool. How can EPA strengthen financial assurance mechanisms to help ensure that adequate resources will be available to address the environmental consequences of industrial and business activities?

Expanding the Definition of SRF Assistance. Could more funding for environmental projects be made available by allowing the Clean Water and Drinking Water SRFs to provide a new form of financial assistance that would not be yield restricted under Internal Revenue Service arbitrage regulations?

Sustainable Watershed Financing. How can EPA increase the capacity of local governments and groups to finance actions/projects needed to implement watershed plans?

EFAB Projects Coordinator

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Highlights — Environmental Finance Center (EFC) Network

The university-based EFCs deal with resource protection, pollution prevention, smart growth, green buildings, sustainability, and global climate change. While each of the EFCs has a slightly different focus and conducts slightly different initiatives to meet goals, they all participate in the same types of activities, described in the following sections.

Training and Education

Many of the EFCs provide outreach services by developing courses or workshops or otherwise educating communities and relevant stakeholders about financial issues. The **New England EFC at the University of Southern Maine,** for example, developed a three-day workshop series for citizen leaders with a curriculum of three eight-hour, highly interactive and experiential sessions about smart growth. The **Syracuse University EFC** organized

six Technical Assistance Partnership forums, with an average of 20 to 30 attendees, covering various water and wastewater technical topics. The **University of Maryland EFC** developed a curriculum on watershed financing by showcasing the strategies of six successful watershed organizations.

The **University of Louisville EFC** co-sponsored the "Sustainable City Workshop Series," designed to raise local communities' awareness of sustainable practices. With the ultimate goal of providing a catalyst to move Louisville, Kentucky, and the region toward a sustainable model for the nation, each forum in the ongoing series focuses on a different aspect of sustainable practice, including gardening and landscaping, architecture, banking, and planning and development.

The **EFC at the New Mexico Institute of Mining and Technology** developed and conducted a three-day training for tribal utility managers for the Indian Health Service. Topics covered by the training included asset management, capital planning and budgeting, utility rate setting, and integrating utility management with economic development.

To meet the needs of today's environmental systems managers, the **Boise State University EFC** developed a convenient online training system called Training on Demand. The online conference workshops in environmental finance and management reduce the Boise State EFC's carbon footprint and allow EFC clients to fit training into their demanding schedules.

Direct Assistance

Many EFCs work directly with and in communities to assist with specialized needs. For example, the **Syracuse University EFC** worked with Oswego County, New York, to help facilitate public input into a year-long process of evaluating alternative management and financing models for its integrated solid waste management system. The **University of Maryland EFC** provided technical assistance to Virginia's Shenandoah Valley communities in developing financing strategies for natural resource protection, including stormwater management, rural land preservation, and greenway planning. This involved planning and completing three charettes, identifying pilot communities toward which to direct additional assistance, and assisting pilot communities in goal setting and finance strategy development.

In response to damages caused by Hurricane Katrina, the **University of North Carolina EFC** assisted in the redevelopment of water resources in Corinth, Mississippi. Specifically, the UNC EFC assessed the feasibility of replacing the Corinth Gas and Water Department's groundwater source with a surface water source.

Recognizing the important work the Clean Ohio Revitalization Fund (CORF) does for large cities, the **Great Lakes EFC at Cleveland State University** is developing a strategy for bringing CORF to Ohio's smaller communities, beginning with examining best practices in small community remediation, identifying small communities in need, and engaging these communities in a dialogue about environmental assessment.

To prevent drinking water contamination in the public water systems representing 30 Native American tribes, the **New Mexico EFC** provides technical assistance on compliance issues, tests for potential health and safety concerns, and assists water operators in conducting their own water quality tests.

The **EFC at Dominican University of California** is working with the Greener Dominican Task Force to develop a plan to green the Dominican University of California campus. Efforts will most likely include greening landscaping practices, improving recycling, reducing energy use, and adopting an environmental management system.

Tools

Most of the EFCs have created reports, Web sites, software, or other tools and products to disseminate financing information to communities and other relevant stakeholders. To help New England communities respond to the challenges of global climate change, for example, the **New England EFC** developed the first of several publications that address issues such as the Regional Greenhouse Gas Initiative, rises in sea level, and the changing socioeconomic uses of the New England coast. The **Syracuse EFC** distributes a listserv providing local government leaders and technical assistance providers a means to submit questions or disseminate information about water rates, water systems, wastewater treatment, finance programs, and technology.

The **Maryland EFC** published a white paper report featuring key recommendations for financing the implementation of the state's nutrient reduction commitments under the Chesapeake Bay 2000 Agreement. In addition, the Maryland EFC is part of a new EPA-led collaborative effort to facilitate source water protection nationwide, and is leading the effort to develop a Web-based source water protection financing clearinghouse. The clearinghouse will provide information on financing resource protection efforts and will incorporate an interactive calculator tool that will enable communities to assess the costs, benefits, and cost savings of a variety of source water protection strategies.

The **Boise State EFC** developed the Web-based Plan2Fund™-OPT (Objective Prioritization Tool) decision-making model, which helps stakeholders prioritize objectives in the implementation of strategic nonpoint pollution control and capital improvement plans. The Boise State EFC is also working on the development of a new user-friendly software tool known as the Financial Dashboard. The Dashboard is designed to give officials rapid feedback on the effect of their decisions on environmental facilities.

Conferences

As part of their financial outreach efforts, most of the EFCs spent a considerable amount of time organizing, sponsoring, and attending conferences, workshops, and other large-venue functions. The **Syracuse EFC** co-sponsored two sustainability summits, each of which attracted more than 1,000 attendees. One of the conferences, the New York State Sustainability Summit/LinkCNY, covered topics such as green buildings, energy conservation, energy pricing, greening of schools, and technological innovations. The other, Accelerate 2007, successfully targeted teens and college students for volunteer work and attendance at the event.

In response to new septic regulations designed to improve regional septic operations and the surrounding environment, the **Maryland EFC** hosted a statewide forum to present and discuss creative financing solutions for low- and moderate-income septic system owners. Potential solutions included developing a septic utility district, developing low-interest loan programs, and expanding subsidy programs.

The **University of North Carolina EFC** provided major support to the Paying for Sustainable Water Infrastructure Conference, which attracted approximately 650 attendees. The EFC designed sessions and moderated events for the "State and Local Innovations" track.

The **Great Lakes EFC** hosted three Urban Redevelopment Forums in Ohio, attended by developers, environmental engineers, lawyers, public finance professionals, and others interested in sharing successful experiences in the remediation of environmentally contaminated properties.

Other

EFCs engaged in a variety of other activities as well. The **New England EFC** began chairing and staffing the governor's new initiative to protect Maine's quality of place. The **Syracuse EFC** helped form, and currently co-facilitates, the Creative Core GreenTeam, a task force put together to promote and encourage sustainable and smart economic growth. The group represents business, government, economic development, academic, and non-profit leaders throughout the region. Current GreenTeam efforts include a study to assess regional industry, an inventory of regional clean/green tech assets, and the promotion of four targeted sites for development clean and renewable energy centers.

The **EFC at Dominican University of California** serves as a member of the California Healthy Nail Salon Collaborative, exploring opportunities for source reduction, pollution prevention, and energy conservation in nail salons. The EFC is working with the collaborative to develop a Healthy Hair Show to showcase environmentally friendly, healthier approaches to African American hair care, as well as nail and other personal care.

EFC Network Coordinator

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Summary — Guidebook of Financial Tools: Paying for Sustainable Environmental Systems

Summary — Guidebook of Financial Tools

The Environmental Finance Program has updated and extensively revised its signature reference work, *Guidebook of Financial Tools: Paying for Sustainable Environmental Systems*. This groundbreaking environmental finance document is composed of more than 300 tools covering a wide range of approaches that assist public- and private-sector parties in finding the most appropriate ways to finance their environmental protection needs. The questions of how to pay and who pays for environmental mandates are central themes for the work of the Environmental Finance Program.

This 2008 revision includes more concise, user-friendly write-ups and the addition of an important new section, "Tools for Accessing State and Local Financing," which introduces a wide variety of creative approaches used by state partners in providing environmental assistance. The 10 sections of the *Guidebook* present outline information on financial tools that can help make environmental protection initiatives more sustainable. This publication also includes substantial revisions and additions to Section 7, "Tools for Financing and Encouraging Pollution Prevention and Recycling," and Section 8, "Tools for Financing Community-Based Environmental Protection."

Sections 1 through 5 of the *Guidebook* examine comprehensive financial tools, such as environmental finance organizations and Web sites, public-private partnerships, traditional means of raising revenue, borrowing capital, and enhancing credit. Sections 6 through 10 examine specialized financial tools, many of which are geared towards specific geographic areas and types of projects. These specialized financial tools include approaches to paying for pollution prevention, community-based environmental protection, as well as brownfields redevelopment. They also include ways of improving access to capital for small businesses and the environmental goods and services industry. Each financial tool in the *Guidebook* is divided into a "Description" section and a "Reference for Further Information" section that includes Internet links and other references.

In response to growing interest from foreign environmental officials and international organizations, Environmental Finance Program staff recently began work on a new section focusing on international environmental financing tools. Tools in this chapter will include valuable international environmental assistance provided by U.S. government organizations such as the

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Department of State/Agency for International Development, the Department of Energy, the Department of Commerce, and EPA itself. The Environmental Finance Program will also develop tools to present the important environmental assistance delivered by U.S.-supported international financial institutions such as the World Bank, the Inter-American Development Bank, and the Asian Development Bank. Finally, essential international environmental programs undertaken by the United Nations, selected foreign governments, and nonprofit organizations will be included in the new section.

The *Guidebook* is the product of an ongoing, collaborative effort among the Environmental Finance Program staff, members of the Environmental Financial Advisory Board and Environmental Finance Center Network, and other expert contributors. The Environmental Finance Program staff will continue to undertake periodic updates of the *Guidebook* and ask that users send comments and suggestions for new tools and updates to those already listed. The *Guidebook* is available online at www.epa.gov/efinpage/guidebook.htm, and limited hardcopies can be obtained through the Environmental Finance Program staff's EFIN librarian. Also, EPA is developing a searchable index for easy access to individual tools.

For comments, suggestions, or questions contact the EFIN Librarian (efin@epa.gov). The side bar on page viii captures the titles for each section of the *Guidebook*.

Environmental Financial Advisory Board

Helping to answer the

EFAB

"How to Pay" question.

EFAB Report: Relative Benefits of Direct and Leveraged Loans in SRF Programs

Issued: August 2008

Finance Highlight

At the U.S. Environmental Protection Agency's (EPA's) request, the Environmental Financial Advisory Board (EFAB) examined the performance of all State Clean Water and Drinking Water Revolving Loan Programs.

The board found that state programs that leverage their funds have provided greater assistance as a percentage of their capitalization grants than states that use the direct loan approach and recommends programs use leveraging to help meet unmet demand.

EFAB also found that direct loan programs could maintain levels of assistance and increase the growth of retained earnings by using leveraging. Augmenting their equity capital through leveraging would allow these states to increase available and future funding.

The board has already received indications of interest in the report from EPA, the General Accounting Office, Congressional committees, and state environmental organizations.

See page 6 for a summary of this report; see page 15 for the full report.

EFAB Report: Innovative Finance Programs for Air Pollution Reduction

Issued: November 2007

Finance Highlight

EPA's Office of Air and Radiation asked EFAB to review its SmartWay diesel retrofit program to look for financing approaches to promote sales of their retrofit kits aimed at reducing emissions of nitrogen oxides (NO_X), carbon dioxide (CO_2), and particulates.

EFAB determined that several innovative financing techniques, including the creation of Air Quality Financing Authorities by state governments, could be used to help finance the SmartWay program as well as other air pollution reduction efforts.

EPA's Air Office has initiated both internal and external discussions about options for creating State Air Quality Financing Authorities and has incorporated a number of the financing concepts from this EFAB report into the request for proposals in a 2008 $3.4-million grant solicitation for innovative finance projects.

See page 8 for a summary of this report; see page 163 for the full report.

The Environmental Financing Challenge

Environmental Finance Challenge Is Growing

Since the creation of EPA in 1970, the nation has made huge investments in, and significant progress toward, controlling pollution and restoring environmental quality. Much of the credit for this success is due to EPA's use of traditional regulatory and enforcement tools, and to the transfer of significant resources from the federal government to state and local governments to help develop environmental infrastructures.

Two trends challenge EPA's ability to maintain and improve our standard of environmental quality. First, the needs and expectations for environmental protection continue to grow. Second, federal deficits, tax reduction initiatives, and growing overall demands on state and local resources increasingly constrain traditional public sources of environmental funding. The result is a growing tension between the increasing costs of environmental protection and the resources available to meet those costs.

EPA Must Address the Financing Challenges

Failure to address the environmental financing challenges would threaten past environmental gains and future environmental progress. It would put at risk ecosystems, human health, and community well-being and quality of life.

To successfully address these environmental and resource challenges in a sustainable manner, EPA will need to consider the full range of available finance-related alternatives. This effort includes a continuing review of traditional regulatory and enforcement tools and federal assistance programs. In addition, it requires an evaluation of innovative projects and technologies, improved efficiencies, creative financing techniques, and leveraged public–private partnerships.

EFAB Was Created to Advise EPA on Financing Issues

The Environmental Financial Advisory Board (EFAB) was established in 1989 under the authority of the Federal Advisory Committee Act (FACA) to provide expert advice and recommendations to the EPA Administrator on environmental financing issues, options, proposals, and trends. Through public meetings and workshops, the board develops independent analysis and advice on "how to pay" for a clean environment. The board seeks practical ways of lowering costs, increasing public and private investments, and building state and local capacity. EFAB is sponsored and supported in its work by EPA's Office of the Chief Financial Officer.

EPA Environmental Goals and EFAB Environmental Finance Objectives

EPA Goals

The board's work in support of the Agency is carefully aligned with the five major goals contained in EPA's 2006 – 2011 Strategic Plan. These goals include:

- **Clean Air and Global Climate Change:** Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Reduce greenhouse gas intensity by enhancing partnerships with businesses and other sectors.
- **Clean and Safe Water:** Ensure drinking water is safe. Restore and maintain oceans, watersheds, and their aquatic systems to protect human health, support economic and recreational activities, and provide healthy habitat for fish, plants, and wildlife.
- **Land Preservation and Restoration:** Preserve and restore the land by using innovative waste management practices and cleaning up contaminated properties to reduce risks posed by releases of harmful substances.
- **Healthy Communities and Ecosystems:** Protect, sustain, or restore the health of people, communities, and ecosystems using integrated and comprehensive approaches and partnerships.
- **Compliance and Environmental Stewardship:** Improve environmental performance through compliance with environmental requirements, preventing pollution, and promoting environmental stewardship. Protect human health and the environment by encouraging innovation and providing incentives for governments, businesses, and the public that promote environmental stewardship.

EFAB Objectives

In accordance with its charter, EFAB seeks to support EPA in meeting the aforementioned major EPA goals by pursuing the following finance-related objectives:

- Reducing the costs of financing environmental facilities and discouraging polluting behavior.
- Creating incentives to increase private investment in the provision of environmental services and removing or reducing constraints on private involvement imposed by current regulations.
- Developing new and innovative environmental financing approaches and supporting and encouraging the use of effective existing approaches.
- Identifying approaches specifically targeted to small community financing.
- Assessing government strategies for implementing public-private partnerships, including privatization, operations and maintenance issues, and other alternative financing mechanisms.
- Improving government principles of accounting and disclosure standards and how they affect environmental programs.
- Increasing the capacity of state and local governments to carry out their respective environmental programs under current federal tax laws.
- Increasing the total investment in environmental protection of public and private environmental resources to help ease the environmental financing challenge facing our nation.
- Removing barriers and increasing opportunities for the U.S. financial services and environmental goods and services industries in other nations.

EFAB Operations and Membership

EFAB Operations

The board is currently composed of 25 members who serve as expert representatives of nonfederal interests. Members are appointed by the Agency's Deputy Administrator and represent federal, state, and local government; the banking, finance, and legal communities; business and industry; and academia and nonprofit organizations. Efforts are made to minimize the influence of special interests through a careful balancing of the points of view represented by the board membership.

The full board meets at least twice a year with a winter session meeting in Washington, D.C., and a summer session meeting in San Francisco, California. In addition, the board hosts workshops and roundtables as needed to gather information for its reports, papers, and advisories. All board meetings, workshops, and roundtables are open to the public and announced in the *Federal Register* as required by FACA.

The work of the board is led by its designated Federal Official who must call or approve every meeting in advance, attend said meetings, and adjourn the meetings when he/she determines it to be in the public interest. EFAB's designated Federal Official is A. Stanley Meiburg, Deputy Regional Administrator for EPA Region 4.

EFAB Membership

The current members of EFAB are:

Terry Agriss
President
TAgriss Advisory Services

James Barnes (EFAB Chair)
Professor of Public and Environmental Affairs
Indiana University

John Boland
Professor Emeritus
Johns Hopkins University

George Butcher
President
ButcherMark Financial Advisors LLP

Donald Correll
President and CEO
American Water

Michael Curley
Executive Director
The International Center for Environmental Finance

Rachel Deming
Partner
Scarolo Ellis LLP

Honorable Kelly Downard
Chairman
Louisville Metro City Council

Mary Francoeur
Managing Director
Assured Guaranty Corp.

James Gebhardt
Chief Financial Officer
New York State Environmental Facilities Corporation

Scott Haskins
Vice President
Global Water Business Group, CH2M Hill

Jennifer Hernandez
Partner and Co-Chair
National Environmental Team, Holland and Knight LLP

Keith Hinds
Financial Advisor
Merrill Lynch

Langdon Marsh
Fellow
National Policy Consensus Center, Portland State University

Gregory Mason
Chief Operating Officer
Georgia Environmental Facilities Authority

Karen Massey
Deputy Director
Missouri Environmental Improvement and Energy Resource Authority

Lindene Patton
Chief Climate Product Officer
Zurich North America

Cherie Rice
Treasurer and Vice President of Finance
Waste Management, Inc.

Helen Sahi
Director
Environmental Services, Bank of America

Andrew Sawyers
Program Administrator
Maryland Water Quality Financing Division, Department of the Environment

Greg Swartz
Vice President
Piper Jaffray & Co.

Steve Thompson
Executive Director
Oklahoma Department of Environmental Quality

Sonia Toledo
Managing Director
Merrill Lynch

Jim Tozzi
Director
Multinational Business Services, Inc.

Justin Wilson
Partner
Waller Lansden

Former Members

EFAB members who have left the board but who served during the period covered by this report include:

Julie Belaga
Co-Chair
Connecticut League of Conservation Voters

Honorable Pete Dominici (New Mexico)
U.S. Senate

Honorable Vincent Girardy (deceased)
Mayor
Peapack and Gladstone, New Jersey

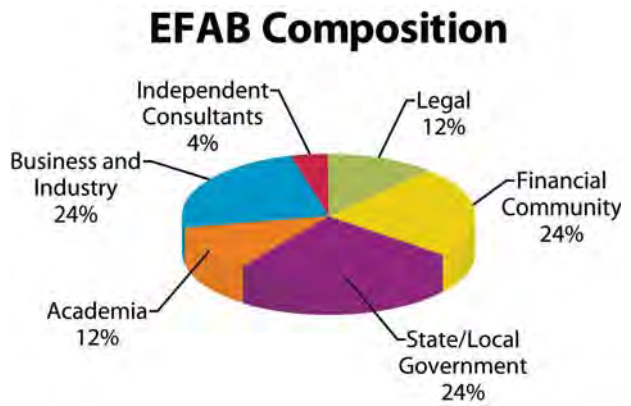
Steven Grossman
Executive Director
Ohio Water Development Authority

Stephen Mahfood
President
Mahfood Associates LLC

James Smith
Environmental Finance Consultant

Billy Turner
President
Columbus Water Works

John Wise
Environmental Finance Consultant



Summaries of EFAB Products and Projects

EFAB Work

The board initiates and develops its work products in two basic ways. It either receives direct requests from EPA on specific environmental financing issues, or the board members independently identify and decide on important environmental financing challenges that they believe the Agency should consider. Following the identification of work projects, EFAB holds public meetings, expert workshops, and working group sessions to develop advisories, reports, and letters to Agency. These products represent the board's independent and expert views on a wide range of environmental finance issues and opportunities.

EFAB uses its annual summer meeting as an opportunity to update its strategic action agenda to reflect projects completed, update work on ongoing projects, and begin new projects of interest to EPA and board members. During the 2007-2008 period covered by this report, EFAB transmitted nine reports to the Agency and is working on another six projects for 2009-2010.

Areas covered by the board projects have ranged from its long-time interest in public and private drinking water and wastewater financing mechanisms to solid waste financial assurance tools to air pollution reduction financing innovations. Some of the current EFAB active projects include a continued examination of solid waste financial assurance issues related to commercial insurance and cost-estimation, investment options for state water financing authorities, and prospective financial assurance issues associated with the long-term storage of carbon dioxide in underground wells.

The following project summaries provide information on recent board work efforts. They include the report or project title, report issue date, and a short narrative of the report or project, followed by the primary Agency strategic goal and customer served, and, where available, EPA's response.

Summaries of Completed Reports/Letters, 2007-2008

★ *EFAB Finance Spotlight: Relative Benefits of Direct and Leveraged Loans in State Revolving Fund (SRF) Programs (August 2008)*

EPA Strategic Goal: Clean and Safe Water

Primary Customer: Office of Water

EFAB Report: EPA and others have estimated that national infrastructure needs for clean water (wastewater) and drinking water range between $485 billion and $916 billion. While there is no single correct estimate, all available data reveal a very large environmental financing challenge. In light of this challenge, EPA asked EFAB to determine if it should more strongly support or remain neutral with regard to the use of leveraging by Clean Water and Drinking Water SRFs. The board conducted a detailed analysis of National Information Management Data for both the Clean Water and Drinking Water SRF programs supplemented by individual EFAB member experiences working with the state SRFs. Based on this analysis, the board concluded that state programs that leverage their SRF funds have provided greater assistance as a percentage of their capitalization grants than states that use the direct loan approach. EFAB recommends that EPA encourage direct loan states that have significant unmet demand for clean water and/or drinking water loans carefully consider leveraging (to help meet unmet demand). The board also found that direct loan programs could maintain levels of assistance and increase the growth of their retained earnings by using leveraging. Augmenting equity capital through leveraging would allow these states to increase available and future funding. The board further recommended that EPA strongly support leveraging and that it conduct a broad outreach to the states and relevant national finance and professional associations about the benefits of leveraging.

EPA Response: None, as of the report deadline. But the board had already received indications of considerable interest in the report from numerous sources, including EPA offices, the General Accounting Office, Congressional committees, and state environmental organizations.

Public-Private Partnerships in Water and Wastewater Services (April 2008)

EPA Strategic Goal: Clean and Safe Water

Primary Customer: Office of Water

EFAB Report: The costs of, and need for, public-purpose environmental infrastructure continue to grow while public resources are increasingly constrained. These colliding trends have contributed to a renewed interest in innovative and alternative financing approaches, including public-private partnerships. The interest in such partnerships derives from the ability of the private sector to devote significant new capital and operational efficiencies to environmental infrastructure projects. After consulting with EPA management, the board focused this effort on examining how these partnerships could, where appropriate, help to address clean water (wastewater) and drinking water infrastructure needs over the next five to 10 years. In this context, EFAB identified the barriers and incentives to successful partnerships and examined successful partnership models. This work involved a thorough review of past public-private partnerships work undertaken by the board and EPA, as well as ongoing partnership developments in all infrastructure areas, particularly transportation. The board provided the Agency with a report detailing its findings and recommendations in these areas.

In the report, EFAB recommended that Congress take action to eliminate state volume caps on private activity bonds issued to construct public-purpose water infrastructure, modify or terminate the federal interest in facilities constructed with assistance from the former EPA Construction Grants Program, and make privately owned, public-purpose clean water facilities eligible for grants and loans from the Clean Water SRFs. For EPA, the board recommended that it review and report on state statutes that restrict or prohibit public-private partnerships, and on the use of state and federal subsidies that support government-owned water facilities, but not private, public-purpose systems. EFAB also recommended that EPA examine the public-private partnership initiatives undertaken by the U.S. Department of Transportation with an eye toward adapting or adopting those activities that could produce environmental benefits. The board further suggested that the Agency continue to disseminate information on public-private partnerships, particularly successful community case studies, and that it support with funding an effort to track progress in eliminating federal and state barriers to these partnerships.

EPA Response: The Agency agreed with EFAB's observations regarding the value and limitations of public-private partnerships. EPA informed the board that EPA staff would be reviewing and addressing some of the legal and institutional barriers to public-private partnerships in the water industry presented in the report. EPA also planned to have staff reexamine the period of federal interest in previously grant-funded projects and to the definition of public ownership. Finally, EPA management indicated that it had directed staff to examine the partnerships initiatives undertaken by the U.S. Department of Transportation that were highlighted in the report with the hope of emulating them.

Environmental Management Systems and the Use of Corporate Environmental Information by the Financial Community (April 2008)

EPA Strategic Goal: Compliance and Environmental Stewardship

Primary Customer: Office of Policy, Economics and Innovation

EFAB Report: EPA's Office of Policy, Economics and Innovation (OPEI) requested the board's advice in identifying organizations and people in the financial and business communities having a demonstrated or potential interest in Environmental Management Systems (EMSs), environmental performance improvement, and financial risks/rewards. OPEI also asked the board to help provide it with a better understanding of current financial services industry beliefs, practices, conventions, and challenges with regards to the consideration of environmental performance and systems. Accordingly, EFAB undertook an extensive dialogue with the Agency on these topics and held interviews with representatives of the insurance and equity sectors. In addition, the board held a formal workshop on June 12, 2007, to collect information and ideas with respect to how professionals in the areas of commercial banking/lending, rating agencies, equity investment, and insurance use or do not use a corporation's environmental information, such as EMSs, in their financial analyses and other work. A detailed summary of the workshop proceedings was developed and made publicly available as required by law. The board processed the information collected at the workshop and developed findings and recommendations that were included in a report to the Agency.

EPA Response: The Agency informed the board that it accepted and was taking steps to implement recommendations from this report. With regard to EFAB's recommendation that EPA

take a leadership role helping the financial sector and companies better understand the relationship of EMSs, environmental performance, and financial value, the Agency sponsored a dialogue in New York City with the financial community to explore how to improve access to, and understanding of, EPA databases. In addition, the Agency committed to continuing to have its Performance Track and Sector Strategies programs explore and develop environmental metrics with their corporate partners.

EFAB Finance Spotlight: Innovative Finance Programs for Air Pollution Reduction (November 2007)

EPA Strategic Goal: Clean Air and Global Climate Change

Primary Customers: Office of Air and Radiation

EFAB Report: EPA's Office of Air and Radiation (OAR) asked EFAB to determine if any innovative financing options could be devised to help make the diesel truck retrofit kits developed by its SmartWay Program more attractive. While the adoption of these kits by truckers would significantly benefit the environment via emissions reductions, the costs of the kits are not insignificant and pose a barrier. The board examined a number of issues related to the use of the kits, including the possibility of parties receiving monetary credits for emissions reductions, identifying/setting the values for credits, enabling national tradability of the credits, and bundling credits for use by sources of financing for the kits. During this examination, EFAB realized that the SmartWay Program addresses just one part of the nation's air pollution problems, and, therefore, it also looked at the impact of millions of small polluting diesel engines, either stationary or mobile. EFAB determined that several innovative financing techniques, including the creation of Air Quality Finance Authorities (AFQAs) by state(s), could be used to promote the SmartWay program as well as air pollution reduction for a wide variety of other small, stationary emission sources. The board also suggested that the Agency meet with the U.S. Department of Transportation (USDOT) to discuss whether allocations of a small portion of private activity bonding authority provided to the states (via AFQAs) could be undertaken in compliance with already funded transportation programs to enhance the value of the proposal. EFAB released the final report in November 2007.

EPA Response: The Agency responded on two occasions to this important EFAB report.

In its first response, EPA agreed with the board regarding the value of encouraging states to create AQFAs, and with its technical recommendations to allow such authorities to make bulk purchases and take advantage of fleet discounts. The Agency also agreed to consider EFAB's recommendation that it review its air funding programs with the idea of using them as an incentive to create the state authorities. EPA further informed the board that it was already taking steps to include the creation of AQFAs as an eligible activity under the diesel emissions reduction provision of the Energy Policy Act of 2005. In response to EFAB's recommendation to take advantage of existing transportation programs, EPA began a dialogue with USDOT to pursue the use of bonding authority to finance diesel retrofits.

In its second response, EPA informed the board that using funds appropriated for fiscal year 2008 under the Energy Policy Act of 2005 it had issued a $3.4-million grant solicitation to establish innovative finance projects as part of the SmartWay Clean Diesel Program. The Agency further noted that it had incorporated concepts from EFAB's report in the Request for Proposals and that it hoped to award projects consistent with the report recommendations, particularly with regard to creating air quality finance centers. Finally, EPA noted that it had already entered into a cooperative agreement with the EFC in Region 5 to conduct demonstration projects on financial mechanisms to support clean diesel projects.

Combined Sewer Overflows Financial Capability Guidance (May 2007)

EPA Strategic Goals: Clean and Safe Water

Primary Customer: Office of Water

EFAB Report: In 1997, EPA published *Combined Sewer Overflows — Guidance for Financial Capability Assessment and Schedule Development*. This document provides the Agency's approach to how a community's financial capability should be assessed as the community develops and implements a long-term control plan for dealing with its Combined Sewer Overflows (CSOs). The document impacts more than just CSO, as it is used to assess financial capability across EPA's clean water programs. Given the guidance's importance and age, the Agency decided to conduct a detailed, multifaceted review to determine whether modifications/improvements to it are warranted. As part of this review, EPA asked the board to assess the guidance and provide the Agency with comments on any necessary revisions

and updates. EFAB met with and kept EPA managers and staff apprised of their preliminary findings, during the course of their assessment. In June 2007, the board completed its review of the guidance and released a final report to the Agency. In this report, the board determined that the existing guidance has a number of limitations and presented a set of detailed findings suggesting a number of important technical improvements to the indicators used in both phases of the current process.

EPA Response: The Agency accepted the board's report with thanks and without comment. The Agency has not revised the guidance as of this date.

Private Activity Bond Letter

EPA Strategic Goal: Clean and Safe Water

Primary Customer: Office of Water

EFAB Letter: The President's budget for EPA for Fiscal Year 2008 included a proposal that, if adopted, would exempt qualified private activity bonds (PABs) used to finance the "furnishing of water" and/or "sewage facilities" from the unified state volume caps. After becoming aware of this important environmental financing initiative, EFAB independently decided to author and transmit to the Agency a letter indicating its strong support for this action. Subsequently, the board sent a letter to the Agency in April 2007 outlining its 16-year record of support for exempting from state volume caps private activity bonds whose proceeds finance public-purpose drinking water and wastewater facilities, stressing the strong positive value of the proposed legislative change, stating its full support for the administration's proposal, and offering to assist EPA in any way possible in its efforts in this area.

EPA Response: Senior managers and staff verbally expressed the Agency's appreciation for the board's strong and unqualified support for the Administration's budget proposal.

The Use of Captive Insurance as a Financial Assurance Tool (March 2007)

EPA Strategic Goals: Land Preservation and Restoration; Compliance and Environmental Stewardship

Primary Customer: Office of Solid Waste and Emergency Response

EPA Report: At EPA's request, EFAB is taking a detailed look at the use of financial assurance mechanisms such as financial tests, corporate guarantees, insurance, bonds, and trust funds to help ensure that adequate resources will be available to address the environmental consequences of industrial and business activities. The board began its review with an evaluation of the use of the financial test and corporate guarantees. In January 2006, EFAB issued a report to EPA with its recommendations on strengthening these important tools. In June 2006, the board held a workshop with public and private representatives overseeing and evaluating the captive insurance industry and users of captive insurance. EFAB heard public comment at the workshop, and later received formal written comments from business associations representing members with experience with the Resource Conservation and Recovery Act (RCRA) and Superfund programs. In April 2007, the board forwarded a report on captive insurance to EPA, providing recommendations on the strengths and weaknesses of the use of captive insurance by corporations to show that they have the capacity to meet their financial assurance obligations.

In this report, EFAB recommended the use of independent credit analysis for demonstrating the financial strength of a captive insurer and supported strong, rigorous, and transparent oversight by state insurance licensing authorities. The board concluded that minimum capitalization requirements for captives were needed and that a respected insurance rating agency such as AM Best was in the best position to make these determinations. EFAB also concluded that captive insurers should be treated the same as regular commercial insurers (assuming effective state oversight) and that policy language should be the same for both types of insurers. Finally, the board recommended that EPA require any financially responsible affiliate that uses a captive insurance policy to either pass the financial test itself or possess an investment grade rating, or that the captive entity issuing the policy have a rating of secure or better with AM best or a comparable rating agency.

EPA Response: The Agency thanked EFAB for including state and EPA staff in many of its meetings and acknowledged the value of the board's input as it moved forward with improvements to RCRA financial assurance requirements. It committed to taking EFAB's findings and recommendations on captive insurance under advisement and noted the consistency of those current findings with EFAB's earlier work on the financial test and corporate guarantee.

The Agency also took this opportunity to inform the board that it is initiating its Action Development Process to more fully analyze its regulatory options regarding the RCRA Subtitle C financial test. EPA pointed out that as part of this process it will be further analyzing the earlier EFAB recommendation that the Agency include an independent ratings requirement to Alternative I of the current financial test.

Expanding the Definition of SRF Assistance (January 2007)

EPA Strategic Goal: Clean and Safe Water

Primary Customer: Office of Water

EFAB Report: Both EPA and EFAB are deeply interested in leveraging existing funding to help address unmet environmental needs facing communities nationwide. This project examined how more funding might be made available to meet environmental goals and objectives by allowing the Clean Water and Drinking Water SRFs to provide a new form of financial assistance to eligible projects that would not be yield restricted under Internal Revenue Service (IRS) arbitrage regulations. Specifically, the board examined how funding the capital and operating costs of eligible projects could provide support equivalent to what is currently provided as a debt service subsidy without triggering IRS rules restricting yields on arbitrage earnings. Any increased arbitrage earnings would flow back into the SRFs to provide additional funds for approved program uses. The board sent a report to the EPA Administrator in January 2007 summarizing this approach and the programmatic changes that would be needed to implement it.

EPA Response: The Agency reviewed the report and acknowledged its innovative approach for using SRF resources, while pointing out that the approach was beyond the existing authority of the clean water and drinking water SRF programs. In that regard, EPA noted that the report would add value and additional perspective to the ongoing Congressional debate with regard to developing legislation to reauthorize the SRF.

Sustainable Watershed Financing (January 2007)

EPA Strategic Goals: Clean and Safe Water; Healthy Communities and Ecosystems

Primary Customer: Office of Water

EFAB Report: Nonpoint sources of pollution are significant contributors to degraded water quality in most watersheds. Paying for projects to correct nonpoint source problems is made difficult by the complexity of the sources and the declining availability of government support. Over the past few years, EFAB has worked closely with EPA's Office of Wetlands, Oceans and Watersheds (OWOW) to address issues involving the capacity of local governments and groups to finance actions/projects needed to implement watershed plans. This work culminated in January 2007 when the board forwarded to EPA a report summarizing its findings on sustainable financing and collaborative governance, and provided specific recommendations for enhancing sustainable watershed financing.

In the report, EFAB recommended that EPA foster the use of collaborative governance approaches, work with an EFC to disseminate innovative financing tools, encourage the marketing of ecosystem services, leverage existing financing mechanisms such as the Clean and Drinking Water SRFs, work with the board and the EFCs to develop a compendium of entities that could implement watershed finance strategies, and initiate watershed demonstration projects incorporating sustainable finance techniques and collaborative governance approaches.

EPA Response: In its response to the report, the Agency either accepted, or agreed to further consider how to best implement, all of these recommendations. For a number of the recommendations that EPA accepted, it committed to implementation (with funding) as well.

Ongoing Projects 2008-2009

Financial Assurance: Commercial Insurance

EPA Strategic Goals: Land Preservation and Restoration; Compliance and Environmental Stewardship

Primary Customers: Office of Solid Waste and Emergency Response; Office of Enforcement and Compliance Assurance

Project Summary: As part of its longer-term work examining the full range of financial assurance tools used to help assure that adequate resources will be available to address the environmental consequences of industrial and business activities, EFAB is examining in detail commercial insurance. States, in particular, have voiced concerns about the use of insurance as a financial assurance tool raising issues regarding the difficulty of ensuring that the coverage in policies meets regulatory requirements, and questions as to whether claims will be paid. To address these and other concerns, the board is examining the strengths and pitfalls of insurance, the value of minimum ratings and capitalization requirements for insurers, and the feasibility and advisability of standard policy language for insurance used to provide financial assurance. The board has already hosted an information gathering workshop with experts from business and industry, the insurance community, and state regulators to explore these topics in detail and to spur additional thought and discussion. EFAB will be drafting a report advising EPA on the use of commercial insurance in the coming year.

Financial Assurance: Cost-Estimation

EPA Strategic Goals: Land Preservation and Restoration; Compliance and Environmental Stewardship

Primary Customers: Office of Solid Waste and Emergency Response; Office of Enforcement and Compliance Assurance

Project Summary: To expedite its financial assurance work on behalf of EPA, EFAB has concurrently undertaken the examination of a second important financial assurance issue, cost-estimation for RCRA closure, post closure, and corrective action. EFAB recognizes that good cost-estimates are both complex and the foundation of successful financial assurance. The board's goal in this project is to identify a methodology or process that will allow for greater confidence that the cost estimates will be sufficient to pay for remediation of the environmental risks remaining at sites which are subject to financial assurance. Inclusion and support of the leadership from the States will be critical in developing a successful program model.

Potential issues to be explored include the consistency with which EPA develops, or oversees the development of, cost estimates; tools being utilized today (e.g., COST-PRO, RACER); the need for more refined estimating protocols; improved coordination on cost-estimation among offices within EPA, the states, and industry; the idea of a national cost-estimation/financial assurance body or institute; and the proper priority for cost-estimation within the Agency. An important step in the project will be the convening of a workshop to allow for subject matter experts to discuss the status of cost estimation methodologies and to give the board a chance to further explore the need for both improvements in analytical techniques and organizational arrangements which would improve the reliability of cost estimates.

Exploring Clean Water and Drinking Water State Revolving Fund (SRF) Investment Options

EPA Strategic Goal: Clean and Safe Water

Primary Customer: Office of Water

Project Summary: In its recent report on SRF leveraging, EFAB identified as an area for further study whether there are modifications to the current approaches used to invest SRF equity that might better meet the objectives of the Clean Water and Drinking Water SRF Programs, including making them more sustainable. The board noted in the report that the SRFs have been capitalized or "endowed" with equity capital in excess of $38.4 billion. This equity is invested in very conservative investments such as high-grade tax-exempt interest rates. An investment strategy that is more typical for such large endowed funds would be expected to significantly increase the growth rate of SRF equity.

EFAB plans, in this new project, to examine in some detail the equity investment question posed above. As part of this effort, the board also plans to generally explore the benefits and risks of an endowment-like approach to the investment of Clean Water and Drinking Water SRF funds, any regulatory issues affecting the implementation of the new approach, and any related impacts, such as impacts on the approach to debt issuance that would be required to implement a new endowment-like investment approach.

Innovative Use of Assessments and Special Districts in Air Pollution and Nonpoint Water Pollution

EPA Strategic Goal: Clean Air and Global Climate Change

Primary Customers: Office of Air and Radiation

Project Summary: This project is a direct follow-up to two important EFAB reports, Innovative Financing for Air Pollution Reduction (SmartWay Transport) and Sustainable Watershed Financing. The new project will involve an examination of innovative uses of tax and financing incentives and the development of new techniques for implementing environmental projects. In particular, the board will consider the development and use of federal, state, and local assessments as well as the creation of special air quality and stormwater districts. These new mechanisms could be used to help finance air pollution reduction at truck stops or drayage yards and nonpoint source water pollution activities involving manure control systems, animal feedlots, or riparian buffer zones.

Financial Assurance and CO_2 Underground Injection Control (UIC)

EPA Strategic Goals: Clean and Safe Water; Clean Air and Global Climate Change

Primary Customers: Office of Water

Recognizing the growing importance of climate change and the Supreme Court's ruling regarding the regulation of CO_2, EPA has begun to explore a range of approaches to addressing these issues. It is clear that global greenhouse gas emissions associated with industrial development and economic growth and the emission reductions needed to reach climate protection goals are in conflict. Carbon capture and storage through underground injection in storage wells could be an important and necessary component of any future emissions reduction plan.

This new EFAB project will seek to identify and examine financing issues related to implementing a CO_2 underground injection control program. Such a program would include the provision of the financial assurance needed to address potential future liabilities associated with the underground injection of CO_2 in storage wells for the purpose of carbon capture and long-term sequestration. In this project, the board will seek to use and build upon the expertise that it has developed while exploring the use of financial assurance in solid waste programs.

Financing Water/Energy Conservation in Water Distribution Systems ("Leaky Pipes")

EPA Strategic Goal: Clean and Safe Water; Clean Air and Global Climate Change

Primary Customer: Office of Water

The growing U.S. population is stressing available water supplies. While the population nearly doubled between 1950 and 2000, public demand for water during that same period more than tripled. This increased demand has put additional stress on water supplies and distribution systems, threatening both human health and the environment. Increased water use also has a significant energy component and a corresponding impact on climate. By using water more efficiently, we can help preserve water supplies for future generations, save money, and protect human health and the environment.

In this new era, water utilities can no longer simply accept inefficiencies in their distribution systems such as the loss of water through leaks in underground pipes. In addition to the environmental impacts such as increased water consumption and air emissions, these water leaks are very costly in terms of increased costs for water treatment, pumping, and operations. Moreover, they impact the utility's environmental reputation and its ability to ask customers to conserve.

This new board effort will examine financing alternatives to detect and reduce leaks and improve water and energy conservation in water distribution systems.

Full Text EFAB Reports/Letters and EPA Responses

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

AUG 28 2008

Honorable Stephen L. Johnson
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Johnson:

The Environmental Financial Advisory Board (EFAB) is pleased to submit the enclosed report, "Relative Benefits of Direct and Leveraged Loans in State Revolving Loan Fund (SRF) Programs" for the Agency's consideration.

Based on the Board's analysis of data on both the Clean Water and Drinking Water SRFs, this report shows that state programs that leverage their SRF funds have provided greater assistance as a percentage of their capitalization grants than those that use the direct loan approach. The Board recommends that EPA encourage a careful evaluation of the benefits of using leveraging by States that have significant unmet current demand for clean water or drinking water loans.

Revolving loan funds, however, are intended to both provide environmental assistance today and to develop sustainable means for providing assistance in the future. An SRF will become sustainable when, on an annual basis, its recycled federal and state capitalization and retained earnings are sufficient to continue its existing level of project funding in inflation adjusted dollars. Under this definition, the SRFs have not yet achieved sustainability.

It is sometimes argued that SRF leveraging increases current assistance at the expense of future projects. However, SRFs that currently use the direct loan approach could maintain the current level of assistance and increase the growth of their retained earnings by using a leveraging approach to fund their loans and investing their remaining equity to grow retained earnings. Augmenting their equity capital through leveraging could allow such States to increase available and future funding for construction of environmental infrastructure regardless of any future changes in Federal capitalization grants.

EFAB recognizes that EPA has worked to educate states about the potential benefits of leveraging. However, we recommend that the Agency expand the audience it is trying to reach. Some State financial officers, for example, may not be especially familiar with the SRF program or how it can be most effectively used. Appearances by EPA at meetings of the Government Finance Officers Association, the National Association of State Treasurers or the Governors' Association may be a productive supplement to meetings with those who already have significant knowledge of the SRF program.

In addition to encouraging leveraging as described above, EFAB believes that there are several other actions the Federal government could take to enhance the potential for SRFs to become self-sustaining over the long term.

1. Allow states to elect an approach that would eliminate the connection between Federal capitalization grant draws and the expenditure of funds for construction of SRF funded projects, similar to what has been done in the past.

2. Interpret the perpetuity rule on a dynamic rather than a static basis, by measuring compliance taking account of an SRF's expected earnings over time, rather than based on annual year-end results

3. Exempt the federal and state investment in the SRFs from federal arbitrage regulations.

Finally, EFAB believes that there are additional potential opportunities to expand the sustainability of SRF's by expanding the kinds of investments that SRFs can use. An investment strategy that is more typical for large endowed funds, such as pension funds, would be expected to significantly increase the growth rate of SRF equity needed to achieve SRF sustainability. We believe that EFAB could provide valuable information to the Agency by exploring the benefits of more aggressive investment of SRF equity. If the Agency would like EFAB to explore this topic in greater depth we would be pleased to do so, with the objective of making recommendations to EPA regarding any appropriate program changes.

The Board appreciates the continuing opportunity to provide financial advisory assistance to EPA on issues of national importance. We want to thank the Agency for the exceptional support we have received in this review from staff in the Office of Water, especially Kit Farber and Howard Rubin, who provided invaluable assistance to our deliberations.

We would be pleased to answer any questions or brief you or any of your staff should you desire additional information about this report, and we look forward to continuing to assist EPA in the mission of protecting human health and the environment.

Sincerely,

A. James Barnes
EFAB Chair

A. Stanley Meiburg
EFAB Designated Federal Official

Enclosure

cc: Marcus Peacock, Deputy Administrator
Ben Grumbles, Assistant Administrator for Water
Lyons Gray, Chief Financial Officer

Environmental Financial Advisory Board

Relative Benefits of Direct and Leveraged Loans in State Revolving Loan Fund (SRF) Programs

August 2008

Printed on Recycled Paper

Report on the Relative Benefits of the Direct Loan and Leveraged Loan Approaches for Structuring State Revolving Loan Funds

Executive Summary

Introduction

USEPA estimates national wastewater infrastructure needs range between $331 and $450 billion and that drinking water infrastructure needs range between $154 and $466 billion. There is no single correct estimate for needs, but the available data illustrate the growing gap between infrastructure needs and spending levels.

In light of the great need and increasing demand for water and wastewater financing, in August, 2006, the Environmental Financial Advisory Board ("EFAB" or "the Board") initiated a review of States use of a financing technique known as leveraging in the management of the State Clean Water and Drinking Water State Revolving Funds (SRFs). Leveraging refers to the practice of using Federal SRF capitalization grants as security for bonds the proceeds of which are deposited in the SRF, as authorized in 33USC1383(d) [Clean Water Act] and 42USC300j-12(2) [Safe Drinking Water Act]. State SRF Programs lend the bond proceeds to communities to support the development of wastewater and drinking water infrastructure.

The questions before the Board were whether States which used leveraging tended to have higher rates of loans as a percentage of their Federal capitalization grants, whether leveraging would improve the sustainability of the SRFs, and whether the Board ought to recommend that EPA do more to promote the use of leveraging. To assess this, EFAB compiled and analyzed substantial data on both the Clean Water and the Drinking Water SRFs.

SRF Programs by Lending Structure

States have substantial flexibility in the design of their SRF programs and, in particular, their lending structures. There are two broad types of SRF loans. Direct loans are made by states directly from SRF equity. Leveraged loans are funded in whole or in part with borrowed money raised in the bond market. The use of bond proceeds permits the amount of loans to exceed the amount of SRF equity. Every SRF program that uses leveraged loans also has some direct loans within its portfolio. This report groups leveraged SRFs by – low (up to 33.33% of loans funded with bond proceeds), medium (between 33.33% and 66.67% of loans funded with bond proceeds), or high (more than 66.67% of loans funded with bond proceeds).

Table 1 details the number of states with direct loan and leveraged loan SRF programs.

Table 1: Number of States by Lending Structure

SRF Program	Direct Loan States	Leveraged ~ Low States	Leveraged ~ Medium States	Leveraged ~ High States
Clean Water	24	9	9	9
Drinking Water	31	4	6	10

their need to use SRF equity for loans and the need to invest equity to generate retained earnings for future SRF uses.

- The "opportunity cost" of an SRF program is the difference between: (a) how much an SRF "earns" on equity used to make a loan; and (b) the investment return that an SRF could have earned on that same amount. The higher the opportunity cost to an SRF, the less sustainable its program will be. EFAB's analysis shows that leveraged loan programs can better enable states to sustain their SRFs than direct loan programs.

- The following analysis shows how direct loan programs may increase retained earnings through leveraging.

  - If a state has $100 of projects that need to be funded and provides a 50% interest rate subsidy versus a borrower's normal 4% tax-exempt borrowing cost, the state could use $100 of equity for a direct loan. In this case, the SRF would earn around 2% on the $100, or $2.00.

  - However, if the state issued bonds to fund the $100 of loans, it could use $50 of equity to support the loans and invest the remaining $50 of equity. In this case, the SRF would be able to earn a taxable market rate of return of about 4.5% on the invested $50, or $2.25, a 12.5% better return.

- Potential uses for additional SRF earnings include supporting additional projects immediately by making additional leveraged loans or retaining such earnings to grow SRF equity and, thus, enhance the SRF's capacity to fund future projects.

- There are also at least two administrative actions the USEPA can take to further enhance the potential for SRFs to be perpetually self-sustaining:

  - EPA could allow states to elect an approach that would eliminate the connection between federal capitalization grant draws by the state and the construction pace of SRF funded projects. Since all grant draws must remain within the SRFs, the federal contributions would remain secure but could be used to accelerate the growth of SRF retained earnings.

  - EPA also could interpret the agency's "perpetuity rule"[1] on a dynamic, rather than, static basis. By measuring perpetuity rule compliance based on expected earnings over time, rather than current year-end results, project funding capacity can grow more rapidly.

- EPA can also promote sustainability by supporting Congressional action to exclude SRF investments from arbitrage regulation. For grant monies pledged to support tax-exempt

[1] *In actuality, there is no specific USEPA "perpetuity rule" although USEPA and the states recognize that the SRFs must be maintained in perpetuity. The Clean Water Act requires that the fund balance in each SRF "shall be available in perpetuity for providing … financial assistance." [33 U.S.C.1383 §603(c)] Similar language appears in the Safe Drinking Water Act, "The fund corpus shall be available in perpetuity for providing financial assistance…." [42 U.S.C. 300j-12(c)]. While EPA does not have any specific rule that implements this language, in its definition of CWSRF Financial Indicators (see CWSRF 01-3,dated October 31 2000), for example, the agency seeks to gauge sustainability of the fund by determining if retained earnings, net of cumulative state match bonds repaid, is equal to or greater than zero. If this test is met, "the CWSRF is deemed to be maintaining its contributed capital…."*

bonds, SRFs would be able to retain market interest returns within the SRFs instead of rebating earnings to the federal government.

- Another potential opportunity that EFAB can explore is expanding SRF investment opportunities. Generally, SRFs are restricted to using only the most conservative investments. An investment strategy similar to large endowed funds, such as pension funds, can increase the growth rate of SRF retained earnings.

Primary Conclusions

- SRF programs have been very successful in financing clean water and drinking water projects, regardless of program design.

- EFAB's analysis of data on both the Clean Water and the Drinking Water State Revolving Funds (SRFs) shows that state programs that have leveraged their SRF funds have provided greater assistance as a percentage of their capitalization grants than those that have not leveraged.

- If federal capitalization grant dollars decrease, to be able to sustain their SRF programs states will need to maximize their earnings on SRF equity.

- States can increase project funding capacity and increase retained earnings by utilizing innovative financing concepts that are now being applied in some states.

- States can enhance project funding capacity if compliance with the perpetuity rule is determined based on expected earnings over time, rather than current year-end results. Compared to direct loan programs, leveraged programs can fund more loans with the same amount of equity.

Recommendations

- EPA should encourage direct loan states to improve SRF sustainability by showing those states how leveraging can be used to increase their retained earnings.

- EPA should assist states to develop sustainable SRFs by administratively allowing states to accelerate capitalization grant draws, modifying its interpretation of the perpetuity rule, and by advocating for arbitrage relief focused specifically on SRF programs.

- EFAB should explore the benefits of developing more aggressive parameters for SRF equity investments and recommend appropriate program changes to EPA.

Report on the Relative Benefits of the Direct Loan and Leveraged Loan Approaches for Structuring State Revolving Loan Funds

Section I. Introduction

USEPA estimates national wastewater infrastructure needs range between $331 and $450 billion and that drinking water infrastructure needs range between $154 and $466 billion. There is no single correct estimate for needs, but the available data illustrate the growing gap between infrastructure needs and spending levels.

In light of the great need and increasing demand for water and wastewater financing, in August 2006, USEPA's Environmental Financial Advisory Board ("EFAB" or "the Board") began an extensive review of both the Clean Water State Revolving Fund ("SRF") and the Drinking Water SRF. The goal of this effort was to determine whether States which used leveraging tended to have higher rates of loans as a percentage of their Federal capitalization grants, whether leveraging would improve the sustainability of the SRFs, and whether the Board ought to recommend that EPA do more to promote the use of leveraging.

Leveraging refers to the practice of using Federal SRF capitalization grants as security for bonds issued the proceeds of which are deposited in the SRF, as authorized in 33USC1383(d) [Clean Water Act] and 42USC300j-12(2) [Safe Drinking Water Act]. State SRF Programs lend the bond proceeds to communities to support the development of wastewater and drinking water infrastructure. There are two primary kinds of SRF loans, direct loans and leveraged loans.

Description of Direct and Leveraged Loans

Direct loans are made by states "directly" from SRF equity which includes federal contributions, state contributions, and retained earnings. For direct loans, a subsidy is provided to borrowers by charging a lower interest rate than would be charged on a market rate loan, i.e., by forgoing potential earnings on equity. The maximum subsidy is achieved by providing a 0% loan. For such a loan, the borrower's subsidy equals the market interest rate at which the SRF loan recipient would otherwise have borrowed, which is the tax-exempt or taxable market interest rate.

In contrast, leveraged loans are funded in whole or in part with the proceeds of bonds issued by the SRF, including 100% bond funded leveraged loans and loans which include various combinations of bond proceeds and equity. States, EPA and the national bond rating agencies categorize SRF leveraging structures as "blended loan," "cash flow," "hybrid" and "reserve fund" models. Each of these leveraging structures share the following common themes: (1) bond proceeds are deposited to the SRF; (2) bond proceeds increase lending capacity; and (3) bond proceeds are secured by combinations of equity investments and other SRF loans (both bond-funded and direct loans).

The descriptions of the types of loans discussed in this report are simple examples of the basic types of leveraging methods rather than specific examples of any individual state program. In actual practice, many SRF programs originate direct loans and leveraged loans through a variety of leveraging structures tailored to the needs of a particular state. Section V analyzes the direct loan, blended loan and reserve fund approaches. This is done to illustrate a primary conclusion of this report, which is that by leveraging their SRF programs, states that currently make only direct loans can increase lending or can maintain lending and simultaneously increase retained earnings.

Contents of the Report

The Report includes detailed historical data on both the Clean Water and Drinking Waters SRFs. It then analyzes that information, identifying various characteristics of the general types of SRF programs managed by all the states and Puerto Rico. Following the discussion of the states' SRF programs' characteristics, the Report offers a detailed analysis of how use of the direct loan and leveraged loan models can affect the long-term sustainability of states' SRF programs and offers recommendations of how the federal government can improve the opportunities for such sustainability.

The Report includes the following sections:

- Section II – Historical Data for the SRF Program

  This section provides information from the inception of the SRF programs to June 30, 2007 regarding the amount and source of equity in the Clean Water and Drinking Water SRFs, the amount of retained earnings in each state program, and the amount of executed loans as a percent of the federal contribution. Section II also includes the states grouped by lending structure.

- Section III – Analysis of Historical Data

  Using the data provided in the tables in Section II, this section summarizes and explains the data.

- Section IV – Characteristics of States by Leveraging Factor

  This section defines "leveraging factor" and uses that factor to indicate how that factor affects or is affected by the role of a financing agency or authority in a state's program, the distribution of states funding their required state match through bonding programs, the relationship between leveraging factor, and the amount of assistance provided to disadvantaged communities and the correlation of leveraging factor to the amount of retained earnings in the SRF programs.

- Section V – Detailed Analysis of the Direct Loan and Leveraged Loan SRF Approaches

Building on the information in prior sections, Section V evaluates the relative effectiveness of the direct loan and leveraged loan models. In addition to reviewing the techniques used by each model to provide subsidized loans for clean water and drinking water projects, this section provides a meticulous analysis of the costs of providing loans under each model, the effectiveness of each approach in growing retained earnings in order to maximize the sustainability of the SRF program and then looks at the policy alternatives regarding the benefits of providing more loans currently versus investing for future sustainability of the SRF programs.

- Section VI – Conclusions and Recommendations

  Drawing from the body of the Report, Section VI outlines the conclusions that are derived from the data and analyses presented and makes recommendations to USEPA regarding how the federal government can improve the opportunities for states to ensure the sustainability of their SRF programs.

Section II. Historical Data for the SRF Program

To begin its analysis of SRF leveraging, EFAB compiled the most comprehensive data available to date on both the Clean Water SRF and the Drinking Water SRF. Data is provided for each of the 50 states' and Puerto Rico's SRF programs.

The tables that follow show the total federal and state contributions to the SRF programs as of June 30, 2007. The tables also provide information on the dollar value of the SRF loans made by each state, the amount of leveraged bond proceeds as a percent of loans executed, and the amount of retained earnings as a percent of equity in the program. Finally, the tables show the amount of SRF loans made as a percent of the federal capitalization in each state.

The four tables in this Section include:

- Table 4-A: CWSRF Data by State as of June 30, 2007

  States are sorted alphabetically.

- Table 4-B: CWSRF Data by Lending Structure as of June 30, 2007

  States are grouped by lending structure:

  - Leveraged ~ High – more than 66.67% of loans funded with bond proceeds.
  - Leveraged ~ Medium – between 33.33% and 66.67% of loans funded with bond proceeds.
  - Leveraged ~ Low – up to 33.33% of loans funded with bond proceeds.
  - Direct Loan – loans are solely funded with equity.

- Table 5-A: DWSRF Data by State as of June 30, 2007

  States are sorted alphabetically.

- Table 5-B: DWSRF Data by Lending Structure as of June 30, 2007

  States are grouped by lending structure:

  - Leveraged ~ High – more than 66.67% of loans funded with bond proceeds.
  - Leveraged ~ Medium – between 33.33% and 66.67% of loans funded with bond proceeds.
  - Leveraged ~ Low – up to 33.33% of loans funded with bond proceeds.
  - Direct Loan – loans are solely funded with equity.

Table 4-A
CWSRF Data by State as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bond Proceeds	Loans Executed	Leveraged Bonds as % Loans Executed	Executed Loans as % of Federal Capitalization
United States	23,549.3	5,309.4	32,899.3	16.6%	27,735.1	62,949.1	44.06%	267.3%
Leveraged ~ High	6,499.9	1,498.9	8,477.7	10.6%	19,116.9	22,333.0	85.60%	343.6%
Leveraged ~ Medium	5,252.9	1,153.0	7,311.2	16.4%	7,226.0	15,968.1	45.25%	304.0%
Leveraged ~ Low	5,148.6	1,177.6	7,442.8	18.9%	1,392.2	11,814.4	11.78%	229.5%
Direct Loan States	6,647.9	1,479.8	9,667.5	20.3%	-	12,833.6	0.00%	193.0%
Alabama	233.0	108.3	341.7	11.2%	587.1	829.3	70.79%	355.9%
Alaska	143.3	30.2	209.4	20.0%	-	237.0	0.00%	165.4%
Arizona	154.9	42.3	209.0	10.0%	449.6	764.7	58.79%	493.7%
Arkansas	168.5	36.5	233.2	15.1%	116.9	403.3	28.99%	239.3%
California	1,765.2	468.1	2,611.5	17.3%	298.9	3,869.0	7.73%	219.2%
Colorado	203.3	41.0	253.8	7.1%	648.7	727.5	89.17%	357.8%
Connecticutt	337.0	103.9	477.9	10.7%	950.5	1,120.3	84.84%	332.4%
Delaware	117.1	23.0	149.8	9.7%	-	175.5	0.00%	149.9%
Florida	838.8	189.3	1,324.3	25.0%	150.7	2,567.7	5.87%	306.1%
Georgia	455.9	97.0	717.9	26.9%	-	808.7	0.00%	177.4%
Hawaii	180.9	70.9	313.1	22.0%	-	355.6	0.00%	196.6%
Idaho	113.8	23.7	172.8	23.1%	-	278.3	0.00%	244.6%
Illinois	1,074.0	198.9	1,492.6	17.7%	189.5	2,028.8	9.34%	188.9%
Indiana	566.1	123.0	666.0	3.8%	1,686.8	1,756.6	96.03%	310.3%
Iowa	282.9	64.2	354.9	14.8%	186.5	560.1	33.30%	198.0%
Kansas	210.5	43.9	245.6	0.0%	464.3	797.6	58.21%	378.9%
Kentucky	322.0	69.2	479.6	21.2%	-	523.5	0.00%	162.6%
Louisiana	274.4	57.2	380.2	15.8%	-	436.6	0.00%	159.1%
Maine	184.7	40.9	257.7	15.4%	97.3	426.0	22.84%	230.6%
Maryland	558.7	114.3	803.8	20.5%	160.9	1,178.8	13.65%	211.0%
Massachusetts	861.5	184.2	1,307.8	22.8%	3,291.1	3,776.7	87.14%	438.4%
Michigan	1,018.4	212.5	1,262.2	5.8%	2,219.8	2,463.3	90.11%	241.9%
Minnesota	451.0	126.1	666.0	16.2%	1,066.7	1,811.1	58.90%	401.6%
Mississippi	223.7	48.6	352.5	25.4%	-	472.3	0.00%	211.1%

Table 4-A ***(continued from prior page)***
CWSRF Data by State as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bond Proceeds	Loans Executed	Leveraged Bonds as % Loans Executed	Executed Loans as % of Federal Capitalization
Missouri	642.2	159.0	852.6	10.4%	1,569.7	1,638.1	95.82%	255.1%
Montana	116.0	36.9	158.4	5.0%	-	229.6	0.00%	197.9%
Nebraska	119.2	26.5	168.2	16.4%	-	268.2	0.00%	225.0%
Nevada	113.5	22.8	146.1	9.9%	104.7	306.8	34.13%	270.3%
New Hampshire	227.5	51.3	316.1	14.8%	-	446.3	0.00%	196.2%
New Jersey	1,019.2	236.6	1,647.6	30.4%	1,177.4	2,751.0	42.80%	269.9%
New Mexico	124.1	30.0	192.9	22.8%	-	205.5	0.00%	165.6%
New York	2,482.1	534.3	3,129.8	9.7%	7,637.0	9,269.8	82.39%	373.5%
North Carolina	441.5	95.8	675.9	23.2%	-	887.4	0.00%	201.0%
North Dakota	114.6	30.0	162.7	16.6%	75.3	189.0	39.84%	164.9%
Ohio	1,363.2	270.4	1,678.5	6.1%	1,638.6	3,818.8	42.91%	280.1%
Oklahoma	172.9	41.3	227.3	16.7%	146.0	512.5	28.49%	296.4%
Oregon	262.5	54.8	388.2	21.1%	-	636.4	0.00%	242.4%
Pennsylvania	841.8	194.0	1,121.0	16.1%	-	1,589.2	0.00%	188.8%
Puerto Rico	306.4	66.1	378.5	8.0%	-	340.0	0.00%	111.0%
Rhode Island	156.3	32.6	185.7	1.8%	526.2	751.4	70.03%	480.7%
South Carolina	281.0	57.2	493.2	32.4%	-	587.4	0.00%	209.0%
South Dakota	102.9	24.2	137.6	22.5%	45.5	268.2	16.96%	260.6%
Tennesse	387.7	81.8	650.1	30.3%	-	839.3	0.00%	216.5%
Texas	1,257.8	262.3	1,630.0	10.0%	1,615.1	3,957.8	40.81%	314.7%
Utah	134.4	27.6	178.6	12.4%	-	259.5	0.00%	193.1%
Vermont	110.7	23.1	132.7	2.6%	-	134.3	0.00%	121.3%
Virginia	568.2	118.7	925.8	28.5%	634.3	1,571.3	40.37%	276.5%
Washington	415.9	86.6	605.6	19.9%	-	930.3	0.00%	223.7%
West Virginia	362.4	75.5	464.3	8.9%	-	536.8	0.00%	148.1%
Wisconsin	608.4	127.0	872.2	21.4%	-	1,386.2	0.00%	227.8%
Wyoming	77.3	25.9	96.4	46.9%	-	269.7	0.00%	348.9%

Table 4-B
CWSRF Data by Lending Structure as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bond Proceeds	Loans Executed	Leveraged Bonds as % Loans Executed	Executed Loans as % of Federal Capitalization
United States	23,549.3	5,309.4	32,899.3	16.6%	27,735.1	62,949.1	44.06%	267.3%
Leveraged ~ High	6,499.9	1,498.9	8,477.7	10.6%	19,116.9	22,333.0	85.60%	343.6%
Leveraged ~ Medium	5,252.9	1,153.0	7,311.2	16.4%	7,226.0	15,968.1	45.25%	304.0%
Leveraged ~ Low	5,148.6	1,177.6	7,442.8	18.9%	1,392.2	11,814.4	11.78%	229.5%
Direct Loan States	6,647.9	1,479.8	9,667.5	20.3%	-	12,833.6	0.00%	193.0%
Leveraged ~ High ~ Leveraged Bonds Funded More than 66.67% of Total CWSRF Loans								
Indiana	566.1	123.0	666.0	3.8%	1,686.8	1,756.6	96.03%	310.3%
Missouri	642.2	159.0	852.6	10.4%	1,569.7	1,638.1	95.82%	255.1%
Michigan	1,018.4	212.5	1,262.2	5.8%	2,219.8	2,463.3	90.11%	241.9%
Colorado	203.3	41.0	253.8	7.1%	648.7	727.5	89.17%	357.8%
Massachusetts	861.5	184.2	1,307.8	22.8%	3,291.1	3,776.7	87.14%	438.4%
Connecticutt	337.0	103.9	477.9	10.7%	950.5	1,120.3	84.84%	332.4%
New York	2,482.1	534.3	3,129.8	9.7%	7,637.0	9,269.8	82.39%	373.5%
Alabama	233.0	108.3	341.7	11.2%	587.1	829.3	70.79%	355.9%
Rhode Island	156.3	32.6	185.7	1.8%	526.2	751.4	70.03%	480.7%
Leveraged ~ Medium ~ Leveraged Bonds Funded Between 33.33% and 66.67% of Total CWSRF Loans								
Minnesota	451.0	126.1	666.0	16.2%	1,066.7	1,811.1	58.90%	401.6%
Arizona	154.9	42.3	209.0	10.0%	449.6	764.7	58.79%	493.7%
Kansas	210.5	43.9	245.6	0.0%	464.3	797.6	58.21%	378.9%
Ohio	1,363.2	270.4	1,678.5	6.1%	1,638.6	3,818.8	42.91%	280.1%
New Jersey	1,019.2	236.6	1,647.6	30.4%	1,177.4	2,751.0	42.80%	269.9%
Texas	1,257.8	262.3	1,630.0	10.0%	1,615.1	3,957.8	40.81%	314.7%
Virginia	568.2	118.7	925.8	28.5%	634.3	1,571.3	40.37%	276.5%
North Dakota	114.6	30.0	162.7	16.6%	75.3	189.0	39.84%	164.9%
Nevada	113.5	22.8	146.1	9.9%	104.7	306.8	34.13%	270.3%
Leveraged ~ Low ~ Leveraged Bonds Funded Up to 33.33% of Total CWSRF Loans								
Iowa	282.9	64.2	354.9	14.8%	186.5	560.1	33.30%	198.0%
Arkansas	168.5	36.5	233.2	15.1%	116.9	403.3	28.99%	239.3%
Oklahoma	172.9	41.3	227.3	16.7%	146.0	512.5	28.49%	296.4%
Maine	184.7	40.9	257.7	15.4%	97.3	426.0	22.84%	230.6%

Table 4-B ***(continued from prior page)***

CWSRF Data by Lending Structure as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bond Proceeds	Loans Executed	Leveraged Bonds as % Loans Executed	Executed Loans as % of Federal Capitalization
South Dakota	102.9	24.2	137.6	22.5%	45.5	268.2	16.96%	260.6%
Maryland	558.7	114.3	803.8	20.5%	160.9	1,178.8	13.65%	211.0%
Illinois	1,074.0	198.9	1,492.6	17.7%	189.5	2,028.8	9.34%	188.9%
California	1,765.2	468.1	2,611.5	17.3%	298.9	3,869.0	7.73%	219.2%
Florida	838.8	189.3	1,324.3	25.0%	150.7	2,567.7	5.87%	306.1%
Direct Loan States ~ CWSRF Loans Funded Only with CWSRF Equity								
Alaska	143.3	30.2	209.4	20.0%	-	237.0	0.00%	165.4%
Delaware	117.1	23.0	149.8	9.7%	-	175.5	0.00%	149.9%
Georgia	455.9	97.0	717.9	26.9%	-	808.7	0.00%	177.4%
Hawaii	180.9	70.9	313.1	22.0%	-	355.6	0.00%	196.6%
Idaho	113.8	23.7	172.8	23.1%	-	278.3	0.00%	244.6%
Kentucky	322.0	69.2	479.6	21.2%	-	523.5	0.00%	162.6%
Louisiana	274.4	57.2	380.2	15.8%	-	436.6	0.00%	159.1%
Mississippi	223.7	48.6	352.5	25.4%	-	472.3	0.00%	211.1%
Montana	116.0	36.9	158.4	5.0%	-	229.6	0.00%	197.9%
Nebraska	119.2	26.5	168.2	16.4%	-	268.2	0.00%	225.0%
New Hampshire	227.5	51.3	316.1	14.8%	-	446.3	0.00%	196.2%
New Mexico	124.1	30.0	192.9	22.8%	-	205.5	0.00%	165.6%
North Carolina	441.5	95.8	675.9	23.2%	-	887.4	0.00%	201.0%
Oregon	262.5	54.8	388.2	21.1%	-	636.4	0.00%	242.4%
Pennsylvania	841.8	194.0	1,121.0	16.1%	-	1,589.2	0.00%	188.8%
Puerto Rico	306.4	66.1	378.5	8.0%	-	340.0	0.00%	111.0%
South Carolina	281.0	57.2	493.2	32.4%	-	587.4	0.00%	209.0%
Tennesse	387.7	81.8	650.1	30.3%	-	839.3	0.00%	216.5%
Utah	134.4	27.6	178.6	12.4%	-	259.5	0.00%	193.1%
Vermont	110.7	23.1	132.7	2.6%	-	134.3	0.00%	121.3%
Washington	415.9	86.6	605.6	19.9%	-	930.3	0.00%	223.7%
West Virginia	362.4	75.5	464.3	8.9%	-	536.8	0.00%	148.1%
Wisconsin	608.4	127.0	872.2	21.4%	-	1,386.2	0.00%	227.8%
Wyoming	77.3	25.9	96.4	46.9%	-	269.7	0.00%	348.9%

Table 5-A
DWSRF Data by State as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bonds	Loans Executed	Leveraged Bonds as % of Loans Executed	Executed Loans as % of Federal Capitalization
United States	6,534.2	1,875.5	9,212.7	8.7%	4,856.0	11,952.2	40.6%	182.9%
Leveraged ~ High	1,612.0	570.1	2,465.8	11.5%	3,685.4	4,683.8	78.7%	290.6%
Leveraged ~ Medium	888.2	217.4	1,269.7	12.9%	984.1	2,084.5	47.2%	234.7%
Leveraged ~ Low	522.9	117.5	679.9	5.8%	186.5	771.4	24.2%	147.5%
Direct Loan States	3,511.2	970.5	4,797.4	6.6%	-	4,412.5	0.0%	125.7%
Alabama	110.1	39.7	167.4	10.5%	191.0	253.1	75.5%	230.0%
Alaska	80.6	19.6	102.2	2.0%	-	121.1	0.0%	150.3%
Arizona	91.1	19.4	113.3	2.5%	158.1	348.7	45.3%	383.0%
Arkansas	62.1	20.6	89.3	7.4%	-	96.2	0.0%	154.8%
California	611.7	160.7	810.0	4.6%	-	616.0	0.0%	100.7%
Colorado	98.9	25.2	129.4	4.1%	219.5	267.5	82.1%	270.4%
Connecticutt	58.1	16.8	83.1	9.9%	69.6	87.2	79.8%	150.1%
Delaware	54.2	15.0	71.8	3.6%	-	71.9	0.0%	132.7%
Florida	145.3	58.0	238.2	14.7%	-	274.1	0.0%	188.7%
Georgia	79.5	30.1	114.0	3.9%	-	130.1	0.0%	163.6%
Hawaii	59.8	17.2	81.2	5.2%	-	69.5	0.0%	116.1%
Idaho	63.3	15.9	83.1	4.7%	-	80.6	0.0%	127.3%
Illinois	282.8	59.7	364.2	6.0%	105.3	417.4	25.2%	147.6%
Indiana	138.9	24.9	170.3	3.8%	255.6	299.5	85.3%	215.6%
Iowa	147.4	25.8	179.0	3.2%	93.1	233.2	39.9%	158.3%
Kansas	100.7	23.6	135.9	8.5%	268.5	373.1	72.0%	370.7%
Kentucky	75.6	27.3	110.8	7.1%	-	96.6	0.0%	127.8%
Louisiana	92.6	14.3	108.8	1.7%	-	91.6	0.0%	99.0%
Maine	47.7	16.9	68.0	5.0%	8.3	60.0	13.8%	125.8%
Maryland	43.0	19.5	74.1	15.7%	-	76.2	0.0%	177.2%
Massachusetts	217.3	57.1	339.9	19.3%	681.4	768.0	88.7%	353.5%
Michigan	241.1	62.3	321.9	5.7%	409.4	417.8	98.0%	173.3%
Minnesota	127.7	40.9	184.5	8.6%	177.0	368.8	48.0%	288.8%
Mississippi	80.7	20.7	119.3	15.0%	-	119.3	0.0%	147.8%

Table 5-A ***(continued from prior page)***
DWSRF Data by State as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bonds	Loans Executed	Leveraged Bonds as % of Loans Executed	Executed Loans as % of Federal Capitalization
Missouri	111.1	33.2	147.1	1.9%	221.9	239.5	92.7%	215.6%
Montana	79.7	17.1	99.7	2.9%	-	105.0	0.0%	131.7%
Nebraska	40.2	16.8	62.4	8.7%	-	71.8	0.0%	178.6%
Nevada	57.9	18.4	80.8	5.6%	-	90.6	0.0%	156.6%
New Hampshire	33.9	17.8	56.8	9.0%	-	69.7	0.0%	205.5%
New Jersey	232.7	41.4	325.8	15.9%	217.6	464.2	46.9%	199.5%
New Mexico	52.1	15.1	71.3	5.8%	-	45.0	0.0%	86.4%
New York	413.6	265.0	827.6	18.0%	1,168.1	1,705.0	68.5%	412.3%
North Carolina	150.5	35.8	202.1	7.8%	-	171.8	0.0%	114.1%
North Dakota	90.1	22.4	119.4	5.8%	43.4	140.8	30.8%	156.3%
Ohio	233.1	74.8	392.1	21.5%	257.8	539.5	47.8%	231.5%
Oklahoma	122.3	22.3	143.3	-0.9%	200.4	273.1	73.4%	223.2%
Oregon	59.3	26.6	94.2	8.8%	-	83.9	0.0%	141.6%
Pennsylvania	239.3	50.4	323.7	10.5%	-	358.7	0.0%	149.9%
Puerto Rico	103.7	19.9	124.6	0.8%	-	110.3	0.0%	106.3%
Rhode Island	56.2	15.1	75.0	4.9%	80.5	130.1	61.9%	231.3%
South Carolina	73.7	19.3	105.7	12.0%	-	99.7	0.0%	135.3%
South Dakota	102.3	18.5	128.3	5.8%	29.5	153.2	19.3%	149.8%
Tennesse	76.1	20.7	105.2	8.0%	-	110.8	0.0%	145.7%
Texas	507.8	122.9	646.3	2.4%	-	482.5	0.0%	95.0%
Utah	44.4	15.1	62.1	4.2%	-	49.4	0.0%	111.2%
Vermont	41.9	16.7	60.7	3.5%	-	44.9	0.0%	107.3%
Virginia	48.1	31.0	83.7	5.5%	-	82.6	0.0%	171.6%
Washington	150.9	42.0	208.5	7.5%	-	218.1	0.0%	144.5%
West Virginia	55.3	15.1	73.8	4.6%	-	58.1	0.0%	105.1%
Wisconsin	161.3	32.5	219.0	11.5%	-	205.5	0.0%	127.4%
Wyoming	86.7	18.4	114.0	7.8%	-	110.8	0.0%	127.8%

Table 5-B
DWSRF Data by Lending Structure as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bonds	Loans Executed	Leveraged Bonds as % of Loans Executed	Executed Loans as % of Federal Capitalization
United States	6,534.2	1,875.5	9,212.7	8.7%	4,856.0	11,952.2	40.6%	182.9%
Leveraged ~ High	1,612.0	570.1	2,465.8	11.5%	3,685.4	4,683.8	78.7%	290.6%
Leveraged ~ Medium	888.2	217.4	1,269.7	12.9%	984.1	2,084.5	47.2%	234.7%
Leveraged ~ Low	522.9	117.5	679.9	5.8%	186.5	771.4	24.2%	147.5%
Direct Loan States	3,511.2	970.5	4,797.4	6.6%	-	4,412.5	0.0%	125.7%
Leveraged ~ High ~ Leveraged Bonds Funded More than 66.67% of Total DWSRF Loans								
Michigan	241.1	62.3	321.9	5.7%	409.4	417.8	98.0%	173.3%
Missouri	111.1	33.2	147.1	1.9%	221.9	239.5	92.7%	215.6%
Massachusetts	217.3	57.1	339.9	19.3%	681.4	768.0	88.7%	353.5%
Indiana	138.9	24.9	170.3	3.8%	255.6	299.5	85.3%	215.6%
Colorado	98.9	25.2	129.4	4.1%	219.5	267.5	82.1%	270.4%
Connecticutt	58.1	16.8	83.1	9.9%	69.6	87.2	79.8%	150.1%
Alabama	110.1	39.7	167.4	10.5%	191.0	253.1	75.5%	230.0%
Oklahoma	122.3	22.3	143.3	-0.9%	200.4	273.1	73.4%	223.2%
Kansas	100.7	23.6	135.9	8.5%	268.5	373.1	72.0%	370.7%
New York	413.6	265.0	827.6	18.0%	1,168.1	1,705.0	68.5%	412.3%
Leveraged ~ Medium ~ Leveraged Bonds Funded Between 33.33% and 66.67% of Total DWSRF Loans								
Rhode Island	56.2	15.1	75.0	4.9%	80.5	130.1	61.9%	231.3%
Minnesota	127.7	40.9	184.5	8.6%	177.0	368.8	48.0%	288.8%
Ohio	233.1	74.8	392.1	21.5%	257.8	539.5	47.8%	231.5%
New Jersey	232.7	41.4	325.8	15.9%	217.6	464.2	46.9%	199.5%
Arizona	91.1	19.4	113.3	2.5%	158.1	348.7	45.3%	383.0%
Iowa	147.4	25.8	179.0	3.2%	93.1	233.2	39.9%	158.3%
Leveraged ~ Low ~ Leveraged Bonds Funded Up to 33.33% of Total DWSRF Loans								
North Dakota	90.1	22.4	119.4	5.8%	43.4	140.8	30.8%	156.3%
Illinois	282.8	59.7	364.2	6.0%	105.3	417.4	25.2%	147.6%
South Dakota	102.3	18.5	128.3	5.8%	29.5	153.2	19.3%	149.8%
Maine	47.7	16.9	68.0	5.0%	8.3	60.0	13.8%	125.8%
Direct Loan States ~ DWSRF Loans Funded Only with DWSRF Equity								
Alaska	80.6	19.6	102.2	2.0%	-	121.1	0.0%	150.3%

Table 5-B ***(continued from prior page)***

DWSRF Data by Lending Structure as of June 30, 2007 (millions)

	Federal Capitalization	State Capitalization	Equity	Retained Earnings as % of Equity	Leveraged Bonds	Loans Executed	Leveraged Bonds as % of Loans Executed	Executed Loans as % of Federal Capitalization
Arkansas	62.1	20.6	89.3	7.4%	-	96.2	0.0%	154.8%
California	611.7	160.7	810.0	4.6%	-	616.0	0.0%	100.7%
Delaware	54.2	15.0	71.8	3.6%	-	71.9	0.0%	132.7%
Florida	145.3	58.0	238.2	14.7%	-	274.1	0.0%	188.7%
Georgia	79.5	30.1	114.0	3.9%	-	130.1	0.0%	163.6%
Hawaii	59.8	17.2	81.2	5.2%	-	69.5	0.0%	116.1%
Idaho	63.3	15.9	83.1	4.7%	-	80.6	0.0%	127.3%
Kentucky	75.6	27.3	110.8	7.1%	-	96.6	0.0%	127.8%
Louisiana	92.6	14.3	108.8	1.7%	-	91.6	0.0%	99.0%
Maryland	43.0	19.5	74.1	15.7%	-	76.2	0.0%	177.2%
Mississippi	80.7	20.7	119.3	15.0%	-	119.3	0.0%	147.8%
Montana	79.7	17.1	99.7	2.9%	-	105.0	0.0%	131.7%
Nebraska	40.2	16.8	62.4	8.7%	-	71.8	0.0%	178.6%
Nevada	57.9	18.4	80.8	5.6%	-	90.6	0.0%	156.6%
New Hampshire	33.9	17.8	56.8	9.0%	-	69.7	0.0%	205.5%
New Mexico	52.1	15.1	71.3	5.8%	-	45.0	0.0%	86.4%
North Carolina	150.5	35.8	202.1	7.8%	-	171.8	0.0%	114.1%
Oregon	59.3	26.6	94.2	8.8%	-	83.9	0.0%	141.6%
Pennsylvania	239.3	50.4	323.7	10.5%	-	358.7	0.0%	149.9%
Puerto Rico	103.7	19.9	124.6	0.8%	-	110.3	0.0%	106.3%
South Carolina	73.7	19.3	105.7	12.0%	-	99.7	0.0%	135.3%
Tennesse	76.1	20.7	105.2	8.0%	-	110.8	0.0%	145.7%
Texas	507.8	122.9	646.3	2.4%	-	482.5	0.0%	95.0%
Utah	44.4	15.1	62.1	4.2%	-	49.4	0.0%	111.2%
Vermont	41.9	16.7	60.7	3.5%	-	44.9	0.0%	107.3%
Virginia	48.1	31.0	83.7	5.5%	-	82.6	0.0%	171.6%
Washington	150.9	42.0	208.5	7.5%	-	218.1	0.0%	144.5%
West Virginia	55.3	15.1	73.8	4.6%	-	58.1	0.0%	105.1%
Wisconsin	161.3	32.5	219.0	11.5%	-	205.5	0.0%	127.4%
Wyoming	86.7	18.4	114.0	7.8%	-	110.8	0.0%	127.8%

Section III. Analysis of Historical Data

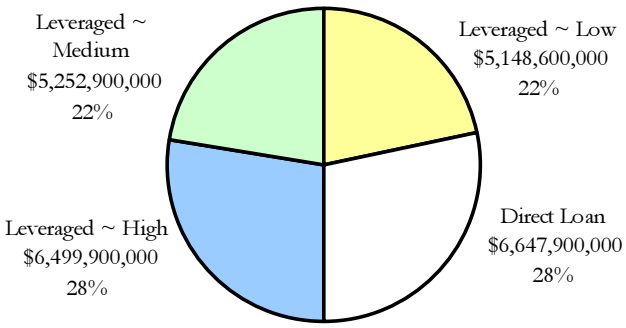
Clean Water SRF Program

To review and compare data, states were grouped into one of four lending structures:

- Direct Loan – Includes 24 states that originate CWSRF loans only with CWSRF equity.
- Leveraged ~ Low – Includes 9 states that have issued leveraged bonds to fund up to 33.33% of their total CWSRF loans.
- Leveraged ~ Medium – Includes 9 states that have issued leveraged bonds to fund between 33.33% and 66.67% of their total CWSRF loans.
- Leveraged ~ High – Includes 9 states that have issued leveraged bonds to fund more than 66.67% of their total CWSRF loans.

As of June 30, 2007, EPA has awarded more than $24.9 billion in Capitalization Grants to CWSRF Programs throughout the United States. Of this $24.9 billion awarded, states have allocated $23.5 billion to capitalize the CWSRF ("CWSRF Federal Capitalization"), $1.0 billion to administer the CWSRF, and $381.8 million for transfer to the DWSRF. The chart to the right depicts the allocation of the $23.5 billion in CWSRF Federal Capitalization by the four groups of states.

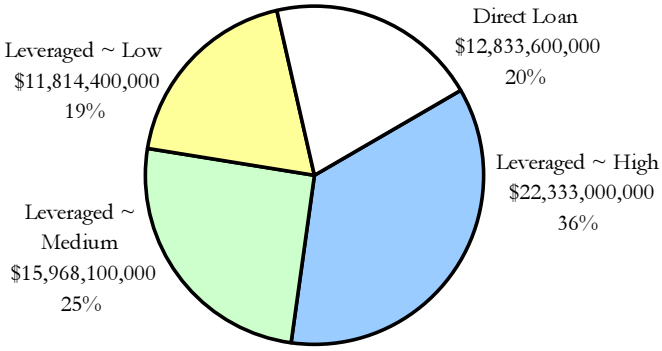
CWSRF Federal Capitalization, June 30, 2007



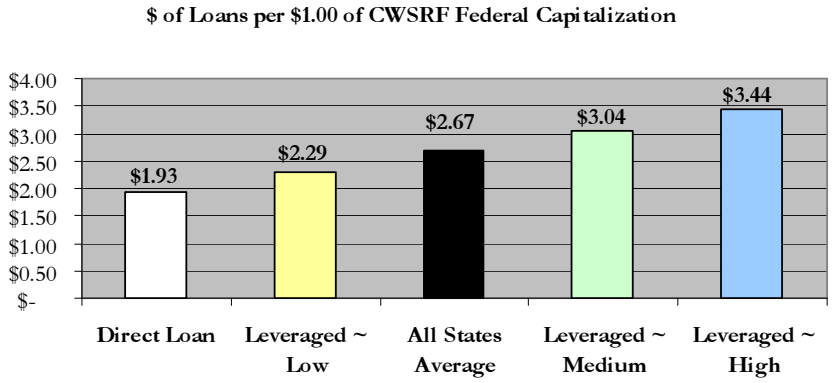
Both direct loan and leveraged loan programs have been successful in making loans in excess of federal capitalization. The $23.5 billion of CWSRF Federal Capitalization has enabled states to originate more than $62.9 billion in CWSRF loans as of June 30, 2007.

As shown in the chart to the right, the 24 states that operate direct loan programs have originated $12.8 billion in loans – 20% of the total loans originated through June 30, 2007. The 27 states that leverage have originated $50.1 billion in loans – 80% of the total loans originated. It is worth noting that 9 states categorized as "Leveraged ~ High" originated 36% or $22.3 billion of the total loans.

$62.9 Billion of CWSRF Loans Executed, June 30, 2007

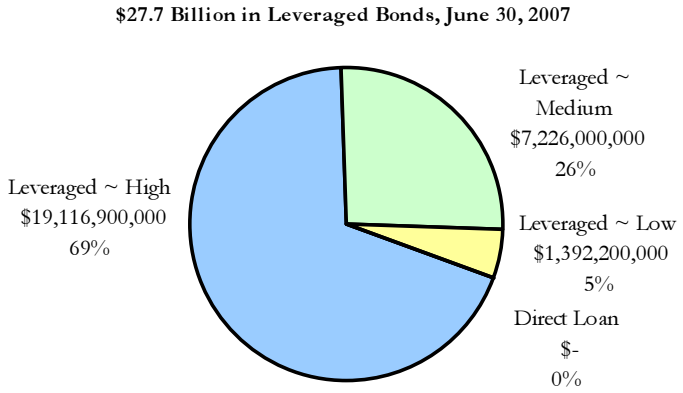


As a result of lending state contributed capital, recycled federal and state contributed capital, and retained earnings, all states have, in effect, "leveraged" their CWSRF federal grants by originating an amount of loans that exceeded their CWSRF Federal Capitalization. As shown in the chart below, the average "leveraging factor" for all state CWSRF programs was $2.67 of loans for each $1.00 of CWSRF Federal Capitalization.



The highest "leveraging factor" for a single state was $4.94 of loans for each $1.00 of CWSRF Federal Capitalization and the lowest "leveraging factor" was $1.11.

Through June 30, 2007, twenty-seven states have issued more than $27.7 billion in leveraged bonds to meet demand for CWSRF loans. As shown in the chart to the right, the nine states categorized as "Leveraged ~ High" have issued 69% of the total leveraged bonds through June 30, 2007.



Each SRF program has three components within their CWSRF equity:

- Federal Capitalization – The amount of federal funding held in perpetuity as an asset within the CWSRF in the form of a loan receivable, cash, or an investment.

- State Capitalization – The amount of state match funding held in perpetuity as an asset within the CWSRF in the form of a loan receivable, cash, or an investment.

- Retained Earnings – The amount of loan interest payments and investment earnings generated and retained by the CWSRF in the form of a loan receivable, cash, or an investment. Unlike federal and state contributions, retained earnings are not required to be held in perpetuity as long as their use/expense is directly related to repaying either match or leveraged bonds.

Many states have a fourth component of CWSRF "related equity" which is held outside EPA's definition of the CWSRF. Loan fees, for example, are not deposited into the SRFs in many states.

Loan fees can be used for any purpose related to the enabling federal CWSRF statutes and do not need to be held in perpetuity. However, it is reasonable to assume that states will eventually expend loan fees to administer the CWSRF or for some other purpose related to the CWSRF. Accordingly, this report excludes loan fees from the analysis of retained earnings.

Based on data reported annually by each state to EPA, it is possible to measure and compare CWSRF retained earnings. The chart below depicts retained earnings as a percentage of CWSRF equity as of June 30, 2007. Due to the greater volume of subsidized loans originated, states categorized as "Leveraged ~ High" and "Leveraged ~ Medium" typically have less retained earnings as compared to states categorized as "Leveraged ~ Low" and "Direct Loan." On average, states have 16.52% of their CWSRF equity in the form of retained earnings.

Retained Earnings as % of CWSRF Equity, June 30, 2007

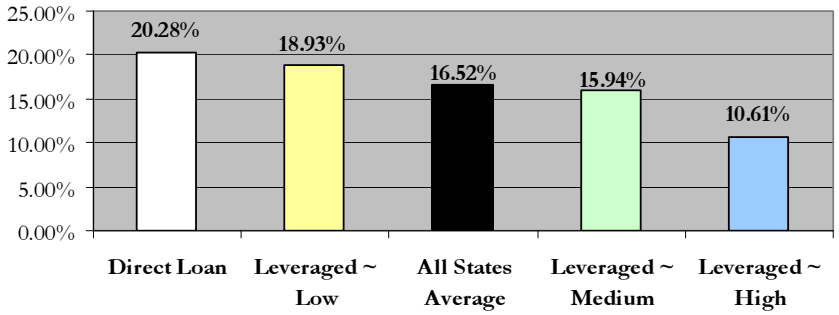


Table 6 provides additional detail on retained earnings. The data indicates that twelve of the twenty-four direct loan states have retained earnings within the top third of all states. In contrast, seven of the nine Leveraged ~ High states have retained earnings within the bottom third.

Table 6: Analysis of Retained Earnings as % of CWSRF Equity

Ranking of States by % of Retained Earnings	Top Third	Middle Third	Bottom Third
Average Retained Earnings as % of Equity	25.95%	16.97%	7.68%
# of States			
Direct Loan (24 States)	12	7	5
Leveraged ~ Low (9 States)	2	7	0
Leveraged ~ Medium (9 States)	2	2	5
Leveraged ~ High (9 States)	1	1	7
Average Loan Rates (Overall Average is 2.10%)	2.14%	2.42%	2.01%
Borrowed Match as % of Total Match	9.31%	15.96%	41.65%
Loan Disbursements as % of Loans	79.31%	87.51%	91.11%

In addition to the impact of issuing leveraged bonds, other factors influence the amount of CWSRF retained earnings including:

- Source of State Match – Appropriated match can have a comparatively positive effect on retained earnings while borrowed match can translate into less retained earnings.

- Loan Disbursements as % of Loans – States that disburse loan proceeds slowly are more likely to earn and retain income on cash balances before loan proceeds are disbursed to borrowers.

- More Recent Financing Innovations –Since the late 1990s, there have been various financing innovations which have enabled states to invest at higher yields and retain the income.

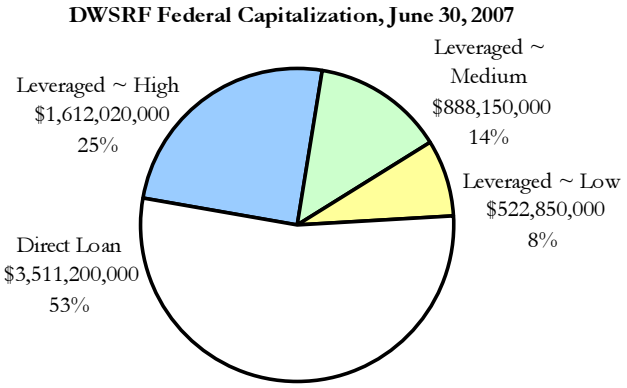
Drinking Water SRF Program

Similar to the CWSRF analysis, to review and compare DWSRF data, states were grouped organized into one of four lending structures:

- Direct Loan – Includes 31 states that originate DWSRF loans only with DWSRF equity.
- Leveraged ~ Low – Includes 4 states that have issued leveraged bonds to fund up to 33.33% of their total DWSRF loans.
- Leveraged ~ Medium – Includes 6 states that have issued leveraged bonds to fund between 33.33% and 66.67% of their total DWSRF loans.
- Leveraged ~ High – Includes 10 states that have issued leveraged bonds to fund more than 66.67% of their total DWSRF loans.

As of June 30, 2007, EPA has awarded more than $8.1 billion in Capitalization Grants to DWSRF and Set-Aside Programs throughout the United States. Additionally, states have transferred $381.8 million of funding from the CWSRF to the DWSRF. Of this $8.5 billion awarded or transferred to the DWSRF, states have allocated $6,522.6 million to capitalize the DWSRF, $689 million to DWSRF forgivable principal, $1,299.1 million to administer set-aside programs, and $11.6 million to set-aside loan programs.

The $6,522.6 million of DWSRF capitalization and the $11.6 million of set-aside loans can be collectively considered as the DWSRF Federal Capitalization. The chart to the right depicts the allocation of the $6,534.2 million ($6.5 billion) in DWSRF Federal Capitalization by the four groups of states.

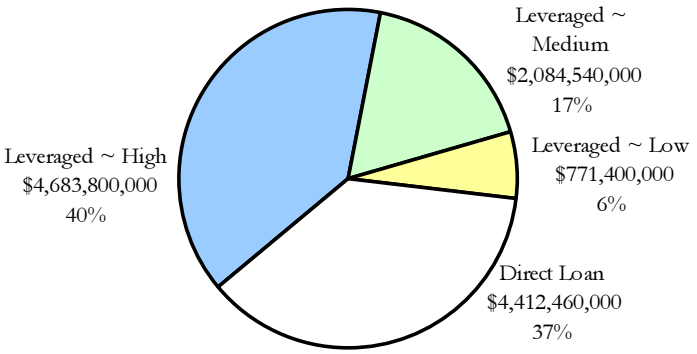


Both Direct Loan and Leveraged Loan programs have been successful in making loans in excess of the DWSRF

Federal Capitalization. The $6.5 billion of DWSRF Federal Capitalization has enabled states to originate more than $11.9 billion in DWSRF loans as of June 30, 2007.

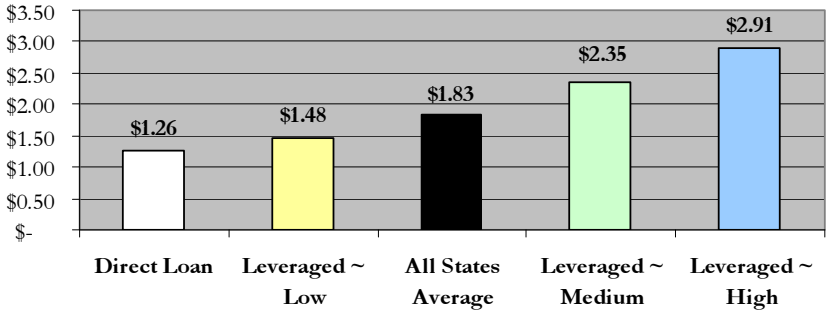
As shown in the chart to the right, the 31 states that operate direct loan programs have originated $4.4 billion in loans – 37% of the total loans originated through June 30, 2007. The 20 states that leverage have originated $7.5 billion in loans – 63% of the total loans originated. It is worth noting that 10 states categorized as "Leveraged ~ High" originated 40% or $4.7 billion of the total loans.

$11.9 Billion of DWSRF Loans Executed, June 30, 2007



As a result of lending state contributed capital, recycled federal and state contributed capital, and retained earnings, most states have, in effect, "leveraged" their DWSRF federal grants by originating an amount of loans that exceeded their DWSRF Federal Capitalization. As shown in the chart below, the average "leveraging factor" for all state DWSRF programs was $1.83 of loans for each $1.00 of DWSRF Federal Capitalization.

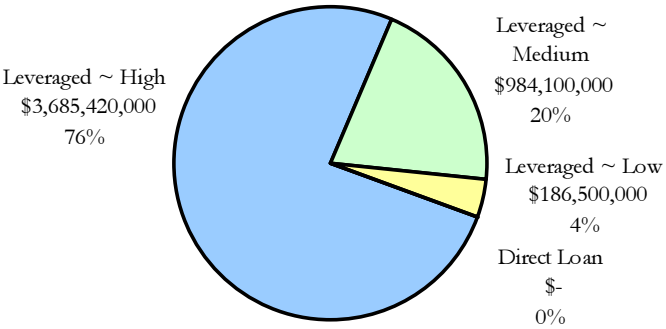
$ of Loans per $1.00 of DWSRF Federal Capitalization



The highest "leveraging factor" for a single state was $4.12 of loans for each $1.00 of federal capitalization and the lowest "leveraging factor" was $0.86.

Through June 30, 2007, twenty states have issued more than $4.9 billion in leveraged bonds to meet demand for DWSRF loans. As shown in the chart to the right, the ten states categorized as "Leveraged ~ High" have issued 76% of the total leveraged bonds through June 30, 2007.

$4.9 Billion in Leveraged Bonds, June 30, 2007



Each DWSRF program has three components within their equity:

- Federal Capitalization – The amount of federal funding held in perpetuity as an asset within the DWSRF in the form of a loan receivable, cash, or an investment.

- State Capitalization – The amount of state match funding held in perpetuity as an asset within the DWSRF in the form of a loan receivable, cash, or an investment.

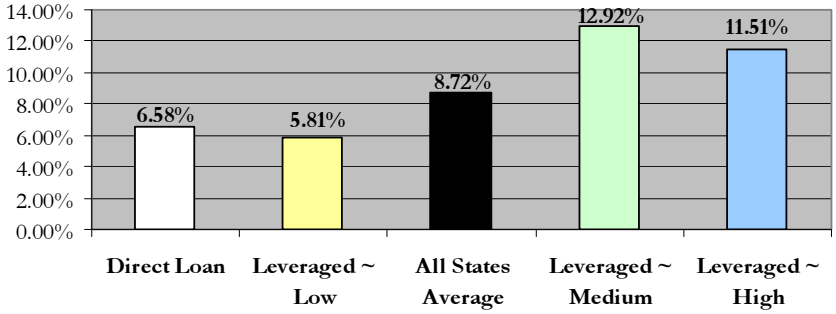
- Retained Earnings – The amount of loan interest payments and investment earnings generated and retained by the DWSRF in the form of a loan receivable, cash, or an investment. Unlike federal and state contributions, retained earnings are not required to be held in perpetuity as long as their use/expense is directly related to repaying either match or leveraged bonds.

Many states have a fourth component of DWSRF "related equity" which is held outside EPA's definition of the DWSRF. Loan fees, for example, are not deposited into the SRFs in many states.

Loan fees can be used for any purpose related to the enabling federal DWSRF statutes and do not need to be held in perpetuity. However, it is reasonable to assume that states will eventually expend loan fees to administer the DWSRF or for some other purpose related to the DWSRF. Accordingly, this report excludes loan fees from the analysis of retained earnings.

Based on data reported annually by each state to EPA, it is possible to measure and compare DWSRF retained earnings. The chart below depicts retained earnings as a percentage of DWSRF equity as of June 30, 2007. On average, states have 8.72% of their DWSRF equity in the form of retained earnings.

Retained Earnings as % of DWSRF Equity, June 30, 2007



It is worth noting that the six states categorized as "Leveraged ~ Medium" and the 10 states categorized as "Leveraged ~ High" have above average DWSRF retained earnings. This contrasts with the CWSRF where "Leveraged ~ Medium" and "Leveraged ~ High" states have below average retained earnings. In part, this can be explained by leveraging innovations states have employed as a result of lessons learned in CWSRF leveraging from 1989 through the implementation of the DWSRF in 1997-1998.

Table 7 provides additional detail on DWSRF retained earnings. Similar to the CWSRF data detailed in Table 6, the source of state match can have an effect on DWSRF retained earnings. Appropriated match can have a comparatively positive effect on retained earnings while borrowed match can translate into retained earnings.

Table 7: Analysis of Retained Earnings as % of DWSRF Equity

Ranking of States by % of Retained Earnings	Top Third	Middle Third	Bottom Third
Average Retained Earnings as % of Equity	14.90%	6.34%	3.10%
# of States			
Direct Loan (31 States)	9	11	11
Leveraged ~ Low (4 States)	0	4	0
Leveraged ~ Medium (6 States)	3	1	2
Leveraged ~ High (10 States)	5	1	4
Average Loan Rates (Overall Average is 2.20%)	2.38%	2.08%	2.16%
Borrowed Match as % of Total Match	16.37%	13.65%	34.64%
Loan Disbursements as % of Loans	79.55%	80.39%	77.30%

Section IV. Characteristics of States by Leveraging Factor

Clean Water SRF Program

As stated earlier within Section III, each state has a "leveraging factor" which measures the amount of executed CWSRF loans based on the amount of Federal CWSRF Capitalization. As of June 30, 2007, states have executed $62.9 billion of CWSRF loans based on $23.5 billion of Federal CWSRF Capitalization. The national average for CWSRF loans executed was $2.67 of loans for each $1.00 of Federal CWSRF Capitalization; in other words the average CWSRF "leveraging factor" was $2.67.

All states can be ranked by their CWSRF leveraging factor and placed into the top third, middle third, and bottom third. The leveraging factor for the top third of the states ranged from $4.94 to $2.70, the middle third ranged from $2.70 to $2.01, and the bottom third ranged from $1.98 to $1.11. For detail on individual states, see Table 4-A or Table 4-B.

As a means of comparing and contrasting states, Table 8 shows the number of states by:

1. Leveraging Factor, and
2. Lending Structure.

Table 8: CWSRF Leveraging Factor and Lending Structure

Lending Structure	Top Third Leveraging Factor	Middle Third Leveraging Factor	Bottom Third Leveraging Factor
Leveraged ~ High	7	2	0
Leveraged ~ Medium	7	1	1
Leveraged ~ Low	2	5	2
Direct Loan States	1	9	14
Total Number of States	17	17	17

As shown in Table 8, states in the top third for leveraging factor are significantly more likely to be "Leveraged ~ High" and "Leveraged ~ Medium" states. In contrast, states in the bottom third are significantly more likely to be "Direct Loan" states.

As another means of comparing and contrasting, states can be categorized into one of four categories by the role of a finance authority/agency in day to day CWSRF management:

- ❒ Lead Role – A finance authority/agency serves as the lead contact and manages all aspects of the CWSRF from generating the Intended Use Plan to servicing loans.
- ❒ Significant Role – A finance authority/agency manages some, but not all, aspects of the CWSRF including programmatic and financial aspects.
- ❒ Minor Role – A finance authority/agency may service loans and may issue state match or leveraged bonds on behalf of the CWSRF.
- ❒ No Role – No finance authority/agency is involved in any aspect of the CWSRF program.

Table 9 shows the number of states by:

1. Leveraging Factor
2. Finance Authority/Agency Role

Table 9: CWSRF Leveraging Factor and Finance Authority/Agency Role

Finance Authority/Agency Role	Top Third Leveraging Factor	Middle Third Leveraging Factor	Bottom Third Leveraging Factor
Lead Role	11	5	3
Significant Role	4	2	3
Minor Role	2	5	5
No Role	0	5	6
Total Number of States	17	17	17

As shown in Table 9, states in the top third for leveraging factor are significantly more likely to assign a lead or significant CWSRF management role to a finance authority/agency. In contrast, states in the bottom third are more likely to assign a minor or no management role to a finance authority/agency.

Table 10 presents CWSRF national averages for five program measures and compares these national averages to the averages by leveraging factor rankings.

Table 10: CWSRF Leveraging Factor and Program Measures

Program Measure	CWSRF National Average	Top Third Leveraging Factor	Middle Third Leveraging Factor	Bottom Third Leveraging Factor
Average Interest Rate	2.10%	2.32%	2.28%	1.96%
Average % of Loans Funded with Leveraged Bonds as % of Total Loans	44.1%	62.4%	29.5%	4.9%
Average % of Match Bonds as % of Total Match	24.1%	37.2%	14.6%	13.8%
Average % of Disadvantaged Assistance as % of Equity	10.9%	10.1%	5.4%	21.2%
Average % of Retained Earnings as % of Equity	16.6%	13.5%	20.1%	16.7%

Based on the data in Table 10, states ranking in the top third for the CWSRF leveraging factor are:

1. more likely to set CWSRF interest rates above the average interest rate of 2.10%,
2. significantly more likely to fund CWSRF loans with leveraged bonds,
3. significantly more likely to rely on bonds for CWSRF state match,
4. somewhat less likely to provide disadvantaged terms to CWSRF borrowers, and
5. less likely to have CWSRF retained earnings, as a percentage of equity, above the average retained earnings of 16.6%.

In contrast, states ranking in the bottom third for the CWSRF leveraging factor are:

1. more likely to set CWSRF interest rates below the national average of 2.10%,
2. significantly more likely to fund CWSRF loans with CWSRF equity,
3. significantly more likely to rely on appropriations for CWSRF state match,
4. significantly more likely to provide disadvantaged terms to CWSRF borrowers, and
5. likely to have CWSRF retained earnings, as a percentage of equity, approximately equal to the average retained earnings of 16.6%.

Drinking Water SRF Program

Similar to the above analysis of the Clean Water SRF, each state has a "leveraging factor" which measures the amount of executed DWSRF loans based on the amount of Federal DWSRF Capitalization. As of June 30, 2007, states have executed $11.9 billion of DWSRF loans based on $6.5 billion of Federal DWSRF Capitalization. The national average for DWSRF loans executed was $1.83 of loans for each $1.00 of Federal DWSRF Capitalization; in other words the average DWSRF "leveraging factor" was $1.83.

States can be ranked by their DWSRF leveraging factor and placed into the top third, middle third, and bottom third. The leveraging factor for the top third of the states ranged from $4.12 to $1.77, the middle third ranged from $1.73 to $1.35, and the bottom third ranged from $1.33 to $0.86. For detail on individual states, see Table 5-A or Table 5-B.

As a means of comparing and contrasting states, Table 11 shows the number of states by:

1. Leveraging Factor, and
2. Lending Structure.

Table 11: DWSRF Leveraging Factor and Lending Structure

Lending Structure	Top Third Leveraging Factor	Middle Third Leveraging Factor	Bottom Third Leveraging Factor
Leveraged ~ High	8	2	0
Leveraged ~ Medium	5	1	0
Leveraged ~ Low	0	3	1
Direct Loan States	4	11	16
Total Number of States	17	17	17

States in the top third for leveraging factor are significantly more likely to be "Leveraged ~ High" and "Leveraged ~ Medium" states. In contrast, states in the bottom third are significantly more likely to be "Direct Loan" states.

Identical to the CWSRF analysis, states can be categorized into one of four categories by the role of a finance authority/agency in day to day DWSRF management:

- ❒ Lead Role – A finance authority/agency serves as the lead contact and manages all aspects of the DWSRF from generating the Intended Use Plan to servicing loans.

- Significant Role – A finance authority/agency manages some, but not all, aspects of the DWSRF including programmatic and financial aspects.
- Minor Role – A finance authority/agency may service services loans and may issue state match or leveraged bonds on behalf of the DWSRF.
- No Role – No finance authority/agency is involved in any aspect of the DWSRF program.

Table 12 presents the number of states by:

1. Leveraging Factor, and
2. Finance Authority/Agency Role.

Table 12: DWSRF Leveraging Factor and Finance Authority/Agency Role

Finance Authority/Agency Role	Top Third Leveraging Factor	Middle Third Leveraging Factor	Bottom Third Leveraging Factor
Lead Role	10	3	3
Significant Role	3	4	3
Minor Role	1	5	2
No Role	3	5	9
Total Number of States	17	17	17

States in the top third for leveraging factor are significantly more likely to assign a lead or significant DWSRF management role to a finance authority/agency. In contrast, states in the bottom third are more likely to assign a minor or no management role to a finance authority/agency.

Table 13 presents DWSRF national averages for five program measures and compares these national averages to the averages by leveraging factor rankings.

Table 13: DWSRF Leveraging Factor and Program Measures

Program Measure	DWSRF National Average	Top Third Leveraging Factor	Middle Third Leveraging Factor	Bottom Third Leveraging Factor
Average Interest Rate	2.20%	2.47%	2.36%	1.79%
Average % of Loans Funded with Leveraged Bonds as % of Total Loans	40.6%	62.8%	25.3%	0.34%
Average % of Match Bonds as % of Total Match	21.5%	24.4%	18.8%	19.9%
Average % of Disadvantaged Assistance as % of Equity	32.3%	42.2%	31.3%	21.3%
Average % of Retained Earnings as % of Equity	8.7%	13.2%	7.2%	4.8%

Based on the data in Table 13, states ranking in the top third for the DWSRF leveraging factor are:

1. significantly more likely to set DWSRF interest rates above the average interest rate of 2.20%,
2. significantly more likely to fund DWSRF loans with leveraged bonds,
3. more likely to rely on bonds for DWSRF state match,
4. significantly more likely to provide disadvantaged terms to DWSRF borrowers, and
5. significantly more likely to have DWSRF retained earnings, as a percentage of equity, above the average retained earnings of 8.7%.

In contrast, states ranking in the bottom third for the DWSRF leveraging factor are:

1. significantly more likely to set DWSRF interest rates below the average interest rate of 2.20%,
2. significantly more likely to fund DWSRF loans with DWSRF equity,
3. more likely to rely on appropriations for DWSRF state match,
4. significantly less likely to provide disadvantaged terms to DWSRF borrowers, and
5. significantly more likely to have DWSRF retained earnings, as a percentage of equity, below the average retained earnings of 8.7%.

Section V. Detailed Analysis of the Direct Loan and Leveraged Loan SRF Approaches

Introduction

Both the direct loan approach and the leveraged loan approach are methods for implementing the purpose of EPA's State Revolving Fund ("SRF") Program – to encourage environmental compliance by providing low-cost or "subsidized" loans to qualifying environmental projects both currently and in the future. The purpose of this section is to evaluate the relative effectiveness of the two approaches in furthering EPA's objectives for the SRF Programs.

The topics discussed below with respect to the two approaches include:

- Descriptions of the two approaches and variations thereof;
- The techniques employed under each approach to provide interest subsidies for qualifying loans;
- The capacity to provide loan subsidies under each approach and the loan capacity of an SRF under each approach;
- The relative cost to an SRF under each approach of providing loan subsidies;
- The effective returns under each approach on SRF equity used to provide interest subsidies, including the impact of the Internal Revenue Service ("IRS") arbitrage regulations which limit the investment returns on SRF equity under certain circumstances;
- The effectiveness of each approach in generating retained earnings in order to grow the amount of equity in the SRF; and
- The policy tradeoff that exists between (i) applying earnings on SRF equity to provide loan subsidies today and (ii) retaining such earnings and utilizing the earnings thereon to provide loan subsidies in the future on either existing or future SRF loans.

Subsidized Borrowing

Loan subsidies are provided by SRF's using two basic approaches (as used herein, "loan" includes purchased obligations as defined in the Clean Water and Drinking Water Acts):

- Direct Loan Approach. Making loans to finance qualifying projects at below market rates funded solely from SRF equity ("direct" loans). The "equity requirement" for a direct loan equals the amount of the loan; the loan rate on the SRF equity equals the target subsidized loan rate.
- Leveraged Loan Approach. Making loans to finance qualifying projects at below market rates funded in whole or in part with borrowed money ("leveraged loans"). For an SRF using

a leveraged loan approach, the capacity of the SRF to make loans for qualifying projects will exceed the amount of the SRF's equity. Historically, two basic techniques have been used to create leveraged loans, the reserve fund approach and the blended loan approach. The descriptions of the types of loans discussed below are simple examples of the basic types of leveraging methodologies that are used in SRF programs. They are the building blocks that states use to design their unique programs. In actual practice, many SRF programs use some or all of the basic loan methodologies in combination (referred to herein as the "cash flow approach"). There are a variety of permutations of the basic approaches which are used together with various financial innovations described later in this report.

- Reserve Fund Approach. Making leveraged loans from money borrowed at market rates and using earnings on invested SRF equity to pay or reimburse part of the interest cost on the bonds issued to fund the loans. The invested SRF equity is typically deposited into a reserve fund. The equity requirement for a loan under the reserve fund approach is the amount of equity, invested at the market interest rate, necessary to produce the target interest subsidy. To produce a loan rate equal to x% of the market rate, i.e., a loan subsidy equal to (1 minus x%) of the market rate, the equity requirement equals (1 minus x%) times the loan amount

- Blended Loan Approach. Making leveraged loans from a combination of equity and money borrowed at market rates. The borrowers' interest cost is a combination of the market rate on the portion of the loans derived from the borrowing and a significantly below market rate (e.g., 0%) that is charged by the SRF on the portion of the loans derived from equity. In order to repay the bonds, the SRF must charge the bond interest rate on the portion of the loan made from bond proceeds. So, if any bond proceeds are used, the borrower's interest cost will be more than 0%. The "equity requirement" for a loan under the blended loan approach is the amount of equity bearing a 0% loan rate that in combination with the balance of the loan (which is funded from bond proceeds and bears a market interest rate) produces a combined loan rate equal to the target subsidized loan rate. To produce a loan rate equal to x% of the market rate, the equity requirement equals (1 minus x%) times the loan amount. Under the blended loan approach, the cost to an SRF of funding the portion of its loans made from bond proceeds is the tax-exempt or taxable market rate. Economically, to use the minimum amount of equity to support the loans (i.e., the equity requirement), the equity must be lent at a 0% interest rate. The SRF may choose to quote a single "blended" interest rate for the entire loan. However, in this discussion, a distinction will be made between the loan rate on the portion of the loan made from bond proceeds (i.e., the market rate) and the 0% loan portion made from equity.

The direct and leveraged loan approaches have been used with success by various SRFs. Over time, many leveraged SRF programs have evolved to incorporate elements of both the blended rate and the reserve fund approaches. The equity requirements described above for each approach represent the minimum amounts of equity needed to support a given subsidized loan. In the discussion below, it is always assumed that the amount of equity associated with a loan under either the blended loan or direct loan approach equals the equity requirement since it would be an inefficient use of SRF resources to utilize more equity than the equity requirement to support a loan.

SRF Financing Models Best Understood in Three Basic Forms

To understanding the financial workings of SRFs it is necessary to understand in some detail how SRFs work in their basic forms. The subsidy provided to an SRF borrower is the difference between (a) the rate at which the entity could otherwise borrow (a tax-exempt or taxable municipal rate, e.g., 4%) and (b) the SRF loan rate (e.g., 2%). Given the illustrative 4% and 2% municipal bond and SRF loan rates, respectively, the loan subsidy provided would be 2% (i.e., the market rate minus the loan interest rate), which represents a 50% subsidy versus the borrower's alternative 4% cost of funds. The loan subsidy as a percentage of the market rate is referred to below as the "subsidy percentage". The technique employed to provide an interest subsidy and the capacity of the SRF to make subsidized loans depend on the SRF's particular approach.

- Direct Loan Approach. For a direct loan SRF with $100 in equity, the SRF could make up to $100 of 2% equity-funded loans. The subsidy is provided by only charging 50% of the market tax-exempt rate that the SRF borrower would otherwise pay. The 2% loan interest (which represents 1 minus the subsidy percentage times the market tax-exempt rate) would go to retained earnings. As the loans are repaid, the SRF equity originally used for the loans would be repaid and become available for new projects in the same amounts as the principal repayments. An SRF's effective return on equity used to make a direct loan is structurally limited to the sum of the subsidy provided plus actual loan interest. Such sum will always equal the interest cost that the borrower would otherwise have paid on a loan, i.e., the market rate.

  Nationally, approximately 25% of SRF loans are considered "hardship" loans, which are loans with interest rates below the state's average SRF loan rate. Hardship loans can be made with a 0% interest rate, or, in the case of the drinking water program, with a rate below 0%, i.e., some principal "forgiveness," which in effect is a grant of some amount. For a 0% loan, there is no benefit to leveraging since earnings on $1 of equity are needed for each $1 of 0% loan. So, 0% loans are made as direct loans, even by leveraging SRFs unless additional state support from outside the SRF is used to pay debt service.

- Blended Loan Approach. For a leveraged SRF originating blended loans (funded by a combination of equity and bond proceeds), the SRF could make $100 of loans funded from (a) $50 of bond proceeds that are lent to the borrowers at the market rate of 4% and (b) $50 of equity that is lent to the borrowers at 0%. The result is that the borrowers' overall rate would be 2%. The subsidy percentage achieved under the blended loan approach is the equity amount used to make loans divided by the total loan amount (i.e., 50% in our example). The effective return on equity used to make the 0% direct loans is structurally limited to the subsidy provided thereon, which equals the market rate on the bonds. As the loans are repaid, the equity originally used to make loans would be repaid and become available for new projects in amounts equal to the subsidy percentage times the principal repayments. The remaining $50 of equity could be similarly used to provide an additional $100 of 2% loans. So, the loan capacity would be twice as much as under the direct loan approach. The loan or

"leveraging" capacity of a blended loan approach, stated as a multiple of SRF equity, equals 1 divided by the subsidy percentage (i.e., 2 times SRF equity in our example). Alternatively, rather than being used for additional loans, the remaining $50 could be invested specifically to generate retained earnings.

- Reserve Fund Approach. For a reserve fund SRF with $100 of equity, the SRF could make $100 of loans from $100 of bond proceeds and use the interest earnings on $50 of equity (e.g., invested at 4%) to pay 50% of the interest on the bonds. The equity required equals the loan amount times the subsidy percentage. As the loans are repaid, the equity originally deposited in the reserve fund would be released and become available for new projects in amounts equal to the subsidy percentage times the principal repayments. The remaining $50 of equity could be similarly used to provide an additional $100 of 2% loans. So, the loan capacity would be twice as much as under the direct loan approach. The loan or "leveraging" capacity of a reserve fund approach SRF, stated as a multiple of SRF equity, equals 1 divided by the subsidy percentage (i.e., 2 times SRF equity in our example). Alternatively, rather than being used for additional loans, the remaining $50 of equity could be invested specifically to generate retained earnings.

When leveraging there are transaction costs associated with the issuance of debt used to fund all or a portion of the SRF loans. In the absence of the SRF program, borrowers would incur most of the same costs. However, when using the direct loan approach, certain of the costs (in particular underwriters' discount) are not incurred by the SRF or the borrower to raise the funds used to make loans.

- For SRF's that leverage for the purpose of funding more loans than can be funded under the direct loan approach, any increased transaction costs are simply the price of funding loans for additional projects. However, the impact of such costs needs to be considered when evaluating the relative benefits of using the direct or leveraged loan approaches in funding the same amounts of loans. To measure the impact, the amount of such costs should be deducted in determining the financial benefits of the leveraged approaches relative to the direct loan approach. However, if a direct loan program does not impose the same transaction charges as the borrowers otherwise would have to pay if they borrowed outside the SRF, the actual debt service cost to SRF borrowers is slightly lower than the costs under either leveraged approach.

- Assuming average incremental transaction costs of $7.50 per thousand dollars of loans, the additional transaction costs for $100 of bonds under the reserve fund approach would be 75 cents. The additional transaction costs for $50 dollars of bonds under the blended loan approach would be 37 cents. As detailed below, even with transaction costs, the increases in retained earnings that can be achieved under the leveraged approaches are significantly greater than the increases in transaction costs under those approaches.

- However, additional transaction charges, such as state bond charges, may be imposed on an SRF in connection with the issuance of SRF bonds. Such charges could offset any relative financial benefit of the leveraged approaches over the direct loan approach. Where such charges are present, a specific analysis of their impact would be required.

In both the direct loan approach and the blended loan approach, the subsidy is created by investing SRF equity in loans to SRF borrowers and by foregoing earnings that could be realized if the loans to the borrowers were made at market rates. In the reserve fund approach, the subsidy is created by (1) making other (i.e., non-SRF loan) investments with SRF equity (which could be taxable investments) and (2) using the earnings thereon to pay or reimburse a portion of the interest cost on the debt issued to fund the borrowers' SRF loans. If the debt is tax-exempt, the taxable investment rate may be higher than the interest cost on the debt. The investment return on SRF equity is restricted under certain circumstances by the "arbitrage regulations" promulgated by the Internal Revenue Service. In particular, the arbitrage regulations provide that the investment return on bond proceeds (including such equity) may not exceed the yield on the tax-exempt bonds.

- Assume for example that an SRF: (1) borrows $100 at a tax-exempt rate (e.g., 4%) to fund SRF loans, (2) invests $50 of equity in higher rate taxable investments (e.g., at 4.50%) and (3) uses the earnings to provide loan subsidies (i.e., by paying or reimbursing a portion of the interest cost on the debt). The arbitrage regulations require that any amount by which the investment earnings exceed the interest cost on the debt (i.e., 0.5%) must be rebated to the IRS. So, the equity deposited in a reserve fund is effectively invested at the market tax-exempt rate. Given that the debt interest rate and the "net" equity investment rate are the same, the subsidy percentage achieved under the reserve fund approach is the equity amount deposited in the reserve fund divided by the loan amount (i.e., 50% in our example). To the extent that SRF equity is not invested in loans and is not treated as bond proceeds, the earnings thereon are neither structurally nor legally limited to the bond yield.

- However, financial innovations which have evolved since inception of the SRF programs have enabled leveraging SRFs to achieve higher investment returns on uncommitted SRF equity by either (a) using funds that are already yield restricted (such as existing direct loans) to fund new loan subsidies or (b) reducing the amount of dollars required to be invested to fund loan subsidies, by using both the principal and interest of direct loans or scheduled releases of principal from other pledged investments to fund loan subsidies. Conserving and investing on an unrestricted basis equity that would otherwise have been pledged to support loan subsidies on a restricted basis would on average increase an SRF's program investment returns by the difference between the arbitrage restricted tax-exempt and unrestricted taxable investment rates. Such increased return could be immediately used to increase funding capacity or captured as retained earnings.

Except for hardship loans within the drinking water SRF, the maximum loan interest subsidy that can be provided by making a direct loan of SRF equity is achieved by making a 0% loan. The subsidy in our example would be 4%, i.e., the difference between the borrower's alternative tax-exempt borrowing cost (4%) and the 0% loan rate, which represents a 100% interest subsidy.

- For a leveraged loan under the blended loan approach, a 0% rate would not be possible if any portion of the loan were derived from bond proceeds (unless a state provides additional support from outside of the SRF). The result of eliminating the bond proceeds (in order to achieve a 0% interest rate) is a loan derived solely from equity, i.e., a direct loan.

- As noted above, for a leveraged loan under the reserve fund approach, the subsidy percentage achieved equals the equity amount deposited in the reserve divided by the loan amount. So, to provide a 100% subsidy from earnings on SRF equity, a dollar of equity must be used (i.e., invested in the reserve fund) for each dollar of loans, just as under the direct loan approach.[2]

The "opportunity cost" to an SRF of funding a subsidized loan is the difference between (a) the investment return on the equity used to make the subsidized loan and (b) the investment return that such equity could earn if it were not used to make a subsidized loan. For this purpose, the "investment return" on equity used to make a direct loan includes both the actual loan interest and the amount of the subsidy that is provided to the loan recipient. Under both the direct loan and leveraged loan approaches, the opportunity cost to the SRF of providing the subsidy on a tax-exempt loan is greater than the subsidy itself. If the equity were simply invested by the SRF in taxable fixed income investments, the SRF would earn a taxable rate, e.g., 4.5%. Given a 4% tax-exempt rate, the cost to the SRF of providing a 50% subsidy (2% loan rate) will exceed the subsidy provided to the borrower by 0.5% times the amount of equity used to provide the loan subsidy. To make $100 of loans to a tax-exempt borrower under the direct loan approach, 2.5% in earnings are forgone (the taxable interest rate at which the equity could otherwise be invested minus the loan interest rate) of which 2% represents the subsidy and 0.5% would be lost to the SRF. To make $100 of loans to a tax-exempt borrower using the blended loan approach, the $50 equity portion of the loan would earn 0%. So, 4.5% of potential investment earnings on $50 would be foregone and the subsidy created on the equity portion of the loan would be 4% (the market tax-exempt rate minus the loan rate). The additional 0.5% that could be earned on a taxable investment would be lost to the SRF. To make $100 of loans to a tax-exempt borrower under the reserve approach, $50 of equity would be invested in taxable investments at 4.5%. Of the 4.5%, 0.5% would be rebated to the IRS and so lost to the SRF and 4% would be used to fund 50% of the interest on the $100 loan.

- The opportunity cost of providing $100 of direct loans is 0.5% on $100, whereas the opportunity cost of providing the same amount of subsidized loans under either the blended loan or reserve fund approach is 0.5% on $50.

- Without the limitations imposed by the arbitrage regulations, an SRF could retain all 4.5% of earnings on the equity invested under the reserve fund approach. The additional 0.5% earnings could go to retained earnings, reducing the cost of the subsidy to 2%. So, the subsidy and the cost to the SRF of providing the subsidy would be identical. If arbitrage relief were achieved, the reserve fund approach and the cash flow approach could be used to generate higher retained earnings, because of the taxable investment rate, than either the direct loan or blended rate approach.

There are basically three potential uses for earnings and forgone earnings on SRF equity, whether such equity is invested in SRF loans or in other investments:

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[2] *Note that Massachusetts has used a leveraged approach to fund 0% loans without using a dollar of equity for every dollar of loan. However, other state monies were used to make debt service assistance payments equal to the loan interest that was not funded with earnings on equity.*

- Earnings and foregone earnings on equity can be used to fund loan subsidies as described above.
- Earnings on equity can be retained by the SRF, which increases the SRF's equity.
- Earnings on equity (including interest on equity-funded loans) can be used to pay debt service on bonds ("state match bonds") that are issued to fund all or a portion of the SRF's required state match. For SRF's that use earnings to pay state match bond debt service, there are fewer earnings on SRF equity available to provide loan subsidies or to grow retained earnings.

An SRF's capacity to provide loan subsidies, to grow retained earnings, and to pay state match bond debt service, which are all funded from actual or foregone earnings on equity, is determined at any point in time by the amount of equity held by the SRF.

Sources of SRF Equity – Retained Earnings

Universally, the principal sources of equity in state SRFs are the federally provided capitalization grants, the required (20%) state matching grants (collectively "contributions"), and any additional state contributions or fees charged to borrowers, to the extent that all of the foregoing have been received and deposited in the SRF ("contributed capital"). An additional source of equity in all SRFs is retained earnings, i.e., earnings that are not immediately spent to fund loan subsidies or to pay state match bond debt service. An SRF's "equity" is comprised of its contributed capital and retained earnings.

Retained earnings are created (a) from loans made from SRF equity under the direct loan approach if the loan interest rate exceeds 0%, or (b) under the blended loan approach if the loan interest rate on the direct loan portion of the SRF loan exceeds 0% or, if applicable, the rate necessary to fund debt service on any state match bonds, or (c) if under the reserve fund approach, the SRF applies less than all of its investment earnings (after arbitrage rebate) toward loan subsidies. Another source of retained earnings is investments made with equity that has been repaid by a borrower or released from a reserve ("recycled") and that has not yet been redeployed by the SRF. Retained earnings could also be generated by specifically investing a portion of the SRF equity solely for the purpose of generating retained earnings, rather than, as is common, using the same dollars of equity to fund loan subsidies and to pay any state match bond debt service and also to generate retained earnings. An advantage of this approach is that the earnings on such specifically invested equity, or program investments as the term is used by some leveraging SRFs, (1) may not be restricted by the arbitrage regulations and (2) would not be effectively restricted by operation of the direct loan or blended rate approach.[3]

Equity may be invested directly in interest-bearing loans related to a project and may be invested in other investments to generate earnings. Such interest and other earnings can be used to fund loan subsidies currently or to grow retained earnings. Due to the perpetuity rule[4], contributed

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[3] *The financial managers of leveraged SRF programs have also developed innovative structuring and management techniques that have enabled them to achieve higher investment returns than can be achieved under the direct loan approach.*

[4] *In actuality, there is no specific USEPA "perpetuity rule" although USEPA and the states recognize that the SRFs must be maintained in perpetuity. The Clean Water Act requires that the fund balance in each SRF "shall be available in perpetuity for providing … financial assistance." [33 U.S.C.1383 §603(c)] Similar language appears in the Safe Drinking Water Act, "The fund corpus shall be available in perpetuity for providing financial assistance…."*

capital derived from federal and state contributions cannot be used directly to pay loan subsidies, only the earnings (or foregone earnings) on contributed capital can be used for loan subsidies. However, retained earnings can be used in all of the same ways as contributed capital – to fund loans and to generate additional earnings – and, in addition, can be directly applied to pay loan subsidies. The flexibility to use retained earnings directly to fund loan subsidies has been important in enabling financial innovation in many SRF leveraging programs.

> Each state SRF must make a policy choice as to (a) the portion of its potential earnings on equity that are used to meet current environmental needs, by funding subsidies on loans made today, and (b) the portion of such earnings that are used to increase the SRF's capacity to meet future environmental needs, by growing retained earnings. Using more earnings to grow equity makes it easier to achieve sustainability in two respects: (1) it reduces the amount of projects that can be funded currently, thus lowering the funding level that has to be sustained (although obviously this has negative environmental impact), and (2) it increases the amount of equity that will be available in the future to fund loan subsidies.

Historically, a leveraged approach has been used to increase or maximize an SRF's ability to meet current environmental needs. By contrast, some states may determine to use a direct loan approach if they have lower loan demand or place a greater emphasis on increasing their capacity to meet future environmental needs. However, by taking advantage of financial innovations developed by leveraging states, a direct loan SRF that makes interest-bearing loans can use leveraging to both (a) make the same amount of subsidized loans that it would otherwise have made and (b) increase the rate of growth of its retained earnings. This result is achieved by devoting separate portions of the SRF's equity to funding loan subsidies and to growing retained earnings. Using both the principal and interest of the equity investments that fund the subsidy, rather than interest only, reduces the principal amount of equity that must be invested to fund the subsidy and permits more equity to be used to grow retained earnings. The equity devoted solely to growing retained earnings can be invested without any yield restriction under the arbitrage regulations.

Comparison of Direct Loan and Leveraged Loan Approaches

Using the direct loan approach, $1 of equity is required for each $1 of loan provided for qualifying projects. In many cases because of SRF resource constraints, this may limit the portion of an individual project that can receive SRF financing; e.g. some states cap the total loan amount a project may receive from the SRF. An advantage of the leveraged approach is the ability to provide subsidized loans for a significantly greater amount of qualifying project costs. The direct loan approach could be utilized to give the same amount of loan subsidies to the same specific projects (by giving 0% direct loans for only a portion of each such project). However, there is a much clearer identification that the benefit of the SRF program is being conveyed to the entire project under the leveraged approaches because a loan can be given to the borrower by the SRF for the entire amount of qualifying project costs.

[42 U.S.C. 300j-12(c)]. While EPA does not have any specific rule that implements this language, in its definition of CWSRF Financial Indicators (see CWSRF 01-3,dated October 31 2000), for example, the agency seeks to gauge sustainability of the fund by determining if retained earnings, net of cumulative state match bonds repaid, is equal to or greater than zero. If this test is met, "the CWSRF is deemed to be maintaining its contributed capital…."

Given any particular interest subsidy, stated as a percentage of the market rate, the leverage factor on SRF equity that can be created using a leveraged loan approach is 1 divided by that subsidy percentage. The loan capacity equals the amount of SRF equity times the leverage factor. So, given a 1/2 market rate interest subsidy, SRF equity can be used to provide 2 times that amount of SRF loans. Given a one third market rate interest subsidy, SRF equity can be used to provide 3 times that amount of SRF loans. If an SRF is fully leveraged (i.e., the targeted loan amount equals the loan capacity), the earnings on equity of the leveraged SRF (other than earnings on recycled equity) would be fully utilized to fund the subsidies on the loans. By contrast, a direct loan SRF that provides a one third of market rate interest subsidy receives loan interest equal to 2/3 of the market interest rate to grow retained earnings, which can be used to provide loans in the future. A direct loan program that provides a 1/2 market rate interest subsidy receives loan interest equal to 1/2 of the market interest rate to grow retained earnings. Consequently, a typical direct loan SRF that makes interest-bearing loans should have more retained earnings (as a percentage of SRF equity) than a typical SRF that uses a leveraged approach.

The additional loan capacity that is available under the leveraging approaches can be used to meet more of the SRF's potential loan demand and to provide loans with longer repayment periods. The Board has previously issued a report entitled "Application of Useful Life Financing to State Revolving Funds" in which, for a variety of reasons described therein, the Board recommended that EPA approve state requests for approval of useful life financing with repayment terms beyond 20 years. One impact of an SRF moving from providing 20 year loans to providing 30 year loans would be a reduction in the amount of equity that is recycled on an annual basis. For a direct loan SRF, such a reduction in recycled equity would in turn reduce the amount of loans that could be funded annually by the SRF. However, leveraging can be used to maintain a similar level of project funding in both the short and intermediate term.

If federal capitalization grant contributions decline in the future, the SRFs will have to depend more on internal growth of equity to sustain their programs. Such internal equity growth comes from retained earnings. Reducing or eliminating impediments to the growth of retained earnings will help the SRFs to become more sustainable.

EPA could enhance the ability of SRFs to grow earnings using financing innovations in two ways.

- EPA could allow states to make draws on federal capitalization grants independent from the expenditure of funds for project costs. This was formerly the case for states that elected to use aggressive leveraging at the outset of the SRF. Given that the purposes of the SRF program include meeting both current and future environmental needs, EPA should be financially indifferent whether capitalization draws are used immediately to fund projects or invested to grow retained earnings. This is particularly true because permitting the latter will enable some SRFs to grow their equity faster.

- EPA could apply the perpetuity rule on a dynamic, rather than a static basis. Under this alternative approach, compliance would be measured over time based on the SRF's

reasonable expectations regarding future investment earnings (including earnings on future investments) rather than be based on current year-end results.

Impact of Debt Structure on Effective Loan Rate

Under today's market conditions, callable bonds are generally sold with a bond coupon (e.g., 5%) that is significantly higher than the yield (e.g., 4%) that the borrower pays until the call date (the "stated yield"). The bonds maturing in years 11 and thereafter are typically callable beginning in 10 years. The price of the bonds is increased to reflect the fact that the borrower will receive interest at 5%, even though the bond yield is 4%. For example, the price of a $100 bond might be increased to $103 to reflect the higher bond coupon. The additional $3 above the amount of the bond is referred to as a "bond premium", and such a bond is referred to as a "premium callable bond". But, the adjusted price only reflects the assumption that the 5% coupon will be received until the call date. As a result, the bond yield until the call date would be 4% (taking account of the impact of the bond premium). But, the borrower's interest cost after the call date would equal the bond coupon, i.e., 5%.

- Due to the prevalence of "premium" callable bonds in the municipal market, the market rate from which the loan subsidy is deducted after year 10 (i.e., after the bond call date) for a leveraged SRF will initially be higher than for a direct loan SRF. If, as is typical, premium callable bonds are used by an SRF, after the call date, the effective interest rate on the bonds will increase from the stated yield (e.g., 4%) to the bond coupon (e.g., 5%). So, the interest rate, before application of the interest subsidy, on the portion of the SRF's loans that are made from bond proceeds would increase after the call date from the stated yield (e.g., 4%) to the bond coupon (e.g., 5%). For an SRF using the blended loan approach and providing a 50% interest subsidy, the subsidized loan rate in this example would increase after the call date from 2% to 2.50%. For an SRF using the reserve fund approach, under the arbitrage regulations, the 50% reserve fund could be invested at only at 4%, both before and after the call date. So, the effective loan rate in this example would increase after the call date from 2% to 3%. By contrast, the loan rate from which the subsidy is deducted for a direct program is typically the stated market tax-exempt yield (e.g., 4%) and does not change during the life of the loan. So, given a 50% subsidy, the loan rate would be 2% throughout the life of the loan.

- If a leveraged SRF issues premium callable bonds and thereafter tax-exempt interest rates decline sufficiently, the SRF's bonds can be refunded for savings relative to the original stated yield. Taking account of refunding savings, the loan rate under a leveraged approach may ultimately be lower than the loan rate under the direct loan approach. Even without a decline in rates, the callable bonds might be refunded to reduce the SRF's interest cost after year 10 to a rate below 5%. However, unless the interest rate after year 10 (net of refunding transaction costs) can be reduced to or below the stated yield of the original financing (i.e., 4%), the leveraged loan borrowers will pay a higher subsidized rate than the direct loan borrowers with the same market rates and interest subsidy.

  SRFs using a leveraged approach can completely avoid the premium bond phenomenon by issuing non-callable bonds, which have a yield (e.g., 4%) that does not change during the term of the bonds. For a leveraged SRF that uses non-callable bonds to fund its SRF loans,

the rate from which the subsidy is deducted would remain the same during the entire term of the SRF loans, just as in the case of the direct loan approach. Also, callable bonds are used by bond issuers with the expectation that the opportunity to refund the bonds in the future will ultimately result in a lower borrowing cost. SRF Borrowers would also face the same dilemma – whether to use callable or non-callable bonds – if they were to fund their projects outside of the SRF program. Accordingly, in the analyses discussed herein, the possible use of premium bonds is ignored and the stated bond yield (e.g., 4%) is used to evaluate the financial benefits of the leveraged approaches relative to the direct loan approach.

Impact of Bond Refunding on Effective Loan Rate

If general interest rate levels decline after an SRF loan is made, a borrower could refinance a market rate loan originally made in a higher (e.g., 4%) market rate environment at the current lower (e.g., 3.50%) market rate. Given the ability to lower the cost of a market rate loan and that the borrower would have acted to refinance a market rate loan, the borrower's effective loan subsidy also declines. If a state refinances SRF bonds, the loan subsidy would decrease from the original 2% to 1.50% (3.50% less the 2% loan rate) unless the SRF loan is also refinanced.

- Generally, there have been few circumstances where states have refinanced direct loans when market interest rates decline. If a direct SRF loan remains unchanged, the 2% loan interest would continue to be allocated to retained earnings and the borrower's effective loan subsidy would be 1.50%. Recreating a 50% interest subsidy would require a reduction in the loan interest rate to 1.75%, reducing the growth in retained earnings by 0.25%.

- For a leveraged loan using a blended loan approach, the bonds issued to fund the market rate portion of the loan could be refinanced to the lower, 3.50% market rate. The equity portion of the loan would remain, in this example, at 0%. The 50 basis point savings on the market rate portion could either be (a) used to reduce the borrower's net interest cost to 1.75% by lowering the loan rate on the market rate portion of the loan to 3.50% (thereby maintaining a 50% interest subsidy) or (b) retained by the SRF (in effect increasing the rate on the equity portion of the loan to 0.50%) and used to increase retained earnings or to fund loan subsidies, in which case the borrower would have a 2% loan rate and a 1.50% interest subsidy. There should be no impact on SRF equity specifically invested to generate retained earnings.

- For leveraged loans using a reserve approach, the entire loan could be refinanced to the lower interest rate (3.50%). If the reserve fund were yield restricted to the new 3.50% tax-exempt loan rate, the result would be the same as for the blended loan approach – a 50 basis point savings on the loan which could be allocated either to the borrower or to retained earnings or loan subsidies. However, consistent with the arbitrage regulations, reserve fund SRF programs have been able to refinance much of their debt initially issued to fund loans to lower interest rates while retaining the earnings on the related reserve funds that remain invested at the higher original bond yield.[5] The result is that reserve fund leveraged programs can generate more earnings to provide loan subsidies or to accumulate retained earnings than

[5] *In accordance with IRS' Universal Cap Rule, the amount of investments on which earnings are subject to yield restriction is limited to the amount of tax-exempt bonds outstanding. Therefore where bonds are refunded in advance of the call date, the amount by which the invested balances in the reserve and refunding escrow exceeds the bonds outstanding can be invested unrestricted*

programs using either the blended rate approach or the direct loan approach. There should be no impact on SRF equity specifically invested to generate retained earnings.

Managing for Optimal Program Performance

For any specific amount of interest-bearing loans that could be funded using the direct loan approach, a better economic result might be achieved in several areas using a leveraged approach by:

- ❒ Specifically investing a portion of the SRF's equity for the purpose of growing retained earnings, to the extent that such equity can be invested without yield restriction (certain considerations relating to the ability to invest equity without yield restriction are discussed below);
- ❒ Taking advantage of financial innovations adopted by leveraging states which increase the amount of earnings that can be generated and retained under a leveraged fund approach; and
- ❒ Taking advantage of reductions in market rates (either to lower the borrower's subsidized interest rate or to make the interest savings available to the SRF) without adversely affecting the originally anticipated growth in retained earnings.

In the $100 example, the present value benefit of an additional 0.50% of earnings on the $50 dollars of equity that could be invested without yield restriction under either the blended loan or reserve fund approaches would exceed $2.10 for a 20 year loan and $2.75 for a 30 year loan. Table 14 at the end of this section summarizes an analysis of the financial benefits of the blended loan approach and reserve fund approach relative to the direct loan approach given various assumptions regarding leverage factors, loan maturities, and refunding opportunities. The indicated benefits are achievable to the extent that the equity specifically invested to grow retained earnings can be invested without yield restriction.

As noted above, other program costs such as state bond charges could reduce or eliminate the indicated financial benefit of the leveraging approaches as shown in the chart.

Financing innovations adopted by leveraging states have capitalized on existing retained earnings balances to achieve higher equity growth rates. This was achieved by (a) pledging either equity invested at the tax-exempt bond rate (as allowed under the arbitrage rules) or reserve releases and direct loan principal and interest payments to meet contracted subsidy obligations and (b) investing recycled SRF equity in unrestricted investments in amounts sufficient to restore paid out equity. Assuming the tax-exempt bond rate is 4% and the taxable investment rate is 4.5%, under the innovative arrangement in use by some states, recycled equity sufficient to restore paid out equity over the life of the subsidy obligation can be invested at the unrestricted 4.5% taxable rate instead of the restricted 4% tax-exempt rate. This represents a 12.5% increased annual return on such equity. The additional return can be captured as a direct increase in retained earnings or by applying such earnings as interest subsidy for additional projects. The additional projects that can be financed are equal to the equity conserved times the leveraging rate. Either approach raises SRF project funding capacity beyond that which can be

achieved with the three basic forms. This is a highly desirable outcome in that it extends the reach of finite SRF equity.

The added value captured by the innovative financing approach can be demonstrated by looking at the relationship between financial assistance benefits delivered and equity allocation needed to deliver the benefits. The three basic loan forms, the direct loan, blended loan, and reserve models provide benefits on a percentage basis that can correlate with the percentage equity allocation made to support the targeted benefit. For each of models discussed, expressed in percentage terms, the benefit/equity ratio (the ratio of the interest subsidy percentage to the equity used as a percentage of the loans made) is 1:1 with the exception of direct loan financings where the loan rate is greater than zero. In such cases the benefit/equity ratio is less than 1:1. However, the new innovative financing approaches can turn the benefit/equity ratio positive. In the above example, the ability to generate cash flow at the unrestricted taxable rate of 4.5% results in a positive 1.125:1 benefit/equity ratio. The ratio between the taxable/tax-exempt yield spread and the tax-exempt yield will drive the benefit/equity ratio. The more positive the taxable/tax-exempt spread, the greater the benefit of investing equity on an unrestricted basis and the higher the benefit/equity ratio for any given tax-exempt yield. In the example cited where the tax-exempt rate equals 4%, if the available taxable/ tax-exempt spread rises by an additional 0.50%, the benefit to equity ratio rises to 1.25:1. The benefit/equity ratio can be an effective measure of SRF equity utilization. Table 15 at the end of this section shows the benefit-to-equity relationship for the basic and innovative financing models discussed in this section.

Constraints on this modification to the leveraging model that have been required by bond counsels for some issuers consist of (a) the present value of the subsidy commitments, to be directly paid by equity, must be less than accumulated retained earnings on the bond closing date (this is necessary to assure that the SRF perpetuity rule is not violated) and (b) only recycled equity and retained earnings can be used to make unrestricted investments (to avoid any nexus between new federal grant draws and the bonds issued to fund leveraged loans).

An SRF program that previously made interest bearing direct loans can (a) use the direct loan principal and interest to fund the interest subsidies on its new loans as described above and (b) invest its recycled equity at an unrestricted yield to grow retained earnings (rather than investing or making direct loans with the recycled equity to fund such subsidies). The interest rates on existing loans are already fixed and using such interest to fund interest subsidies on new loans does not subject such interest to yield restriction. So, using such interest on existing loans would not adversely affect the investment returns of the SRF. Also, a direct loan SRF can use leveraging to fund all of its loan demand using new capitalization grants and specifically invest all of its recycled equity at an unrestricted yield to grow retained earnings. This strategy would also flip the benefit/equity ratio of such programs from <1:1 to >1:1.

It is possible that the innovations described in the preceding two paragraphs can be applied using new capitalization grants as well as recycled equity. The legal issue for some SRF bond counsels is whether there is a sufficient nexus between the new capitalization grant draws and the bonds issued to make leveraged loans that such grants would be treated as bond proceeds, even though they are not used to pay or secure the bonds. EPA could eliminate the legal issue, and thus increase the ability of the SRFs to grow their equity, by modifying any provisions of the

SRF regulations that may be viewed as creating a nexus between the capitalization grant draws and an SRF's bonds. For example, capitalization grant draws could be made on a quarterly basis, as was at one time permitted for states that elected to use "aggressive leveraging." To the extent that funds are drawn before being applied to fund loans, such funds would contribute to the loan capacity and/or sustainability of the SRF by generating additional retained earnings.

Another regulatory provision that, as currently applied, limits an SRF's ability to grow its equity using the innovations described above is the perpetuity rule. EPA could address this issue by viewing compliance with the perpetuity rule on a dynamic, rather than a static, basis. For example, compliance could be certified by each SRF taking account of its reasonably expected earnings over the life of its loan portfolio, rather than by looking only at the equity available in the SRF at the end of each year. This change could allow states that adopt the new innovative financing approaches, discussed in this report, to further reduce the amount of equity needed (together with the earnings thereon) to fund interest subsidies. Consequently, it would decrease the amount that is subject to yield restriction and permit a larger amount of unrestricted equity to be invested specifically to grow retained earnings.

The Trade-Off between Current and Future Loan Capacity

A policy issue affecting SRF programs that provide loan subsidies of less that 100%, (i.e., interest-bearing loans) is what portion of the earnings on SRF equity should be allocated to retained earnings rather than being used to provide loan subsidies today on a larger amount of loans for qualifying environmental projects. A decision by an SRF to apply a portion of its current earnings on SRF equity toward retained earnings, rather than loan subsidies, can be reflected either in a lower loan subsidy percentage or in a lower dollar amount of loans. Such a decision might reflect a thoughtful policy determination that balances current and future environmental needs.

As noted above, retained earnings can be used to make loans or can be invested in market rate securities or structured investments to generate additional earnings. In either case, such retained earnings would be available in the future to provide loan subsidies for current or future projects. Over a very long period of time, the retained earnings accumulated by an SRF will contribute to the "sustainability" of its SRF program. Achieving sustainability is an important goal of the SRF program. For this purpose, an SRF would be expected to achieve "sustainability" at that point in the future at which it is projected to develop the ability using its current loan funding approach to continue to provide subsidized loans for qualifying environmental projects solely from recycled equity derived from its contributed capital and retained earnings (i.e., without receiving additional funding grants beyond such point, but assuming the continuation of the current level of funding grants until such point) in an amount equal to some target funding level (e.g., the amount of loans that the SRF provides today) and in real (i.e., SRF project cost inflation-adjusted) dollars. Even over a long period of time, in order for an SRF to achieve sustainability, a significant portion of the earnings on the SRF's equity would have to be allocated to retained earnings, rather than being applied to provide loan subsidies today.

Allocating a larger share of the earnings on SRF equity to retained earnings would increase the rate of growth of retained earnings, thus reducing the time required to achieve sustainability. But,

it would also make it easier to achieve sustainability in a somewhat misleading way. Since such an allocation reduces the amount available to provide loan subsidies today, it reduces the SRF's current ability to make loans. If the target funding level were defined in terms of today's funding level, such an allocation would make it easier to achieve sustainability simply by lowering the target funding level.

An Area for Further Study

A potential area for further study by the Board is whether there are modifications to the current approaches used to invest SRF equity that might better facilitate meeting the objectives of the SRF Program, including making SRFs more sustainable.

In aggregate, the state SRFs have been capitalized or "endowed" with contributed capital in excess of $32.6 billion and with total equity in excess of $38.4 billion. Such SRF equity is invested in extremely conservative investments. In fact, it is overwhelmingly invested at high-grade tax-exempt interest rates. An investment strategy that is more typical for such a large endowed fund would be expected to significantly increase the growth rate of SRF equity.

Observations

- In the context of state pension funds, every state has extensive experience in managing the investment of pools of equity that have achieved long-term investment returns in excess of both tax-exempt and taxable fixed-income returns.
- What is important to the future health and success of the SRF Program is the investment return achieved over the long term, not the result achieved from year to year. This highlights the importance of viewing compliance with the perpetuity rule on a dynamic, rather than static, basis.
- As discussed herein, it is currently possible for SRFs to invest a portion of their equity on an unrestricted basis with no impact on loan funding capacity. As further noted, through various regulatory changes, EPA can enhance the ability of SRFs to invest equity without yield restriction. Such unrestricted equity could be invested using a modified investment approach that produces higher investment returns.
- If SRFs could achieve endowment-like returns on SRF equity, it might be advantageous for them to fund a portion of their loan demand with taxable bonds in order to fully avoid any yield restriction. The expected benefit of the unrestricted investment would exceed the increase in borrowing cost.
- The incremental investment return benefit could be significant on the portion of SRF equity invested using the new approach, conservatively 1% to 1.5%. However, for credit reasons, only a portion of the SRF equity could be invested using the new approach, perhaps as much as 33% to 50% of the invested portion of SRF equity. Also, given existing investments and bond financings, it would take a period of years for the alternative approach to be fully implemented. Finally, an endowment-like investment approach can be expected to achieve a higher investment return over the long-term.

- By using a modified investment approach, SRFs that currently leverage could both (1) continue to make the same amount of loans that they would have previously made, given their available equity and (2) achieve additional earnings growth that is neither rebated to the IRS nor required to fund loan subsidies.
- Arbitrage relief would enable SRFs to achieve the best of both worlds – to fund all of their loan demand at low tax-exempt rates and to maximize the investment returns on their equity.

Table 14: Comparison of the Example Leveraged Approaches to the Direct Loan Approach

Assumptions						
Project Cost	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100
Reserve Approach Loan Par	$ 101	$ 101	$ 101	$ 101	$ 101	$ 101
Blended Loan Approach Equity Loan Par	$ 67	$ 67	$ 50	$ 50	$ 33	$ 33
Blended Loan Market Rate Loan Par	$33.58	$33.58	$50.38	$50.38	$67.17	$67.17
Maturity	**20**	**30**	**20**	**30**	**20**	**30**
Tax-exempt Bond Interest Rate	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Loan Rate	1.33%	1.33%	2.00%	2.00%	2.67%	2.67%
Leveraging Factor	**1.5**	**1.5**	**2**	**2**	**3**	**3**
Reserve Fund	$67.17	$67.17	$50.38	$50.38	$33.58	$33.58
Reserve Investment Rate	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%
Transaction Costs/$1000	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50
Refunding Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Bonds Refunded Under Reserve Approach	33%	33%	50%	50%	67%	67%
Results for Reserve Fund Approach versus Direct Loan Approach						
PV Benefit of Original Reserve Fund Approach Loan Debt Service (A)	($0.57)	($0.52)	($0.61)	($0.57)	($0.66)	($0.63)
PV Benefit of Reserve Fund Approach Loan Debt Service After Refunding (B)	($0.24)	$0.34	($0.09)	$0.77	$0.07	$1.25
PV of Reserve Fund Approach Retained Earnings (C)	$1.29	$1.68	$2.12	$2.78	$2.97	$3.92
Total Original Benefit of Reserve Fund Approach (D=A+C)	$0.72	$1.17	$1.50	$2.21	$2.31	$3.29
Total Benefit of Reserve Fund Approach After Refunding (E=B+C)	**$1.05**	**$2.02**	**$2.03**	**$3.55**	**$3.04**	**$5.17**
Results for Blended Loan Approach versus Direct Loan Approach						
PV Benefit of Original Blended Loan Approach Loan Debt Service (F)	($0.25)	($0.25)	($0.38)	($0.38)	($0.50)	($0.50)
PV Benefit of Blended Loan Approach Loan Debt Service After Refunding (G)	$0.09	$0.61	$0.15	$0.97	$0.23	$1.38
PV of Blended Loan Approach Retained Earnings (H)	$1.49	$1.94	$2.27	$2.98	$3.07	$4.06
Total Original Benefit of Blended Loan Approach (I=F+H)	$1.24	$1.69	$1.89	$2.60	$2.57	$3.56
Total Benefit of Blended Loan Approach After Refunding (J=G+H)	**$1.58**	**$2.55**	**$2.42**	**$3.95**	**$3.30**	**$5.43**

Table 15: Comparison of Basic and Innovative Financing Models Using the Benefit/Equity Ratio

Financing Amount: $100.00. In all cases, the SRF loans are assumed to be tax-exempt and the market loan rate is assumed to be 4%. Under the three basic approaches, the taxable/ tax-exempt spread does not affect the outcome because the SRF equity is legally or structurally yield restricted to a 4% investment rate. For leveraged loans, the SRF equity allocation for each scenario equals (A) the interest subsidy percentage divided by (B) the effective investment rate divided by the loan rate.

Model	Available Taxable Rate/Effective Investment Rate	Interest Subsidy Benefit	SRF Equity Allocation[6]	Interest Subsidy Percentage	SRF Equity Allocation Percentage	B/E Ratio
	%	%	$	%	%	
	(2)	(3)	(4)= see above	(5)=(2)/4%	(6)=(4)/(100	=(5)/(6)
Direct	4.5/4	2	100.00	50	100	.50
	4.5/4	4	100.00	100	100	1.00
Blended Loan	4.5/4	2	50.00	50	50	1.00
	4.5/4	1	25.00	25	25	1.00
Reserve	4.5/4	2	50.00	50	50	1.00
	4.5/4	1	25.00	25	25	1.00
Innovative	4.5/4.5	2	44.44	50	44.44	1.125
	4.5/4.5	1	22.22	25	22.22	1.125
	5.0/5.0	2	40.00	50	40.00	1.25
	5.0/5.0	1	20.00	25	20.00	1.25

Section VI. Conclusions and Recommendations

Conclusions

- The federal State Revolving Fund (SRF) programs for clean water and drinking water allow states substantial flexibility in the design of individual state programs.
- Both direct loan and leveraged loan programs have been successful in funding SRF projects representing significantly greater value than the amount of federal capitalization grants.
- In both direct and leveraged loan programs, a subsidy to borrowers is provided by the SRF using some or all of the earnings on SRF equity that could otherwise be used to grow program equity.
- If federal capitalization grant contributions decline in future years, the SRFs will have to depend more on internal growth of equity to sustain their programs.
- Leveraged loan programs make it possible for an SRF to meet a greater amount of current loan demand by using more of its earnings on equity to provide loan subsidies currently, rather than to grow retained earnings.
- Historically, the direct loan approach has been used by SRFs that have less current loan demand or that place more emphasis on growing retained earnings to meet future environmental needs. However, by taking advantage of recent financial innovations developed by leveraging SRFs, direct loan SRFs can use leveraging to fund the same amount of loans as they would currently fund and can simultaneously maximize their earnings on SRF equity by investing a portion of their equity specifically to enhance the growth of their retained earnings.
- EPA can administratively facilitate the use of such financial innovations to grow equity, and thereby develop more sustainable SRFs by allowing states:
    - To allow draws of capitalization grants, without regard to the expenditure of SRF funds for project costs; and
    - To interpret the perpetuity rule on a dynamic, rather than a static, basis, by measuring compliance taking account of an SRF's expected earnings over time, rather than based on current year-end results.
- Arbitrage relief for SRFs would have an even greater impact on the ability of SRFs to become sustainable.
- A potential area for further study by the Board is whether a different approach to investing SRF equity would enhance the ability of SRFs to grow equity, meet long term program demands, and to become sustainable.

Recommendations

- ❒ EPA should encourage direct loan states to improve SRF sustainability by showing the states how leveraging can be used to increase those states' retained earnings.

- ❒ EPA should assist states to develop sustainable SRFs by administratively allowing states to accelerate draws of capitalization grants, modifying its interpretation of the perpetuity rule and by advocating for arbitrage relief focused specifically on SRF programs.

- ❒ EFAB should explore the benefits of developing more aggressive parameters for SRF equity investments and recommend appropriate program changes to EPA.

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

APR 29 2008

Honorable Stephen L. Johnson
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Johnson:

The Environmental Financial Advisory Board (EFAB) is pleased to submit the enclosed report, *"Public Private Partnerships in the Provision of Water and Wastewater Services: Barriers and Incentives,"* for the Agency's consideration and use. This report presents an important opportunity for the Agency to strengthen its continuing efforts to insure sustainable water and wastewater services.

The report responds to the Agency's request for an assessment of the potential of public private partnerships (PPPs) to help alleviate chronic funding problems in the water industry. In preparing for this assessment, the Board reviewed previous EFAB reports as well as earlier Agency initiatives. We describe the present role of PPPs in the water industry and analyze various barriers to wider implementation. Information on eleven existing PPPs is reviewed and tabulated. We also examined the efforts of the US Department of Transportation to remove barriers to private sector participation in that sector. The report concludes with a number of specific recommendations for action by the Agency and by Congress, all designed to remove unnecessary barriers to beneficial use of PPPs.

PPPs cannot solve all water and wastewater utility financing or management problems and are not appropriate in every situation. However, experience has shown that these partnerships can be helpful and beneficial in many cases. In fact, the private sector has at all times maintained a substantial presence in the water industry.

The Board has found that the need for wider use of PPPs is well demonstrated, the mechanisms for considering and structuring these arrangements are known, and success stories and model applications are available. In certain situations, these partnerships can reduce costs, improve the quality of service, and speed the provision of needed infrastructure. Even though PPPs may not be

The report takes that view that, while there are no easy choices, there are a number of current and developing innovative finance tools that may be used to help fill the gap that watersheds face. Some of the tools are well established, such water and sewer rate increases and special districts for flood control and management of septic tanks and stormwater. Others are innovations such as special purpose financing as in Maryland's Bay Restoration Fund and transfer of development rights. Potential future tools include payments for and markets in ecosystem and other intergenerational services.

Critical to the success of any whole watershed financing mechanism will be the choice of the right collaborative governance approach to reach agreement across multiple jurisdictions and among government, business, utility, nonprofit and citizen organizations on the best mix of finance tools to implement the watershed plan or other needed projects. The report recommends that EPA strongly encourage the use of collaborative approaches to achieving sustainable watershed finance and educate potential participants in their use.

The recommendations contained in the report urge EPA to further knowledge and development of whole watershed sustainable finance approaches. In particular, the report urges EPA to assist in the development and dissemination of innovative finance mechanisms, collaborative governance approaches, ecosystem services markets and appropriate watershed-wide implementing entities. To demonstrate some of these recommendations, we recommend that EPA assist in funding one or more demonstration projects that use a collaborative governance approach to implement one or more innovative financing mechanisms.

We thank you for the opportunity to present these recommendations and look forward to your response. We will be glad to answer questions or do further work as you may request.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Designated Federal Official

Enclosure

cc: Ben Grumbles, Assistant Administrator for Water
Lyons Gray, Chief Financial Officer

Environmental Financial Advisory Board

Public Private Partnerships in the Provision of Water and Wastewater Services: Barriers and Incentives

April 2008

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Financial Advisory Board

PUBLIC PRIVATE PARTNERSHIPS IN THE PROVISION OF WATER AND WASTEWATER SERVICES: BARRIERS AND INCENTIVES

April 2008

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EXECUTIVE SUMMARY

Various sources, including EPA's 2002 "Gap Analysis," have pointed to a large and growing investment shortfall in the water industry. In the case of clean water, symptoms include continued reliance on combined sewer systems, problems with combined sewer overflows, and frequent sewage spills--not to mention a long series of consent decrees addressing the worst of these problems. Infrastructure problems in the drinking water industry are less frequently publicized, but probably not less serious. Aging treatment plants, century-plus-old water mains, crumbling structures all add up to a need for major investments to rehabilitate existing facilities plus more major investments to meet future demands.

A parallel discussion has taken place with respect to utility operating revenues. While some utilities have sound rate-making and financing practices, many others fail to cover the full cost of operating and maintaining water systems, much less the cost of replacing and expanding infrastructure. Among the remedies proposed for this problem, wider use of public private partnerships (PPPs) may help enforce full cost pricing in some situations, while offering communities the opportunity to increase efficiency and maintain desired levels of service.

EFAB has been asked to consider the potential for PPPs to alleviate the chronic funding problems in the drinking water and clean water industries. This report discusses the nature of PPPs, their present role in the industry, and certain barriers or disincentives to wider use of PPPs.

PUBLIC PRIVATE PARTNERSHIPS

This report utilizes the following definition of a PPP:

> A public private partnership (PPP) is a contractual, institutional, or other relationship between government and a private sector entity that results in sharing the duties, risks, and rewards of providing a service in which the government has an interest, recognizing that the government retains ultimate responsibility for insuring that social needs and objectives are met.

Water Sector

The private sector has always had a prominent role in the provision of drinking water in the U.S. Considering only the largest systems, serving populations of 100,000 or more, about 16 percent are investor-owned utilities. This fraction has been roughly constant for many years. More recently, there is anecdotal evidence of expansion in the diversity of PPP types, other than investor-ownership. One industry source lists 15 major drinking water PPPs in effect in 2006, as well as 29 major clean water PPPs.

PPPs in the water sector take many forms. Services provided by the private sector partner may range from support functions (e.g., laboratory services) to facility-level activities (e.g., operating a wastewater treatment plant) to contract operation of all facets of the utility. Among the variants commonly employed are contracts for design-build (DB), design-build-operate (DBO),

design-build-finance-operate (DBFO). build-operate-transfer (BOT), etc. An important characteristic of many of these contracts is that they require a long-term relationship between the public and private sector. In the U.S., contract terms for PPPs may range up to 25 years; in other countries, longer-term contracts may be found.

Where PPPs are used, government retains the responsibility to regulate private sector partners so that the public goods are preserved. Regulation can take the form of drinking water quality standards, requirements for universal access, regulatory commission or local government oversight of rates and charges, environmental regulations and standards, contractual provisions, etc. Each form of partnership imposes different regulatory requirements and has advantages and disadvantages in specific applications.

Transportation Sector

An incipient crisis in infrastructure investment has been noted for the transportation sector and, similar to the water sector, PPPs have been suggested as one approach to enhancing the availability of funds and improving the capability for project execution. Unlike the water industry, the public highway component of the transportation sector has no significant history of private sector infrastructure provision, or of PPPs. Other activities within the sector--such as rail, air, river crossings, and water transportation--have had varying degrees of private sector involvement in the past.

The U.S. Department of Transportation (US DOT) has moved aggressively to clear the way for wider use of PPPs, both by working to remove legal and institutional barriers and by disseminating information on PPPs to various transportation agencies. The Federal Highway Administration (FHWA) has developed a PPP website, published a User Guidebook on implementing PPPs, and produced model legislation designed to remove unnecessary barriers in state law. Changes in federal law have exempted from state caps up to $15 billion in Private Activity Bonds for transportation projects.

The US DOT PPP website reports that, as of October 2007, 21 states and one U.S. territory have enacted statutes which enable the use of PPPs for transportation projects. Among the large-scale PPPs that have emerged recently are the 75-year leased operation of the Indiana Toll Road (valued at $3.85 billion) and the 99-year leased operation of the Chicago Skyway (valued at $1.83 billion). Additional initiatives in the transit sector have led to, among other things, contract design, construction, and operation (DBO) of the Hudson-Bergen Light Rail Line for New Jersey transit (total value $1.67 billion).

Alternative Institutional Arrangements

It is a commonplace observation that many drinking water and clean water utilities are too small to provide the kind of professional management and technical competence that is required in the present regulatory environment. It is also apparent that, because of economies of scale and other reasons, user charges are often dramatically higher for small utilities, as compared to large metropolitan systems. Still, small systems persist, usually for political, jurisdictional, or geographical reasons.

Consolidation of small systems can be accomplished within a governmental ownership structure, perhaps by means of a quasi-corporate, fiscally autonomous management structure (sometimes called "commercializing" the utility). This promotes professional management, reduces unit costs, and facilitates innovation and performance improvement. Local governments can maintain their ultimate control over commercialized utilities through appointments to the governing board and through approval of tariffs.

BARRIERS TO PUBLIC PRIVATE PARTNERSHIPS

State and Federal Subsidies

The Clean Water State Revolving Fund (CWSRF) has become an important source of debt capital to wastewater utilities. However, the CWSRF does not permit borrowings by privately-owned systems for abatement of point source pollution, except in a rare case where private point-sources are cited in the Comprehensive Conservation & Management Plan (CCMP) of a National Estuary Program. To the extent the that CWSRFs offer below-market, or even zero interest rates, this policy creates a substantial subsidy for government-owned wastewater systems.

Several states accompany their SRF programs with other programs that offer grants for specific infrastructure improvements, such as wastewater treatment upgrades. In many cases, privately-owned wastewater facilities are not eligible for subsidies. Whether conveyed through interest rates or outright grants, these subsidies amount to significant barriers to those forms of PPP which involve private ownership of treatment facilities. The Board finds that the rationale for this exclusion is flawed, since rate of return regulation causes all subsidies to flow through to ratepayers, where they are intended to reside.

Legal and Institutional Barriers

Some public sector utilities are bound by state and local statutes or regulations which constrain the contracting process in ways that are inconsistent with PPPs. In particular, there may be term limits on contracts, prohibitions on negotiated contracts, prohibitions on take-or-pay agreements, and no authorization for private parties to collect service fees. These constraints, where present, may require a change in legislation or revised regulations. Many states, in the interest of facilitating PPPs, have undertaken these changes. No survey on this issue was performed in connection with this report, but a 1988 survey performed by EPA found that 19 states had modified legislation in an attempt to eliminate certain contracting barriers. The Board has learned of recent legislative changes in two states (Texas and New Jersey) which have led directly to new PPP initiatives in both states.

Barriers Created by Past Grant Funding

Prior to 1987, many wastewater utilities received substantial grant assistance from the federal government through the Construction Grants Program. As a result, there is an existing federal interest in many wastewater facilities that may be candidates for transfer, through sale or long-term lease, to a private partner. This requires that the PPP agreement be reviewed and approved by EPA. The Board is not aware of any instance in which EPA has failed to approve a proposed

disposition of a grant-funded facility. However, the need to apply for such approval as well as the potential requirement for distributing the proceeds from a sale or lease amounts to a significant perceived barrier to PPPs involving grant-funded facilities.

Public and Political Objections

Proposals to enter into PPPs often face considerable public and political opposition. Some of this reflects unfamiliarity with the new arrangement and skepticism regarding claimed advantages. Some opponents distrust the reliability of private sector arrangements to deliver services as important as drinking water and wastewater management. Others believe that it is the duty of government to provide these services, and that private sector provision is somehow inappropriate. Another concern has to do with the utility's labor force. One effect of most PPPs involving operations and maintenance is that some employees are no longer needed. They may be terminated, or the new operator may reduce staff through attrition. Either way, there is often public and political concern about this effect.

In most cases, though, the issue is simply one of economics: some people assume that the involvement of the private sector will result in higher rates and charges. Obviously, PPPs should not be entertained if their only effect is to increase costs. But public concern remains.

Previously Identified Barriers

A 1991 EFAB report identified twelve possible barriers to PPPs, affecting contracting, financing arrangements, tax liability, and other factors. The 1991 report pointed out the need for legislative changes at federal and state levels and made a number of recommendations for EPA action on certain barriers. As noted above, the Board has not conducted a survey of state and local legislative changes, but is aware of significant changes in some states. With respect to any other EPA or government action that may have been taken subsequent to the Board's 1991 recommendations, it appears that there were some initiatives in the first ten years, mostly directed to utility outreach and to the preparation of various kinds of guidance. Recently, EFAB and EPA have gone on record as supporting an Administration proposal to exempt water projects from state-level caps on Private Activity Bonds (PABs). Overall, however, there is no indication of a comprehensive, coordinated effort at the federal level to lower barriers or to otherwise facilitate PPPs.

REVIEW OF SELECTED PARTNERSHIPS

In order to assess the current industry perception of barriers to PPPs, the Board performed a limited review of the experience of private sector firms presently active in various kinds of partnerships. Seven firms were contacted; five were able to provide substantive responses for a total of eleven variants of PPPs. The information provided by the companies is tabulated in an Appendix to this report.

Some of the noteworthy results of this review include:

- Some operators reported problems with political will or with local concern over job

security for existing employees and others noted protracted, complex negotiations. The most significant barrier mentioned was a Texas statutory prohibition on DB contracts, which required legislative action to overcome.

- Two factors in the success of these contracts were mentioned multiple times: (1) the ability to arrange for comparable jobs for existing employees who would no longer be needed and (2) the proximity of existing operations of the private sector partner. The latter factor may be most important for PPPs in relatively small communities, where the private partner can easily bring to bear technical and management expertise that would normally be unavailable in a small operation.

- Nearly all of the PPPs described by the companies are claimed to provide operational improvements, improved performance, and lower costs. Since these are existing, successful PPPs, these results would be expected, but some of the reported cost savings are surprisingly large (e.g., United Water reported a 30% cost reduction in Indianapolis). In some cases, performance improvement seemed especially noteworthy (e.g., American Water in Buffalo).

In addition to these successful PPPs, the report also takes note of the unsuccessful experience of the City of Atlanta. In that case, a long-term operating contract for the water system was dissolved after less than four years, amid evidence of failed expectations on both sides.

RECOMMENDATIONS

For Action by the U.S. Congress

- Eliminate the state-level caps on public-purpose PABs issued for construction of drinking water and clean water infrastructure.

- Modify or terminate the federal interest in clean water facilities constructed with assistance from the former EPA Construction Grant Program, so that communities are free to consider PPPs in connection with these facilities.

- Make privately-owned, public purpose clean water facilities eligible for loans and grants from the CWSRFs on the same footing as government-owned systems.

For Action by EPA

State and Federal Subsidies

- The Agency should conduct and publish a survey of state and local programs, linked to or separate from the SRFs, that offer grants or other forms of subsidy to government-owned drinking water or clean water agencies, but which deny such assistance to privately owned, public purpose systems.

State-Level Statutory Barriers

- Conduct and publish a survey of existing state statutes which restrict or prohibit various forms of PPPs, either through procurement policies and other means.
- Assist the States in identifying and correcting these restrictions, including the preparation of draft model legislation, similar to the US DOT effort.
- Monitor the results of this initiative.
- The Agency should examine the initiatives undertaken at the US DOT with respect to PPPs as a possible model for federal agency activity in this arena. The Agency should adapt/adopt those activities that would advance the use of such partnerships where beneficial for environmental utilities.

Tax Policy Barriers

- Conduct and publish a survey of existing state and local taxing policy with respect to government-owned vs. investor-owned drinking water and clean water utilities. The survey should address access to state-tax-exempt bond financing, real and personal property taxes, inventory taxes, gross receipts taxes, etc. The purpose of the survey is to identify cases where tax exemptions to government-owned utilities act as hidden subsidies.
- Assist the States in identifying and correcting tax policy distinctions which discourage consideration of some kinds of PPP.
- Monitor the results of this initiative.

Information Barriers

- Continue to disseminate information on PPPs, including case studies which document specific situations in which these arrangements were beneficial to the community. In particular, describe the process of tailoring a PPP to a community's needs, so that it:
  - Is cost-effective
  - Protects the interests of all parties
  - Avoids unacceptable impacts on customers including low income households, and
  - Maximizes gains to the community as a whole.
- Disseminate information on structural reform of government-owned utilities, as an alternative or as an adjunct to PPPs. EPA should encourage state and local initiatives to regionalize water and sewer utilities where cost reductions and operational improvements are likely to result.

Monitoring Progress

- EPA should consider funding an extra-governmental organization to track progress in eliminating barriers to PPPs, at both federal and state levels, and to monitor the results of these changes.

CONCLUSION

PPPs are not the solution to every problem afflicting the delivery of drinking water and clean water services and they are not appropriate in every community or in every situation. However, experience has shown that PPPs can be helpful and beneficial in many cases. Despite this experience, these arrangements are often precluded or restricted by a number of barriers originating in law, regulation, policy, and perception.

The Board has found that the need for wider use of PPPs is well demonstrated, the mechanisms for considering and structuring these arrangements are known, and success stories and model applications are available. What is now required is a strong initiative by EPA to clear barriers and to take other steps needed to facilitate PPPs where they are appropriate. Since many of the barriers exist in legislation and at both state and federal levels, this initiative will require more than programs, guidance, and workshops. It requires committed and sustained leadership by EPA.

I. INTRODUCTION

In 2002, EPA published the widely noted "Gap Analysis," which examined the growing disparity between infrastructure needs and investments in the drinking water and clean water industries.[1] Following a series of "needs" assessments, the Gap Analysis was the first detailed attempt to assess the likelihood of meeting current and future infrastructure needs, given existing financing practices and sources. The Gap Analysis stated, for example, that a continuation of then-current investment rates would result in an expected cumulative twenty-year investment shortfall of $122 billion for clean water, and $102 billion for drinking water (measured in 2001 dollars): $224 billion in total. Given the various sources of uncertainty, the report suggests that the true shortfall could almost double to $444 billion.

While the specific numerical results of the Gap Analysis have been controversial, there is no doubt that the water sector, as a whole, has suffered from substantial underinvestment for some time. In the case of clean water, symptoms include continued reliance on combined sewer systems, problems with combined sewer overflows, and frequent sewage spills--not to mention a long series of consent decrees addressing the worst of these problems. Infrastructure problems in the drinking water industry are less frequently publicized, but probably not less serious. Aging treatment plants, century-plus-old water mains, crumbling structures all add up to a need for major investments to rehabilitate existing facilities plus more major investments to meet future demands.

While there are public sector examples of efficiently managed utilities with adequate, well-maintained facilities, there remains widespread skepticism as to the ability of the bulk of the industry to self-finance needed improvements. This concern has led to a vigorous discussion, still continuing, of available options. Measures have been proposed, including various proposals by EFAB, to strengthen the state Revolving Funds and otherwise increase the borrowing capacity of government-owned utilities. EFAB has also addressed the availability of Private Activity Bonds for investor-owned utilities. EPA and EFAB have strongly advocated full-cost pricing by utilities. But the perception remains that government-owned utilities frequently face capital, management, and/or political constraints which make it difficult to finance needed improvements. Among the remedies proposed for this problem, wider use of PPPs may help enforce full cost pricing in some situations, while offering communities the opportunity to increase efficiency and maintain desired levels of service.

A parallel discussion has taken place with respect to the operating and maintenance costs associated with drinking water and clean water utilities. The Gap Analysis reported that rate-making and budgeting practices observed as of 2001 would, if they continued, result in an expected twenty-year shortfall of $309 billion in operating and maintenance costs. Note that this number is even larger than the capital shortfall estimated in the same report. Consistent, industry-wide application of full cost pricing, as advocated by EPA and EFAB, would erase this gap, but many utilities are very far from this goal.

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1 U.S. EPA, "The Clean Water and Drinking Water Infrastructure Gap Analysis," EPA-816-R-02-020, September 2002.

For these reasons, EFAB has been asked to consider the potential for PPPs to alleviate the chronic funding problems in the drinking water and clean water industries. This report discusses the nature of PPPs, their present role in the industry, and certain barriers or disincentives to wider use of PPPs.

II. PUBLIC PRIVATE PARTNERSHIPS

THE PROVISION OF WATER SERVICES

In every modern urban society, the economy and many aspects of the quality of life depend upon the provision of efficient and adequate infrastructure services. These essential services include transportation, communications, energy, and water-related services. In all cases, and particularly in the case of water, the way in which these services are provided has important implications for the quality of life and of the environment as well as equity and fairness. For all of these reasons, it has always been understood that government has a broad responsibility for insuring appropriate provision of infrastructure services, even if government itself is not the provider in every case.

Since the latter half of the 19th century, water and wastewater services in the U.S. have most often been provided by local government. The public is accustomed to looking to government for safe and adequate drinking water supply, for wastewater services, for insuring that these services are consistently and universally available, and that the cost of providing them is reasonable and fairly allocated. Government is also expected to insure that there is no significant damage to the environment or unnecessary exploitation of natural resources.

To understand government's responsibility, it is helpful to divide these requirements into two categories. The first category consists of water supply and wastewater services provided to individual users. These services are, in the language of economics, ordinary market goods. They can be sold for a price, non-payers can be excluded, and others are not necessarily worse off if some do not purchase the service. Water and wastewater services, as market goods, can be provided by government, as they often are, but they can also be provided just as effectively by the private sector.

The second category of services is qualitatively different. This category includes the quality and safety of drinking water, universal access to services, fair and equitable cost sharing, environmental protections, resource conservation, etc. These are public goods. The benefits extend to all, regardless of who pays for the service, or whether anyone pays. Public goods are distinguished from market goods because they do not lend themselves to private sector provision. There is no incentive for an individual to pay for such services, since they receive them whether or not they pay. Consequently, it is difficult for a for-profit firm, acting on its own, to insure a revenue stream which covers the cost of providing these public goods. The responsibility falls to government, to be exercised by itself or through a PPP.

This report utilizes the following definition of a PPP:

> A public private partnership (PPP) is a contractual, institutional, or other relationship between government and a private sector entity that results in sharing the duties, risks, and rewards of providing a service in which the government has an interest, recognizing that the government retains ultimate responsibility for insuring that social needs and objectives are met.

At the most simplistic level, it may be argued that there is an advantage to pure government provision in that it centralizes responsibility and minimizes the need for regulation, while it can also be argued that the use of the private sector improves efficiency and relieves various constraints associated with the public sector (access to capital, for example). But it is not necessary to choose one side or the other. Private sector firms can be involved in varying degrees, through a wide range of possible PPPs.

Where PPPs are used, government retains the responsibility to regulate private sector partners so that the public goods are preserved. Regulation can take the form of drinking water quality standards, requirements for universal access, regulatory commission or local government oversight of rates and charges, environmental regulations and standards, contractual provisions, etc. Each form of partnership imposes different regulatory requirements and has advantages and disadvantages in specific applications. The following sections describe some of the forms of PPPs that have proven useful in the past.

PUBLIC PRIVATE PARTNERSHIPS IN THE WATER SECTOR

Historical Perspective

The private sector has always had a prominent role in the provision of drinking water in the U.S. In 2005, EPA identified 52,837 community water systems, about half of them classified as private sector providers.[2] A large majority of these private sector providers are very small, often not-for-profit, organizations (community associations, etc.). Considering only the largest water systems, serving at least 100,000 people each, the 2005 survey found 61 private sector providers out of a total of 386 (16 percent) utilities. The private sector providers also account for approximately 16 percent of the 126 million people served by utilities in this category.[3] It is safe to assume that most of these private sector entities are for-profit firms, and that a majority of those are subject to price regulation by state-level public utility commissions.

Some historical perspective can be gained from a survey EPA commissioned in 1982. This survey found 262 utilities serving populations of 100,000 or more, of which 47, or 18 percent, were private.[4] Using the data from this survey, a later calculation concluded that, of the 91 million persons served by these 262 utilities, 14.8 million (16.3 percent) were supplied by private

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2 U.S. EPA, "Factoids: Drinking Water and Ground Water Statistics for 2005," downloaded Aug. 6, 2007; "community water systems" provide year-round service to a non-transient population of at least 25 persons, through at least 15 service connections.

3 Calculations taken from Boland, John J., "The Business of Water," *Journal of Water Resources and Management, ASCE*," vol. 133, no. 3, May/June 2007, pp. 189.

4 Temple, Barker & Sloane, Inc., "Final Descriptive Summary: Survey of Operating and Financial Characteristics of Community Water Systems," for U.S. EPA, Washington, D.C., 1982, pp. II-2 and II-3.

utilities.[5]

After allowing for the uncertainties inherent in surveys as well as the likely restructuring of many utilities during the intervening 23 years, it is still possible to conclude that there has been little change in the number or importance of the largest privately-owned and operated drinking water utilities in recent decades. There are many other kinds of PPP, where water service remains a government function but the private sector provides important services. There is no comprehensive list or survey of these arrangements, now or in the past, so it is not possible to say anything about their prevalence.

Comparable statistics could not be located for the clean water industry, but anecdotal evidence suggests that private sector provision is much less common, especially for the larger communities.

Possible Forms of PPPs

As discussed above, PPPs take many forms. Two polar cases are:

- Investor-owned utility.--A drinking water or clean water utility is wholly owned and operated by a for-profit firm; the public sector role is limited to regulation, normally by a state-level public utility commission

- Contract service provision.--A drinking water or clean water utility is wholly owned and managed by a government entity; the private sector role is limited to contract provision of specific services

In the second case, services provided by the private sector partner may range from support functions (e.g., laboratory services) to facility-level activities (e.g., operating a wastewater treatment plant) to contract operation of all facets of the utility.

A 1991 EPA document considered six kinds of participation in service provision:[6]

5 Boland, J.J., "Water/Wastewater Pricing and Financial Practices in the United States," for U.S. AID, Washington, D.C., 1983, p. 1.2.

6 U.S. EPA, "Public Private Partnerships for Environmental Facilities: A Self-Help Guide for Local Governments," 20M-2003, July 1991, p. 4.

	Function
A	Decision to provide services
B	Facility design
C	Financing
D	Construction
E	Ownership
F	Operation and maintenance

Each of these functions can be performed by a government entity or by a private sector entity. The different forms of PPPs are distinguished by different combinations of functions allocated to each partner. Some possibilities are shown on the following list.

- Investor-owned utility: functions A, B, C, D, E, F (often subject to government regulation)
- Design-build (DB): functions B, D
- Design-build-operate (DBO): functions B, D, F
- Design-build-finance-operate (DBFO): functions B, C, D, F
- Build-operate-transfer (BOT): functions C, D, E (until transfer), F (until transfer)
- Developer financing: function C
- Contract utility operation: functions B, C, D, F
- Contract service provision: function F (for part or all of utility O&M)

Other combinations of services are possible, as local needs dictate.

An important characteristic of these partnerships (with the possible exception of some kinds of contract service provision) is that they require a long-term relationship between the public and private sector. In the U.S., contract terms for PPPs may range up to 25 years; in other countries, longer-term contracts have been used.

Overview of Current Status

Public Works Financing publishes an annual summary of the major long-term water PPPs in the U.S. The 2006 summary lists 15 drinking water partnerships, totaling some 850 MGD of

capacity, and 29 clean water partnerships, involving a total of 1,363 MGD of treatment capacity.[7] In most cases, these are contract operation arrangements, with contract terms in the range of 10 to 25 years. A few are DBO or BOT contracts. The largest drinking water partnership is with Seattle, WA, where two treatment plants with a combined capacity of 300 MGD have been constructed and are being operated under DBO arrangements. The largest clean water partnership is with Milwaukee, WI, where 550 MGD of wastewater treatment capacity is under contract operation, under a 10-year contract.

Public Works Financing also reports that the total outsourcing market (defined as contract operation plus DBO fees) has remained relatively constant over the past seven years, fluctuating in the range of $1.5 to $1.9 billion per year.[8]

PUBLIC PRIVATE PARTNERSHIPS IN THE TRANSPORTATION SECTOR

A similar crisis in infrastructure investment has been noted for the transportation sector.[9] In response to this problem, the U.S. Department of Transportation (US DOT) has become an active proponent of innovative funding mechanisms, especially PPPs, to enhance the availability of funds and the capability for project execution.

Unlike the water industry, the public highway component of the transportation sector has no significant history of private sector infrastructure provision, or of PPPs. Other activities within the sector--such as rail, air, river crossings, and water transportation--have had varying degrees of private sector involvement. As concerns have arisen regarding infrastructure needs and the perceived limitations of the ability of governments to secure adequate financing, proposals for increased use of PPPs have appeared.

Highway transportation planning, funding, and construction are handled primarily by state departments of transportation. State user fees, in the form of gasoline taxes and motor vehicle registration fees, are the primary sources of funds, with additional support from the Federal-Aid Highways program of the Federal Highway Administration (FHWA). Transportation facilities for other modes such as airports and seaports have a strong history of self-support through user fees. Mass transit obtains revenue from user fees, but is substantially subsidized by state and federal grants.

PPP Initiatives by US DOT

Despite its well-established role in supporting highway and transit maintenance and improvements, the US DOT actively promotes PPPs as a source of funding and as an alternative means of project delivery. The most recent federal funding authorization, SAFETEA-LU[10], provided for, among other things, $15 billion in Private Activity Bond allocations for highway

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7 "PWF's 11th Annual Water Outsourcing Report," *Public Works Financing*, Vol. 214, March 2007, p. 10.

8 *Ibid.,* p 4.

9 Testimony of Assistant Transportation Secretary Tyler Duvall before House Committee on Transportation and Infrastructure, February 13, 2007.

10 SAFETEA-LU is the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, signed into law on August 10, 2005.

projects, as well as authority to implement tolls on some interstate highway projects. The FHWA has also developed model legislation that states may use to authorize and encourage PPP transportation projects.[11] Previously, under TIFIA,[12] FHWA established a program for providing federal loans and guarantees as a means to encourage private investment in transportation projects. Also, DOT has established a website in order to provide access to various PPP-related resources.[13]

The DOT PPP website was created "for the transportation community in response to the growing interest in capitalizing on new forms of partnerships between the public and private sectors to plan, finance, build and operate the nation's transportation infrastructure." The website provides information from a variety of sources on a broad array of transportation PPPs. The website has links to other websites, informational resources including case studies, a glossary and a calendar of events.

FHWA has created a User Guidebook on Implementing Public-Private Partnerships for Transportation Infrastructure Projects in the United States that was published July 2007 and is available from the website. In preparing model PPP legislation, FWHA included an overview of the 28 key elements for PPP enabling legislation for highway projects, together with an explanation of their importance and sample provision text for each of the elements.

FHWA has also taken action to reduce impediments to the use of PPP procurement that result from federal regulation. The first, Special Experimental Project Number 15 or SEP-15 derives from section 502 of title 23, and it allows the Secretary to waive the requirements of title 23 and the regulations under title 23 on a case-by-case basis. SEP-15 allows FHWA to experiment in four major areas of project delivery - contracting, right-of-way acquisition, project finance, and compliance with the FHWA's National Environmental Policy Act (NEPA) process and other environmental requirements. While FHWA has long encouraged increased private sector participation in federal-aid projects, SEP-15 allows FHWA to actively explore much needed changes in the way it approaches the oversight and delivery of highway projects to further the Administration's goals of reducing congestion and preserving our transportation infrastructure.

The second initiative is increased access to tax-exempt financing. Section 11143 of Title XI of SAFETEA-LU amends Section 142 of the Internal Revenue Code to add highway and freight transfer facilities to the types of privately developed and operated projects for which Private Activity Bonds may be issued. This change allows private activity on these types of projects, while maintaining the tax-exempt status of the bonds. The law limits the total amount of such bonds to $15 billion and directs the Secretary of Transportation to allocate this amount among qualified facilities. The $15 billion in exempt facility bonds is not subject to the state volume caps. Providing private developers and operators with access to tax-exempt interest rates lowers the cost of capital significantly, enhancing investment prospects.

While not technically part of its PPP initiative, the FHWA has created a federal credit program

11 See: <http://www.fhwa.dot.gov/PPP/legislation.htm>
12 The Transportation Infrastructure Finance and Innovation Act of 1998.
13 <http://www.fhwa.dot.gov/ppp>

under TIFIA whereby DOT may provide three forms of credit assistance – secured (direct) loans, loan guarantees, and standby lines of credit. The program's fundamental goal is to leverage federal funds by attracting substantial private and other non-federal co-investment in critical improvements to the nation's surface transportation system. The DOT awards credit assistance to eligible applicants, which include state departments of transportation, transit operators, special authorities, local governments, and private entities. The program has awarded over $3.66 billion in assistance to projects that had total investments of over $15 billion.

Status of PPPs in the Transportation Sector

Even as the US DOT initiatives have encouraged some projects to move forward with a PPP structure, individual states had already begun to make use of design-build (DB) arrangements with private firms. These contracts integrate design and construction functions, often in a way that sets performance standards for the private partner, but allows considerable latitude to minimize costs. The projects are turned over to the government on completion. These arrangements are sometimes labeled "turn-key" projects. Some partnerships call upon the private partner to arrange financing (DBF), and others are DBO or BOT contracts.

It is worth noting that, prior to the US DOT initiatives, many states lacked legislative authority for PPPs involving highway projects. The US DOT PPP website, as of October 2007, reports that 21 states and one U.S. territory have since enacted statutes that enable the use of PPP arrangements for transportation infrastructure.

As of the end of 2006, the largest PPPs in the highway transportation field are the 75-year leased operation of the Indiana Toll Road (valued at $3.85 billion) and the 99-year leased operation of the Chicago Skyway (valued at $1.83 billion).[14] In each of these instances, the government entered into a concession agreement for which it received an up-front payment. Over the course of the concession, the private party must operate, improve, and maintain the project. In turn, it has the right to receive the toll revenues under a regime that is generally regulated by consumer price index or gross national product deflator increases.

Partnerships have also been reported for the rail transit sector. New Jersey Transit has developed the Hudson-Bergen Light Rail line using contracted design and construction, contracted equipment supply, and contracted O&M (total value $1.67 billion).[15] Meanwhile, the U.S. Federal Transit Administration (FTA) announced a PPP Pilot Program in January 2007 with the purpose of promoting, funding and studying transit PPPs, to highlight advantages and disadvantages. The initiative contemplates the selection of up to three projects with "high demonstration value" for the pilot program. Projects selected may be eligible for "New Starts" funding and other benefits, depending on the specific scheme. It is interesting to note that the FTA program contemplates a possible need to alter state and local legislation in order to permit some projects.

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14 "U.S. and Canadian Transportation Projects Scorecard," *Public Works Financing*, Vol. 214, March 2007, p. 14.
15 *Ibid.*

ALTERNATIVE INSTITUTIONAL ARRANGEMENTS

It is a commonplace observation that many drinking water and clean water utilities are too small to provide the kind of professional management and technical competence that is required in the present regulatory environment. It is also apparent that, because of economies of scale and other reasons, user charges are often dramatically higher for small utilities, as compared to large metropolitan systems. Still, small systems persist, usually for political, jurisdictional, or geographical reasons. Consolidation of small systems can be accomplished within a governmental ownership structure, but it requires moving operating responsibility to either a higher level of government or to a special-purpose government corporation (authority, management district, commission, etc.).

The latter alternative involves creating a quasi-corporate management structure and requiring fiscal autonomy (sometimes called "commercializing" the utility). This promotes professional management and facilitates innovation and performance improvement. Local governments can maintain their ultimate control over commercialized utilities through appointments to the governing board and through approval of tariffs. Otherwise, the utility is free to operate much like a private sector firm, answering to its owners (governments) for performance and efficiency, not for day-to-day actions. A further advantage is that larger, professionally managed utilities are much better prospects for beneficial PPPs. Compared to smaller utilities embedded in local government, the high transaction costs and political interferences associated with partnerships are expected to be minimal.

III. BARRIERS TO PUBLIC PRIVATE PARTNERSHIPS

While PPPs are not advisable or beneficial in every situation, proponents often argue that these arrangements are sometimes not even considered in cases where they may be helpful. The failure to consider a PPP may be due to real or perceived barriers, leading to a belief on the part of the public agency that no effective partnership with a private entity will be possible. Some of the possible barriers are discussed in general terms in this section.

STATE AND FEDERAL SUBSIDIES

The Drinking Water and Clean Water State Revolving Funds (DWSRF and CWSRF) have become important sources of debt capital to the water industry. The DWSRF makes no distinction between government and investor ownership. However, the CWSRF does not permit borrowings by privately-owned systems for abatement of point source pollution, except in a rare case where private point-sources are cited in the Comprehensive Conservation & Management Plan (CCMP) of a National Estuary Program. To the extent the that CWSRFs offer below-market, or even zero interest rates, this policy creates a substantial subsidy for government-owned wastewater systems.

Several states accompany their SRF programs with other programs that offer grants for specific infrastructure improvements, such as wastewater treatment upgrades. In many cases, privately-owned facilities are not eligible for these programs. This may be a matter of policy, or it may

result from the use of tax-exempt bond proceeds. Whether conveyed through interest rates or outright grants, current subsidy policy creates a significant barrier to those forms of PPP which involve private ownership of treatment facilities.

It is believed that the reason for this provision in the CWSRF was a desire to avoid using public funds to subsidize private enterprises. But if the wastewater utility is subject to state-level rate regulation, this problem does not arise. Conventional rate-of-return regulation requires that grants and interest subsidies flow through directly to rate payers. The private firm is only permitted to earn a return on its own funds invested in the utility. Thus the prohibitions serve no discernable purpose, while potentially making it more difficult to achieve affordability. Current policy is particularly problematic in hardship cases, where grants intended for such cases are denied to low-income communities because of the ownership of the wastewater utility.

LEGAL AND INSTITUTIONAL BARRIERS

Contracting

Most types of PPPs require a complex, long term contractual relationship between the public and private partners. Competing bids for PPPs often differ in important ways, preventing evaluation on the basis of price alone. In many cases, especially where capital investments are required, private sector partners may require contract terms of 10, 20, or more years. The longer the contract term, the more important it is to provide a means of renegotiating specific contract provisions to reflect unexpected changes in costs or other parameters. These renegotiations cannot, in most cases, be competitively bid without doing harm to the underlying contract.

Some public sector utilities are bound by state and local statutes or regulations which constrain the contracting process in ways that are inconsistent with PPPs. In particular, there may be term limits on contracts, prohibitions on negotiated contracts, prohibitions on take-or-pay agreements, and no authorization for private parties to collect service fees. These constraints, where present, may require a change in legislation or revised regulations. Some states, in the interest of facilitating PPPs, have undertaken these changes. Many have not. No survey on this issue was performed in connection with this report, but an earlier survey performed by EPA found that 19 states had enacted "comprehensive privatization statutes" intended to eliminate many kinds of contracting barriers.[16] The Board has learned of recent legislative changes in two states (Texas and New Jersey) which have led directly to new PPP initiatives in both states.

Depending on the form of PPP contemplated, other legislative barriers may exist in the form of public utility laws, partnership laws, and tax codes. The exact situation is specific to every state and application. The Board has conducted no survey on this subject and is not aware of any survey conducted by others.

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16 U.S. EPA, "Public-Private Partnerships for Environmental Services: Anatomy, Incentives, and Impediments," Office of the Comptroller, Washington, DC, 1988.

Contract Negotiation

The need to provide for the lowest cost provision of public services, and to do so while respecting the interests of both private and public partners, results in complex contracts which must usually be negotiated between the parties. Because of the nature of the services being provided, the term of the contract, and the complexity of the agreement, very few government agencies first contemplating a PPP possess in-house competence on all aspects of the contract negotiation. This is particularly true where the PPP includes a financing role for the private partner. In this case, it is necessary for the public partner to secure competent, experienced, and independent advice. Accordingly, the contract negotiation process itself may appear to be a barrier to some utilities.

Level and Size of Relevant Governments

In 2005, more than 150 million people were served by drinking water utilities in service areas with less than 100,000 population.[17] Private firms wishing to form partnerships with any utility must face the prospect of interfacing and potentially negotiating with government agencies at the federal, state, regional, and local level. In some places, government may be as much as five levels deep. A PPP may require approval at several levels, may be regulated at one or more levels, and is likely subject to often-conflicting political forces at all levels.

These facts impose significant transaction costs on the private partner, irrespective of the size of the resulting contract. For large utilities, or for utilities serving multiple jurisdictions, the potential benefit to the private firm may outweigh the transactions costs. But if the utility is small and/or is situated at the lowest level of government, there may be little incentive for any partnership more complex than simple operating or design-build contracts. Yet it is often these small utilities that can benefit the most from the financial, technical, and operating expertise of an experienced private firm.

Federal and State Tax Policy

Although there is a long history of investor ownership of water utilities, the tax treatment of these entities continues to differ markedly from the tax treatment of otherwise identical government-owned utilities. While the details differ from state to state, and sometimes from community to community, the general situation is that investor-owned utilities pay at least some taxes that do not apply to government-owned utilities. These include real- and personal-property taxes, gross receipts taxes, franchise taxes, etc. The tax treatment of bond interest is a related issue, where interest paid on government-issued bonds is exempt from federal income tax and may be exempt from state income tax. The effect of this unequal treatment has long been recognized as provided a significant hidden subsidy to government ownership.[18]

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17 U.S. EPA, "Factoids: Drinking Water and Ground Water Statistics for 2005," p.2.

18 Gardner, B. Delworth, "The Efficiency of For-Profit Water Companies Versus Public Companies," *Water Resources Update*, No. 117 (October 2000), pp.34-39.

BARRIERS CREATED BY PAST GRANT FUNDING

Prior to 1987, many wastewater utilities received substantial grant assistance from the federal government through the Construction Grants Program. As a result, there is an existing federal interest in many wastewater facilities that may be candidates for transfer, through sale or long-term lease, to a private partner. In 1992, Executive Order 12803 was issued to simplify requirements related to such disposition. However, under the terms of that Order, whenever non-operational revenues are received by the original federal grantee as a result of the transfer, the PPP agreement must be reviewed and approved by EPA. The approval, which ends the federal interest in the asset, is contingent on an approved distribution of the proceeds of the sale or lease between grantee, state or local government, and the federal government. The federal government receives any residual revenues, after other parties have recovered their costs.

The Board is not aware of any instance in which EPA has failed to approve a proposed disposition of a grant-funded facility. However, the need to apply for such approval as well as the potential requirement for distributing the proceeds from a sale or lease amounts to a significant perceived barrier to PPPs involving grant-funded facilities.

PUBLIC AND POLITICAL OBJECTIONS TO PRIVATE SECTOR PARTICIPATION

While many advantages can be claimed for properly constructed PPPs (operating economies, improved access to capital, increased technical competence, long-term sustainability, etc.), there are a number of reasons to be cautious about these arrangements.[19] In the case of full privatization (where the private sector partner acquires full operating and rate-making authority), these reasons include the loss of certain hidden subsidies to public sector operations. Examples of these subsidies are exemptions from many taxes, access to capital through tax-exempt bonds, and the use of costless retained earnings in place of equity capital. Other issues associated with full privatization have to do with the opportunity for monopoly pricing, possible loss of control over system expansion policies, and the loss of various public goods (such as providing affordable service to low income households). These latter issues can be addressed through regulation, but regulation itself is costly and results in higher tariff levels.

Other forms of PPPs present few, if any, such concerns. In these cases, the major issue is whether the private sector partner can perform its assigned function(s) effectively and at a lower cost than the former government entity. Or, in some cases, the private partner may be able to deliver a service that the public partner cannot, such as increased access to capital. The public partner remains in control of all major policies, including rate-making.

Still, proposals to enter into PPPs often face considerable public and political opposition. Some of this reflects unfamiliarity with the new arrangement and skepticism regarding claimed advantages. Some opponents distrust the reliability of private sector arrangements to deliver services as important as drinking water and wastewater management. Others believe that it is the duty of government to provide these services, and that private sector provision is somehow inappropriate. Another concern has to do with the utility's labor force. One effect of most PPPs

19 Portions of this section are based on Boland, John J., "The Business of Water."

involving operations and maintenance is that some employees are no longer needed. They may be terminated, or the new operator may reduce staff through attrition. Either way, there is often public and political concern about this effect.

In most cases, though, the issue is simply one of economics: some people assume that the involvement of the private sector will result in higher rates and charges. Obviously, PPPs should not be entertained if their only effect is to increase costs. But public concern remains.

The concern about rates and charges is particularly hard to address in circumstances where rates are rising in any case. If the PPP produces significant efficiencies and still results in higher rates in the future, it is hard to argue that rates would have been even higher in the absence of the PPP.

Regardless of the specific issues, the prospect of public and political opposition to a PPP appears to many public agencies to be a significant barrier. In fact, few agencies will risk this kind of reaction unless the cost and operational advantages are relatively large. On the other hand, some kinds of limited PPP will produce little or no public reaction. These include most kinds of simple outsourcing which have little impact on the required labor force. But the dilemma here is that it is exactly the PPP proposals which promise the greatest cost savings that have the largest impact on the labor force (cost is reduced by reducing staff).

PREVIOUSLY IDENTIFIED BARRIERS

In 1991, EFAB reviewed the status of PPPs in the water industry, identifying a number of barriers to wider application.[20] These barriers, along with EFAB's earlier recommendations, are summarized in the following table.

20 U.S. EPA, "Private Sector Participation in the Provision of Environmental Services: Barriers and Incentives," advisory report by the Environmental Financial Advisory Board, November 25, 1991.

Barriers in 1991	Perceived Obstacles to Forming PPPs	EFAB Recommendations	Changes/Activities
Federal policies and regulations	● Federal tax laws impact cost of capital for construction of facilities. Regulations on federal grant programs restrict profitability or availability of financing. ● State-level caps of Private Activity Bonds (PABs) may discourage use of private sector capital	● Demonstration programs. ● Awards programs by EPA. ● Funding such as federal appropriations, corporate funding, and non-federal source funding. ● EPA assistance such as seminars, publications, and direct consultation on projects. ● Consistent support for relaxing or lifting caps of PABs issued for environmental or water/ wastewater purposes	● 3 pilot projects 1991-1995 ● Publications, including guidance n EO 12803 on privatization ● Funding of 2 PPP seminars by National Council for Public-Private Partnerships ● EPA supports provision in President's FY08 Budget proposal which would lift PAB caps for water/wastewater projects
User fees below the cost of service	● Private investors are less likely to invest in facilities operating at a loss. Causes hesitation to commit long-term and depend on annual budget appropriation for price subsidies.	● Promote a greater public awareness of cost of services. ● EPA could endorse the practice in EPA publications and operational guidance. ● EPA could help localities implement full-cost pricing by providing assistance to set up cost-accounting procedures and establish volume discounts/rebates for commercial on-site treatment. ● EPA could provide technical support for public outreach and information programs that explain benefits of full-cost pricing. ● EPA could help guide States to review adequacy of the fees during permit process.	● "Full cost pricing" has become on of EPA's Four Pillars of Sustainable Infrastructure ● EPA endorses setting rates at the full value of service provided in all testimony, speeches, and presentations ● EPA is working with industry partners to develop tools and techniques to assist utilities recover long-term, full cost of service ● EPA plans workshops in 2008 on cost allocation and rate design

Barriers in 1991	Perceived Obstacles to Forming PPPs	EFAB Recommendations	Changes/Activities
State and local procurement practices	● Certain procurement practices can limit flexibility in design, financing, operations or providing services. ● Procurement laws may require selection of the lowest cost bidder, eliminating competition on basis of best service or innovative technology. ● Some states prohibit local government from entering into long term contracts. ● Limits flexibility of industry to seek cost-effective means of complying with environmental quality standards.	● EPA could provide guidance to states that consider revision of procurement laws to adopt ABA Model Procurement Code and Ordinance. ● EPA could provide guidance to states and localities on legislation that authorizes long-term contracts when practical. ● EPA could develop “best practice” guidance on long term service contracts.	● No significant EPA action ● Some states (e.g., NJ, TX) have passed legislation liberalizing procurement laws to facilitate PPPs ● U.S. Conference of Mayors has developed "best practice" guide to long-term service contracts

Barriers in 1991	Perceived Obstacles to Forming PPPs	EFAB Recommendations	Changes/Activities
Investment Risk	• Lenders are reluctant to invest due to potential low return for risks involved. Risks can include limited availability of adequate liability insurance, environmental liability, and lack of adequate information on the true level of risks. • Laws subjecting contracts to annual re-approval and appropriation of funds exposes contractions to early termination risk before investments are amortized.	• EPA could help lenders/investors evaluate real risks by detailing information about the different types of risk and activities from which they derive. • EPA could provide assistance to develop "risk ratings" from an independent organization. • EPA could reduce magnitude of liabilities, such as risk-pooling through insurance programs. • EPA could endorse and facilitate new programs to offer environmental liability insurance to capital lenders and provider of services. • AIG could propose privately funded alternatives to government involvement in liability insurance. • Consider having private insurers act as third-party regulators and police use of sites they insure.	• No significant EPA activity

Barriers in 1991	Perceived Obstacles to Forming PPPs	EFAB Recommendations	Changes/Activities
Federal grants	● Private firms have to consider grant repayments for grant-funded facilities which lead to potentially high rate increases. ● The definition of public ownership and SRF regulations results in preventing public entities who are seeking SRF loans from combining existing public owned portions of a facility with privately owned ones. ● Financing options under the Title II construction grants are limited by restrictions in what is used as collateral to secure refinancing.	● Evaluate case by case waivers to federal statues and grant regulations. ● EPA could permit waivers from grant regulations to redefine public ownership. ● Consider allowing the federal repayment requirement for facilities to be reinvestment in EPA approved WWT projects. ● Redefining the period of federal interest and the period for which plants are needed equivalent to the design life of facility. ● Define concept of acceptable encumbrance for the facility.	● EPA issued draft guidance on 2000 to guide utilities through encumbrance of title and grant repayment issues ● EPA currently revising the draft guidance to be less burdensome and more flexible

The table reflects one recent activity worthy of note, under the first heading, "Federal policies and regulations." This concerns Private Activity Bonds (PABs) which could conceivably provide a source of low-cost capital to the water industry. PABs were authorized by the 1986 Tax Reform Act for the purpose of creating tax exempt status for certain public purpose bonds issued by private sector firms. Unfortunately, state-level caps on the total amount of such bonds have effectively marginalized PABs as a source of capital for the water sector. The Board has consistently advocated, beginning in 1991, the liberalization or the lifting of these caps with respect to environmental or water projects.[21] Early in 2007, with the full support of the Board, EPA endorsed the President's proposal for exempting PABs intended to finance water and wastewater facilities from the unified state volume caps. As of October 2007, Congress has taken no action on this proposal.

Another prior recommendation that has received recent attention pertains to the need for full-cost pricing by local utilities. This is an issue that goes beyond the present PPP discussion, since it pertains to the fiscal sustainability of the entire industry. However, full cost pricing is often cited as a beneficial outcome of some kinds of PPPs. Since 2003, when full-cost pricing was incorporated into EPA's Four Pillars of Sustainable Infrastructure, it has figured prominently in EPA policy statements and initiatives.

State and local procurement policies have been another area of concern. The prior EFAB report pointed to state and local laws and regulations that restricted DBO and DFBO arrangements and that limited the ability of jurisdictions to enter into long-term operating contracts. The Board has not conducted a survey of the present status of state and local policies, but we are aware of significant changes in legislation in New Jersey and Texas, both of which led to new PPPs that would not have been possible before the changes.

With respect to any other EPA or government action that may have been taken subsequent to the Board's 1991 recommendations, it appears that there were some initiatives in the first ten years, mostly directed to utility outreach and to the preparation of various kinds of guidance. There is no indication of a comprehensive, coordinated effort to lower barriers or to facilitate PPPs.

IV. EFAB REVIEW OF SELECTED PARTNERSHIPS

2007 REVIEW

In order to assess the current industry perception of barriers to PPPs, the Board performed a limited review of the experience of private sector firms presently active in various kinds of partnerships. Seven firms were contacted; five were able to provide substantive responses for a total of eleven variants of PPPs. The information provided by the companies is tabulated in an

21 Environmental Financial Advisory Board, "Incentives for Environmental Investment: Changing Behavior and Building Capital," U.S. Environmental Protection Agency, Washington, D.C., August 9, 1991; Environmental Financial Advisory Board, "Recommendations and Final Report on Financing Opportunities for the Clean Water Action Plan," U.S. Environmental Protection Agency, Washington, D.C., July 1999; Environmental Financial Advisory Board, "Private Sector Initiatives to Improve Efficiencies in Providing Public-Purpose Environmental Services," U.S. Environmental Protection Agency, Washington, D.C., June 2001.

Appendix to this report.

Some of the noteworthy results of this review are summarized here:

- Of the eleven examples given, three were DBO contracts and two were long-term operating concessions. The others were various arrangements for full or partial operating services.

- Most contracting arrangements were competitive in nature, although some were simple sole source negotiations, or negotiations following a competitive qualification review.

- Some operators reported problems with political will or with local concern over job security for existing employees and others noted protracted, complex negotiations. The most significant barrier mentioned was a Texas statutory prohibition on DB contracts, which required legislative action to overcome.

- Two factors in the success of these contracts were mentioned multiple times: (1) the ability to arrange for comparable jobs for existing employees who would no longer be needed and (2) the proximity of existing operations of the private sector partner. The latter factor may be most important for PPPs in relatively small communities, where the private partner can easily bring to bear technical and management expertise that would normally be unavailable in a small operation.

- Nearly all of the PPPs described by the companies are claimed to provide operational improvements, improved performance, and lower costs. Since these are existing, successful PPPs, these results would be expected, but some of the reported cost savings are surprisingly large (e.g., United Water reported a 30% cost reduction in Indianapolis). In some cases, performance improvement seemed especially noteworthy (e.g., American Water in Buffalo).

- In terms of lessons learned, there were comments about the need to maintain momentum in the contracting process; the need to provide escalators for fuel, materials, and labor costs in long-term contracts; the need to resolve uncertainties regarding existing employees; and the need to go into the negotiation process with a clear understanding of existing work rules. However, the strongest messages in this category came from United Water and referred to their Indianapolis and Jersey City contracts. In both cases, it was noted that the contracting process had been smooth and professional, and that these partnerships could serve as a model for other similar situations.

It should be noted that EFAB's review was limited to the experience of the private sector providers of utility services; it did not solicit the opinions of the communities who used those services. But a recent study by R.W. Beck did seek the opinions of government-owned utilities serving populations 100,000 or more.[22] Of those responding (53% completed telephone interviews), 79% had used some form of private sector service delivery, such as DB and DBO

22 R.W. Beck, "Alternative Project Delivery Survey of Water and Wastewater Utilities," 2006.

contracts. Most important, 96% of those utilities that had used these forms of PPP reported that they would do so again. Among the advantages cited were time savings, fewer construction problems, innovative designs, cost savings, and increased staff competency.

CITY OF ATLANTA EXPERIENCE

In 1999, the City of Atlanta, Georgia, entered into a 20-year agreement with United Water Services for the operation of the City's water system. Less than four years later, the Company and the City agreed to dissolve the contract. A joint press release stated that the contract was not "in the best interests of either party."[23] Other press reports at the time indicated that both the City and the Company had very serious claims against each other.[24] This negative experience confirms many of the lessons learned from the positive experiences summarized in the Appendix to this report. Successful PPPs require careful planning, continuing political will, and must clearly serve the interests of both parties.

V. RECOMMENDATIONS

FOR ACTION BY THE U.S. CONGRESS

- Eliminate the state-level caps on public-purpose PABs issued for construction of drinking water and clean water infrastructure.
- Modify or terminate the federal interest in clean water facilities constructed with assistance from the former EPA Construction Grant Program, so the communities are free to consider PPPs in connection with these facilities.
- Make privately-owned, public purpose clean water facilities eligible for loans and grants from the CWSRFs on the same footing as government-owned systems. This change recognizes that utility regulation results in all subsidies flowing through to ratepayers. But it should be noted that some states may continue to limit such subsidies.

FOR ACTION BY EPA

State-Level Statutory Barriers

- Conduct and publish a survey of existing state statutes which restrict or prohibit various forms of PPPs, either through procurement policies and other means.
- Assist the States in identifying and correcting these restrictions, including the preparation of draft model legislation, similar to the US DOT effort.

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23 The joint press release can be found at <http://www.unitedwater.com/pr012403.htm>.

24 For an account of the City's case, see <http://www.bizjournals.com/atlanta/stories/2002/08/12/story1.html>. A different perspective on this dispute can be found in Geoffrey Segal, "What Can We Learn From Atlanta's Water Privatization," Georgia Public Policy Foundation, January 21, 2003 <http://www.reason.org/commentaries/segal_20030121.shtml>.

- Monitor the results of this initiative.
- The Agency should examine the initiatives undertaken at the US DOT with respect to PPPs as a possible model for federal agency activity in this arena. The Agency should adapt/adopt those activities that would advance the use of such partnerships where beneficial for environmental utilities.

State-Level Subsidies

- The Agency should conduct and publish a survey of state and local programs, linked to or separate from the SRFs, that offer grants or other forms of subsidy to government-owned drinking water or clean water agencies, but which deny such assistance to privately owned, public purpose systems.

Tax Policy Barriers

- Conduct and publish a survey of existing state and local taxing policy with respect to government-owned vs. investor-owned drinking water and clean water utilities. The survey should address access to state-tax-exempt bond financing, real and personal property taxes, inventory taxes, gross receipts taxes, etc. The purpose of the survey is to identify cases where tax exemptions to government-owned utilities act as hidden subsidies.
- Assist the States in identifying and correcting tax policy distinctions which discourage consideration of some kinds of PPP.
- Monitor the results of this initiative.

Information Barriers

- Continue to disseminate information on PPPs, including case studies which document specific situations in which these arrangements were beneficial to the community. In particular, describe the process of tailoring a PPP to a community's needs, so that it:
  - Is cost-effective
  - Protects the interests of all parties
  - Avoids unacceptable impacts on customers including low income households, and
  - Maximizes gains to the community as a whole.
- Disseminate information on structural reform of government-owned utilities, as an alternative or as an adjunct to PPPs. EPA should encourage state and local initiatives to regionalize water and sewer utilities where cost reductions and operational improvements are likely to result.

Monitoring Progress

- EPA should consider funding an extra-governmental organization to track progress in eliminating barriers to PPPs, at both federal and state levels, and to monitor the results of these changes.

VI. CONCLUSION

PPPs are not the solution to every problem afflicting the delivery of drinking water and clean water services and they are not appropriate in every community or in every situation. However, experience has shown that PPPs can be helpful and beneficial in many cases. Despite this experience, these arrangements are often precluded or restricted by a number of barriers originating in law, regulation, policy, and perception.

The Board has found that the need for wider use of PPPs is well demonstrated, the mechanisms for considering and structuring these arrangements are known, and success stories and model applications are available. What is now required is a strong initiative by EPA to clear barriers and to take other steps needed to facilitate PPPs where they are appropriate. Since many of the barriers exist in legislation and at both state and federal levels, this initiative will require more than programs, guidance, and workshops. It requires committed and sustained leadership by EPA.

APPENDIX

2007 EFAB REVIEW OF SELECTED PARTNERSHIPS

Private Sector Partner	American States Water Company
Role in PPP	All of the PPP's in which American States Water Company and its affiliates, hereinafter, collectively referred to as AWR, have engaged have resulted in AWR being the service provider or operator if you will. In each case, the PPP's have not involved operation of a WTR or WWTP but rather the provision of full service O&M of water systems or partial O&M services.
Site name, location (city, state) and type of plant (WTP, WWTP)	See response above.
Type of PPP and specific PPP role of each party	AWR, the O&M operator, provided a wide variety of services for a number of municipalities including meter reading, billing, customer service, or a combination of some or all of the previous functions; as well as total O&M functions.
Requirements for bid participation	In each case, the PPP's listed above were open competition for all qualified participants.
Major obstacles that delayed the bidding-stage process and how they were overcome	In as much as AWR's involvement in PPP's has largely resulted from bids placed by a municipality or other agency, AWR was not informed about potential or real obstacles in the bidding-stage. However, there is significant concern relating to political will and about the lack of full disclosure of information that made certain aspects of the process cumbersome or, worse, incomplete.
Major obstacles that delayed the contract-negotiations process and how they were overcome	It is fair to say that the most significant obstacle faced by AWR was the political will (described above) to consummate a transaction. In addition, AWR could list the following: (i) level of technical sophistication of parties; and (ii) hidden agendas; (iii) lack of meaningful time set aside to engage in potentially beneficial negotiations.
Factors that helped make this PPP a success	The main factor is trust by the governmental authority in the ability of the utility to perform the function(s) of the PPP for the price and terms negotiated.
Benefits to public and private sectors	It goes without saying – efficient provision of O&M services at a price acceptable to all parties.
What, if anything, would you have done differently?	Realistically, there are a number of pointed items that AWR may have done differently. The key item, however, is to keep the process continuous and not fall prey to diversions or "other things that come up."
What is the single, most compelling reason you would offer a city to consider a PPP?	The efficient provision of full or partial O&M services at a price fair to all parties.

Private Sector Partner	Connecticut Water Company - I
Role in PPP	Middlebury Water System
Site name, location (city, state) and type of plant (WTP, WWTP)	Middlebury, CT, distribution system with pump station
Type of PPP and specific PPP role of each party	The Town of Middlebury established a water system in the mid-1990's to serve an area of contaminated wells. The initial construction of the system was paid for by the polluter. The distribution system was expanded through access to various state grants to serve other areas. The source of water was an interconnection with a neighboring city. Middlebury purchased water from the city and took on a portion of the city's debt service for construction of its water treatment plant under an agreement between the two parties. Connecticut Water, through it's unregulated subsidiary New England Water Utilities Services, had been providing fulltime contract operations, customer service and billing services to Middlebury since the system's inception. The neighboring city became involved in a lawsuit over its water supply. In turn the continued availability of water to Middlebury to supply its needs became uncertain. The Connecticut Water Company (CWC) had a water system.
Requirements for bid participation	No bid. This was a unique situation brought about by the proximity of the water systems and the availability of supply.
Major obstacles that delayed the bidding-stage process and how they were overcome	This was a complicated deal that required months of study by the Town and Middlebury and negotiation with CWC
Major obstacles that delayed the contract-negotiations process and how they were overcome	See previous response.
Factors that helped make this PPP a success	The proximity of CWC's water system with available supply and the willingness of the Town and CWC to forge a mutually beneficial partnership.
Benefits to public and private sectors	The Connecticut Water Company was able to add several hundred customers in an area with substantial growth potential. Much of that growth continues to be paid for through the Town's access to grant funds. The Town of Middlebury was able to achieve its plans for growth and provide water supply to areas of contamination or deficient supply while relieving itself of its financial obligations to the neighboring city. The Town also avoided the customer service/meter reading/billing/collection costs of running its own water system.
What, if anything, would you have done differently?	Nothing.
What is the single, most compelling reason you would offer a city to consider a PPP?	In this situation the Town of Middlebury was faced with creating its own water department. Instead it was able to access the personnel, equipment and expertise of a neighboring utility without increasing the costs to the Town or ratepayers.

Private Sector Partner	Connecticut Water Company - II
Role in PPP	Operations, Management and Maintenance Agreement between The University of Connecticut and New England Water Utility Services. New England Water Utility Services operates, manages and maintains the public water systems owned by the University of Connecticut.
Site name, location (city, state) and type of plant (WTP, WWTP)	Site Name: University of Connecticut Main Campus and Depot Campus Location: Storrs, CT Type of Plant: Public Water Systems including wells, disinfection and corrosion control treatment, and distribution systems.
Type of PPP and specific PPP role of each party	Operation, maintenance and management services provided by New England Water Utility Services, Inc for water systems owner, The University of Connecticut.
Requirements for bid participation	Request for Qualifications, followed by Request for Technical Proposals, which included a price proposal, from all qualifying firms. Upon selection of a firm's Proposal, that firm negotiated a Contract with the University.
Major obstacles that delayed the bidding-stage process and how they were overcome	The bidding-stage was delayed approximately 3 months. We were not aware of any major obstacles that had to be overcome.
Major obstacles that delayed the contract-negotiations process and how they were overcome	The contract-negotiations process was somewhat slowed as five separate departments within the University system and/or the State of Connecticut were involved in review of the contract.
Factors that helped make this PPP a success	The Connecticut Water Company, which is the sister company to New England Water Utility Services, is a regulated public water utility which has operating territories close to the University campuses and has interacted with university water system personnel over the years. In addition, New England Water Utility Services has performed various services for the University in the past, including the collection and processing of water quality samples, cross connections inspections and backflow device testing. These factors have resulted in a level of trust and cooperation between the Company and the University which continues under the contract.
Benefits to public and private sectors	Under the current contract, the University has access at a very cost-effective price to the expertise and resources of a large public water utility, including a large staff specifically trained in the operation, maintenance and management of a complex public water utility system.
What, if anything, would you have done differently?	Nothing.
What is the single, most compelling reason you would offer a city to consider a PPP?	Access to the expertise and resources of a neighboring professional water utility at a cost-effective price.

Private Sector Partner	San Jose Water Company
Role in PPP	Maintenance, installation, consulting, and other service contracts with municipal utility.
Site name, location (city, state) and type of plant (WTP, WWTP)	San Jose Water Company (SJWC) is an investor-owned public water supply utility, which supplies, treats and distributes water to a population of 1 million in the Santa Clara Valley. The company also provides utility services to other agencies.
Type of PPP and specific PPP role of each party	SJWC has maintenance, installation and consulting contracts with San Jose Municipal Water System (SJMWS), which is owned and operated by the City of San Jose. These include water main and service leak repairs, water main and appurtenance installation, preventative maintenance services (such as valve exercising) and various consulting services. In addition, SJWC provides meter testing and repair service for eight regional water utility clients. We test, rebuild and certify the accuracy of water meters in sizes 1" to 10" in our state-of-the-art Meter Shop at a cost far less than replacement.
Requirements for bid participation	The requirements are: 1. Hold a corporate General contractor's License. (An employee obtained a state contractor's license and assigned it to SJWC.) 2. Look at the City's Internet site frequently for bid solicitations. 3. Obtain each of the City's RFPs and provide bids, when there is a good fit, competing against several local contractors. 4. Attach a bidder's bond and proof of insurance to our submittals. 5. Awards were made for the annual general contract and several additional large jobs based on being the lowest qualified bidder. 6. After award, submit a performance bond and sub-contractors' payment bond. 7. Also, after award, submit references to prove we are qualified (previous job of same scope and $-magnitude).
Major obstacles that delayed the bidding-stage process and how they were overcome	Obtaining the bidders bond quickly was a challenge, but our financial staff found a source. Preparing a bid is time consuming. In lieu of customer references, we described several capital improvement projects, which our staff constructed. We have to bid every large City project separately against local contractors. We have to re-bid the general installation contract annually. We may not always be price-competitive if a high percentage of the work is delegated to our sub-contractors.
Major obstacles that delayed the contract-negotiations process and how they were overcome	The City required several forms be completed to verify living-wages for field crews; since we use subcontractors for paving and backhoe, their response delayed the contract negotiations.
Factors that helped make this PPP a success	Proximity to SJMWS and familiarity with its service area; SJWC's expertise, staff and equipment available for distribution system repair, installation and preventative maintenance; A long-term working relationship with staff at SJMWS; The need by SJMWS to have a reliable contractor who could provide rapid response to leaks.
Benefits to public and private sectors	SJWC is able to maintain the staff size needed to deal with the cyclical nature of distribution system repairs; SJMWS is provided with cost effective, high quality services, with fast response; SJWC is able to leverage its economies of scale, and pass those savings onto SJMWS; As leak repair experts, SJWC crews need less oversight by SJMWS than typical construction companies performing similar work. In addition, SJWC's crew trucks and support equipment have been specifically designed for fast response to leaks of all sizes. This ultimately results in faster repairs, while minimizing service disruption to consumers.

Private Sector Partner	San Jose Water Company
What, if anything, would you have done differently?	SJWC would have crafted the contract to better allow for actual market costs for fuel, materials and labor.
What is the single, most compelling reason you would offer a city to consider a PPP?	Under the right conditions, a PPP is a way to get the high quality services needed for the lowest cost to ratepayers.

Private Sector Partner	American Water Company - I
Role in PPP	American Water is the prime contractor for DBO and plant operator.
Site name, location (city, state) and type of plant (WTP, WWTP)	Fillmore, California; New wastewater recycling plant to replace existing antiquated wastewater treatment plant.
Type of PPP and specific PPP role of each party	The procurement was structured as DBO. • City of Fillmore: client • Boyle Engineering: procurement advisor / program manager • American Water: prime contractor; facility operator • Kennedy-Jenks Consultants: design subcontractor • WM Lyles: construction subcontractor
Requirements for bid participation	Client issued RFQ setting forth financial, technical and business qualifications criteria for bidders.
Major obstacles that delayed the bidding-stage process and how they were overcome	None.
Major obstacles that delayed the contract-negotiations process and how they were overcome	None.
Factors that helped make this PPP a success	The following factors they believe will contribute to making this a successful PPP: (i) sole source responsibility; (ii) reduction of project duration; (iii) reduced E&O claims; (iv) integrated and aligned DBO team; (v) early cost and schedule certainty; and (vi) promotes innovation and creativity.
Benefits to public and private sectors	The primary benefits are the partnership's innovative open-book / contingency sharing approach on the DB side and striking a better balance of risk allocation/ sharing, particularly in the areas of bonding, repair and replacement and sludge disposal.
What, if anything, would you have done differently?	There is nothing suggested to have done differently.
What is the single, most compelling reason you would offer a city to consider a PPP?	PPPs provide cities that do not possess internal expertise and resources for one-time infrastructure and O&M procurements an alternative approach that provides, among other things, tangible, quantifiable value to the ratepayers and, specifically, access to the private sector expertise and resources at a reasonable, cost-effective price.

Private Sector Partner	American Water Company - II
Role in PPP	American Water is the private contract operator providing professional management oversight of all day-to-day operations as well as giving direction and support for more than 130 operations and administrative staff members who are City of Buffalo/Water Board employees. There are four American Water employees at this project led by James Campolong, American Water's project manager.
Site name, location (city, state) and type of plant (WTP, WWTP)	This project includes the management of the Colonel Ward Water Pump Station and Water Treatment Plant, the Massachusetts Avenue Pump Station and Exchange Street customer service and billing office located in Buffalo, NY.
Type of PPP and specific PPP role of each party	This is a full scope O&M project. The main parties and corresponding responsibilities are as follows: American Water (Contract Operator) ● Project Management--overall O&M project oversight and contract compliance, including management oversight of city employees who carry out O&M services ● Customer Service Management--responsible for the day-to-day operations of the customer service functions, including the call center, billing operations, and collections, including delinquent collections program for water and sewer charges ● Assistant Business Management--responsible for management of the project purchase order process and vendor relations, budget compliance, and staff liaison. ● Systems Administration--responsible for support of all billing system software and development support, including field meter reading equipment and staff liaison for computer hardware and network. **City of Buffalo/Water Board (Owner)** ● Water Board sets rates, rules and regulations for the system, manages capital improvements and otherwise provides full governance of the system. ● City of Buffalo is the employer of operations, maintenance and administrative staff engaged in direct operation and maintenance activities of the system. ● Commissioner of Public Works--official representative of the Water Board and acts as the primary "responsible party" representing the City of Buffalo and Water Board. Negotiates contract terms on behalf of the Board and acts as the liaison between American Water O&M group and the City's administration. ● Principal Water Engineer-oversees capital works projects funded by the Water Board, primary contact with O&M manager related to technical and operations matters for the contract. **Conestoga Rovers & Associates (CRA Engineering) (Owner's Engineer)** ● CRA is the water board's consulting engineer for the O&M contract. CRA prepared the RFP and took a lead role in evaluating respondents' proposals as well as negotiations leading up to the Operating Agreement. CRA continues to perform contract compliance oversight on behalf of the water board.
Requirements for bid participation	Bidders were required to show that they had previous experience managing projects of a similar size and scope and the financial capacity and technical resources to support the project.

Private Sector Partner	American Water Company - II
Major obstacles that delayed the bidding-stage process and how they were overcome	Since this proposal for private management of public services was the first of its kind to be suggested in western New York, the first RFP in 1997 faced initial pushback from the public sector unions as well as the members of the City's Common Council largely over job security. The Commissioner of Public Works appeased concerns by meeting with all parties and assured them that labor retention would be a key component of the project and that these efforts by the Water Board were not only an effort to avoid future significant rate increases but also an attempt to actually reduce costs through efficiencies.
Major obstacles that delayed the contract-negotiations process and how they were overcome	Contract negotiations had to be held with not just one union group but four, and, as such, concessions over work rules were required with all four public sector unions. A Memorandum of Agreement was required which detailed management and union responsibilities and guaranteed staff reductions only through attrition. Also, since there was no preexisting management model in the area, the scope of service requirements were challenging to develop, since clear roles were not well defined within the municipal management staff. As a result, the first five-year term lacked the kind of clarity that the second five-year term provided regarding delineation of responsibilities. During the second five-year term, the scope of services were spelled out in much greater detail using examples and detailed definitions of roles and responsibilities.
Factors that helped make this PPP a success	There were many standout success factors in this milestone project for western New York. In fact, this project won the NCPPP's 2005 Public/Private Partnership award in the "service" category and was featured on the cover of *Underground Infrastructure Management's* March/April 2006 edition. Some key successes are as follows: ● The willingness of both parties to approach the Agreement as a true partnership, agreeing to work cooperatively to address all management issues as they arose, and the level of trust developed which allowed both parties to work out the details related to roles and responsibilities later. ● Clear, well-defined descriptions of scope of service deliverables that were mutually agreed to and were reasonable, which resulted in a positive experience for both parties and continues to this day. ● Well-defined contract compliance oversight by a neutral third party with the technical expertise to monitor the operations contractor as well as to provide guidance to the client with respect to interpretation of contract terms and conditions. ● Full commitment and support by American Water's O&M project team towards the City's long-term goals and objectives for operational and financial improvements. ● A contract based on reasonable commercial risks and a risk profile that is predicated upon which party is best able to control certain risks. For example, The Water Board has accepted price risk, while American Water has accepted utilization risk for electric power.

Private Sector Partner	American Water Company - II
Benefits to public and private sectors	• $4-5 million savings *annually* via across-the-board operating improvements and improved financial management. These were some of the efficiencies alluded to earlier. • Initial water rate reduction of 8 percent held for five years and rate stabilization and control in subsequent years • Huge productivity gains: an innovative labor contract utilizes city employees with no involuntary staff reductions; work rule changes and improved deployment yielded a sustainable 26 percent increase in productivity. • Complete automation of customer records and general operations (90,000 customer records were previously maintained on index cards). • Collection rate increased from an 80-percent range to 97% or greater resulting in *significant positive revenue impact.* • New state-of-the-art customer service center was built, with easy access to mass transit. • Conversion to metered water from flat rate, with installation of over 63,000 water meters. • Improvement in water quality through implementation of best practices reduced turbidity by more than 80 percent. • Responsiveness and efficiency of water- line repairs increased substantially with implementation of a computerized maintenance and management system (CMMS). • Vehicle reliability improved via a new replacement and repair program. Average age of fleet reduced from 14 years to 8 years. • Community involvement and support was an integral part of American Water's mission – water education in schools, help to disadvantaged, involvement in civic improvements and redevelopment efforts.
What, if anything, would you have done differently?	Better advanced insight into work rules could have accelerated the negotiations process and have realized the multitude of successes listed above much more quickly (time to money). Although AW participated in contract discussions and championed process change and work rule revisions, the staff continues to be governed by the Civil Service and Public Sector Collective Bargaining Agreements which are very restrictive and require multiple levels of participation and agreement before change can be implemented. Perhaps an agreement which would either enlist the staff as employees of American Water or which has a provision affording more influence over the agreements governing the operations staff would result in accelerated improvements for all parties; however, the current model has proven to be workable and a success by many accounts.
What is the single, most compelling reason you would offer a city to consider a PPP?	By entering into a partnership with a company like American Water, it will benefit from **private-sector discipline coupled with a strong public-service ethic.** The discipline, in particular, translates into a positive municipal cultural shift which will have heightened awareness of best practices and which gives greater focus to efficiencies and effectiveness top to bottom. As a result, it will save money and/or thwart higher costs, be better prepared for future "curve balls," and will be more easily adaptable to change, if required. The public-service ethic translates to better access to technologies to help sustain or improve water and wastewater protection and supply, as well as provide an ongoing high-level of customer satisfaction.

Private Sector Partner	American Water Company - III
Role in PPP	Director / NJ Contracts / project manager
Site name, location (city, state) and type of plant (WTP, WWTP)	Liberty Water Company- City of Elizabeth water system
Type of PPP and specific PPP role of each party	O&M contract 40 years- Dee Gillespie- Project manager- oversees entire project- Operated by various departments within American Water's NJ American Water subsidiary.(i.e. production, network, environmental, CFS, etc..) Too many to list.
Requirements for bid participation	Not available.
Major obstacles that delayed the bidding-stage process and how they were overcome	The contract may have originally included another City but decided to drop out. No knowledge of any other obstacles
Major obstacles that delayed the contract-negotiations process and how they were overcome	Not aware of any obstacles.
Factors that helped make this PPP a success	The biggest success factors were making certain that the existing employees from the city were offered new or related job opportunities. The other key factor was having identified the project contact person for providing immediate service and response.
Benefits to public and private sectors	The upfront payment to the City as part of the concession deal enabling the City to stabilize property taxes and pay down existing debt on water and sewer obligations. Also having an experienced operator like American Water ensured the timely and cost effective implementation of key capital and operational projects.
What, if anything, would you have done differently?	Nothing in my opinion. Both parties are satisfied, and the major has strongly endorsed our partnership.
What is the single, most compelling reason you would offer a city to consider a PPP?	PPP provides innovative measures to solve multiple City problems. In this case the concession model provided dollars to the City to address tax and debt issues, through services from a skilled operator. This often reduces system costs without affection the work force.

Private Sector Partner	American Water Company - IV
Role in PPP	Director / NJ Contracts / project manager
Site name, location (city, state) and type of plant (WTP, WWTP)	Edison Water Company- Township of Edison Water system
Type of PPP and specific PPP role of each party	O&M contract 20 years- Dee Gillespie- Project manager- oversees entire project- Operated by various departments within American Water's NJ American Water subsidiary.(i.e. production, network, environmental, CFS, etc..) Too many to list. Same as Liberty
Requirements for bid participation	Bid participation required participants to verify related experience in all facets of the water industry (i.e. repairs & maintenance, meter reading, billing and collection, customer service, production, etc.) Also, it was the obligation of the successful participant to satisfy the existing employees with employment or at least pay the township the employee salaries for a specific period if they remained with the town.
Major obstacles that delayed the bidding-stage process and how they were overcome	The township council was not all in favor; however, as stated earlier, a brief township open discussion was extremely effective in getting everyone on board. Edison was the first concession contract which generated many questions from us as manager and operator of the system.
Major obstacles that delayed the contract-negotiations process and how they were overcome	Not all council members were on board regarding the privatization. After a thorough presentation of American Water's obligations from an American Water employee the votes were all in favor. The process of questions and answers were belabored due to the lack of information in the RFP (system information).
Factors that helped make this PPP a success	The biggest success factors were making certain that the existing employees from the city were offered new or related job opportunities. The other key factor was having identified the project contact person for providing immediate service and response. Additionally, providing the capital projects to eliminate major discoloration complaints was key.
Benefits to public and private sectors	The upfront payment to the City as part of the concession deal enabling the City to stabilize property taxes and pay down existing debt on water and sewer obligations. Also having an experienced operator like American Water ensured the timely and cost effective implementation of key capital and operational projects. Edison, unlike Elizabeth, had many customer water quality complaints which were addressed and taken into consideration for long term corrective measures.
What, if anything, would you have done differently?	Nothing in my opinion, each contract / municipality is unique in its own way.
What is the single, most compelling reason you would offer a city to consider a PPP?	PPP provides innovative measures to solve multiple City problems. In this case the concession model provided dollars to the City to address tax and debt issues, through services from a skilled operator. This often reduces system costs without affection the work force.

Private Sector Partner	United Water - I
Role in PPP	Long-term O&M of the City of Indianapolis' two advanced wastewater treatment facilities; 250 MGD combined capacity
Site name, location (city, state) and type of plant (WTP, WWTP)	United Water Indianapolis, Indianapolis, IN Belmont Advanced WWT Facility Southport Advanced WWT Facility Indianapolis Collection System
Type of PPP and specific PPP role of each party	The PPP is a long-term O&M of the City of Indianapolis' two advanced WWT facilities. United Water's role as O&M manager is to treat the effluent of two advanced WWT facilities with a 250 MGD combined capacity; 193 MGD combined average daily flow collection system and Eagle Creek Dam; laboratory services; industrial pretreatment monitoring and program management services.
Requirements for bid participation	Contractor must: ● have been in the business of providing full service contract O&M and management of WWT facilities for at least five years prior to 11/01/96 and must be currently licensed to do business in Indiana; ● currently provide full service contract operations to at least five or more WWT facilities with a design average flow capacity of 15 MGD; ● currently provide full service contract operation services for at least one WWTP with a design average flow of 60 MGD. Additional requirements include: specific liability and property damage insurance, an acceptable annual (renewable) Performance Bond, an acceptable annual (renewable) Payment Bond and a requirement to accept AFSCME as the bargaining agent for the same or similar classifications of employees as are covered by the current contract.
Major obstacles that delayed the bidding-stage process and how they were overcome	Other than the delays which resulted from the exhaustive study on asset sale, the process was very professionally and efficiently done. The City used some outside consultants to assist in this endeavor but it had put together a very talented and multi-disciplined in-City team which enabled it to focus on its priorities and not be diverted by outside agendas.
Major obstacles that delayed the contract-negotiations process and how they were overcome	No Answer.

Private Sector Partner	United Water - II
Role in PPP	DB management and operation of an 11MGD ultrafiltration surface WTP
Site name, location (city, state) and type of plant (WTP, WWTP)	Bexar Metropolitan Water District (BMDC) WTP San Antonio, Texas
Type of PPP and specific PPP role of each party	The PPP is a DBO&M. Under the terms of the contract, United Water is responsible for all aspects of designing, building, managing and operating the surface water facilities. BMDC is an industrial development corporation formed by the water district. BMDC owns the facilities, provided financing for the project and constructed a five-mile pipeline and the storage facility.
Requirements for bid participation	The project was sole sourced and therefore an RFP was not issued. The project was a DBO which in Texas required special authorizing legislation since currently government entities cannot enact DB's without specific approvals.
Major obstacles that delayed the bidding-stage process and how they were overcome	The contract was sole sourced. Montgomery Watson was contracted for the design-build and saw an opportunity to bring in United Water. The biggest obstacle was financing. Special legislation, mentioned previously, took time and cost for the District to enact. The project could have been done as a BOT with private financing if sufficient Private Activity Bond financing had been available. Lifting of the PAB bond cap would have made this option one that the District could have seriously considered since it would have created comparable costs to muni-bond financing.
Major obstacles that delayed the contract-negotiations process and how they were overcome	Refer to the above discussion on Texas DBO authorization
Factors that helped make this PPP a success	The factors that made this PPP a success were its use of innovative membrane technology, the procurement methodology which reduced the total cost of the project to $1.163 per 1,000 gallons produced – an estimated 30 percent reduction over traditional approaches and the assistance in the preservation of the Edward Aquifer by saving of nearly 3.56 million gallons of water annually through the construction of a 12.5 million gallon storage facility. The technology and design-build principles employed in conjunction with its overall benefit to the environment and the community, won United Water and Bexar Met the Texas Consulting Engineering Council Engineering Excellence Award and American City and County Crown Community Award
Benefits to public and private sectors	The ultra filtration plant treats water from the Medina River, making it the first facility in the San Antonio area to treat surface water. For generations the Edwards Aquifer has been the sole source of water for the residents in San Antonio and the surrounding areas. The demand of the aquifer has steadily increased with the development of new communities and business. As a result of the surface WTP, nearly 3.56 billion gallons of water are saved each year, decreasing the demand on the aquifer. In addition, United Water has safely upgraded the plant's design capacity to 14.5 MGD in the summer and 10.8 MGD in the winter without additional capital investment.
What, if anything, would you have done differently?	The process leading up to and throughout the contract has been successful. No changes would be made in retrospect.
What is the single, most compelling reason you would offer a city to consider a PPP?	Value and efficiency. A public-private partnership typically results in annual operating cost savings of 10 to 40 percent, allowing municipalities to avoid or mitigate increases in water rates. A sample of such partnerships realized average savings of 24 percent over the period 1992–1997 as reported in a joint publication of the Association of Metropolitan Sewerage Agencies and the

Private Sector Partner	United Water - II
	Association of Metropolitan Water Agencies (AMSA/AMWA). The high rate of contract renewal indicates that service levels and environmental compliance are not compromised as a result of these efficiencies and that the private sector is capable of adding value rather than simply cutting costs.

Private Sector Partner	United Water - III
Role in PPP	O&M and management of Hoboken's water distribution system. Customer service, billing and emergency services are also included among the company's responsibilities
Site name, location (city, state) and type of plant (WTP, WWTP)	Hoboken Water Services Hackensack, NJ Jersey City WTP Boonton, New Jersey
Type of PPP and specific PPP role of each party	The PPP is OM&M. United Water is responsible for providing the city's water supply, as well as all system maintenance and repairs, customer service, billing and collections, and 24-hour emergency service.
Requirements for bid participation	The contract was sole sourced. United Water approached the City of Hoboken at a time when the Mayor and council had interest in revitalization of the city. Consideration was given to creating an Economic Development Authority with an initial investment of $5 million, which at the time the city did not have. This was the last project before legislation was introduced to legally develop public-private partnerships in New Jersey
Major obstacles that delayed the bidding-stage process and how they were overcome	The two obstacles at the time of the birth of the relationship between United Water and the City of Hoboken were the divide between the mayor and the council over whether this partnership was in the best interest of the City and the expectations of the contract's value. Ultimately the Mayor was able to convince the council members and unions who were not previously supportive of the partnership that this was the best option for the City.
Major obstacles that delayed the contract-negotiations process and how they were overcome	As referenced in question #5, economic obstacles were the cause of the delays in contract negotiations. Eventually, both the City and United Water came to an agreement that was mutually beneficial
Factors that helped make this PPP a success	In 1994, the city of Hoboken and United Water reached an agreement that set the standards for municipal asset management in New Jersey. The city was faced with an annual $800,000 loss if it continued to operate its 40-mile water distribution system. That's when they teamed up with United Water in an innovative arrangement, the first public-private partnership for water services in New Jersey. The partnership enabled the city to retain ownership of the infrastructure and retain rate-setting responsibility. United Water has made numerous capital investments (will total $15 million over the life of the contract) including the installation of new automatic meters, new mains, new valves and new fire hydrants. Among other things, these efforts have helped upgrade Hoboken's fire rating from the worst to the best.
Benefits to public and private sectors	Investments in water infrastructure have improved the reliability and quality of the water service. This has helped the city develop a thriving waterfront which now boasts new park and recreation areas, high rise housing and commercial and retail space. United Water's role in rehabilitating NJ Transit's historic Hoboken Train Station has also helped improve the life for city commuters. The benefits to the private sector are reflected in the success of the contract with the City of Hoboken as the first of its kind in New Jersey and having set the standard across the State and country. The contract has received national recognition in the Best Practices Database of the US Conference of Mayors.
What, if anything, would	

Private Sector Partner	United Water - III
you have done differently?	The process leading up to and throughout the negotiations and contract thus far has been positive and successful. There would be no changes.
What is the single, most compelling reason you would offer a city to consider a PPP?	Value and efficiency. A public-private partnership typically results in annual operating cost savings of 10 to 40 percent, allowing municipalities to avoid or mitigate increases in water rates. A sample of such partnerships realized average savings of 24 percent over the period 1992–1997 as reported in a joint publication of the Association of Metropolitan Sewerage Agencies and the Association of Metropolitan Water Agencies (AMSA/AMWA). The high rate of contract renewal indicates that service levels and environmental compliance are not compromised as a result of these efficiencies and that the private sector is capable of adding value rather than simply cutting costs.

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

JUL 9 2008

OFFICE OF
WATER

Mr. A. James Barnes
Professor of Public and
Environmental Affairs and
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Indiana University
1315 East 10 Street, Suite 418
Bloomington, Indiana 47406

Dear Mr. ~~Barnes~~ Jim:

Thank you for your letter to Administrator Stephen L. Johnson dated April 29, 2008, in which you transmit on behalf of the Environmental Financial Advisory Board (EFAB) the report entitled "*Public Private Partnerships in the Provision of Water and Wastewater Services: Barriers and Incentives.*" As always, I appreciate the opportunity to review and examine any input from EFAB.

The report assesses the potential of public private partnerships (PPPs) to help alleviate chronic funding problems in the water industry. The report notes that, "PPPs cannot solve all water and wastewater utility financing or management problems," though they can be helpful and beneficial in many cases. I agree with the assertion that, "these partnerships can reduce costs, improve the quality of service, and speed the provision of needed infrastructure…the availability of this tool should be a powerful weapon in the Agency's struggle to achieve sustainable water services at a reasonable cost."

The report notes and examines a number of legal and institutional barriers to PPPs in the water industry. These include prohibitions in state or local law, the continued federal interest in existing facilities funded by EPA, and public and political objections. Office of Water staff are currently in the process of addressing one of these concerns. The application process for privatizing facilities with a federal interest is being streamlined to encourage greater participation by the private sector. Additionally, as your findings suggest, my staff will examine the period of federal interest to determine potential limits, and reexamine the definition of public ownership.

The report also brings to light a number of initiatives undertaken by the Department of Transportation (DOT), including a website with various PPP-related resources, and model legislation for states to use in order to promote PPP transportation projects. I believe these types of initiatives are needed not only in the transportation sector, but in the water industry as well, and I am directing my staff to further examine these initiatives with the hope of potentially emulating DOT.

Once again, thank you for providing this valuable input. I continue to be a strong proponent of public private partnerships in the water industry. As I am sure you know, legislation that I strongly support, authorizing the creation of "Water Enterprise Bonds," has recently been introduced in Congress. I plan to continue working with Congress and the water industry to try to achieve many of the efficiencies highlighted in the report. Furthermore, I would like to continue this discussion with the Board at your earliest convenience. These efforts, and this dialogue, are much needed in a time of dwindling resources.

If you have any questions or wish to speak further about this issue, please contact James A. Hanlon, Director, Office of Wastewater Management, at (202) 564-0748.

Sincerely,

Benjamin H. Grumbles
Assistant Administrator

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

APR 29 2008

Mr. Brian F. Mannix
Associate Administrator for
Policy, Economics and Innovation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Mr. Mannix:

The Environmental Financial Advisory Board (EFAB) is pleased to enclose its observations and recommendations regarding *Environmental Management Systems and the Use of Corporate Environmental Information by the Financial Community*. The Board's work was led by its Environmental Management Systems Project Workgroup, chaired by Ms. Rachel Deming, a partner with Scarola Ellis LLP of New York City. In finishing this important project, the Board would be sorely remiss if we failed to recognize the excellent work and cooperation of two individuals from your Office, Mr. Chuck Kent and Ms. Shana Harbour.

EPA has long recognized the potential that environmental management systems (EMSs) have for improving environmental performance and compliance. In the past few years, EPA's Financial Incentives for EMSs Steering Group, led by your Office, has done important work in examining the extent to which the financial sector values the development and implementation of corporate EMSs. As an adjunct to the Steering Group's work, your Office asked EFAB to explore some questions regarding EMSs and financial issues. When EFAB started looking into these questions, it became clear that the initial request needed to be examined in a broader context. The EFAB workgroup worked closely with your staff to refine the questions to take into account market realities. The enclosed report is the product of Board meetings, conference calls, member discussions and a workshop involving experts from the equity, debt and insurance financial sub-sectors. A detailed summary of the workshop is also enclosed for your reference.

The Board believes that the work of the Steering Group is very timely in light of the increasing awareness of the role the environment plays is all segments of the economy and strongly supports the continuation of the Agency's work with

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the financial sector and companies to develop and promote a better understanding of the relationship between EMSs, environmental performance and financial value. EFAB believes that among the many areas that EPA could work, attention should be given to developing mutually useful environmental metrics that can be used as indicators by financial analysts, identifying all relevant environmental information collection systems, and improving the measurement of certain environmental impacts, starting with carbon footprints and the developing markets relating to use of greenhouse gases.

We hope that you will find Board's more detailed observations and recommendations constructive and useful. The members of EFAB appreciate the opportunity to advise and assist the Agency on important environmental finance issues. If you would like to discuss the report in more detail, we would be happy to meet with you and/or members of your Office as you deem appropriate. EFAB is very interested in helping to facilitate better evaluation of environmental performance for the financial markets and remains willing to help the Agency in any way requested consistent with its charter.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Designated Federal Official

Enclosures

cc: Stephen L. Johnson, Administrator
Marcus C. Peacock, Deputy Administrator
Lyons Gray, Chief Financial Officer

Environmental Financial Advisory Board

Environmental Management Systems and the Use of Corporate Environmental Information by the Financial Community

April 2008

Printed on Recycled Paper

EFAB EMS Project Final Draft Report

Environmental Management Systems and the Use of Corporate Environmental Information by the Financial Community

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Original Request: Financial Market Incentives for Organizations to Reduce Risk and Improve Environmental Performance Using Tools like Environmental Management Systems (EMSs)

Original Requester: Stephanie Daigle, Acting Associate Administrator for Policy, Economics and Innovation

Original Questions:

1. Do EMSs yield information on financial risk that is relevant and meaningful to investment and underwriting decisions? If yes, how?

2. What are the financial services industry's beliefs, practices, and conventions regarding EMS?

3. What additional organizations have an interest in EMS?

Request Date: June/August 2005

Addressee: Brian Mannix, Associate Administrator for Policy, Economics and Innovation
United States Environmental Protection Agency

cc: Honorable Stephen L. Johnson, Administrator
United States Environmental Protection Agency

Lyons Gray, Chief Financial Officer
United States Environmental Protection Agency

Subject: EFAB Findings and Recommendations on the Use of Corporate Environmental Information Management Systems in Investment Evaluations and Decisions Made by the Financial Services Communities in the Equity, Commercial Banking, and Insurance Sectors

Background

The United States Environmental Protection Agency (EPA) has recognized the potential for environmental management systems (EMSs) to achieve compliance and to establish standardized systems for monitoring and enhancing environmental performance. EPA's policy is to encourage companies to implement EMSs. In connection with this policy, EPA created a program called *Performance Track* which is focused on the implementation of EMSs by operating facilities. EPA also decided to examine ways in which the financial markets could provide incentives for companies to implement EMSs.

A Steering Group was established by EPA to look at financial market incentives, which is led by the Office of Policy, Economics and Innovation (OPEI). This Steering Group conducted extensive research and prepared a Phase 1 report on its findings, entitled "Financial Market Incentives for Environmental Management Systems" http://www.epa.gov/ems/docs/resources/FinalFinancialIncentivesforEMS%203-07.pdf.

While this research was in progress, OPEI staff attended the August 2005 meeting of the Environmental Financial Advisory Board (EFAB) and requested the Board's assistance in identifying the financial advantages of EMSs. OPEI also asked the Board to provide recommendations to EPA on ways in which the market value of EMSs could be promoted. EFAB formed an EMS Workgroup (the Workgroup) to assist EPA.

Initially, the Workgroup had to assess whether the charge from EPA was feasible. Very few of the EFAB members knew what an EMS was, and those that did knew there were wide variations in EMSs. EPA itself did not establish specific requirements for EMSs, since it wanted to allow companies the maximum flexibility to implement a management system that worked for each company.

At the EFAB meeting in March 2006, the Workgroup considered options for addressing OPEI's requests. The Workgroup members recognized that an EMS as a standard suffered from definitional problems. First, in establishing a qualified EMS, each facility is given the latitude to establish its own goals. The main benefit of the EMS is to establish a mechanism to systematically evaluate those goals and assess the company's performance in attaining those goals. From a market standpoint, there is no specific endpoint that can be measured across companies or business segments. EMSs are used by the financial sector largely as an indicator of good management. Second, EMSs do not usually exist as a stand-alone system. A company that has an EMS will also have management systems for several other operational areas such as health and safety and product stewardship.

The Workgroup decided to look at three financial market sectors separately, equity, debt and insurance, and developed a couple of concepts to test in each sector: (1) what is the importance of measurable results; and (2) whether branding a form of EMS would assist the market sector in valuing environmental performance. In connection with the latter charge, a representative of EPA's *Energy Star* program talked to the Workgroup about the development of that program and the time it took for recognition by consumers in the marketplace.

At the August 2006 Board meeting, the Workgroup discussed some results of contacts with representatives of the equity and insurance markets, as well as contacts within

companies, and the on-going review of the available literature. The Workgroup also heard a presentation by a representative of the American Chemistry Council (ACC) on the discussions she had with certain sustainability indices in the equity market. ACC's *Responsible Care*® Program includes an EMS requirement that is consistent with EPA's EMS criteria for *Performance Track*. The ACC representative stated that an EMS is one of the factors that sustainability indices look at when evaluating the criteria for including companies on the index. ACC was working with the FTSE4Good Index, on the London Stock Exchange, to get recognition for its *Responsible Care*® Program and felt it was having some success.

The Workgroup decided to explore the possibility of setting up a workshop to get more formal feedback from the financial market sectors. As part of that effort, some potential questions were developed for a workshop and presented to the Workgroup at the March 2007 meeting. The Workgroup refined those questions and developed a format for a workshop consisting of three panels, one for each of the market segments: equity, debt and insurance.

In connection with preparation for the workshop, the chair of the Workgroup attended an EPA-sponsored dialogue among financial and corporate representatives. Some important conclusions from that dialogue are:

(1) the focus of the financial markets is on short-term performance while they perceive environmental performance to require a long-term focus, unless it is a sudden negative event;

(2) environmental metrics currently collected by EPA are not readily useful because the data are facility-based and the information is backward looking;

(3) other environmental reporting frameworks like the Global Reporting Initiative (GRI) are not as useful as they might be to mainstream investors; and

(4) this arena is changing due to climate concerns.

An excellent summary of the June 2007 workshop is attached for reference. Some of the key points made during the workshop include:

(1) Standardized and consistent reporting has value to a number of stakeholders;

(2) independent verification of the information reported is important;

(3) several participants mentioned the need for stronger EPA enforcement;

(4) the measurement and reporting on carbon footprints is already happening and is the kind of metric that the financial sector has found useful; and

(5) EPA should not speak for the market, but it could help to make data more transparent and understandable.

Further work on developing sensible metrics that can be used to measure a few leading indicators will take more work. Continued dialogues among regulators, the regulated community and market sector representatives would be helpful to identify metrics that add value.

Some Observations

1. The equity market is looking for endpoints, while an EMS is focused on process. The insurance market segment is interested in both endpoints and process. The banking sector is generally a follower as a market sector.

2. Financial analysts are often asked to make decisions on the financial value of a company with a significant environmental footprint in a short time span. Therefore, standardized metrics and transparent reporting are more helpful to financial analysts than information that requires value judgments.

3. Information currently being collected by EPA overall is not as helpful as it could be to financial analysts to assess business value. The information collected by EPA primarily relates to its role as a regulator rather than an assessor of environmental performance. In addition, EPA collects data by facility and investors need information on companies. Similarly, information from environmental reporting organizations like GRI has not been especially helpful to the mainstream financial community.

4. The one environmental issue that is getting traction in the financial markets is the emission of greenhouse gases and the measurement of carbon footprints.

Recommendations

1. EPA should take a leadership role in working with the financial sector and companies to better understand the relationship between EMSs, environmental performance and financial value. This will assist the financial industry to better understand the benefits of using environmental criteria in valuing individual firms and/or in determining actual risks that can be reflected in the appropriate cost of financing such firms.

2. EPA should work with companies and the three financial market segments already identified in developing environmental metrics or categories of data that would be of value to the financial markets, for both operational and legacy environmental concerns. This would give the financial markets better information for making more knowledgeable decisions on environmental risks and performance. The adoption of metrics can drive implementation of management systems in order to collect the information necessary for reporting the requested information. The reporting of such metrics could be on a voluntary basis; it does not need to be mandatory. The greater the interest of the financial sector in the metrics, the more likely that companies will implement systems to collect the information to report the metrics. The development

of key environmental metrics could provide enhanced methods of differentiating corporate environmental performance, which to date have been evaluated primarily on a qualitative basis.

3. If EPA decides to pursue this path, then it should make sure that the Steering Group identifies all the relevant information collection systems within the agency, including information that may reside in the regions, so that any new system considers all the information available within the agency.

4. The agency should consider contacting environmental regulators and organizations in Europe, Japan and Australia, which are geographical regions that have been identified as more advanced in collecting environmental performance information that is of interest to the financial markets. Examples of such information include energy use, water use and carbon footprints.

5. EPA should coordinate on the development and use of environmental metrics with other agencies, such as the Securities and Exchange Commission (SEC) and the Occupational Safety and Health Administration (OSHA), and State environmental regulators.

U. S. Environmental Protection Agency

Environmental Financial Advisory Board

Meeting Summary

The Use of Corporate Environmental Information in Financial Decisions

June 12, 2007 – Arlington, Virginia

Prepared by:
International Decision Strategies, Inc.
911 Duke St.
Alexandria, Va.

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United States Environmental Protection Agency
Environmental Financial Advisory Board

Meeting Summary
The Use of Corporate Environmental Information in Financial Decisions

June 12, 2007 – Arlington, Virginia

Welcome and Introductions

- Stan Meiburg, EFAB Designated Federal Official

Stan Meiburg opened the meeting and described the Environmental Financial Advisory Board (EFAB) and its purpose. Founded in 1989, EFAB is concerned with how to pay for environmental protection. Its initial work focused on state revolving funds to finance water and wastewater infrastructure, and has evolved since. Today's workshop started with an EPA request regarding Environmental Management Systems (EMS)—how can we make EMS more attractive to firms through financial incentives? Expanding this question, how do financial professionals use or not use environmental information to make decisions? He added that the EFAB is fortunate to have a distinguished panel at today's meeting.

He then introduced EFAB members in attendance. Rachel Deming has been a big help in bringing better understanding of financial assurance issues. Jim Gebhardt is a relatively new (two months) member, who is a Chief Financial Officer (CFO) and can help address matters related to socially responsible investment (SRI). Lindene Patton also is a relatively new member and can speak to insurance issues, while Helen Sahi can address the environmental banking perspective because she is a former President of the Environmental Bankers Association. The chair also thanked members of the EFAB Staff, Vanessa Bowie and Tim McProuty, for setting up the meeting.

Review of Questions Asked to Panels

- Rachel Deming, EFAB Member; Partner, Scarola Ellis LLP

Rachel Deming introduced the topics and questions for the meeting. She began by describing her own involvement with the EFAB, which started at a meeting in San Francisco at which she heard a presentation given by Shana Harbour of EPA; Ms. Deming then volunteered to chair an EFAB subcommittee focusing on EMS. Prior to her current employment, she worked at CIBA, a major European-based chemical company. While there, she became well grounded in the Responsible Care® program and developed a background in management systems.

In preparation for this meeting, she said she worked with EPA to refine the EFAB's charge, and break it into pieces to be better understood. She suggested that financial people do not frame their questions in the same way as EPA, and that getting all participants to fully understand one

another has been a challenge. She thanked fellow EFAB members Lindene Patton and Helen Sahi for help in recruiting participants for today's meeting.

On a more personal note, Ms. Deming said she had retired from CIBA earlier this year, and found herself needing to better understand her retirement assets; this coincided with hearing a presentation by Bruce Kahn (a panelist), which piqued her interest in the connections between investing and the environment. It is not her impression that people rarely ask about SRI funds or environmental issues, nor do others in the financial services industry generally promote or talk about environment or environmentally screened companies.

She then described the questions that EPA would like to have addressed by meeting panelists, and indicated that they had been refined several times. The questions are organized by topic and are as follows:

- To what degree do you consider environmental performance or environmental management information when assessing the financial strength of a company? Of a sector?

- If there is no (or minimal) consideration made for environmental performance/ management in fundamental analysis, why not? Is it a perceived lack of relevance? Is environmental performance considered not material in relation to corporate fundamentals? Or, are the data to accurately measure the impact of environmental performance not reliable or not readily accessible to analysts?

- Are there environmental impacts/elements that you would like to see measured?

- Would branding something as Responsible Care one or more forms of EMS help?

- What role can EPA play to promote greater understanding, increased information exchange and generation, and use of environmental performance data that are more relevant, consistent, timely, and meaningful to capital market participants?

Corporate Environmental Information and the Financial Community—EPA Overview

- Charles W. Kent, Director, Office of Business and Community Innovations, Office of Policy, Economics and Innovation (OPEI)

Stanley Meiburg introduced Charles Kent, and noted that Mr. Kent had provided nearly 30 years of service to EPA in a variety of roles.

Mr. Kent opened his remarks by thanking Mr. Meiburg, and stated that he worked with him closely over the years and that the EFAB is fortunate to have his involvement. Mr. Kent continued by saying EPA is trying to learn about the financial sector and the relevance of this sector to decisions regarding environmental performance. EPA wishes to test the theory that better information would lead to better decisions, and serve as an incentive for better behavior

and performance. He stated that EPA's job is to find new ways to provide incentives to stimulate this improved behavior. He expressed appreciation for panelists' willingness to help EPA staff learn about the work of the financial markets, and to better ask questions of financial market participants.

He then provided some background on EPA's Steering Group and its work. The Group was formed and performed extensive research before going to the EFAB for further ideas and guidance. EPA seeks EFAB input on the extent to which EMSs provide useful information, but acknowledges that EMSs are not widely understood.

Mr. Kent described some of the key findings of the Group's early stage research, which include:

- There is a positive association between environmental performance and financial performance
- Intangible assets are an increasingly important determinant of company financial performance
- Equity markets do react to environmental events, both positive and negative
- Investors are only moderately aware of environmental issues, at best, but their interest is growing, and
- Investors have an interest in EMS as concept, but not as a specific tool; at best the presence or absence of an EMS serves as a proxy for effective environmental management and, more commonly, as a surrogate for good management generally.

Mr. Kent also described several significant trends that developed as the Group was conducting the initial phase of its work:

- Interest in environmental issues and performance is perceived by many to be increasing both in investment firms and in the companies in which they invest
- Disclosure requirements for public corporations have been strengthened significantly during the past two years—as a result, corporations have begun to disclose more information on environmental issues
- Institutional shareholders are increasingly asking for management action to define environmental/sustainability policies, actions, measurement, and reporting
- Due to concerns about climate change, major insurance companies are bringing renewed attention to environmental and sustainability issues
- A number of companies—including some of the largest companies in the world, like GE, are visibly seeking to turn environmental issues to their business advantage, and
- These trends will likely shape the interests and behaviors of financial sector participants relative to EMS and environmental issues in the coming years.

The Group has prepared and issued a report describing these findings, which has been delivered to all EFAB members. He also indicated that EPA had received some press coverage for its work, and had been invited to a Wall Street dialog with representatives of several financial firms.

Mr. Kent then described a dialog held in April with another group of financial market participants and corporate representatives. Findings from this dialog include:

- There is a fundamental disconnect between the short term orientation of the financial markets and the long term value created by most environmental investments
- Currently used environmental metrics are not useful to investors
- Major environmental reporting frameworks (e.g., Global Reporting Initiative—GRI) are not germane to investor concerns, and
- The "game" is, however, changing due to climate concerns.

He closed by thanking all participants.

Mr. Meiburg then recognized EFAB expert witness Sarah Diefendorf, who represents one of EPA's Environmental Finance Centers. He then asked panelists to each limit their remarks to about ten minutes and then opened the session to dialog.

Commercial Banking/Lending

- Helen Sahi, Past President, Environmental Bankers Association

Helen Sahi began her remarks by stating that the EFAB and EPA meeting organizers were unable to find a traditional banker to participate in today's meeting. She emphasized that today's large banks are now financial institutions offering a variety of services (equity, insurance), and not just "banks." She indicated that she and other EFAB members were able to find traditional risk managers, but no one was willing to come, for several reasons. One is that bankers felt that they did not sufficiently understand EMS to feel comfortable discussing the issue in an open forum. Also, because loan officers often hold relationships with customers for many years, environmental issues may be examined but generally may not be viewed as very important in relation to other issues.

Continuing, she said larger banks now use their own internal environmental experts to evaluate environmental issues. These experts are not risk managers or underwriters. Most of these positions came into being following release of the FDIC bulletin in 1992 stating that banks need to have an environmental policy appropriate to their size, and a person responsible for environmental issues. The bulletin did not, however, include any definitions. Over time, the internal environmental experts at a number of the larger banks founded the Environmental Bankers Association to provide a forum to discuss issues of common interest. Ms. Sahi said she has been involved since the early days of this organization. It remains small, with only about 60-80 banks as members. The larger institutions (30 or so) may have a small dedicated staff, but most other banks rely on consultants to address environmental issues.

Given the principle business and risk exposure of banks, the focus was and continues to be on real estate transactions, with little attention paid to EMS. Most large institutions hire outside scientists and other experts to handle (i.e., clean up and sell) foreclosed real estate. Work on other environmental issues, when it occurs, is driven by the business lines. Many institutions with customers in the chemical sector tend to examine company financial statements (i.e., Form 10(k)), and develop a deep understanding of their customers, their product offerings, and the information they are providing to their customers (e.g., Responsible Care, EMS). She believes

few banks have looked at larger issues, and those that do often use outside legal counsel to investigate.

That said, major institutions are now saying that the environment is a major issue and are making substantial commitments in this area (e.g., $20 billion by Bank of America). Many, however, have not specified or may not know in what manner these funds will ultimately be spent. One emerging area is a growing interest in Leadership in Energy and Environmental Design (LEED) certification of buildings. This point of focus seems natural given the heavy real estate orientation of most banks. One promising idea is to try to measure productivity changes from green building, though this thinking is in its formative stages.

On the issue of reporting, many financial institutions use or follow the Global Reporting Initiative, and report on their own internal processes (e.g., paper, water, energy consumption). Some are starting to think about EMSs, for reasons of scale if nothing else. Ms. Sahi illustrated her point by stating that Bank of America, uses the equivalent of two sheets of every ream of paper sold in the U.S., and occupies more office space than is available in the City of Chicago.

She closed by saying that Bank of America is focusing on the costs of mail, internal operations, and other opportunities for improvement. She believes that the banks are getting there, but will need more time and working experience to fully understand EMS. She also feels that banks need to complete their internal (environmental) efforts before looking at other organizations (e.g., prospective customers).

Ms. Patton asked whether bank lending has any parallels with insurance underwriting, and why banks are so focused on real estate. More specifically, what are the remaining concerns if things go bad, and what can make them go bad?

Ms. Sahi responded that real estate is often the security for the loan or the lender's last resort. What this means at a practical level is that if a customer has one piece of property, the bank will focus on legacy contamination using a site assessment. If, however, the borrower has a portfolio of properties, performing environmental site assessments (ESAs) may not be feasible; this might instead be a good point of application for an EMS. In lieu of performing site assessments on a sizeable portfolio, a bank might examine who is responsible for environmental issues, or establish escrows or buy insurance to mitigate risk. The key question is, "What steps or tactics can be used to produce an informed, forward-looking assessment?"

Wilhelm Wang, a member of the public who certifies EMSs, asked about EPA support of small and medium-sized enterprises (SMEs), stating the presumption that EPA is promoting a systems approach when working with these businesses. He asked whether there were any signs of operating risks being evaluated with an EMS.

Ms. Sahi responded that the burden is on the customer to show the value of a management practice, whether it is EMS or something else. She added that legacy (contamination) issues could be managed with an EMS, and that banks might change loan rates or terms based on its perceived strength.

Panelist, Paul Scian, asked whether in evaluating a single property versus a portfolio there is a "tipping point" e.g., 12 properties, at which one would look for systems instead of performing ESAs at all sites.

Ms. Sahi responded this varies by bank; some will do ESAs at 40-60 properties while others will go earlier to an EMS to save time and capture a deal. Timeliness is very important because bank lending is very competitive.

Ms. Patton noted that in the banking industry, environmental experts came into the business from the outside in the 1980s. She asked whether people are looking at operational versus legacy issues, and if so, what is the split between these perspectives?

Ms. Sahi responded that operational issues usually are handled internally, while consultants are retained to handle legacy issues.

Mr. Meiburg asked whether banks offer lower rates for good environmental performers.

Ms. Sahi responded there are no established metrics to prove lower lending risk for such companies, and that EPA could help provide these metrics.

Mr. Kent asked whether environmental performance is viewed as material; he noted that some say it's of tertiary importance.

Another panelist, Peter Meyer, asked whether environmental performance affects the terms and conditions attached to a loan.

Ms. Sahi responded that revised terms and conditions are being looked at, but are not used currently. She added that activity in this area is being driven by announcements concerning greening and a corresponding need to "walk the talk." She believes the current view of materiality will change, and that the need for maintaining a reputation as a sound environmental performer is growing in importance. New scrutiny being applied to lenders; stakeholders are now focusing on who is receiving loans from whom. Bank marketing departments are now measuring and reacting to positive and negative media coverage in this regard.

Ms. Patton concurred that in her industry, marketers also are trying to quantify these issues. And a number of people are now quantifying the value of green offerings for consumer products, though not much is being done concerning commercial products or services. She added that historically, materiality always focused on the security issue, so unless an EMS can substitute for collateral (security) it would not be considered material. Unless you can reduce costs (security), EMS and other environmental improvements are not likely to be considered material.

Ms. Sahi, acknowledging these comments, said things are changing by the week. People are looking more at the company level and at behavior as well as more traditional, tangible endpoints. There seems to be a belief that doing so will enhance a bank's marketing capabilities.

Another EFAB member, Jim Gebhardt, said that in a collateral-based (e.g., real estate) context, financial value is the key question, and in that situation, EMS has a very marginal impact. He added that EMS has some traction, but will not save you if your balance sheet does not hold up. There is a continuum of relevance here, and EMS is most valuable in an equity context.

Panel 1: Credit Analysis and Equity Investment

- Kyle Loughlin, Managing Director, Corporate and Government Services, Standard & Poors
- Bruce Kahn, Investment Management Consultant, Smith Barney
- Sonia Wildash, Senior Research Analyst, EIRIS – Ethical Investment Research Services
- Michelle Smith, Director, Environmental Health and Safety Development, Rohm and Haas Company

Mr. Meiburg initiated this session by stating that EMS may mean different things to different people, and that in this session we would likely hear a range of views.

The first panelist, Bruce Kahn, began by describing his role in the equity markets. He manages the SRI practice for a variety of investors. In his work, he looks at all investments while accounting for environmental, social and governance (ESG) issues and conducts due diligence research on these issues. In response to a topic raised in the earlier discussion, he assumes that these issues are material. His firm does not perform exclusionary screening of prospective investments, but instead practices "responsible" investment.

Mr. Kahn responded to EPA's question one, by saying yes, I do look at environmental issues when evaluating companies, as I believe that these issues are material to equity pricing. Translating EMS to balance sheet information is, however, a big challenge and a gap that has yet to be spanned.

His analysis involves integrating separate (i.e., project-level) analyses done by individual analysts using a variety of techniques (e.g., ratio analysis, discounted cash flows, profit impact relative to cost of capital, option pricing), then rolling up all of the initiatives for the company. This is a labor-intensive approach and is very expensive.

Regarding EPA's second question, Mr. Kahn said the problem is that one cannot capture all of the relevant facts with which to evaluate environmental management quality or performance. The data are not that available or reliable, and there is too much required granularity across multiple business lines.

With respect to metrics, he examines greenhouse gas (GHG) emissions and risk as well as other fundamentals, such as waste, water use, etc. These more traditional indicators are, however, being eclipsed by global warming concerns.

On question 3, Mr. Kahn said he thought branding might be helpful. At present, some of the existing extra-financial researchers look at company EMSs, though usually as a binary (yes/no) consideration. Having a brand associated with certification is important.

Finally, he believes EPA could play a useful role by fostering EMS standards and/or processes. EPA already has an abundance of data, and there are huge amounts of data available in journals, dissertations and other sources. The key question is how to get this information into the capital markets. In terms of any new data requirements, he believes there would be value in looking first at the ultimate endpoints, i.e., the condition of the environment, and then tracking any substandard conditions back to company behavior and its association impacts. EPA also can reach out to other agencies and collect, organize and analyze data held by these organizations.

The next panelist, Kyle Loughlin, began by describing his function, which is to evaluate waste management companies from the standpoint of default risk; he manages a team of ten people, and collectively, they determine the debt ratings of 130 companies in the United States.

To them, the key issues are default risk and the likelihood of loss given a default. They do use environmental information, but its importance varies. They treat environmental and asset retirement obligations in similar fashion to debt, and look at a range of indicators. Environment is not a key factor, except in certain cases. To develop the pertinent facts, they rely on financial statements and accompanying notes and other Securities and Exchange Commission (SEC) filings.

Mr. Loughlin's firm conducts approximately 100 meetings with company management teams over the course of a typical year. These often happen during "road show" events hosted by companies seeking additional financing. In his experience, it is a very rare company that will talk about environmental risks or systems in the absence of questions from analysts. Finally, in his view, existing disclosures usually are sufficient regarding liabilities and their cash flow impacts. In cases in which they may not be or impacts are potentially significant, he and his colleagues drill down further, asking additional, more specific questions.

Mr. Loughlin then provided a few examples of how environment can affect the ratings assigned to a company or otherwise intersect with financial markets:

- Some notes now provide ranges of and time frames for addressing contingent liabilities; often an environmental adjustment is notable but not a major rating factor, though sometimes it is.
- Adjustments may be made in financial models to account for environmental liabilities, along with many other issues; this may result in adjustments to conventional financial ratios.
- Default risk may be affected by environmental issues, in particular by required capital outlays, bonding/letters of credit, and other financial obligations that affect liquidity as well as by contingent or even perceptual risks.
- Similarly, phase-out of a product, particularly an important one, can affect a company's cash flow and, therefore, its risk of default.

Mr. Loughlin next described how his firm addresses the risk of loss for all companies that are rated "speculative," or below investment grade. This is done by conducting a recovery analysis, which involves simulating a path to default, then forecasting a revised cash-flow-at-default estimate. Debt and non-debt claims are evaluated, along with a distribution of the projected value of the firm. The end result is a recovery rating. Environmental claims and risks must be included in these analyses, but they rarely are important, because the typical time frame of analysis is less than five years.

Mr. Kahn asked whether the ratings evaluation considers only legal liability and compliance issues.

Mr. Loughlin responded it did, not least because the entire analysis is conducted within about a two-week time frame. This is because the road shows are performed to raise capital and to make deals quickly. Accordingly, the focus is on default risk over the intermediate term.

The next panelist, Michelle Smith, represents a major multi-national chemical company. She is responsible for the company's EHS (environment, health and safety) & Sustainability Report, which includes a detailed description of its EMS, among many other items.

The company serves the electronics, paint and coatings, household, personal care and industrial segments, and has little direct exposure to consumers. Ms. Smith believes her company's products can yield environmental benefits, an issue they will be looking at more closely in the future. Energy, health care and water are specific new areas for potential expansion.

The company is now looking at its supply chain, especially high risk areas such as waste management.

Regarding environmental performance, she suggested language may be an important barrier to effectively communicating what is in a sustainability report as well as the meaning of particular results. In her experience, investors may not be familiar with environmental issues and their relevance to business results, so better communication will be important to raising awareness.

With respect to EPA's question on branding, she believes that in the case of the American Chemistry Council (ACC)'s Responsible Care program, branding has been valuable.

Ms. Smith suggested that EPA play a role in defining what the important leading and lagging indicators should be, and put some sustained scientific horsepower behind filling this need.

The final panelist of this session, Sonia Wildash, explained that she is employed by a company that performs sustainability ratings of companies, and that she had formerly worked as a mainstream investor. She described the typical SRI understanding of environmental issues—there is a relatively large upfront cost associated with making environmental improvements, but these investments lead to savings, and essentially, a sustainability "sweet spot" through creating less volatile companies that make better long-term investments.

In contrast, she characterized the mainstream investor perspective as: if a company is not breaking the law, environmental issues are of no interest. More generally, she believes the market does not put a price on environmental benefits from existing and new corporate behavior, but does punish disappointments.

Environmental information must be easy to find or it will not be used. In cases in which such information is found, it usually has not been independently audited, so investors may be suspicious of its reliability. Ms. Wildash noted there is no global standard for environmental reports, which tend to be full of photos of children and fluffy text rather than data that are of interest to investors. In her view, lack of time is a frequent excuse of corporate representatives for not providing more extensive environmental information. Also, meetings with corporate management tend to be short and are not focused on the environment.

Ms. Wildash believes ESG issues and their importance must be introduced in investor training programs early on and not left to personal interest or random chance.

As far as useful indicators are concerned, she would like to have a single number or index with which to compare companies.

She also spoke to the perceived lack of materiality of environmental issues by saying that they are not viewed as important until it is too late to prevent a rare but profound occurrence; because such incidents are rare, time is better spent focused on other issues. In her view, a catalyst is needed to break the circular logic that inhibits consideration of environmental issues by investors. A virtuous circle could be created if the market started to differentiate between companies on environmental issues. As an example, the position of the sell-side appears to be changing in Europe. Sell-side analysts are influential. In the U.S. they are notably unconcerned about environmental issues.

Regarding branding, Ms. Wildash thought such efforts would not be especially helpful; only 15 percent of companies have one-third or more of their locations certified to the ISO 14001 standard in the U.S. as opposed to 50 percent in Japan. She believes it would be much more fruitful to focus on getting more companies to comply with existing regulatory and other standards, rather than further "raising the bar."

As to the question of what EPA can do, Ms. Wildash suggested developing a framework for public reporting of environmental performance and, perhaps, making it compulsory. EPA also could define key issues and metrics, and time frames for attainment. She also suggested there be a legal requirement for audits of publicly reported environmental information. She also called for a means to ensure board-level responsibility for environmental performance. As partial justification for this, she noted that American companies have had more trouble staying in the sustainable company indices than their European counterparts.

As examples of possible approaches to consider, she said the UK government has promoted companies displaying leadership behavior. In Japan, the Ministry of Environment has facilitated many stakeholder consultations, leading to a number of performance improvements. For example, 40 percent of companies now have independent environmental reviews and 80 percent

disclose their internal environmental accounting standards. EPA could help U.S. companies emulate these behaviors.

Ms. Wildash closed her remarks by thanking EPA for inviting her and stating that panels like this are valuable.

Ms. Patton said there seems to be consensus that there is a lack of good indicators relating environmental performance to financial issues, and asked where one should start in producing standards for use by the financial markets. As an example, how do you move from proprietary models for greenhouse gas (GHG) emission risks to generally accepted rules?

Ms. Wildash said her firm uses several management and performance indicators when evaluating GHG and other environmental dimensions of a company. They provide the environmental analysis for the FTSE4GOOD index. She would like all of this information to be publicly disclosed, e.g., on company web sites and/or in Form 10(k)'s.

Mr. Kahn also responded to the question by saying that the ESG world has no standard, so EPA has an opportunity to establish some kind of new standard or approach. He concurred that all existing players are competing with their own individual proprietary methods. He added that all financial analysis is an art, so evaluating ESG issues is not fundamentally different than assessing other aspects of company performance. He said EPA should help establish a credible, scientific standard for environmental measurement and reporting.

Ms. Wildash noted there is need for an analog to Generally Accepted Accounting Principles (GAAP) for mainstream financial information, as analysts and investors want to spend time analyzing information rather than finding it. Ms. Smith added that metrics across businesses can swing considerably, and their interpretation is part of the "art" of investment analysis. She urged EPA to be careful in crafting any standards, especially if they are rigid or uniform.

Ms. Deming asked what we might learn from the experience of Europe and Japan in this area.

Ms. Wildash said the focus currently in evaluating EMS is its presence or absence in companies. Rather than focusing on more nuanced evaluation of EMS quality, she advocated the promotion of more certification of EMSs in the U.S. and getting information on this out to the financial markets.

Ms. Patton said she thought self certification of EMSs is of questionable value. Ms. Smith responded that, in her view, EMS is best applied in concert with other improvements, but has added value to her firm in a variety of ways.

Mr. Loughlin returned to the issue of branding, saying it is not likely to be critical; instead, consistency in reporting is much more important. He added that anything EPA could do to bring consistency would be helpful, as there is little uniformity in the ways that environmental risks, management processes, methods, ranges of estimates and time frames are addressed and described by companies, even those with EMS.

Ms. Patton asked about the emphasis between legacy and forward-looking issues in terms of getting new standards developed. She suggested legacy issues are very controversial in this regard.

Mr. Kahn said an EMS is not a trivial matter, as many companies use them as a management tool. He also questioned whether branding might be used by some companies to "game" the system. He thought EPA needs to get the SEC involved with this. Existing regulations require disclosure, but the government is behind the curve in understanding that companies have appropriated environmental services while creating significant externalities and social burdens. He believes accounting for these environmental services (externalities) will be increasingly important in the future. EMS, he believes, can help illuminate these issues.

Mr. Meiburg saw two possible opportunities. One is for the SEC to step up and play a more active role in promoting more full disclosure; the other is to equip financial analysts with the background information and questions needed to conduct meaningful company level analysis of environmental issues.

Regarding metrics, Ms. Deming said the Responsible Care program is developing new metrics that will address many stakeholder interests, including GHG. She asked whether these will be of value to investors.

Mr. Meyer asked whether the desired environmental reporting does or will consider secondary impacts (e.g., employee travel), or whether that would produce an "envelope" that is too large.

Ms. Sahi responded that in the case of her company, it would indeed consider secondary impacts.

Mr. Gebhardt suggested that ecosystem services might be beyond the context or reach of EMS. He believes that a whole new paradigm may be needed, the costs of which may be significant.

Mr. Kahn agreed, saying this conversation has gone further than the original focus of the meeting. He would like to be able to measure impacts rather than natural conditions first, so that he can determine the better steward of natural resources among different companies.

Ms. Diefendorf said her state government (California) seems to be very interested in greening companies and in green chemistry and asked, to what degree should government force environmental performance when the financial sector doesn't act?

Ms. Wildash responded that some of the large public pension funds (e.g., the California Public Employees Retirement System (CalPERS) have been important in pushing this debate. She believes their large size creates influence and noted that, in addition to CALPERS, the pension funds of Connecticut, Vermont and New York also have been active.

Ms. Smith said consumers are the driver of innovation and whatever can influence them is the shortest path.

EPA representative, Dale Ruhter, returned to the issue of the SEC and legacy costs, asking, to what degree has the financial community gone to the SEC with the concerns voiced here?

Mr. Loughlin responded he knew of no specific examples of lobbying for action.

Mr. Kahn said the group, Friends of the Earth, has lobbied the SEC and members of the environmental media (e.g., CSR wire) have reported on these discussions. He also noted the U.S. Supreme Court had very recently ruled that companies may be held responsible for climate change risk.

Finally, Ms. Smith said she would be open to using other environmental metrics, but emphasized that voluntary approaches are preferable to new mandates. She also noted that issues of confidentiality may be important in certain cases, as these may limit which issues a particular corporation can report on.

Panel 2: Insurance

- Susan M. Vetter, Vice President, Environmental Services Group, AON Risk Services, Inc. of New York
- Laurie Rudolph, Senior Risk Engineering Consultant, Zurich NA
- Paul Scian, AIG Consultants
- Dr. Peter Meyer, Director, Center for Environmental Policy and Management, University of Louisville

The first panelist, Susan Vetter, began her remarks by saying her firm helps clients with risk management overall, an approach that includes not just insurance but other products and methods that take into account a particular client's appetite for risk. She also related her own professional experience, which began with another carrier, where she became involved in all types of insurance. Her perspective on the environment reflects the industry's history, in which products and services initially had a casualty focus, which then evolved to a financial-risk management perspective. This perspective is reflected in current environmental insurance products, which remain a "discretionary buy" for many companies.

She then described the major types of environmental insurance that currently are available:

- Site specific, e.g., pollution legal liability
- Environmental services
- Cost cap

Underwriters evaluate risks under each, based on warranted information (applications signed by a director). Issues of interest to underwriters include reportable releases, Phase II environmental site assessment results, and the like. In an acquisition (due diligence) context, information on permits, consent decrees, "no further action" letters, closed UST reports and waste management vendors all would be of interest. In addition, real estate liability underwriters now often require spill plans and other evidence of a proactive approach to controlling site-related risks. Moreover, typical insurance products automatically exclude known conditions, so having public

information on site characteristics is very important. In fact, the most useful information to an underwriter relates to site conditions.

While not required, EMSs would be embraced by underwriters, as they provide a source of information on environmental conditions as well as some assurance that environmental risks are being controlled. In other words, EMSs can help carriers make informed business decisions.

Underwriters would value an easily accessible way to access information on a site or operations; in this regard, an EMS could be of interest. The effect would be an increasing level of comfort by an underwriter with a particular site or company; greater underwriter comfort level leads to better insurance policy rates and terms.

Ms. Vetter also stated that a partnership results once risk issues are fully identified, i.e., the insured and insurer tend to work together on an ongoing basis to resolve and control the identified risks. Because an EMS can serve to store and manage risk-related information and increase an underwriter's level of comfort that relevant issues have been identified and controlled, it could help to produce financial benefits for a company.

Despite its potential value, EMS still has yet to fully demonstrate that it provides quantifiable risk reductions. When companies can show the long-term cost effectiveness of their EMS, they will then be offered the best terms and conditions.

Ms. Vetter concluded by saying she would like to see an EMS requirement, and observed that many companies are integrating other issues, such as health and safety, into their environmental programs. She believes that insurance underwriters will increasingly want to work with such forward-looking companies in the future.

The second panelist, Paul Scian, began his remarks by stating that he served as a consultant, or in-house service provider to his employer, a major insurance carrier. His firm's work is mainly transaction driven; in that context, the key question is, what could go wrong?

Mr. Scian's area of special expertise is the costs of complex environmental site remediation. In his work, his role is to pose "impolite" questions of a prospective insured, to bring to the surface important risk-related issues. While he does not decide to offer or not offer coverage, unconvincing answers to his questions may result in notes to the file, which in some cases might put future claims at risk. This would occur if the insured did not fully disclose pre-existing site conditions, for example.

Mr. Scian stated that in a sound insurance underwriting transaction, all parties should win.

He then turned his attention to the four questions posed by EPA.

In response to the first, Mr. Scian said he evaluates environmental information every day. In talking with prospective insured parties, he conducts telephone dialogs and completes a checklist while doing so. The absence of a complete or convincing answer to a question raises "red flags," causing him to probe more deeply into the issue.

He emphasized no insurer wants to inadvertently underwrite a known condition and so he questions company representatives closely. On the other hand, assessment and underwriting are usually conducted very quickly—a two-week window at most. This can result in a "war of paper," in which it can be a struggle to find and adequately review what may be a large assortment of site-related documentation that addresses conditions over a period of years.

Mr. Scian said risks can be segmented (e.g., legacy known vs. unknown, on-going), and can be covered in various ways by insurance policies. Because underwriters make business decisions, coverage may be offered even if risks are identified, though higher risks result in higher premiums, more stringent conditions, and/or more limited scope of coverage. Because all of these variables are in flux for any given underwriting situation, he and his peers are accustomed to dealing with ambiguity.

With regard to the relationship of environment to corporate fundamentals, Mr. Scian asked, what is material? This judgment is somewhat situational and arbitrary. For example, he said, a $5 million liability may be material in one situation and inconsequential in another. In practice, insurers strike a balance among many factors.

He also commented on emerging financial accounting and reporting requirements, stating that the Financial Accounting and Standards Board (FASB) doesn't necessarily require disclosure of potential contamination if investigations are ongoing. Sarbanes-Oxley may change this behavior, however. He believes that, as a result, there will be lots of "new" sites and related liabilities announced in the future. He also felt that more data is preferable to less, but suggested that it is important to know when to make the decision with the available data rather than continue to seek new information.

Mr. Scian also offered an opinion on the question of branding, with respect to ISO 14001 EMSs as well as other variants on the EMS concept. He believes that EPA should focus on getting more attainment of well-functioning EMSs, rather than setting the bar higher.

Mr. Scian also said EPA could play a valuable role in developing/promoting some common quantitative metrics (e.g., energy/unit) that could be used across a wide variety of companies and industries. Teasing out some of the data currently subsumed in the balance sheet and income statement would enable better industry-wide comparisons.

The third panelist, Laurie Rudolph, described her main responsibility as risk assessment. She also emphasized that pollution insurance and related products are not mandatory. There is substantial negotiation in establishing coverage and rates and considerable variability in the terms, conditions and scope of individual policies.

She said she has not observed any direct relationship between the presence of an EMS and lower insurance costs. In her view, interest in environmental issues and EMS varies by insurer and depends upon individual appetite for risk.

She did suggest that in the context of her work—trying to assess what could go wrong—the aspects analysis of an EMS could be very useful. She further thought that it would be helpful if

EPA could in some way assist with the quantification of risk and exposures for benchmarking and cross-company comparisons. From an insurer's perspective, EMS is most useful for its ability to control or minimize risks and demonstrate and document that effective controls are in place.

In Ms. Rudolph's view, EMSs are often written well, but the key is quality of implementation. Insurers would look to a well-implemented EMS to formulate and track action on risk reduction recommendations and might modify coverages, terms and rates accordingly.

With respect to EPA's question about branding, Ms. Rudolph does not believe that it would be likely to be appealing. In her view, ISO 14001 certification of an EMS is not meaningful, because registration has been market (customer) driven, rather than stimulated by a desire to truly improve performance (e.g., risk reduction). Accordingly, it is not clear that registered EMSs are any better than non-registered management systems. She does believe that having some form of management system will make companies more desirable to insurance underwriters.

The fourth panelist, Peter Meyer, began his remarks by reviewing some features of environmental insurance policies and contrasted them with other types of insurance products.

He stressed that environmental insurance policies are "surplus" or "admitted" rather than "admitted" insurance lines. This means that they are not standardized, and may (and do) vary considerably from state to state. Coverage may or may not be available in a given location, as there is no pool of insurers to guarantee access to coverage as there typically is for admitted insurance lines (e.g., homeowners, auto insurance).

Also, insurers are not regulated at the federal level, though they may (or may not) be regulated in individual states. He suggested the discretionary nature of environmental policies may inhibit more extensive environmental disclosure, particularly by poorly performing companies.

He also suggested the risk appetite for underwriting may vary over time within the same company. Indeed, such changes may occur from month to month as the characteristics of the firm's portfolio evolve, as well as in response to more general market conditions.

Another important factor, in Mr. Meyer's view, is that the "industry" offering environmental insurance products is narrow enough to pose problems when thinking about standardization.

Also, as these products are "surplus" or non-standardized lines, meaning each policy is individually tailored and negotiated, there can be an important lack of clarity regarding the utility of EMS to identify and control risks and, by extension, influence insurance policy rates and terms. That said, he believes having an EMS may lead to some negotiating room for an insured. For example, a company may receive fewer exclusions from policy coverage.

With regard to influencing insurance coverage for ongoing operations, Mr. Meyer said EPA should be careful about mandating EMS requirements. He believes it is important to avoid

creating redundant information. On the other hand, getting more information reported should lead to self-correcting behavior and improved environmental performance.

Looking toward the future, Mr. Meyer concluded that if an EMS standard to satisfy everyone could be developed and adopted, it might help in someday getting environmental insurance products standardized and admitted as insurance lines. Indeed, if the relationship between EMS and the process of risk transfer that is provided by insurance were to be fully defined, he suggested in the long term, EMS might even take the place of insurance in some cases.

In response to this statement, Ms. Patton said that while not required now or (probably) in the future, companies would likely continue to need environmental insurance, and offered an analogy to automobile insurance. She also asked how EMSs or their components affect underwriters of "core" insurance coverages (e.g., property, workers comp).

Ms. Rudolph responded that workers' compensation, property coverage and general liability coverages may be affected by a good management system. These systems may reduce the risk of serious illness or injury in an insured company's operations and make them more attractive to the insurer.

Ms. Vetter said having a plan is better than not having one, even if it is not implemented perfectly. She added that many factors do intermingle in designing coverages, e.g., employee driving records. In that respect, the management system can help to delineate, or clarify, the relationships between the company and the employee, as well as between the company and insurer. In some respects, a company demonstrates that it is investing in its own future by going through this process. In assisting a company in developing plans, underwriters often ask for information on general liability losses; these show the effects of prior investments as well as company cultural aspects.

Ms. Deming then asked the panelists whether the applications used by different carriers pose the same questions.

Ms. Vetter responded they did. Because the information solicited by the form is warranted, it tends to be the same, though carriers all have their own application form that must be completed. In terms of differences between environmental coverages and more general business insurance (e.g., CGL), applications for both will require a description of operations, revenues, employee counts and the like, but as discussed previously, forms for environmental coverages also require information on (and from) ESAs and other relevant site data.

Ms. Rudolph added that for coverages addressing ongoing operations, underwriters also will want to know what the company has done to mitigate risks. It is important to understand, however, that all underwriters have their own particular concerns, and that policy underwriting remains both art and science in practice.

Ms. Deming then asked whether there were typically gaps in the information reported to the underwriter.

Mr. Scian said gaps always exist at a particular site.

Ms. Patten asked about legacy exposure and EMS.
Ms. Rudolph said, in her view EMS is focused on the present and future. To address legacy issues, she generally relies on ESAs and other site-specific documentation. She added, there are good mechanisms available to manage site assessment data.

Mr. Scian observed that EMSs have been in place for many years in some companies, and the "history" of such systems can be important, in that reviewing the company's experience can reveal important insights into its attitudes, behaviors and responses to new information. Ms. Rudolph added, EMS history shows something about the culture of the host organization.

Mr. Meyer indicated that "legacy" includes current off-site disposal of wastes, so if an EMS tracks waste disposal sites, it may provide a bridge to legacy issues.

Ms. Diefendorf said, in California there is a third-party certification program that recognizes companies that achieve compliance and beyond, i.e., a "green company" certification. She added that, in her view, some certified companies might invite review of their past history, but only if it is solid. She then asked the panelists whether such a certification might serve as basis for an insurance rate reduction.

Ms. Vetter responded it would. She said credits are available to underwriters that might be used to account for this, and insurers are most interested in companies that can show evidence of effective risk management.

EFAB Workgroup/EPA Office of Policy, Economics and Innovation Follow-up Discussion

Mr. Meiburg shared a few observations and posed some questions to begin this session.

He outlined some of the differences among sectors and between the operational and legacy perspectives when considering environmental risks. He also was struck by the degree of commonality between EPA and financial sector with respect to the information that is of interest in an environmental system, performance and risk context. He asked how these commonalities could be harnessed for the mutual benefit of all.

He then asked about a prominent EPA database that is intended to provide the types of information that should be of interest to meeting participants, the Enforcement and Compliance History Online (ECHO) database. He asked whether anyone uses it.

He closed by saying that EFAB has focused on insurance as a financial assurance mechanism. He has heard, however, many complaints from state regulators regarding insurance industry behavior, and asked, somewhat facetiously, whether insurance companies ever pay on claims made on policies used for financial assurance purposes.

To add some perspective to the discussion, Mr. Kent reviewed some of what had been heard in the previous dialog. He said that Paul Portney (formerly with Resources for the Future and now with the University of Arizona) had said that most environmental information is incorporated already into market decisions, i.e., no further action is needed. Many others, however, still believe that new information is out there and being used for a variety of purposes. What is to be made of it?

He added, some also believe it is not EPA's business to define what is important (or not) regarding environmental performance. Instead, the market place should dictate what should be measured, communicated and considered by financial analysts.

He went on to say that EPA's OPEI is looking at EPA's information management functions, and observed that they could be improved. He asked the group, what does the Agency need to do differently? Is the information of interest really there?

He stated that much behavior change is based upon rules changing, which is now occurring in ways that are somewhat unclear. He believes some of the observed behavior change is occurring not based on data, but on new social expectations for improved environmental performance, or even sustainability, i.e., on intangibles. In such a context, environmental leadership may produce a first mover advantage.

Another EPA representative, Shana Harbour, recounted some of the discussions that EPA conducted with financial representatives over data. It is unclear at this point whether the data are there but are not used in the right way(s), or are not there and are hard to get at. While there is a lot of "buzz" around integration of environment into financial markets, it is not yet really happening in mainstream markets.

She asked the group how we can develop forward-looking metrics, where EPA's leverage points might be, how EPA can act as a catalyst, and what are appropriate roles for EPA and other parties.

Mr. Scian drew an analogy to the early days of the EPA underground storage tank program. This program started very simple, but became very complex over time. He added EPA should be careful about what it asks companies to do, and go with simple, basic metrics and build over time.

Ms. Smith suggested tying metrics to a goal, and asked, what are our national priorities (e.g., water quality, carbon footprint)? One should not have metrics for metrics' sake. She pointed out the emerging stakeholder expectation that environmental/sustainability performance reports should be global may pose some issues for EPA; as many will want global data that may not correspond to EPA's needs.

She added that, ideally, the marketplace would ensure that environmental issues are integrated into mainstream business practice and offered the analogy of the TQM/quality management movement as an example.

She noted that issues may evolve in the same direction on environment, with companies achieving accelerated progress on environmental impacts, quality, cost and other key determinants of value. She asked whether environmental performance is actually improving over time, and whether more environmental insurance is being purchased.

Ms. Vetter said that more companies are buying environmental insurance products, or at least looking at related issues, as well as improving their management of legacy issues. Leaders in the more sophisticated companies also are getting more comfortable with the management of these issues. Interestingly, chains of effect are kicking in, e.g., environmental insurance may be required to obtain a bank loan. In this type of market environment, clients will want to contribute to addressing risks and finding solutions.

Mr. Scian said growth in the environmental insurance business is slowing but still there; environmental coverages are now an accepted component of risk management. The recent high level of merger and acquisition (M&A) activity is fueling demand at present.

Ms. Patton said the environmental insurance market does not appear to be slowing down. She added that the industry covers many activities, from real estate to services, and each may be affected by different things. For example, there may be issues on the state level. Each competitor has a different profile.

Mr. Meyer said there is an important distinction between a claims-made versus current policy. This is important because the disclosure of some information can lead to a refusal to renew a policy. On a claims-made policy, the claim must precede the expiration of the policy to be honored by the insurer even when the insurer refuses to renew the policy. This means a bigger risk for the insured, which often has less power in the relationship than the insurer.

With respect to suitable environmental metrics (e.g., for water, energy use), he said all companies have data on expenses, so there would be no additional data required to report consumption of these endpoints. He also suggested it might be most appropriate to express such resource consumption data as a ratio of consumption to output. He asked whether such questions might be an appropriate focus for EPA.

He added that there are extensive data in state agencies regarding permit or other regulatory violations, and suggested perhaps EPA could form a clearinghouse in which to house and distribute these data.

Ms. Vetter asked whether the data of interest are really there. She believes a large portion is, but one would need to consider how much time should be invested in sifting through it. EPA has data, but it would be helpful if access could be made simpler. She added having good data is more important than a lot of data, so imposing additional reporting requirements may not get us to where we would like to be quickly. As an illustration from the insurance industry, she said environmental insurance applications are now typically two pages in length rather than seven.

Mr. Meiburg asked Mr. Kahn whether his evaluation of a particular company is time limited. Mr. Kahn responded that for a firm like Standard & Poors, the evaluation period is very time limited, although in other firms and contexts it might not be similarly constrained.

He spoke further to the short-term versus long-term orientation question. He noted that many environmental issues have a long time span (a decade or more). To address this problem, the analyst looks at company culture and the value creators that have been important during the past 18 months. He added that environmental investments are analogous to R&D investments, which are widely viewed as important determinants of long-term value creation potential.

Ms. Deming recounted the experience of her former (chemical) company in measuring energy and water consumption 18 years ago, and stated that doing so was very difficult. She said, however, that ratings firms liked metrics that went beyond the traditional ones, so her company realized some benefit in the longer term.

She noted that the American Chemistry Council, which represents many U.S. chemicals producers, has added some of these types of metrics to its Responsible Care program. These enhancements make the program more consistent globally as well as more satisfying to stakeholders.

In the current context, she suggested the group should first figure out which endpoints and metrics are helpful to the financial community before proceeding further, as there is a lot of variation in what is used and in what ways.

Ms. Rudolph suggested one needs to be careful to consider local climates and conditions when looking at metrics such as energy consumption. Geography (e.g., local climate) may be important, so it is important to not oversimplify.

Mr. Gebhardt pointed out this is a mis-assessment of the information and results in mis-pricing. Eventually, the marketplace will sort out the issue of what information is important; he expressed the view that EMS may be helpful in that regard.

Ms. Diefendorf said small and medium-sized enterprises (SMEs) would need help if information requirements became more extensive.

At this point, Mr. Meiburg posed two questions for participants to consider, and asked that each panelist respond to the one of their choice: 1) What is most important thing EPA can do to stimulate progress? and 2) What would you most like to ask one of the other panelists?

Mr. Kahn responded to the first question by stating that EPA should act as the enforcer of existing regulations and policies, as well as be a conduit for receiving information from other agencies, which should then be put into a concise, accessible database. Similarly, Mr. Scian said EPA should take the lead in developing, quantifying and enforcing key metrics.

Ms. Sahi asked whether the panelists had received much feedback on GRI and other environmental/sustainability performance reports. Mr. Scian asked Ms. Sahi what the most

useful environmental metric(s) is/are in executing a property transaction. She responded that data found within ESAs and similar documents that speak to risks are the key metrics; her role is to evaluate these risks and deliver her assessment to the lender, who prices the service accordingly.

Ms. Vetter indicated that she views EPA as an enforcer, adding that it can add value by making performance visible, as no entity wants to be non-compliant in the public eye. She expressed support for the idea that EPA should be a conduit for information.

Ms. Rudolph said people need to talk the same language, e.g., across sectors. Topics of interest here include defining what an EMS is, and industry-specific liability issues. She added that having some common goals across all sectors would be helpful.

A different perspective was provided by Ms. Smith, who encouraged EPA to "do what only you can do." She noted that a shift toward more proactive behavior over time has occurred in U.S. corporations. She suggested that EPA's activities might be able to help address potential major environmental and resource challenges, such as shortages of water and energy shortages. Ms. Smith added that industry is a customer for environmental performance information just as are financial markets. She expressed the hope that EPA could help to make these markets and underlying processes more efficient.

Ms. Wildash took a different tack endorsing (more) vigorous enforcement of existing regulations, as well as an expanded role for EPA in identifying key environmental metrics for investors, promoting standardization and inclusion of these metrics in company financial (e.g., 10(k)) reports.

Mr. Meyer emphasized that EPA can and should make state-level public data more available and accessible to people in other states and nationally.

Mr. Kahn inquired of the EFAB members and EPA representatives whether they have SRI funds available in their 401(k) or other retirement accounts. Mr. Kent responded that legislation has been introduced to allow SRI funds to be included in the federal government's thrift savings plan; this effort is being supported by EPA.

Mr. Kahn continued by stating that $2.1 trillion or one of twelve U.S. investment dollars, are being screened in some way, and pointed out that there has been enormous growth (2001-05) in demand for climate risk data. More assets are being placed with explicit reference to environmental and social issues, which to him suggests that perhaps this is a "buy" signal. This could reflect a continuing maturation of SRI as a discipline, or perhaps is simply more people "putting their money where their mouth is."

Mr. Gebhardt responded to these comments by saying that, to him, it seemed that, behavior increasingly is being driven by financial considerations, not traditional SRI screening criteria.

Public Comment

Michael Joiner, of Georgia Gulf, offered his view that environmental metrics need to be normalized, measured, and reported in real time, and as much as possible, leading rather than lagging indicators. He also expressed some frustration with the way in which EMS is defined and used within EPA; he said EMS is defined in at least seven different ways on EPA web sites, and called for a common operational definition. He would like to know where companies should invest their resources, considering that they are major consumers of environmental performance information just as are financial market participants.

Closing Comments and Next Steps

Ms. Deming stated that there will be a meeting of the EMS subgroup in San Francisco in August as part of a broader EFAB meeting. At this time, the subgroup will discuss options for further activity and action. She identified two common threads that emerged during today's discussion:

- Standardizing and normalizing information is important to a variety of stakeholders, and
- The process of reaching a widely accepted standard for measuring and reporting environmental information will be iterative.

In the near term, she would like to see the questions and criteria that are of interest to all parties compiled so that one can determine where there is overlap. She also wondered how much of the current "disconnect" between providers and users of environmental performance information is due to terminology or language differences. She also endorsed the idea that EPA can serve as a clearinghouse for state-level information.

Ms. Patton said that focusing on common threads in simple, valuable ways is a key step and favors maximizing the information value that can be aggregated into a few leading indicators or surrogates. She said existing indicators have limitations and their relevance varies by sector.

Mr. Gebhardt expressed the view that the market is moving in competitive mode regarding EMS, and returned to the question of the appropriate role for EPA. He believes EPA could help make data more transparent, and could offer useful expertise in defining and making sense of metrics that capture the essence of EMS, as well as testing candidate metrics in the marketplace. He emphasized, however, that EPA should not speak for the market, but rather enable market participants to make more informed decisions.

Ms. Sahi suggested possible efforts to educate and raise awareness more broadly. This might be done, for example, by providing training for financial analysts. She also highlighted campaigns being conducted in some states, e.g., New Hampshire's *EMS is Not Just for Big Businesses* effort, and more general outreach in schools.

Mr. Meiburg responded by stating that EMSs can work and add value to many enterprises, even small farms.

Mr. Kent expressed thanks to all participants, and described several new EPA information products. These include new energy use data by sector (found at www.EPA.gov/sectors), and the overall Sectors Program performance report. He indicated that both products provide performance data over a ten year time period. He added that EPA also is working on a product that would express TRI data adjusted for risk. He closed by saying that feedback on these products would be very helpful.

Mr. Meiburg expressed thanks to the panelists, noting the day's conversations were rich and will require time in which to reflect.

He stated that during the day the issue of legacy versus ongoing operations continued a pattern exhibited in previous dialogs, and seemed to be a useful distinction. He added that metrics, databases and indicators are all within the scope of the Environmental Information Exchange Network, which has a ten year life span and participation from all 50 states. He asked whether this network might have potential for use in the current context.

He observed further that branding did not seem to be viewed as very important by panelists, and that the suggested role(s) for EPA focusing on enforcement and related activities was interesting.

Mr. Kent noted EPA had not endorsed a specific EMS model or construct as yet, as the concept has room to grow. EPA wants to promote EMS as a tool, but not any particular variant. That said, he believes EMSs will help EPA and others to analyze sustainability questions, and further consideration of much more than traditional "within fence-line" issues and endpoints.

Mr. Meiburg closed the meeting with the comment that when the EFAB tried six years ago to gauge the level of interest in EMS as it related to water/wastewater treatment plant financing within the financial markets, there was little or no interest. Recent events and today's discussion show that change is in wind. The form that this change will take, however, has yet to be defined.

The meeting adjourned at 4:30 p.m.

Participants

EFAB Designated Federal Official

Stan Meiberg, National EPA Liaison to Centers for Disease Control and Prevention, National Center for Environmental Health/Agency for Toxic Substances and Disease Registry

EFAB Members

Rachel Deming, Partner, Scarola Ellis LLP
Jamed Gebhardt, Chief Financial Officer, New York State Environmental Facilities Corporation
Lindene E. Patton, Senior Vice President and Counsel, Zurich North America
Helen Sahi, Past President, Environmental Bankers Association

Business & Industry

Susan Briggum, Vice President for Federal Public Affairs, Waste Management, Inc.
Bruce Kahn, Investment Management Consultant, Smith Barney, Citigroup
Kyle Loughlin, Managing Director, Corporate and Government Services, Standard & Poors
Laurie Rudolph, Senior Risk Engineering Consultant, Zurich North America
Paul Scian, AIG Consultants
Susan M. Vetter, Vice President, Environmental Services Group, AON Risk Services, Inc. of New York
Michael Joiner, Georgia Gulf Corporation
Robert Kerr, Managing Director, Pure Strategies, Inc.
Ray Potter, Casals & Associates
Michelle Smith, Director, Environmental Health and Safety Development, Rohm and Haas Company
Peter Soyka, Soyka & Company, LLC
Tomaysa Sterling, American Chemistry Council
Chiara Trabucchi, Principal, Industrial Economics Incorporated
Wilhelm Wang, Lead EMS Auditor/Marketing Manager–Sustainability, BSI Management Systems, BSI-Global
Sonia Wildash, Senior Research Analyst, Ethical Investment Research Services

Academia

Dr. Peter Meyer, Director, Center for Environmental Policy and Management, Louisville University; EFAB Expert Consultant
Sarah Diefendorf, Director, Environmental Finance Center, Dominican University of California; EFAB Expert Consultant

Press

Colin Finan, Reporter, Inside EPA

U.S. Environmental Protection Agency

Nishkam Agarwal
Kathleen Bailey
Deb Berlin
Vanessa Bowie
Kevin Donovan
George Faison
Charles W. Kent
William Hansen
Shana Harbour
Richard Kashmanian
Sandra Keys
Dinah Koehler
Sarah Mazur
Timothy McProuty
Bhanna Patfl
Verena Radulovic
Dale Ruhter
Pamela Scott
Larry Zaragoza

U.S. Department of Energy

Myra Sinnott

Workshop Agenda

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL FINANCIAL ADVISORY BOARD (EFAB)

WORKSHOP ON THE USE OF ENVIRONMENTAL INFORMATION IN FINANCIAL DECISIONS

United States Environmental Protection Agency
One Potomac Yard
2777 S. Crystal Drive, 4th Floor Conference Center (S-4380)
Arlington, VA 22202-3553

AGENDA

June 12, 2007

TOPIC: The Agency and the Board seek to collect information and ideas with respect to how professionals in the areas of credit ratings, equity investment, commercial banking/lending, and insurance use or do not use a corporation's environmental information in their analyses.

Questions to be Addressed

(1) To what degree do you consider environmental performance or environmental management information when assessing the financial strength of a company or a sector?

(2) If there is no (or minimal) consideration made for environmental performance or management in fundamentals analysis, why not? Is it a perceived lack of relevance? Is environmental performance considered not material proportionate to corporate fundamentals? Or, are the data to accurately measure the impact of environmental performance unreliable, or not readily accessible, to analysts?

(3) Are there environmental impacts/elements that you would like to have measured?

(4) Would branding (e.g. Responsible Care) one or more forms of EMSs help?

(5) What role can EPA play to promote greater understanding and increased generation and use of environmental performance data that are more relevant, consistent, timely, and meaningful to capital market participants

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8:30 am **REGISTRATION**

9:00 am	**Welcome and Introductions** Stan Meiburg, EFAB Designated Federal Official, National EPA Liaison to CDC, NCEH/ATSDR Rachel Deming, EFAB Member, Partner, Scarola Ellis LLP
9:15 am	**Corporate Environmental Information and the Financial Community -- EPA Overview** Charles W. Kent, Director, Office of Business and Community Innovations, Office of Policy, Economics and Innovation (OPEI)
9:30 am	**Panel 1: Credit Analysis and Equity Investment** Kyle Loughlin, Managing Director, Corporate and Government Services, Standard & Poor's Bruce Kahn, Investment Management Consultant, Smith Barney, Citigroup Global Capital Markets Inc. Sonia Wildash, Senior Research Analyst, EIRIS – Ethical Investment Research Services Michelle Smith, Director, Environmental Health and Safety Development, Rohm and Haas Company
10:45 am	**BREAK**
11:00 am	**Speaker: Commercial Banking/Lending** Helen Sahi, Past President Environmental Bankers Association
12:00 – 1:30 pm	**LUNCH**
1:30 pm	**Panel 2: Insurance** Susan M. Vetter, Vice President Environmental Services Group, AON Risk Services, Inc. of New York Laurie Rudolph, Senior Risk Engineering Consultant, Zurich NA Paul Scian, AIG Consultants Dr. Peter Meyer, Director, Center for Environmental Policy and Management, Louisville University
2:45 pm	**BREAK**
3:00 pm	**EFAB Workgroup/EPA Office of Policy, Economics and Innovation**

Follow-up Discussion

4:00 pm **Public Comment**

4:30 pm **Meeting Close: Next Steps and Adjourn**

Rachel Deming, EFAB Member, Partner, Scarola Ellis LLP
Stan Meiburg, EFAB Designated Federal Official

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

JUL 8 2008

OFFICE OF POLICY,
ECONOMICS, AND INNOVATION

Mr. A. James Barnes
Professor of Public and Environmental Affairs
Adjunct Professor of Law
Indiana University
1315 E. 10th Street, Suite 418
Bloomington, Indiana 47405

Dear Mr. Barnes:

Thank you for providing the Environmental Protection Agency with the Environmental Financial Advisory Board's (EFAB) report on "Environmental Management Systems (EMSs) and the Use of Corporate Environmental Information by the Financial Community." The Administrator, Stephen L. Johnson, has asked me to respond directly to you about the Agency response to the report's findings and recommendations.

First, I want to thank the EFAB for taking on this complex and sometimes difficult subject. The relationship between corporate environmental performance and its financial performance is often an indirect relationship with many factors influencing corporate decision-making and corporate performance. We knew this was a complex task and we appreciate the EFAB exploring it with us. EFAB deliberations provided valuable information on the direct and indirect links between corporate environmental performance and their financial performance. We agree that there is increasing awareness of corporate environmental information and performance in many segments of the economy.

We accept and are taking steps to implement the recommendations in the EFAB report. The EFAB recommended that EPA take a leadership role in working with the financial sector and companies to better understand the relationship of EMS's, environmental performance and financial value. Consistent with this recommendation, EPA sponsored a dialogue with the financial community, on Thursday, June 19, 2008, to explore how to improve access to EPA's data bases. Over 75 people attended from the financial community. Many offered suggestions that are actionable through the Office of Environmental Information's (OEI) database access strategy which will be issued this Fall. During the Dialogue the financial community stressed that improved access to environmental data will improve its usefulness to the financial sector as well as to other stakeholder groups. My office will use the Agency-wide Financial Sector Working Group to continue to exploration of these issues with OEI and Region 2.

EPA appreciates the expertise and experience that the Board brings and values the insights it can provide. EPA looks forward to receiving the findings in response to the other questions presented to the Board.

Sincerely,

Susan Parker Bodine
Assistant Administrator

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

NOV 1 2007

Honorable Stephen L. Johnson
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Johnson:

The Environmental Financial Advisory Board (EFAB) was asked by the Office of Air and Radiation to review the SmartWay Transport program to determine if there were any innovative finance mechanisms that could be devised to make the program more attractive. This report is our response to this request.

We have realized that the SmartWay Transport program is only the beginning of the opportunities for financing small-source emissions reductions. There are millions of small stationary or mobile diesel engines which are either owned by small businesses or private individuals, and which could be either retrofitted or replaced in order to reduce emissions. Furthermore, we found that among the states there were almost no finance programs to deal with these matters.

We, therefore, recommend that the Agency embark on a major effort to encourage the states to create Air Quality Finance Agencies (AQFAs). We would like to make two observations about this recommendation.

First, the Agency is home to two of the most innovative environmental finance programs in the world: the almost $60 billion Clean Water State Revolving Fund and the $11+ billion Safe Drinking Water State Revolving Fund (the "SRFs"). These, however, are in the water sector. Apart from the limited application of CWSRF dollars to fund mitigation of atmospheric deposition that impacts water quality, there is nothing comparable in the air sector or in any individual state. We believe such programs could address a great need.

Second, because of the inherent nature of the financial transactions themselves, such programs should not be onerous at the state level. The State of Maryland, for example, estimates that the average annual borrowing from its SRFs is in the $8 million range. The average annual borrowing from a state AQFA is likely to be in the $40,000 range – an immense difference. Furthermore,

SRF borrowers are public; state AQFA borrowers will be private. This means that the capitalization requirements for state AQFAs will be relatively modest. There are resources within state governments, such as state departments of economic development, which are experienced in private sector lending.

For these reasons the Board does not believe that implementation of AQFAs would prove overly burdensome to the states. On this point, the Agency should consider discussing, with the Department of Transportation, whether allocations of a small portion of its private activity bonding authority to state AQFAs could be undertaken in compliance with the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users ("SAFETEA-LU") to enhance the value of such programs.

This recommendation offers an opportunity to use an innovative set of tools to address our nation's air pollution problems. The creation of state AQFAs would be a landmark beginning to such efforts; and we commend this concept to you and the Agency.

It is a pleasure to offer this recommendation to you. As always, if the Board may provide further information or assist on this or any other matter, we would be delighted to do so.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Designated Federal Official

Environmental Financial Advisory Board

EFAB

Report on Innovative Finance Programs for Air Pollution Reduction

November 2007

Printed on Recycled Paper

United States Environmental Protection Agency
Environmental Financial Advisory Board

Report on Innovative Finance Programs for Air Pollution Reduction

SUMMARY

The Environmental Financial Advisory Board (the "Board") was originally asked by the Office of Air and Radiation (OAR) to review the SmartWay retrofit program to determine if any innovative financing programs could be developed to spur sales of SmartWay kits and thus reduce the emissions of various oxides of nitrogen (collectively "NOx"), carbon dioxide (CO_2), and particulates that attend the various products comprising the kits.

The Board has identified several major innovations that will create significant market incentives not only for SmartWay Kits, but also for other programs that reduce air emissions from mobile sources and even other small, stationary sources. The Board recommends that these innovations be implemented at the State level. There are presently a few states that offer the odd, one-off grant, loan, or other incentive for these purposes[1]; but none do so on the order of magnitude or with the concerted effort that we recommend here. To this end, we propose a major effort by the Agency to encourage States to create Air Quality Finance Authorities with the power to introduce these financial innovations. This would be the first major air emission reduction finance program anywhere in the world that we know of. In short, we recommend:

- States should create Air Quality Finance Authorities (AQFAs), or empower existing environmental finance authorities to finance certain types of air emission reduction equipment; or, at least, create a state-wide or regional air emission reduction financing program.

- State AQFAs should offer long-term, low-rate financing to small private owners of polluting equipment to upgrade their equipment or, if applicable, to retrofit it to reduce emissions.

- State AQFAs should be the nominal purchasers of such pollution reduction equipment for the purpose of achieving volume discounts which can be passed on to end-users. The equipment can be resold, or leased, to end-users.

- State AQFAs should negotiate fleet fuel discounts on behalf of those companies who use their programs.

[1] Grants: CA, PA, WI and TX. Loans: AR, MN. Other: OR.

- State AQFAs should acquire the rights to the emission reduction credit on each transaction and use or sell those emission credits to further reduce the cost of the program.

- EPA should review all of its funding programs which have a nexus to air emissions with a view to, wherever possible, using them as an incentive to encourage states to take the above actions.

BACKGROUND AND FINDINGS

The Board has determined that several innovative financing techniques can be used to promote the SmartWay program. Moreover, we have also determined that the same techniques may be applicable to a wide variety of other small, stationary emission sources.

The Board's investigations into the SmartWay program found that the real need for innovative finance lay in dealing with the tens of thousands of small trucking firms that lacked capital and did not enjoy superior credit ratings. Most of these truckers are locked into a financial regime with terms so short (3 – 5 years) and interest rates so high (~14%), that the cost of financing the kits was only marginally offset by the fuel savings – and only so for extremely long-haul carriers (125,000+ miles per year). For example, the cost of a SmartWay kit is estimated at $20,100. To finance this amount for three years at 14% would require an annual payment of $8,657. Estimated fuel savings of 3,500 gallons per year per tractor (based on a 14% savings on 125,000 miles at 5 miles per gallon) at a cost of $2.50 per gallon would result in fuel cost savings of $8,750 per year. Thus, a trucker who drove 125,000 miles would save only $92.30 per year. This means that if the trucker erred on his actual mileage by only 200 miles (0.16%), he would lose money. This problem is exacerbated when shorter-haul trucks are considered, some of which drive only 20,000 miles per year. In addition, professional truckers are at least as skeptical as the average motorist when it comes to believing claims of fuel efficiency. So, the SmartWay retrofit program has not taken off, as it should have.

(It should be noted that the SmartWay program has pioneered two loan programs. The first, the SmartWay Loan program, takes advantage of the U.S. Small Business Administration's Business Express Loan program, offering 12% loans to firms that are 51% owned by women, veterans, minorities or firms located in certain distressed areas. It has generated about 100 loans to date, nationwide. The second is the SmartWay Plus Loan program which is offered through community development banks in Norfolk, Virginia, and New York City.)

The Board then learned of the activities of Cascade Sierra Solutions (CSS), a Non Governmental Organization (NGO) operating on the West Coast, which, we understand, was created by a grant from the SmartWay program, and which is "dedicated to saving fuel and reducing emissions from heavy-duty diesel engines". CSS has developed a program that exploits two additional cost saving factors. CSS, acting as an agent for the kit manufacturers, sells SmartWay kits directly to truckers. By aggregating these sales, they are able to achieve volume discounts of 6% on their

purchases of SmartWay kits[2]. This volume discount could be passed on to end users to further enhance the attractiveness of the program. In addition, although their "clients" had no legal relationships among themselves, their "client" relationship with CSS was sufficient for CSS to negotiate a fleet fuel discount of 6%. For a 125,000 mile carrier, this results in additional savings of $3,150 per year (with a SmartWay kit).

It soon became clear to the Board that the genius of CSS's innovation lay in their ability to synthetically aggregate hundreds of small truckers to avail them of volume discounts.

We then began to further consider the question of the "synthetic aggregation" of small trucking companies and began to look at ports, where tens of thousands of trucks congregate daily[3]. Many ports are run by port authorities, which are units of state or local government.

There are four important conclusions we drew from our investigations of ports. First, port authorities have the ability to issue bonds. Second, ports, as large stationary sources of air pollution, have need to reduce emissions not only from their own equipment, but also from equipment owned by others, such as trucking companies, which are naturally drawn to, and use, port facilities. Third, because of this overarching interest in reducing air emissions, port authorities could afford to be less sensitive to credit concerns than are commercial bankers who have clear fiduciary responsibility for their depositors' and shareholders' funds. For this reason, port authorities should be more willing to extend the tenor of loans to terms commensurate with the service lives of air emission reduction facilities financed with their bonds.

Fourth, as a result of this need to reduce emissions *in situ*, port authorities need emissions credits. It would, therefore, be very beneficial for ports to assist their trucking clientele to reduce emissions if the ports themselves could, in turn, get credit for the reductions.

At this stage of our investigations, two other important considerations occurred to us. First, there are other "non-port" areas (such as truck stops) where the intervention of a government agency could provide the same benefits. Thus we began to think of new, statewide agencies with financing authority for air pollution reduction.

Our second, and most important, consideration is that there is a wide universe of air polluters – both mobile and stationary - who share the same economic profile as do the truckers in the SmartWay program. These types of entities typically own various kinds of diesel powered vehicles - stationery equipment, such as cranes, powered by diesel engines; diesel powered construction equipment, and the like. The characteristics they share are as follows:

1) They are small source polluters.
2) There are literally millions of these small source polluters.

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[2] CSS does not pass this savings on to their customers, but rather uses it to cover their administrative costs. In this report, we will recommend that these savings be passed along to SmartWay kit purchasers.
[3] The Port of Baltimore, which is 13th in size in the United States, estimates that 2,500 trucks visit their facilities daily.

3) They are almost all owned by small private businesses or private owners.
4) They do not have superior credit and, therefore, have limited access to capital.

Our conclusion, in one sentence, is that these small polluters need to be synthetically aggregated and offered favorable financing terms by State AQFAs as an incentive either to install pollution reduction equipment, such as SmartWay kits, other air emission reduction equipment, or to purchase new state-of-the-art low emission engines.

From all of the above investigations, we conclude that a major finance program to advance the use of SmartWay kits and other air pollution reduction devices could be developed through State AQFAs or other governmental entities such as port authorities. Specifically, we believe:

1) That State AQFAs and other governmental entities with bonding authority should be able to issue bonds at favorable rates to finance the acquisition of SmartWay kits or other mobile-source pollution reduction devices, which can be sold or leased to trucking companies.
2) That the terms of such bonds can be commensurate with the service lives of the equipment so financed. In this case, term could be extended from 3 to as much as 10 years, with accompanying dramatic reductions in financing costs[4].
3) That such agencies can negotiate volume discounts from the manufacturers of the components of the kits, and pass along this savings to SmartWay kit purchasers.
4) That such agencies can have their SmartWay kit purchasers collectively designated as a fleet for the purpose of obtaining fleet discounts for diesel fuel.
5) That such agencies should be allowed to keep for their own account, or trade, the emission credits attributable to all of the emission reductions from the trucks in their respective SmartWay fleets.

Below are a few examples of what could be done through State AQFAs.

Example #1 – New low emission trucks

Instead of just a SmartWay kit, let us consider brand new low-emission diesel tractor. Let us say that the average new, fuel-efficient, environmentally friendly tractor costs $100,000. At conventional rates for small truckers paying full price for the tractor, it would cost them some $29,128 per year. If they bought the same truck through a State AQFA with a volume discount, it would cost the same trucker only $11,096 per year. Add in a fleet fuel discount card and the cost is lowered even further. The result is a very strong financial incentive for truckers to modernize their fleets with more fuel efficient models that pollute less.

[4] A 10% loan of $1,000 with a three-year term requires an annual payment of $402.11. The same loan, with a 10-year term, only requires an annual payment of $162.75. A 60% reduction!

Example #2 – Truck Stops

The characteristic emission problem with truck stops arises from idling. Trucks idle at such facilities, with their engines on, for as much as 10 hours per day. Each hour they idle consumes one gallon of fuel.

The alternative to idling is to have an Auxiliary Power Unit (APU) which supplies power to the cab while the driver sleeps or rests or to use Truck Stop Electrification (TSE). Both APUs and TSE significantly reduce idling emissions.

Truck stops are largely privately owned. The installation of APUs or TSE depends solely on whether the manufacturers of these devices can convince truck stop owners to install them. The manufacturers want to get paid in full as soon as possible. The truck stop owner, if he invests in APUs or TSE, wants to recover his investment as soon as possible. However, as the fees for using an on-site APUs or TSE approach the cost of burning fuel for the same period of time ($2.50 per hour), the incentive for drivers to use them disappears.

If, however, a State AQFA were to acquire a non-possessor easement interest in the air rights over the truck stop from the truck stop owner (for which it would pay the truck stop owner an annual fee), then the state agency could purchase the APUs or TSE from the manufacturers, and finance them with low-cost, long-term, bonds and have the manufacturers install and, if necessary, maintain them. The manufacturer would get paid in full up front. The truck stop owner would receive additional risk-free annual income from the state. And the State AQFA would be able to set user fees at substantially lower rates because of the low cost of the underlying long-term financing.

For example, a truck stop owner would likely want to recover his investment in three years on a cash-on-cash basis. For every $1,000 of investment he would need to recover $333 per year in net fees. But with 10-year, taxable bonds at 5%, a state agency would only have to recover $130 per year. Thus there would be much more room to offer truckers savings sufficiently substantial to induce them to use the APU and avoid the polluting emissions.

Depending on state law, the same result might be achieved by the creation of Air Quality Improvement Districts; much like the Neighborhood Improvement Districts used in brownfields reclamations. An Air Quality Improvement District could be created at a truck stop, which might allow the issuance of bonds to finance the installation of APUs at that site. This could be done at truck stops all over the State. If there were 10 truck stops in a State that could accommodate 50 trucks each, the daily fuel savings would be 5,000 gallons or over 1,750,000 gallons per year with commensurate reductions in NOX and CO_2.

Example #3 – "Drayage Yards"

The second stationary source of mobile emissions that we considered are what might be called – for lack of a better term – "drayage yards". Drayage, the Board came to learn, has a very specific meaning in port-related terminology. It refers to trucks that remove containers from ports and deliver them to marshaling yards a few miles from the port from whence they are

further disbursed. They also do the reverse, i.e. deliver containers from the yard to the port. These drayage yards are privately owned and, like ports, are magnets for trucks.

There are two issues regarding drayage yards that need consideration. The first is that, like truck stops and ports, much idling occurs there. However, there are differences between the idling that occurs at truck stops and that which occurs at drayage yards. At truck stops, there are a relatively small number of trucks that idle for long periods of time. These can be dealt with effectively by stationary APUs that are affixed to each truck parking space. At drayage yards, the characteristic idling is the converse, i.e., many trucks idling for relatively short periods of time. This type of idling can best be dealt with by replacing older trucks with newer, cleaner models. Privately owned drayage yards, however, have no capability of offering the owners of their older user-trucks any financial incentives to replace them. States, however, could intervene and create such incentives through AQFAs.

It would certainly be in the interest of a State to reduce such emissions by creating a program to finance cleaner trucks that use such facilities.[5] In this regard, the concepts of an Air Quality Improvement Easement or an Air Quality Improvement District would be very useful in bringing the financial power of long-term, bond financing to bear on this problem.

The second issue involving drayage yards deals directly with emission credits.

As previously noted, drayage yards reside only a few miles from the port they serve. Thus, they will virtually always be in the same airshed as is the port itself. So, too, will be the dray trucks. They will always be driving and polluting within the same airshed where the port is located. Ways and means, therefore, need to be developed where a stationary source of mobile emissions, such as a port (public) or a drayage yard (private), can legally obtain emissions credits from the owners of the mobile sources whose emission reductions they finance. Ports and State AQFAs should be able to acquire the emissions credits from the truckers whom they induce to buy SmartWay kits; newer, cleaner trucks and other pollution reduction devices.

We understand that the Agency has already dealt with this issue at least once in San Diego, California, where an electric generating utility in need of emission credits purchased a fleet of sanitation trucks that used natural gas/propane for a privately-owned company that handled solid waste disposal for the county government. The utility was able to acquire and use the Mobile source Emission Reduction Credits (MERCs) effected by the new engines. These sanitation trucks always remained within the county which, in turn, was within the same non-attainment area as the power plant. In this case, the Agency was able to satisfy itself that such reductions were "real, quantifiable, federally enforceable, permanent and surplus" within the meaning of the Clean Air Act. This precedent must be expanded to encourage lower vehicle emissions which will benefit more non-attainment areas.

[5] We understand the SmartWay program is already cooperating with the ports of Norfolk and New York/New Jersey on a pilot program similar hereto.

ADDITIONAL CONSIDERATIONS

Before concluding, we would like to offer some observations on two related matters: the possible use of tax-exempt bonds and the implementation of the recommendations contained herein

Tax-exempt Bonds

Tax-exempt bonds are the mainstays of finance programs in the water and wastewater sectors. This is not the case in the air sector. The reason for this is that most drinking water providers and wastewater treatment system operators are public entities that can readily issue tax-exempt bonds for capital projects. Most air polluters, on the other hand, are private, where the issuance of tax-exempt bonds is awkward and problematic. Tax-exempt bonds issued for the benefit of private entities are called Private Activity Bonds (PABs).

The discussions above regarding the possible issuance of tax-exempt bonds raise the following questions: Under what circumstances, if any, could a government agency such as a port authority, or State AQFA, issue tax-exempt bonds to purchase mobile source air pollution abatement equipment for sale or lease to private entities?

Based on informal discussions with bond counsel, we believe that tax-exempt PABs cannot be issued to finance air pollution control devices for private users. There are, however, two small exceptions. The first is what might be called a *de minimis* exception: if the PAB is a part of a larger bond issue and constitutes less that 5% of such issue and is less than $15 million. Thus, bonds issued for the purposes described herein could be issued as a small part of a larger tax-exempt bond financing issued for other purposes as long as the amount was below those two stated thresholds. The large capital programs of ports may avail them of the opportunity to aggregate air emission financing as part of larger tax-exempt financings while remaining compliant with these *de minimis* thresholds.

The second exception appears to be of even more limited applicability. It was created by the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or "SAFETEA-LU", (Pub. L. No. 109-59), which was enacted in 2005. Section 11143 of this Act added sections 142(a)(15) and 142(m) to the Internal Revenue Code, which authorize up to $15,000,000,000 of tax-exempt private activity bonds to be issued by State or local governments for a new type of exempt facility, i.e. "qualified highway or surface freight transfer facilities". The relevant part of the definition of this term for our purposes is "any surface transportation project that receives Federal assistance under title 23, United States Code". So, if one of the programs described above is part of a larger transportation program that is receiving grants from the U.S. Department of Transportation under title 23 of the U.S. Code, then bonds issued for that program are eligible for this exception. Included under title 23 (section 149(b)) are qualified highway or surface freight transfer projects that have air quality benefits. These are projects that are, determined by the Transportation Secretary, after consultation with the EPA Administrator, "likely to contribute to the attainment of a national ambient air quality standard, whether through reductions in vehicle miles traveled, fuel consumption, or through other factors."

It is apparent that this matter is quite complicated. States should be aware of these exceptions and seek competent bond counsel to advise them.

In the final analysis, however, if all avenues to tax-exempt bond financing fail, States should be prepared to issue taxable bonds for the programs described herein. In the current interest rate environment, a tax-exempt, 10-year bond would yield about 4%; while its taxable counterpart would yield about 5%. The difference in payment between these two bonds is $123 vs. $130 per year (per $1,000 financed). This is minimal; whereas the difference between these and the conventional financing available to most small truckers ($430.73) is many times larger. In addition, if State AQFAs chose to lease the emission reduction equipment to end-users, they would be able to aggregate and sell the depreciation benefits of the equipment for tax purposes, and use the proceeds of such sales to further reduce the cost of the program to the end users. So, State AQFAs should pursue taxable financing when all else fails.

Implementation

In the course of our investigations, we had informal conversations with officials at two major ports. When the subject of establishing financing programs for the truckers who use their facilities came up, it became abundantly clear that the port officials did not see themselves in the banking business and were very uncomfortable with the thought of entering it, even on a limited basis. The same sentiment is probably true of state air pollution control agencies that see themselves as regulators, and certainly not lenders.

That said, the Board believes there are two points to consider. The first is that there are ample skills in most state governments for mounting private sector lending programs. They are not in any department that deals with the environment; rather they are in the department of economic development. Even most large counties have private sector lending programs associated with their economic development programs. This is a very important point because there will most certainly be some defaults and delinquencies in any lending program for truckers or other such small businesses. The agencies that run the State Revolving Fund programs deal largely with municipal borrowers or public authorities where defaults and delinquencies are very rare. But the economic developers have appropriate analytical skills to minimize initial credit risks as well as the skills to manage defaults, foreclosure, repossession and the resale of physical assets.

The second point is that there are alternative strategies for implementing such lending programs. CSS is a good example. Instead of having a state, or port authority, directly manage an air quality financing program, they could contract with a NGO such as CSS to manage it for them. Or, in the final analysis, states could set up linked deposit programs or issue limited loan guaranties to qualified commercial banks and let them manage these types of lending programs.

Setting up state sponsored programs will require capital commitments. Seed money can be provided from a number of state sources such as general, economic development or environmental funds from taxes or fee income. Existing federal programs may also provide a complement of capitalization dollars to support state efforts.

RECOMMENDATIONS

Bearing in mind the above considerations, the Board now recommends:

1) That the Agency adopt a series of formal policies to encourage States to form AQFAs, or empower existing state environmental finance authorities to finance air pollution reduction equipment; or, at least, create a state-wide or regional air pollution reduction financing program.

2) That the Agency encourage the States to offer long-term, low-rate financing to small private owners of polluting equipment to upgrade their equipment or, if applicable, to retrofit it to reduce emissions.

3) That the Agency encourage States to take advantage of volume discounts in the purchasing of such equipment.

4) That the Agency encourage States to negotiate fleet fuel discounts on behalf of those who use their programs.

5) That the Agency work with the States to permit them to acquire the rights to the emission reduction credits on each transaction and sell those credits to further reduce the cost of their programs.

6) EPA should review all of its funding programs which have a nexus to air emissions with a view to, wherever possible, using them as an incentive to encourage states to take the above actions.

The Board further recommends:

7) That the Agency approach DOT regarding the use of a portion of the untapped $15 billion in private activity bonds to underwrite mobile source air emissions reduction efforts if this can be done on terms consistent with title 23 of the US Code.

8) That, bearing in mind differences in State laws and differences in State priorities with respect to air emission reductions, the Agency form Regional Task Forces in each EPA region to facilitate the dialogue with the States on these matters.

9) That the Agency consider:
   a) undertaking the development of new rules which would permit the trading of MERCs generated through financing programs such as those described herein,
   b) obtain advice on generic questions such as bond counsels' opinions on the questions of tax-exempt bond issuance that are raised above,
   c) coordinate the work of the respective Regional Task Forces, and
   d) disseminate information about advances made in developing innovative financing programs among them.

CONCLUSION

In the water and wastewater sectors, the Agency is home to some of the most innovative financing programs in the world. Similar innovations have been used to support "brownfields" redevelopment. However, because the world of air polluters is populated with small, private entities that are difficult to finance – instead of large public ones that are easy to finance – little has been done to create financial incentives in this field. This need not continue.

The Agency now has a unique opportunity to launch a major initiative to reduce air pollution throughout the country by working with the States to create financial incentives for low emission equipment of all types.

Such programs need not be costly. Most can be accomplished with financial guaranties. As such they can be initially capitalized with modest loans from State governments and supported on an ongoing basis by reasonable guaranty fees. Ultimately the initial capitalization loans could even be repaid to State treasuries.

In summary, the creation of State AQFAs which provide a combination of long-term, low-cost financing; trading of emissions credits; and the utilization of volume discounts can form a powerful innovative financing program that, we believe, can significantly reduce air pollution throughout the United States. We commend these methods to the Agency.

Finally, we note that "air quality finance" is almost an entirely new field with some entirely new concepts. The Board will be happy to continue to work with the Agency to expand this field in the interests of improving air quality for all Americans.

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

DEC 21 2007

OFFICE OF
AIR AND RADIATION

Mr. A. Stan Meiburg
National EPA Liaison to CDC NCH/ATSDR
1600 Clifton Road, N.E.
MSE-28
Atlanta, Georgia 30333

Dear Mr. Meiburg:

Thank you for your letter of November 1, 2007, to Administrator Stephen L. Johnson regarding the Environmental Financial Advisory Board's *Innovative Finance for Air Pollution Reduction* report. I appreciate EFAB's efforts to review the SmartWay Transport Partnership and identify finance mechanisms to help deploy technologies that reduce mobile-source and other air emissions.

The board's primary recommendation is for EPA to encourage states to create Air Quality Finance Authorities to provide low-cost financing and other market incentives for emission reductions in the mobile-source and other sectors. We agree that state authorities could provide low-cost financing and have initiated internal and external discussions to identify possible options for creating and implementing AQFAs. As mentioned in the report, EPA currently hosts two environmental finance programs, the $60 billion Clean Water State Revolving Fund and the $11 billion Safe Drinking Water State Revolving Fund. AQFAs could provide a similar function for the Clean Air Act, and they would be operated with capital from tax-free bonding authority.

Regarding EFAB's other recommendations, we agree that state AQFAs should consider the purchase of certain pollution-reduction equipment "in bulk" to achieve volume discounts, which can be passed on to end-users. Bulk purchases of standardized devices like auxiliary power units and diesel filters would be one example. While state authorities might not be able to directly purchase and stock technologies, our Office of Transportation and Air Quality would be able to work with state AQFAs to assist them with high-volume discount strategies.

Another EFAB recommendation suggests that EPA encourage states to negotiate fleet fuel discounts. While negotiating such discounts is a common practice in the trucking industry, each state would need to decide the appropriate role of the AQFAs for such purposes. In addition, EFAB's recommendation that EPA should review its funding programs that have a nexus to air emissions, possibly using them as an incentive for states to create AQFAs, will require further review. Our office is already taking steps to include the creation of AQFAs as an eligible activity under the diesel emissions reduction provisions of the Energy Policy Act of 2005. EFAB also recommends that the Agency approach the Department of Transportation on

the use of their private activity bonding authority. EPA has initiated a dialogue with DOT and will continue to pursue the use of this bonding authority to finance diesel retrofits.

Thank you for EFAB's valuable input and efforts to recommend innovative finance mechanisms to facilitate the deployment of fuel-saving and emission-control devices for the air sector. If you have any questions or wish to speak further about this report, please contact Mitchell Greenberg, SmartWay program manager in the Office of Transportation and Air Quality, at (202)-343-9269.

Sincerely,

Robert J. Meyers
Principal Deputy Assistant Administrator

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

APR 29 2008

OFFICE OF
AIR AND RADIATION

Mr. A. James Barnes
Chair, Environmental Financial Advisory Board
Indiana University School of Law
211 South Indiana Avenue
Bloomington, Indiana 47405-7001

Dear Mr. Barnes:

On behalf of the Office of Transportation and Air Quality (OTAQ), I would like to thank the Environmental Financial Advisory Board (the "Board") for your "Report on Innovative Finance Programs for Air Pollution Reduction" (Nov. 1, 2007). This report provides excellent recommendations for us to consider as we develop and implement innovative finance projects to reduce diesel emissions.

For fiscal year 2008, Congress appropriated funds for the first time under the Energy Policy Act (2005) to help reduce harmful emissions from heavy duty diesel engines. We have issued a $3.4 million grant solicitation, as part of the SmartWay Clean Diesel Finance Program, to establish innovative finance projects (see www.epa.gov/air/grants/08-04.pdf for the Request for Proposals). In addition, our EPA Regions may also offer grants to establish innovative loan programs (see www.epa.gov/diesel). We have incorporated concepts from your report in our Requests for Proposals, and we hope to award projects that are consistent with your recommendations. For example, we share a common interest in empowering states to create air quality finance centers throughout the country that can issue bonds to create low cost loan programs that will provide incentives to companies and individuals to purchase cleaner, more fuel efficient diesel vehicles and equipment. OTAQ has also entered into a cooperative agreement with the Great Lakes Environmental Finance Center to conduct demonstration projects on the issuance of bonds, financial and tax incentives, and other financial mechanisms to support clean diesel projects.

We look forward to continuing to work with the Board to find new and innovative financial approaches to reducing diesel emissions and conserving fuel.

Again, I want to thank you for your efforts to assist our program with financial methods to deploy cleaner and more fuel efficient vehicles.

Sincerely,

Margo Tsirigotis Oge
Director
Office of Transportation and Air Quality

cc: Robert Meyers
Robert Brenner
Stan Meiburg

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

MAY 3 1 2007

Mr. Ben Grumbles
Assistant Administrator, Office of Water
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Ben:

The Environmental Financial Advisory Board (EFAB) is pleased to submit the enclosed report, ***"EFAB Comments on EPA Document: Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development."*** The report summarizes EFAB's review of this guidance and provides EPA with our comments. Dr. Andrew Sawyers, Program Administrator, Maryland Water Quality Financing Administration, and Jeff Hughes, Director, University of North Carolina (Chapel Hill) Environmental Finance Center, were instrumental in the development of this report. In keeping with EPA's request, the report is limited to examining the existing components of the Financial Capability Assessment (FCA) methodology and does not address policy issues related to implementing EPA's Combined Sewer Overflows (CSO) regulatory approach.

The FCA Guidance has been used since 1997 as a tool to assist EPA in assessing a permittee's financial capability to meet the terms of EPA's CSO Policy. The Guidance outlines a two-part test in determining financial capability, with one element addressing household impact and the second element addressing system-wide financial capability. EFAB in this report recognizes the merits of the two-part test. However, the Board believes that the current residential and the system financial capability indicators used in the two part test have some significant limitations. EFAB believes that EPA will be better able to assess a permittee's financial capability by updating both of these indicators.

For example, the residential indicator now used to measure the impact on individual households does not fully consider the breadth of factors that impact household finances, particularly in communities with a high proportion of disadvantaged households. The reliance on median household income only may disguise the impact of income distribution and poverty rate for many utilities. In revising the FCA Guidance, EFAB recommends that EPA develop a residential indicator which considers actual household expenditures based on average water use, using the rate structures expected to be in effect after the CSO improvements are implemented, rather than assume that the entire cost of controls is spread evenly across households. This would also allow consideration of the effect which lifeline rates or low-income assistance programs could have on mitigating impacts.

In looking at costs to systems, the FCA Guidance relies on a limited definition of cost that excludes the impact of certain management strategies such as asset management, proactive cash flow planning and rate setting strategies, and does not fully consider factors such as investment timing, population growth, and investment options/terms. Finally, reliance solely on household cost comparisons may neglect the effect of costs on commercial or industrial customers who in some instances may be essential to utility financial health.

The FCA guidance currently considers the cumulative impacts of existing wastewater treatment and proposed CSO control initiatives. EFAB understands the reasons behind this approach, including the value of considering the impact of CSO implementation in the context of other water pollution control costs being borne by the community. However, the Board also recognizes the value of incremental costs in providing more immediate and specific indicators of financial stress. EFAB therefore recommends that EPA consider both the cumulative impact of pollution control services as well as the incremental impact of CSO control initiatives.

Finally, the Board urges EPA to revisit the portions of the FCA guidance which discuss system financial capability and include additional management indicators to better reflect advances since the document was written in 1997. Areas outlined by the Board for improvements include debt indicators, bond ratings, socio-economic indicators, and financial management indicators. For example, unlike operating ratio, property tax collections do not adequately illustrate the ability of utilities to incur debt and meet future costs.

The Board is prepared to discuss its findings and recommendations with you, answer any questions you may have, and take any follow-up actions you would like to pursue consistent with the Board's charter. We greatly appreciate the continuing opportunity to serve the Agency.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Designated Federal Official

Enclosure

cc: James A. Hanlon
Director, Office of Wastewater Management
Cynthia C. Dougherty
Director, Office of Ground Water and Drinking Water

Environmental Financial Advisory Board

Report on Innovative Finance Programs for Air Pollution Reduction

This report has not been reviewed for approval by the U.S. Environmental Protection Agency; and hence, the views and opinions expressed in the report do not necessarily represent those of the Agency or any other agencies in the Federal Government.

November 2007

Printed on Recycled Paper

United States Environmental Protection Agency
Environmental Financial Advisory Board

Report on Innovative Finance Programs for Air Pollution Reduction

SUMMARY

The Environmental Financial Advisory Board (the "Board") was originally asked by the Office of Air and Radiation (OAR) to review the SmartWay retrofit program to determine if any innovative financing programs could be developed to spur sales of SmartWay kits and thus reduce the emissions of various oxides of nitrogen (collectively "NOx"), carbon dioxide (CO_2), and particulates that attend the various products comprising the kits.

The Board has identified several major innovations that will create significant market incentives not only for SmartWay Kits, but also for other programs that reduce air emissions from mobile sources and even other small, stationary sources. The Board recommends that these innovations be implemented at the State level. There are presently a few states that offer the odd, one-off grant, loan, or other incentive for these purposes[1]; but none do so on the order of magnitude or with the concerted effort that we recommend here. To this end, we propose a major effort by the Agency to encourage States to create Air Quality Finance Authorities with the power to introduce these financial innovations. This would be the first major air emission reduction finance program anywhere in the world that we know of. In short, we recommend:

- States should create Air Quality Finance Authorities (AQFAs), or empower existing environmental finance authorities to finance certain types of air emission reduction equipment; or, at least, create a state-wide or regional air emission reduction financing program.

- State AQFAs should offer long-term, low-rate financing to small private owners of polluting equipment to upgrade their equipment or, if applicable, to retrofit it to reduce emissions.

- State AQFAs should be the nominal purchasers of such pollution reduction equipment for the purpose of achieving volume discounts which can be passed on to end-users. The equipment can be resold, or leased, to end-users.

- State AQFAs should negotiate fleet fuel discounts on behalf of those companies who use their programs.

[1] Grants: CA, PA, WI and TX. Loans: AR, MN. Other: OR.

- State AQFAs should acquire the rights to the emission reduction credit on each transaction and use or sell those emission credits to further reduce the cost of the program.

- EPA should review all of its funding programs which have a nexus to air emissions with a view to, wherever possible, using them as an incentive to encourage states to take the above actions.

BACKGROUND AND FINDINGS

The Board has determined that several innovative financing techniques can be used to promote the SmartWay program. Moreover, we have also determined that the same techniques may be applicable to a wide variety of other small, stationary emission sources.

The Board's investigations into the SmartWay program found that the real need for innovative finance lay in dealing with the tens of thousands of small trucking firms that lacked capital and did not enjoy superior credit ratings. Most of these truckers are locked into a financial regime with terms so short (3 – 5 years) and interest rates so high (~14%), that the cost of financing the kits was only marginally offset by the fuel savings – and only so for extremely long-haul carriers (125,000+ miles per year). For example, the cost of a SmartWay kit is estimated at $20,100. To finance this amount for three years at 14% would require an annual payment of $8,657. Estimated fuel savings of 3,500 gallons per year per tractor (based on a 14% savings on 125,000 miles at 5 miles per gallon) at a cost of $2.50 per gallon would result in fuel cost savings of $8,750 per year. Thus, a trucker who drove 125,000 miles would save only $92.30 per year. This means that if the trucker erred on his actual mileage by only 200 miles (0.16%), he would lose money. This problem is exacerbated when shorter-haul trucks are considered, some of which drive only 20,000 miles per year. In addition, professional truckers are at least as skeptical as the average motorist when it comes to believing claims of fuel efficiency. So, the SmartWay retrofit program has not taken off, as it should have.

(It should be noted that the SmartWay program has pioneered two loan programs. The first, the SmartWay Loan program, takes advantage of the U.S. Small Business Administration's Business Express Loan program, offering 12% loans to firms that are 51% owned by women, veterans, minorities or firms located in certain distressed areas. It has generated about 100 loans to date, nationwide. The second is the SmartWay Plus Loan program which is offered through community development banks in Norfolk, Virginia, and New York City.)

The Board then learned of the activities of Cascade Sierra Solutions (CSS), a Non Governmental Organization (NGO) operating on the West Coast, which, we understand, was created by a grant from the SmartWay program, and which is "dedicated to saving fuel and reducing emissions from heavy-duty diesel engines". CSS has developed a program that exploits two additional cost saving factors. CSS, acting as an agent for the kit manufacturers, sells SmartWay kits directly to truckers. By aggregating these sales, they are able to achieve volume discounts of 6% on their

purchases of SmartWay kits[2]. This volume discount could be passed on to end users to further enhance the attractiveness of the program. In addition, although their "clients" had no legal relationships among themselves, their "client" relationship with CSS was sufficient for CSS to negotiate a fleet fuel discount of 6%. For a 125,000 mile carrier, this results in additional savings of $3,150 per year (with a SmartWay kit).

It soon became clear to the Board that the genius of CSS's innovation lay in their ability to synthetically aggregate hundreds of small truckers to avail them of volume discounts.

We then began to further consider the question of the "synthetic aggregation" of small trucking companies and began to look at ports, where tens of thousands of trucks congregate daily[3]. Many ports are run by port authorities, which are units of state or local government.

There are four important conclusions we drew from our investigations of ports. First, port authorities have the ability to issue bonds. Second, ports, as large stationary sources of air pollution, have need to reduce emissions not only from their own equipment, but also from equipment owned by others, such as trucking companies, which are naturally drawn to, and use, port facilities. Third, because of this overarching interest in reducing air emissions, port authorities could afford to be less sensitive to credit concerns than are commercial bankers who have clear fiduciary responsibility for their depositors' and shareholders' funds. For this reason, port authorities should be more willing to extend the tenor of loans to terms commensurate with the service lives of air emission reduction facilities financed with their bonds.

Fourth, as a result of this need to reduce emissions *in situ*, port authorities need emissions credits. It would, therefore, be very beneficial for ports to assist their trucking clientele to reduce emissions if the ports themselves could, in turn, get credit for the reductions.

At this stage of our investigations, two other important considerations occurred to us. First, there are other "non-port" areas (such as truck stops) where the intervention of a government agency could provide the same benefits. Thus we began to think of new, statewide agencies with financing authority for air pollution reduction.

Our second, and most important, consideration is that there is a wide universe of air polluters – both mobile and stationary - who share the same economic profile as do the truckers in the SmartWay program. These types of entities typically own various kinds of diesel powered vehicles - stationery equipment, such as cranes, powered by diesel engines; diesel powered construction equipment, and the like. The characteristics they share are as follows:

1) They are small source polluters.
2) There are literally millions of these small source polluters.

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[2] CSS does not pass this savings on to their customers, but rather uses it to cover their administrative costs. In this report, we will recommend that these savings be passed along to SmartWay kit purchasers.
[3] The Port of Baltimore, which is 13th in size in the United States, estimates that 2,500 trucks visit their facilities daily.

3) They are almost all owned by small private businesses or private owners.
4) They do not have superior credit and, therefore, have limited access to capital.

Our conclusion, in one sentence, is that these small polluters need to be synthetically aggregated and offered favorable financing terms by State AQFAs as an incentive either to install pollution reduction equipment, such as SmartWay kits, other air emission reduction equipment, or to purchase new state-of-the-art low emission engines.

From all of the above investigations, we conclude that a major finance program to advance the use of SmartWay kits and other air pollution reduction devices could be developed through State AQFAs or other governmental entities such as port authorities. Specifically, we believe:

1) That State AQFAs and other governmental entities with bonding authority should be able to issue bonds at favorable rates to finance the acquisition of SmartWay kits or other mobile-source pollution reduction devices, which can be sold or leased to trucking companies.
2) That the terms of such bonds can be commensurate with the service lives of the equipment so financed. In this case, term could be extended from 3 to as much as 10 years, with accompanying dramatic reductions in financing costs[4].
3) That such agencies can negotiate volume discounts from the manufacturers of the components of the kits, and pass along this savings to SmartWay kit purchasers.
4) That such agencies can have their SmartWay kit purchasers collectively designated as a fleet for the purpose of obtaining fleet discounts for diesel fuel.
5) That such agencies should be allowed to keep for their own account, or trade, the emission credits attributable to all of the emission reductions from the trucks in their respective SmartWay fleets.

Below are a few examples of what could be done through State AQFAs.

Example #1 – New low emission trucks

Instead of just a SmartWay kit, let us consider brand new low-emission diesel tractor. Let us say that the average new, fuel-efficient, environmentally friendly tractor costs $100,000. At conventional rates for small truckers paying full price for the tractor, it would cost them some $29,128 per year. If they bought the same truck through a State AQFA with a volume discount, it would cost the same trucker only $11,096 per year. Add in a fleet fuel discount card and the cost is lowered even further. The result is a very strong financial incentive for truckers to modernize their fleets with more fuel efficient models that pollute less.

[4] A 10% loan of $1,000 with a three-year term requires an annual payment of $402.11. The same loan, with a 10-year term, only requires an annual payment of $162.75. A 60% reduction!

Example #2 – Truck Stops

The characteristic emission problem with truck stops arises from idling. Trucks idle at such facilities, with their engines on, for as much as 10 hours per day. Each hour they idle consumes one gallon of fuel.

The alternative to idling is to have an Auxiliary Power Unit (APU) which supplies power to the cab while the driver sleeps or rests or to use Truck Stop Electrification (TSE). Both APUs and TSE significantly reduce idling emissions.

Truck stops are largely privately owned. The installation of APUs or TSE depends solely on whether the manufacturers of these devices can convince truck stop owners to install them. The manufacturers want to get paid in full as soon as possible. The truck stop owner, if he invests in APUs or TSE, wants to recover his investment as soon as possible. However, as the fees for using an on-site APUs or TSE approach the cost of burning fuel for the same period of time ($2.50 per hour), the incentive for drivers to use them disappears.

If, however, a State AQFA were to acquire a non-possessor easement interest in the air rights over the truck stop from the truck stop owner (for which it would pay the truck stop owner an annual fee), then the state agency could purchase the APUs or TSE from the manufacturers, and finance them with low-cost, long-term, bonds and have the manufacturers install and, if necessary, maintain them. The manufacturer would get paid in full up front. The truck stop owner would receive additional risk-free annual income from the state. And the State AQFA would be able to set user fees at substantially lower rates because of the low cost of the underlying long-term financing.

For example, a truck stop owner would likely want to recover his investment in three years on a cash-on-cash basis. For every $1,000 of investment he would need to recover $333 per year in net fees. But with 10-year, taxable bonds at 5%, a state agency would only have to recover $130 per year. Thus there would be much more room to offer truckers savings sufficiently substantial to induce them to use the APU and avoid the polluting emissions.

Depending on state law, the same result might be achieved by the creation of Air Quality Improvement Districts; much like the Neighborhood Improvement Districts used in brownfields reclamations. An Air Quality Improvement District could be created at a truck stop, which might allow the issuance of bonds to finance the installation of APUs at that site. This could be done at truck stops all over the State. If there were 10 truck stops in a State that could accommodate 50 trucks each, the daily fuel savings would be 5,000 gallons or over 1,750,000 gallons per year with commensurate reductions in NOX and CO_2.

Example #3 – "Drayage Yards"

The second stationary source of mobile emissions that we considered are what might be called – for lack of a better term – "drayage yards". Drayage, the Board came to learn, has a very specific meaning in port-related terminology. It refers to trucks that remove containers from ports and deliver them to marshaling yards a few miles from the port from whence they are

further disbursed. They also do the reverse, i.e. deliver containers from the yard to the port. These drayage yards are privately owned and, like ports, are magnets for trucks.

There are two issues regarding drayage yards that need consideration. The first is that, like truck stops and ports, much idling occurs there. However, there are differences between the idling that occurs at truck stops and that which occurs at drayage yards. At truck stops, there are a relatively small number of trucks that idle for long periods of time. These can be dealt with effectively by stationary APUs that are affixed to each truck parking space. At drayage yards, the characteristic idling is the converse, i.e., many trucks idling for relatively short periods of time. This type of idling can best be dealt with by replacing older trucks with newer, cleaner models. Privately owned drayage yards, however, have no capability of offering the owners of their older user-trucks any financial incentives to replace them. States, however, could intervene and create such incentives through AQFAs.

It would certainly be in the interest of a State to reduce such emissions by creating a program to finance cleaner trucks that use such facilities.[5] In this regard, the concepts of an Air Quality Improvement Easement or an Air Quality Improvement District would be very useful in bringing the financial power of long-term, bond financing to bear on this problem.

The second issue involving drayage yards deals directly with emission credits.

As previously noted, drayage yards reside only a few miles from the port they serve. Thus, they will virtually always be in the same airshed as is the port itself. So, too, will be the dray trucks. They will always be driving and polluting within the same airshed where the port is located. Ways and means, therefore, need to be developed where a stationary source of mobile emissions, such as a port (public) or a drayage yard (private), can legally obtain emissions credits from the owners of the mobile sources whose emission reductions they finance. Ports and State AQFAs should be able to acquire the emissions credits from the truckers whom they induce to buy SmartWay kits; newer, cleaner trucks and other pollution reduction devices.

We understand that the Agency has already dealt with this issue at least once in San Diego, California, where an electric generating utility in need of emission credits purchased a fleet of sanitation trucks that used natural gas/propane for a privately-owned company that handled solid waste disposal for the county government. The utility was able to acquire and use the Mobile source Emission Reduction Credits (MERCs) effected by the new engines. These sanitation trucks always remained within the county which, in turn, was within the same non-attainment area as the power plant. In this case, the Agency was able to satisfy itself that such reductions were "real, quantifiable, federally enforceable, permanent and surplus" within the meaning of the Clean Air Act. This precedent must be expanded to encourage lower vehicle emissions which will benefit more non-attainment areas.

[5] We understand the SmartWay program is already cooperating with the ports of Norfolk and New York/New Jersey on a pilot program similar hereto.

ADDITIONAL CONSIDERATIONS

Before concluding, we would like to offer some observations on two related matters: the possible use of tax-exempt bonds and the implementation of the recommendations contained herein

Tax-exempt Bonds

Tax-exempt bonds are the mainstays of finance programs in the water and wastewater sectors. This is not the case in the air sector. The reason for this is that most drinking water providers and wastewater treatment system operators are public entities that can readily issue tax-exempt bonds for capital projects. Most air polluters, on the other hand, are private, where the issuance of tax-exempt bonds is awkward and problematic. Tax-exempt bonds issued for the benefit of private entities are called Private Activity Bonds (PABs).

The discussions above regarding the possible issuance of tax-exempt bonds raise the following questions: Under what circumstances, if any, could a government agency such as a port authority, or State AQFA, issue tax-exempt bonds to purchase mobile source air pollution abatement equipment for sale or lease to private entities?

Based on informal discussions with bond counsel, we believe that tax-exempt PABs cannot be issued to finance air pollution control devices for private users. There are, however, two small exceptions. The first is what might be called a *de minimis* exception: if the PAB is a part of a larger bond issue and constitutes less that 5% of such issue and is less than $15 million. Thus, bonds issued for the purposes described herein could be issued as a small part of a larger tax-exempt bond financing issued for other purposes as long as the amount was below those two stated thresholds. The large capital programs of ports may avail them of the opportunity to aggregate air emission financing as part of larger tax-exempt financings while remaining compliant with these *de minimis* thresholds.

The second exception appears to be of even more limited applicability. It was created by the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or "SAFETEA-LU", (Pub. L. No. 109-59), which was enacted in 2005. Section 11143 of this Act added sections 142(a)(15) and 142(m) to the Internal Revenue Code, which authorize up to $15,000,000,000 of tax-exempt private activity bonds to be issued by State or local governments for a new type of exempt facility, i.e. "qualified highway or surface freight transfer facilities". The relevant part of the definition of this term for our purposes is "any surface transportation project that receives Federal assistance under title 23, United States Code". So, if one of the programs described above is part of a larger transportation program that is receiving grants from the U.S. Department of Transportation under title 23 of the U.S. Code, then bonds issued for that program are eligible for this exception. Included under title 23 (section 149(b)) are qualified highway or surface freight transfer projects that have air quality benefits. These are projects that are, determined by the Transportation Secretary, after consultation with the EPA Administrator, "likely to contribute to the attainment of a national ambient air quality standard, whether through reductions in vehicle miles traveled, fuel consumption, or through other factors."

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

JUL 23 2007

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Receipt of EFAB's Review of EPA Document: *Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development* (1997)

FROM: Benjamin H. Grumbles
Assistant Administrator

TO: Lyons Gray
Chief Financial Officer

I am writing today to acknowledge receipt of your report summarizing the Environmental Financial Advisory Board's (EFAB) review of, and comments on, the above-referenced EPA guidance document.

I would like to thank you and the members of EFAB for your thoughtful review and analysis of the guidance document. As you know, we are undergoing an assessment of the guidance, and are considering revising it. Your thoughtful comments and recommendations will be taken into consideration as part of this assessment.

If you have any questions or comments regarding this guidance, please contact me or have your staff contact Don Brady at 564-0642.

Thanks!

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

APR 17 2007

Honorable Stephen L. Johnson
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Johnson:

There is a long history of concern over the large shortfalls in infrastructure investment in the drinking water and clean water sectors. A 2002 EPA report estimated capital needs of $602 billion over a twenty-year period ending in 2019.[1] While this amount may be modest by comparison to the overall U.S. capital market, it has proven beyond the means of many local government providers of water services. The same EPA report found that current rates of capital spending in these sectors would fall short of infrastructure needs by some $224 billion over the twenty-year period.

The 1986 Tax Reform Act created a new category of bond--the private activity bond (PAB) -- which would be eligible, under certain conditions, for tax exempt status. The PAB category replaced an earlier provision for similar bonds, usually known as industrial development bonds (IDBs). The Act also set a substantially more restrictive limit, or cap, on the total volume of PABs which can be issued in a given State each year.

In its first-ever Advisory Statement to the Administrator[2], this Board argued that the unified State volume caps were constraining tax-exempt financing in a way that was limiting the supply and/or increasing the cost of investment funds for environmental facilities.[3] Accordingly, the Board recommended that bonds for environmental purposes be either (1) reclassified as government bonds or (2) specifically exempted from the State volume caps.

This recommendation was repeated several times in various forms during the following 16 years. In 1999, the Board advocated reclassifying all public-purpose bonds for water and wastewater projects as tax-exempt government

1 U.S. Environmental Protection Agency, "The Clean Water and Drinking Water Infrastructure Gap Analysis," Washington, D.C., September 2002.
2 Environmental Financial Advisory Board, "Incentives for Environmental Investment: Changing Behavior and Building Capital," U.S. Environmental Protection Agency, Washington, D.C., August 9, 1991.
3 Ibid., pp. 15-16.

bonds.[4] That same report also recommended a State volume cap exemption for watershed restoration bonds. In 2001, while addressing the need for increased participation by the private sector in providing environmental services, the Board identified the State volume cap on PABs as one of three major barriers.[5] At that time, the Board stated that:

"EPA should support the exemption of private activity bonds from state volume caps, whose proceeds finance public-purpose drinking water and wastewater facilities."[6]

It has now come to the attention of the Board that the President's budget for Fiscal Year 2008 includes a proposal that is virtually identical to the Board's 2001 recommendation. If adopted, the effect would be to exempt, from the unified State volume cap, qualified private activity bonds (PABs) used to finance the "furnishing of water" and/or "sewage facilities."

The Board continues to support the work of the Clean Water and Drinking Water State Revolving Funds, believing that they have already made, and will continue to make, a large contribution to closing the investment gap. However, much more needs to be done.

After reviewing the President's proposal, the Board concludes that its adoption will be another important step in the effort to finance needed water supply and wastewater infrastructure. We believe that the proposed exemption will increase the supply of capital for these purposes as well as lower the cost of capital to many of those communities already making use of private investment.

The Board expresses its full support for this proposed change in the tax law and is prepared to assist EPA in any way in its efforts to achieve this.

Sincerely,

G. James Barnes

A. James Barnes 4/04/07
Chair

A. Stanley Meiburg
Designated Federal Official

cc: Benjamin Grumbles
Assistant Administrator for Water

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4 Environmental Financial Advisory Board, "Recommendations and Final Report on Financing Opportunities for the Clean Water Action Plan," U.S. Environmental Protection Agency, Washington, D.C., July 1999, p. 12.

5 Environmental Financial Advisory Board, "Private Sector Initiatives to Improve Efficiencies in Providing Public-Purpose Environmental Services," U.S. Environmental Protection Agency, Washington, D.C., June 2001, pp. 6-8.

6 Ibid., p. 9.

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

MAR 20 2007

Honorable Stephen L. Johnson, Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: EFAB Report on the Use of Captive Insurance as Financial Assurance Tool in Office of Solid Waste and Emergency Response Programs

Dear Administrator Johnson:

At the request of the Agency, the Environmental Financial Advisory Board (EFAB) has convened a workgroup to address questions concerning the financial assurance requirements for Office of Solid Waste and Emergency Response (OSWER) programs. These requirements address closure, post-closure, corrective action and other aspects of the Resource Conservation and Recovery Act (RCRA) Subtitle C, D and I programs and also are viewed as guidance with regard to Superfund response action. On January 11, 2006, EFAB submitted to the Agency its initial findings concerning use of the financial test and corporate guarantees. We were pleased to receive on February 21, 2006, a letter from the Assistant Administrator of OSWER thanking EFAB for its work and highlighting elements of our analysis that were of particular assistance. We are grateful for this prompt and substantive response, which we have taken into account in approaching the use of captive insurance for financial assurance.

As we noted in our letter of January 11, 2006, the financial assurance requirements and the issues concerning them are complex and multi-faceted. For this reason, the Board, working with the Agency and other interested stakeholders, is addressing financial assurance mechanisms in discrete and manageable pieces, and focusing sequentially on them. The enclosed report on captive insurance represents a second step in our efforts. We recognize that many of the issues associated with policies issued by captive insurers are also issues posed by commercial insurance. While we acknowledge that there could be benefits in assessing both at the same time, we also found some unique issues associated with captive insurance that warranted a separate review. In fact, we found some commonalities with our earlier analysis of the financial test. In effect, the methods by which a party complies with its financial assurance requirements fall within a continuum of inherent financial capacity to fulfill guaranties by unrelated third parties. We expect that commercial insurance will be the next area of focus. As we complete our review of other aspects of financial assurance, we will apprise you of our responses to the questions posed by the Agency along with our findings.

The Board was charged with addressing three questions regarding captive insurance: (1) Should there be minimum capitalization requirements for captive or other insurers who provide policies for financial assurance and, if so, what requirements would best assure funds are available for protection of the environment, including closure, post-closure, corrective action and other environmental clean-up?; (2) Should policies written by captives and commercial insurers be treated as equally acceptable mechanisms?; and (3) Should the language of policies written by captives differ in any way from those issued by commercial insurers?

In June 2004, EFAB conducted a workshop in New York City which began to explore the issues raised by the use of several financial assurance mechanisms, including captive insurance. On June 27, 2006, we convened a second workshop in New York City focused exclusively on captive insurance in which we heard from governmental and financial community representatives overseeing and evaluating the captive insurance industry, users of captive insurance, a representative of the EPA Office of the Inspector General, and State government representatives familiar with the use of captive insurance for RCRA financial assurance. We received public comment at the meeting, and subsequently have received additional written comments from business interests and State solid waste management officials.

Our work has been informed throughout by the expertise of government officials willing to share their extensive knowledge of environmental insurance. In particular, we appreciate the insights provided by EPA staff in both OSWER and OECA, and State regulators familiar with the details of both RCRA and Superfund financial assurance requirements and the structure and operations of the captive insurance industry. The active participation of expert EPA staff and representatives of five States in extended discussions at the New York City workshop and in deliberations both before and after the workshop assisted the Board in understanding the nature of and regulatory structure for captive insurance.

The Board appreciates EPA's continuing support and participation in the development of this report and the findings contained herein. If the Agency decides to go forward with the informational materials recommended by the Board, we would be pleased to work with the Agency or its designees on that effort. Meanwhile, we will continue to gather and analyze information on additional topics involving financial assurance in order to respond to the full range of questions EPA has posed to the Board.

We would be pleased to respond to any questions that you may have with regard to today's report or any other aspect of our on-going deliberations.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Designated Federal Official

Enclosure

cc: Susan Parker Bodine, Assistant Administrator, Office of Solid Waste and Emergency Response
Grant Nakayama, Assistant Administrator, Office of Enforcement and Compliance Assistance

Environmental Financial Advisory Board

Report on Innovative Finance Programs for Air Pollution Reduction

November 2007

Printed on Recycled Paper

United States Environmental Protection Agency
Environmental Financial Advisory Board

Report on Innovative Finance Programs for Air Pollution Reduction

SUMMARY

The Environmental Financial Advisory Board (the "Board") was originally asked by the Office of Air and Radiation (OAR) to review the SmartWay retrofit program to determine if any innovative financing programs could be developed to spur sales of SmartWay kits and thus reduce the emissions of various oxides of nitrogen (collectively "NOx"), carbon dioxide (CO_2), and particulates that attend the various products comprising the kits.

The Board has identified several major innovations that will create significant market incentives not only for SmartWay Kits, but also for other programs that reduce air emissions from mobile sources and even other small, stationary sources. The Board recommends that these innovations be implemented at the State level. There are presently a few states that offer the odd, one-off grant, loan, or other incentive for these purposes[1]; but none do so on the order of magnitude or with the concerted effort that we recommend here. To this end, we propose a major effort by the Agency to encourage States to create Air Quality Finance Authorities with the power to introduce these financial innovations. This would be the first major air emission reduction finance program anywhere in the world that we know of. In short, we recommend:

- States should create Air Quality Finance Authorities (AQFAs), or empower existing environmental finance authorities to finance certain types of air emission reduction equipment; or, at least, create a state-wide or regional air emission reduction financing program.

- State AQFAs should offer long-term, low-rate financing to small private owners of polluting equipment to upgrade their equipment or, if applicable, to retrofit it to reduce emissions.

- State AQFAs should be the nominal purchasers of such pollution reduction equipment for the purpose of achieving volume discounts which can be passed on to end-users. The equipment can be resold, or leased, to end-users.

- State AQFAs should negotiate fleet fuel discounts on behalf of those companies who use their programs.

[1] Grants: CA, PA, WI and TX. Loans: AR, MN. Other: OR.

- State AQFAs should acquire the rights to the emission reduction credit on each transaction and use or sell those emission credits to further reduce the cost of the program.

- EPA should review all of its funding programs which have a nexus to air emissions with a view to, wherever possible, using them as an incentive to encourage states to take the above actions.

BACKGROUND AND FINDINGS

The Board has determined that several innovative financing techniques can be used to promote the SmartWay program. Moreover, we have also determined that the same techniques may be applicable to a wide variety of other small, stationary emission sources.

The Board's investigations into the SmartWay program found that the real need for innovative finance lay in dealing with the tens of thousands of small trucking firms that lacked capital and did not enjoy superior credit ratings. Most of these truckers are locked into a financial regime with terms so short (3 – 5 years) and interest rates so high (~14%), that the cost of financing the kits was only marginally offset by the fuel savings – and only so for extremely long-haul carriers (125,000+ miles per year). For example, the cost of a SmartWay kit is estimated at $20,100. To finance this amount for three years at 14% would require an annual payment of $8,657. Estimated fuel savings of 3,500 gallons per year per tractor (based on a 14% savings on 125,000 miles at 5 miles per gallon) at a cost of $2.50 per gallon would result in fuel cost savings of $8,750 per year. Thus, a trucker who drove 125,000 miles would save only $92.30 per year. This means that if the trucker erred on his actual mileage by only 200 miles (0.16%), he would lose money. This problem is exacerbated when shorter-haul trucks are considered, some of which drive only 20,000 miles per year. In addition, professional truckers are at least as skeptical as the average motorist when it comes to believing claims of fuel efficiency. So, the SmartWay retrofit program has not taken off, as it should have.

(It should be noted that the SmartWay program has pioneered two loan programs. The first, the SmartWay Loan program, takes advantage of the U.S. Small Business Administration's Business Express Loan program, offering 12% loans to firms that are 51% owned by women, veterans, minorities or firms located in certain distressed areas. It has generated about 100 loans to date, nationwide. The second is the SmartWay Plus Loan program which is offered through community development banks in Norfolk, Virginia, and New York City.)

The Board then learned of the activities of Cascade Sierra Solutions (CSS), a Non Governmental Organization (NGO) operating on the West Coast, which, we understand, was created by a grant from the SmartWay program, and which is "dedicated to saving fuel and reducing emissions from heavy-duty diesel engines". CSS has developed a program that exploits two additional cost saving factors. CSS, acting as an agent for the kit manufacturers, sells SmartWay kits directly to truckers. By aggregating these sales, they are able to achieve volume discounts of 6% on their

purchases of SmartWay kits[2]. This volume discount could be passed on to end users to further enhance the attractiveness of the program. In addition, although their "clients" had no legal relationships among themselves, their "client" relationship with CSS was sufficient for CSS to negotiate a fleet fuel discount of 6%. For a 125,000 mile carrier, this results in additional savings of $3,150 per year (with a SmartWay kit).

It soon became clear to the Board that the genius of CSS's innovation lay in their ability to synthetically aggregate hundreds of small truckers to avail them of volume discounts.

We then began to further consider the question of the "synthetic aggregation" of small trucking companies and began to look at ports, where tens of thousands of trucks congregate daily[3]. Many ports are run by port authorities, which are units of state or local government.

There are four important conclusions we drew from our investigations of ports. First, port authorities have the ability to issue bonds. Second, ports, as large stationary sources of air pollution, have need to reduce emissions not only from their own equipment, but also from equipment owned by others, such as trucking companies, which are naturally drawn to, and use, port facilities. Third, because of this overarching interest in reducing air emissions, port authorities could afford to be less sensitive to credit concerns than are commercial bankers who have clear fiduciary responsibility for their depositors' and shareholders' funds. For this reason, port authorities should be more willing to extend the tenor of loans to terms commensurate with the service lives of air emission reduction facilities financed with their bonds.

Fourth, as a result of this need to reduce emissions *in situ*, port authorities need emissions credits. It would, therefore, be very beneficial for ports to assist their trucking clientele to reduce emissions if the ports themselves could, in turn, get credit for the reductions.

At this stage of our investigations, two other important considerations occurred to us. First, there are other "non-port" areas (such as truck stops) where the intervention of a government agency could provide the same benefits. Thus we began to think of new, statewide agencies with financing authority for air pollution reduction.

Our second, and most important, consideration is that there is a wide universe of air polluters – both mobile and stationary - who share the same economic profile as do the truckers in the SmartWay program. These types of entities typically own various kinds of diesel powered vehicles - stationery equipment, such as cranes, powered by diesel engines; diesel powered construction equipment, and the like. The characteristics they share are as follows:

1) They are small source polluters.
2) There are literally millions of these small source polluters.

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[2] CSS does not pass this savings on to their customers, but rather uses it to cover their administrative costs. In this report, we will recommend that these savings be passed along to SmartWay kit purchasers.
[3] The Port of Baltimore, which is 13th in size in the United States, estimates that 2,500 trucks visit their facilities daily.

3) They are almost all owned by small private businesses or private owners.
4) They do not have superior credit and, therefore, have limited access to capital.

Our conclusion, in one sentence, is that these small polluters need to be synthetically aggregated and offered favorable financing terms by State AQFAs as an incentive either to install pollution reduction equipment, such as SmartWay kits, other air emission reduction equipment, or to purchase new state-of-the-art low emission engines.

From all of the above investigations, we conclude that a major finance program to advance the use of SmartWay kits and other air pollution reduction devices could be developed through State AQFAs or other governmental entities such as port authorities. Specifically, we believe:

1) That State AQFAs and other governmental entities with bonding authority should be able to issue bonds at favorable rates to finance the acquisition of SmartWay kits or other mobile-source pollution reduction devices, which can be sold or leased to trucking companies.
2) That the terms of such bonds can be commensurate with the service lives of the equipment so financed. In this case, term could be extended from 3 to as much as 10 years, with accompanying dramatic reductions in financing costs[4].
3) That such agencies can negotiate volume discounts from the manufacturers of the components of the kits, and pass along this savings to SmartWay kit purchasers.
4) That such agencies can have their SmartWay kit purchasers collectively designated as a fleet for the purpose of obtaining fleet discounts for diesel fuel.
5) That such agencies should be allowed to keep for their own account, or trade, the emission credits attributable to all of the emission reductions from the trucks in their respective SmartWay fleets.

Below are a few examples of what could be done through State AQFAs.

Example #1 – New low emission trucks

Instead of just a SmartWay kit, let us consider brand new low-emission diesel tractor. Let us say that the average new, fuel-efficient, environmentally friendly tractor costs $100,000. At conventional rates for small truckers paying full price for the tractor, it would cost them some $29,128 per year. If they bought the same truck through a State AQFA with a volume discount, it would cost the same trucker only $11,096 per year. Add in a fleet fuel discount card and the cost is lowered even further. The result is a very strong financial incentive for truckers to modernize their fleets with more fuel efficient models that pollute less.

[4] A 10% loan of $1,000 with a three-year term requires an annual payment of $402.11. The same loan, with a 10-year term, only requires an annual payment of $162.75. A 60% reduction!

Example #2 – Truck Stops

The characteristic emission problem with truck stops arises from idling. Trucks idle at such facilities, with their engines on, for as much as 10 hours per day. Each hour they idle consumes one gallon of fuel.

The alternative to idling is to have an Auxiliary Power Unit (APU) which supplies power to the cab while the driver sleeps or rests or to use Truck Stop Electrification (TSE). Both APUs and TSE significantly reduce idling emissions.

Truck stops are largely privately owned. The installation of APUs or TSE depends solely on whether the manufacturers of these devices can convince truck stop owners to install them. The manufacturers want to get paid in full as soon as possible. The truck stop owner, if he invests in APUs or TSE, wants to recover his investment as soon as possible. However, as the fees for using an on-site APUs or TSE approach the cost of burning fuel for the same period of time ($2.50 per hour), the incentive for drivers to use them disappears.

If, however, a State AQFA were to acquire a non-possessor easement interest in the air rights over the truck stop from the truck stop owner (for which it would pay the truck stop owner an annual fee), then the state agency could purchase the APUs or TSE from the manufacturers, and finance them with low-cost, long-term, bonds and have the manufacturers install and, if necessary, maintain them. The manufacturer would get paid in full up front. The truck stop owner would receive additional risk-free annual income from the state. And the State AQFA would be able to set user fees at substantially lower rates because of the low cost of the underlying long-term financing.

For example, a truck stop owner would likely want to recover his investment in three years on a cash-on-cash basis. For every $1,000 of investment he would need to recover $333 per year in net fees. But with 10-year, taxable bonds at 5%, a state agency would only have to recover $130 per year. Thus there would be much more room to offer truckers savings sufficiently substantial to induce them to use the APU and avoid the polluting emissions.

Depending on state law, the same result might be achieved by the creation of Air Quality Improvement Districts; much like the Neighborhood Improvement Districts used in brownfields reclamations. An Air Quality Improvement District could be created at a truck stop, which might allow the issuance of bonds to finance the installation of APUs at that site. This could be done at truck stops all over the State. If there were 10 truck stops in a State that could accommodate 50 trucks each, the daily fuel savings would be 5,000 gallons or over 1,750,000 gallons per year with commensurate reductions in NOX and CO_2.

Example #3 – "Drayage Yards"

The second stationary source of mobile emissions that we considered are what might be called – for lack of a better term – "drayage yards". Drayage, the Board came to learn, has a very specific meaning in port-related terminology. It refers to trucks that remove containers from ports and deliver them to marshaling yards a few miles from the port from whence they are

further disbursed. They also do the reverse, i.e. deliver containers from the yard to the port. These drayage yards are privately owned and, like ports, are magnets for trucks.

There are two issues regarding drayage yards that need consideration. The first is that, like truck stops and ports, much idling occurs there. However, there are differences between the idling that occurs at truck stops and that which occurs at drayage yards. At truck stops, there are a relatively small number of trucks that idle for long periods of time. These can be dealt with effectively by stationary APUs that are affixed to each truck parking space. At drayage yards, the characteristic idling is the converse, i.e., many trucks idling for relatively short periods of time. This type of idling can best be dealt with by replacing older trucks with newer, cleaner models. Privately owned drayage yards, however, have no capability of offering the owners of their older user-trucks any financial incentives to replace them. States, however, could intervene and create such incentives through AQFAs.

It would certainly be in the interest of a State to reduce such emissions by creating a program to finance cleaner trucks that use such facilities.[5] In this regard, the concepts of an Air Quality Improvement Easement or an Air Quality Improvement District would be very useful in bringing the financial power of long-term, bond financing to bear on this problem.

The second issue involving drayage yards deals directly with emission credits.

As previously noted, drayage yards reside only a few miles from the port they serve. Thus, they will virtually always be in the same airshed as is the port itself. So, too, will be the dray trucks. They will always be driving and polluting within the same airshed where the port is located. Ways and means, therefore, need to be developed where a stationary source of mobile emissions, such as a port (public) or a drayage yard (private), can legally obtain emissions credits from the owners of the mobile sources whose emission reductions they finance. Ports and State AQFAs should be able to acquire the emissions credits from the truckers whom they induce to buy SmartWay kits; newer, cleaner trucks and other pollution reduction devices.

We understand that the Agency has already dealt with this issue at least once in San Diego, California, where an electric generating utility in need of emission credits purchased a fleet of sanitation trucks that used natural gas/propane for a privately-owned company that handled solid waste disposal for the county government. The utility was able to acquire and use the Mobile source Emission Reduction Credits (MERCs) effected by the new engines. These sanitation trucks always remained within the county which, in turn, was within the same non-attainment area as the power plant. In this case, the Agency was able to satisfy itself that such reductions were "real, quantifiable, federally enforceable, permanent and surplus" within the meaning of the Clean Air Act. This precedent must be expanded to encourage lower vehicle emissions which will benefit more non-attainment areas.

[5] We understand the SmartWay program is already cooperating with the ports of Norfolk and New York/New Jersey on a pilot program similar hereto.

ADDITIONAL CONSIDERATIONS

Before concluding, we would like to offer some observations on two related matters: the possible use of tax-exempt bonds and the implementation of the recommendations contained herein

Tax-exempt Bonds

Tax-exempt bonds are the mainstays of finance programs in the water and wastewater sectors. This is not the case in the air sector. The reason for this is that most drinking water providers and wastewater treatment system operators are public entities that can readily issue tax-exempt bonds for capital projects. Most air polluters, on the other hand, are private, where the issuance of tax-exempt bonds is awkward and problematic. Tax-exempt bonds issued for the benefit of private entities are called Private Activity Bonds (PABs).

The discussions above regarding the possible issuance of tax-exempt bonds raise the following questions: Under what circumstances, if any, could a government agency such as a port authority, or State AQFA, issue tax-exempt bonds to purchase mobile source air pollution abatement equipment for sale or lease to private entities?

Based on informal discussions with bond counsel, we believe that tax-exempt PABs cannot be issued to finance air pollution control devices for private users. There are, however, two small exceptions. The first is what might be called a *de minimis* exception: if the PAB is a part of a larger bond issue and constitutes less that 5% of such issue and is less than $15 million. Thus, bonds issued for the purposes described herein could be issued as a small part of a larger tax-exempt bond financing issued for other purposes as long as the amount was below those two stated thresholds. The large capital programs of ports may avail them of the opportunity to aggregate air emission financing as part of larger tax-exempt financings while remaining compliant with these *de minimis* thresholds.

The second exception appears to be of even more limited applicability. It was created by the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or "SAFETEA-LU", (Pub. L. No. 109-59), which was enacted in 2005. Section 11143 of this Act added sections 142(a)(15) and 142(m) to the Internal Revenue Code, which authorize up to $15,000,000,000 of tax-exempt private activity bonds to be issued by State or local governments for a new type of exempt facility, i.e. "qualified highway or surface freight transfer facilities". The relevant part of the definition of this term for our purposes is "any surface transportation project that receives Federal assistance under title 23, United States Code". So, if one of the programs described above is part of a larger transportation program that is receiving grants from the U.S. Department of Transportation under title 23 of the U.S. Code, then bonds issued for that program are eligible for this exception. Included under title 23 (section 149(b)) are qualified highway or surface freight transfer projects that have air quality benefits. These are projects that are, determined by the Transportation Secretary, after consultation with the EPA Administrator, "likely to contribute to the attainment of a national ambient air quality standard, whether through reductions in vehicle miles traveled, fuel consumption, or through other factors."

It is apparent that this matter is quite complicated. States should be aware of these exceptions and seek competent bond counsel to advise them.

In the final analysis, however, if all avenues to tax-exempt bond financing fail, States should be prepared to issue taxable bonds for the programs described herein. In the current interest rate environment, a tax-exempt, 10-year bond would yield about 4%; while its taxable counterpart would yield about 5%. The difference in payment between these two bonds is $123 vs. $130 per year (per $1,000 financed). This is minimal; whereas the difference between these and the conventional financing available to most small truckers ($430.73) is many times larger. In addition, if State AQFAs chose to lease the emission reduction equipment to end-users, they would be able to aggregate and sell the depreciation benefits of the equipment for tax purposes, and use the proceeds of such sales to further reduce the cost of the program to the end users. So, State AQFAs should pursue taxable financing when all else fails.

Implementation

In the course of our investigations, we had informal conversations with officials at two major ports. When the subject of establishing financing programs for the truckers who use their facilities came up, it became abundantly clear that the port officials did not see themselves in the banking business and were very uncomfortable with the thought of entering it, even on a limited basis. The same sentiment is probably true of state air pollution control agencies that see themselves as regulators, and certainly not lenders.

That said, the Board believes there are two points to consider. The first is that there are ample skills in most state governments for mounting private sector lending programs. They are not in any department that deals with the environment; rather they are in the department of economic development. Even most large counties have private sector lending programs associated with their economic development programs. This is a very important point because there will most certainly be some defaults and delinquencies in any lending program for truckers or other such small businesses. The agencies that run the State Revolving Fund programs deal largely with municipal borrowers or public authorities where defaults and delinquencies are very rare. But the economic developers have appropriate analytical skills to minimize initial credit risks as well as the skills to manage defaults, foreclosure, repossession and the resale of physical assets.

The second point is that there are alternative strategies for implementing such lending programs. CSS is a good example. Instead of having a state, or port authority, directly manage an air quality financing program, they could contract with a NGO such as CSS to manage it for them. Or, in the final analysis, states could set up linked deposit programs or issue limited loan guaranties to qualified commercial banks and let them manage these types of lending programs.

Setting up state sponsored programs will require capital commitments. Seed money can be provided from a number of state sources such as general, economic development or environmental funds from taxes or fee income. Existing federal programs may also provide a complement of capitalization dollars to support state efforts.

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

APR 25 2007

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

Mr. A. James Barnes
Chair, Environmental Financial Advisory Board
United States Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Dear Mr. Barnes:

Thank you for your letter of March 20, 2007, to Administrator Johnson on the Environmental Financial Advisory Board's report that explores the use of captive insurance as a financial assurance tool in the Agency's waste and remediation programs. My staff and I appreciate all of the work the Board has done on this important topic, and recognize the Board's consultation with a broad range of interested parties. EPA greatly appreciates the Board's inclusion of State and EPA staff in many of its meetings on this topic. We find that the Board's input on captive insurance, as well as other issues, is extremely valuable as we consider moving forward with improvements to the RCRA financial assurance requirements.

In response to its charge, the Board presented several important findings and recommendations on captive insurance that the Agency will take under advisement. Consistent with the Board's findings with regard to the use of the financial test for financial assurance purposes, the Board found that the use of independent credit analysis is a cost-effective mechanism for demonstrating the financial strength of a captive insurer. We note that the Board will also examine the issue of ratings as it looks at commercial insurers.

With respect to the Board's earlier recommendations on the financial test, I recently directed my staff to initiate the Agency's Action Development Process (ADP) to more fully analyze possible regulatory options concerning the RCRA Subtitle C financial test. By entering into the ADP, EPA is acknowledging that the current financial test does present a number of issues that need to be explored. One of the options that will be analyzed through this process is the recommendation from the Board that EPA include an independent ratings requirement to Alternative I of the current financial test. Although initiating the ADP is the first step in pursuing regulatory alternatives, a possible outcome of the process could be to address these concerns through implementation assistance rather than pursuing regulatory changes.

EPA appreciates the expertise and experience that the Board brings and values the insights it can provide. EPA looks forward to receiving the findings in response to the other questions presented to the Board.

Sincerely,

Susan Parker Bodine
Assistant Administrator

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

JAN 5 2007

Hon. Stephen L. Johnson
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Johnson:

The Environmental Financial Advisory Board is pleased to submit the enclosed report, "Expanding the Definition of SRF Financial Assistance" for the Agency's consideration and use. This report supports authorizing SRFs to provide a form of financial assistance to eligible projects that would not require that invested program equity be yield restricted under IRS arbitrage regulations. Without the restrictions, SRF programs could earn more interest and use that money for projects. The perpetuity requirement applicable to SRFs would remain unchanged.

Under EPA's current SRF regulations, a subsidy can be given to a borrower in order to provide a below market interest rate on a loan either made or local debt obligation purchased by the SRF. However, the use of SRF equity to provide a debt service subsidy triggers the federal arbitrage restrictions on the investment of SRF program equity. Efforts to obtain relief from the arbitrage regulations by exempting SRFs from application of the generally applicable arbitrage rules have not been successful thus far.

The proposed alternative is to permit SRF assistance to eligible projects for capital or operating costs. Project eligibility would be determined under the same set of rules as presently exist, so that the kinds of projects eligible for assistance would not change under this new program. For example, an SRF could provide assistance (in an amount equivalent to what would currently be provided as a debt service subsidy) either by funding construction costs or funding an annual operating subsidy for a project that receives a market rate SRF financing. The SRF would still have to be maintained in perpetuity. The effect of the perpetuity requirement is that whatever the form of the financial assistance (i.e., for debt service, capital or operating cost of an eligible project), it would have to be provided from accumulated, current or future earnings on SRF equity.

By combining a guaranty of borrower debt (or a market rate loan from the SRF to the borrower or a purchased local debt obligation) with the provision of capital or operating assistance, there would be no basis under the arbitrage regulations for any yield restriction of SRF money relating to the provision of that assistance. While the Department of the Treasury may have some concerns with this approach, we believe this idea derived from a guaranty approach, creates the possibility of realizing the benefit of arbitrage relief without the need to change existing IRS regulations.

Rather than requiring a change in or exception to IRS regulations, this approach allows SRF assistance to be structured in a way that does not trigger the application of the IRS arbitrage rules. Amendments to Clean Water SRF and Drinking Water SRF regulations that could be made to implement this concept (with complementary statutory authority) are offered in this paper.

No significant change in the administration or supervision of the state SRFs would be required under this approach. Also, this would not change the SRF program into a traditional "grant" program since the SRF would still be maintained in perpetuity. However, small communities, in particular, that may have previously been reluctant to take advantage of the SRF program because of lack of understanding of the benefits of reduced interest rates may be attracted to the idea of operating subsidies (even though the net financial impact would be the same). Thus, this programmatic change may have the collateral benefit of attracting new participants to the SRF program. This would be especially beneficial because a community that participates in the SRF program is subject to conditions that move the community toward improved financial management and full-cost pricing.

The Board appreciates the continuing opportunity to provide financial advisory assistance to the Agency on issues of national importance.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Executive Director

Enclosure

cc: Ben Grumbles, Assistant Administrator for Water
Lyons Gray, Chief Financial Officer

Environmental Financial Advisory Board

EFAB

Report on Innovative Finance Programs for Air Pollution Reduction

November 2007

Printed on Recycled Paper

Expanding the Definition of SRF Financial Assistance

The goal of the concept discussed herein is to permit SRFs to be managed more efficiently and provide more funding for SRF-eligible projects. The proposed mechanism for allowing more efficient operation is to authorize SRFs to provide a form of financial assistance to eligible projects that would not require that invested program equity be yield restricted under IRS arbitrage regulations. Without the restrictions, SRF programs could earn more interest and use that money for projects. The perpetuity requirement applicable to SRFs would remain unchanged.

Under EPA's current SRF regulations, a subsidy can be given to a borrower in order to provide a below market interest rate on a loan either made or local debt obligation purchased by the SRF. However, the use of SRF equity to provide a debt service subsidy triggers the federal arbitrage restrictions on the investment of SRF program equity. Efforts to obtain relief from the arbitrage regulations by exempting SRFs from application of the generally applicable arbitrage rules have not been successful thus far.

The proposed alternative is to permit SRF assistance to eligible projects for capital or operating costs. Project eligibility would be determined under the same set of rules as presently exist, so that the kinds of projects eligible for assistance would not change under this new program. For example, an SRF could provide assistance (in an amount equivalent to what would currently be provided as a debt service subsidy) either by funding construction costs or funding an annual operating subsidy for a project that receives a market rate SRF financing. The SRF would still have to be maintained in perpetuity. The effect of the perpetuity requirement is that whatever the form of the financial assistance (i.e., for debt service, capital or operating cost of an eligible project), it would have to be provided from accumulated, current or future earnings on SRF equity.

By combining a guaranty of borrower debt (or a market rate loan from the SRF to the borrower or a purchased local debt obligation) with the provision of capital or operating assistance, there would be no basis under the arbitrage regulations for any yield restriction of SRF money relating to the provision of that assistance. While the Department of the Treasury may have some concerns with this approach, we believe this idea derived from a guaranty approach, creates the possibility of realizing the benefit of arbitrage relief without the need to change existing IRS regulations.

Rather than requiring a change in or exception to IRS regulations, this approach allows SRF assistance to be structured in a way that does not trigger the application of the IRS arbitrage rules. Amendments to CWF and DWF regulations that could be made to implement this concept (with complementary statutory authority) are attached hereto.

No significant change in the administration or supervision of the state SRFs would be required under this approach (although a modest change of interpretation described below would maximize the benefits of the new approach). Also, this would not change the SRF program into a traditional "grant" program since the SRF would still be maintained in

perpetuity. However, small communities, in particular, that may have previously been reluctant to take advantage of the SRF program because of lack of understanding of the benefits of reduced interest rates may be attracted to the idea of operating subsidies (even though the net financial impact would be the same). Thus, this programmatic change may have the collateral benefit of attracting new participants to the SRF program. This would be especially beneficial because a community that participates in the SRF program is subject to conditions that move the community toward improved financial management and full-cost pricing.

Currently SRFs are permitted to provide assistance in an amount (the "Maximum Assistance Amount" or "MAA") up to the cumulative retained earnings available at any time. (In the case of direct loans, the SRF forgoes earnings by making below-market investments in the form of borrower loans). The decision as to how much of the MAA to apply currently to provide assistance is made by each state. Each state certifies on an annual basis that it has not provided assistance in excess of that amount – i.e., that it is in compliance with the perpetuity requirement. Currently, the portion of the MAA applied to provide assistance is applied to provide an interest subsidy either:

- By paying down a portion of the interest on bonds used to fund a loan to or purchase a debt obligation from the borrower or
- By providing financing to the borrower from SRF equity at a below-market interest rate.

Under the proposed approach, each state SRF would also have the option of applying its accumulated earnings to fund construction or operating costs rather than to provide an interest subsidy. The provision of capital assistance would reduce the amount of SRF financing that the borrower would need for the project. The SRF would also make or guarantee the market-rate SRF financing (a loan or purchased debt obligation) for the balance of the borrower's construction costs. In the case of operating assistance, the SRF would also make or guarantee financing for the construction costs of the project.

The reason that only 40% to 60% of the benefit of arbitrage relief would be obtained from the provision of capital assistance is that to provide an equivalent amount of capital assistance, at the outset the SRF would need to pay to the borrower an amount equal to the present value of the interest subsidy that is currently being provided. If the present value of the assistance were 40% of the amount of equity allocable to provide the subsidy, then only 60% of the equity would remain to be invested on an unrestricted basis. Hence, only 60% of the benefit of arbitrage relief would be achieved.

The payment of up-front capital assistance could raise a potential question of interpretation of the perpetuity rule. No question is raised to the extent that the capital assistance is funded from previously accumulated earnings. However, to the extent that future earnings on the SRF's invested capital will be needed to maintain perpetuity, the current application of the rule (which looks only at earnings in hand) may limit the use of this more beneficial approach. This issue could be eliminated by interpreting the perpetuity requirement to allow SRFs to take into account of:

- Expected earnings on existing investments:

    - Since the SRF had credit exposure to the investment provider for both principal and interest, there is no reason to only consider investment earnings that have already been "earned".

- Projected earnings on invested equity based on reasonable assumptions made by the SRF:

    - To maximize its investment earnings, an SRF may want to adopt a more innovative investment strategy than locking up its investments for the full period that it would otherwise have funded loans or purchased obligations. This should be encouraged by authorizing SRFs to make reasonable projections of future earnings on reinvestments of its existing equity.

    - Under this approach, the projections would be over the entire period for which the SRF has outstanding financial assistance in the form of loans, purchased local debt obligations or guarantees.

Providing operating assistance payable annually for a period equal to what the term of an SRF financing would be, has the benefit of allowing 100% of the SRF's equity to be invested on an unrestricted basis. So, the full benefit of arbitrage relief would be achieved. Also, the current interpretation of the perpetuity rule would not pose any problem to implementation of this approach. The attached diagrams contrast the cash flows for an SRF providing operating assistance to the cash flows of an SRF that uses the reserve model.

For SRFs that currently use the Reserve Fund approach, there would likely be no federal budgetary impact of the proposal. The amount of borrowing by such SRFs would not change. Also, while they are currently required to invest at a restricted yield, they have not complied with such restriction by investing in SLGS (which benefit the US Treasury) but by investing in other lower yielding investments (from which the US Treasury derives no benefit). Those programs would modify their structures to look more like the General Revenue Bond approach adopted by Connecticut or the Subordinate Bonds approach utilized by New York which would permit unrestricted investment of program equity if financial assistance were provide for either capital costs of operating expenses.

However, if capital assistance or operating assistance were permitted, SRFs in states (a) that have to date made only direct loans (i.e., funded from program equity) or (b) that use a combination of direct financing and bond-funded financing (referred to as the Cash Flow approach), would be likely to convert to an approach in which SRF financing is provided from bond proceeds rather than from equity. This could significantly increase the amount of funding available for clean water and drinking water projects in those states, but it would also increase the amount of their tax-exempt borrowing. So, there

would be budgetary impact relating to the SRFs that use direct loans or the Cash Flow approach. The budgetary impact would be the same as if arbitrage relief were granted.

35.3115 Eligible activities of the SRF.

Funds in the SRF shall not be used to provide grants. SRF balances must be available in perpetuity and must be used solely to provide loans and other authorized forms of financial assistance:

(a) to municipalities, intermunicipal, interstate, or State agencies for the construction of publicly owned wastewater treatment works as these are defined in section 212 of the Act and that appear on the State's priority list developed pursuant to section 216 of the Act; and

(b) for implementation of a nonpoint source pollution control management program under section 319 of the Act; and

(c) for development and implementation of an estuary conservation and management plan under section 320 of the Act.

§ 35.3120 Authorized types of assistance.

The SRF may provide seven general types of financial assistance.

(a) Loans. The SRF may award loans at or below market interest rates, or for zero interest.

(1) Loans may be awarded only if:

(i) all principal and interest payments on loans are credited directly to the SRF;

(ii) the annual repayment of principal and payment of interest begins not later than one year after project completion;

(iii) the loan is fully amortized not later than twenty years after project completion; and

(iv) each loan recipient establishes one or more dedicated sources of revenue for repayment of the loan.

(2) Where construction of a treatment works has been phased or segmented, loan repayment requirements apply to the completion of individual phases or segments.

(b) Refinancing existing debt obligations. The SRF may buy or refinance local debt obligations at or below market rates, where the initial debt was incurred after March 7, l985, and building began after that date.

(1) Projects otherwise eligible for refinancing under this section on which building began:

(i) before January 28, 1988 (the effective date of the Initial Guidance for State Revolving Funds) must meet the requirements of title VI to be fully eligible.

(ii) after January 28, 1988, but before the effective date of this rule, must meet the requirements of title VI and of the Initial Guidance for State Revolving Funds to be fully eligible.

(iii) after (effective date of the rule) must meet the requirements of this rule to be fully eligible.

(2) Where the original debt for a project was in the form of a multi-purpose bond incurred for purposes in addition to wastewater treatment facility construction, an SRF may provide refinancing only for eligible purposes, and not for the entire debt.

(c) Guarantee or purchase insurance for local debt obligations. The SRF may guarantee local debt obligations where such action would improve credit market access or reduce interest rates. The SRF may also purchase or provide bond insurance to guarantee debt service payment.

(d) Guarantee SRF debt obligations. The SRF may be used as security or as a source of revenue for the payment of principal and interest on revenue or general obligation bonds issued by the State provided that the net proceeds of the sale of such bonds are deposited in the SRF.

(e) Loan guarantees for "sub-State revolving funds." The SRF may provide loan guarantees for similar revolving funds established by municipal or intermunicipal agencies, to finance activities eligible under title VI.

(f) Earn interest on fund accounts. The SRF may earn interest on Fund accounts. Interest earned on Fund accounts may be used to provide financial assistance for debt service, capital expenditures, operations, treatment facilities or be retained to grow SRF balances. Such assistance may only be provided to support eligible activities, identified in §35.3115, and may be provided pursuant to or in connection with one of the seven general types of financial assistance.

(g) SRF administrative expenses.

(1) Money in the SRF may be used for the reasonable costs of administering the SRF, provided that the amount does not exceed 4 percent of all grant awards received by the SRF. Expenses of the SRF in excess of the amount permitted under this section must be paid for from sources outside the SRF.

(2) Allowable administrative costs include all reasonable costs incurred for management of the SRF program and for management of projects receiving financial assistance from the SRF. Reasonable costs unique to the SRF, such as costs of servicing loans and issuing debt, SRF program start-up costs, financial, management, and legal consulting fees, and reimbursement costs for support services from other State agencies are also allowable.

(3) Unallowable administrative costs include the costs of administering the construction grant program under section 205(g), permit programs under sections 402 and 404 and Statewide

wastewater management planning programs under section 208(b)(4).

(4) Expenses incurred issuing bonds guaranteed by the SRF, including the costs of insuring the issue, may be absorbed by the proceeds of the bonds, and need not be charged against the 4 percent administrative costs ceiling. The net proceeds of those issues must be deposited in the Fund.

§ 35.3125 Limitations on SRF assistance.

(a) Prevention of double benefit. If the SRF makes a loan in part to finance the cost of facility planning and preparation of plans, specifications, and estimates for the building of treatment works and the recipient subsequently receives a grant under section 201(g) for the building of treatment works and an allowance under section 201(l)(1), the SRF shall ensure that the recipient will promptly repay the loan to the extent of the allowance.

(b) Assistance for the non-Federal share.

(1) The SRF shall not provide a loan for the non-Federal share of the cost of a treatment works project for which the recipient is receiving assistance from the EPA under any other authority.

(2) The SRF may provide authorized financial assistance other than a loan for the non-Federal share of a treatment works project receiving EPA assistance if the Governor or the Governor's designee determines that such assistance is necessary to allow the project to proceed.

(3) The SRF may provide loans for subsequent phases, segments, or stages of wastewater treatment works that previously received grant assistance for earlier phases, segments, or stages of the same treatment works.

(4) A community that receives a title II construction grant after the community has begun building with its own financing, may receive SRF assistance to refinance the pre-grant work, in accordance with the requirements for refinancing set forth under § 35.3120(b) of this part.

(c) Publicly owned portions. The SRF may provide assistance for only the publicly owned portion of the treatment works.

(d) Private operation. Contractual arrangements for the private operation of a publicly owned treatment works will not affect the eligibility of the treatment works for SRF financing.

(e) Water quality management planning. The SRF may provide assistance only to projects that are consistent with any plans developed under sections 205(j), 208, 303(e), 319 and 320 of the Act.

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installation or replacement of transmission and distribution pipes to improve water pressure to safe levels or to prevent contamination caused by leaks or breaks in the pipes.
(iii) *Source.* Examples of projects include rehabilitation of wells or development of eligible sources to replace contaminated sources.
(iv) *Storage.* Examples of projects include installation or upgrade of eligible storage facilities, including finished water reservoirs, to prevent microbiological contaminants from entering a public water system.
(v) *Consolidation.* Eligible projects are those needed to consolidate water supplies where, for example, a supply has become contaminated or a system is unable to maintain compliance for technical, financial, or managerial reasons.
(vi) *Creation of new systems.* Eligible projects are those that, upon completion, will create a community water system to address existing public health problems with serious risks caused by unsafe drinking water provided by individual wells or surface water sources. Eligible projects are also those that create a new regional community water system by consolidating existing systems that have technical, financial, or managerial difficulties. Projects to address existing public health problems associated with individual wells or surface water sources must be limited in scope to the specific geographic area affected by contamination. Projects that create new regional community water systems by consolidating existing systems must be limited in scope to the service area of the systems being consolidated. A project must be a cost-effective solution to addressing the problem. A State must ensure that the applicant has given sufficient public notice to potentially affected parties and has considered alternative solutions to addressing the problem. Capacity to serve future population growth cannot be a substantial portion of a project.
(c) *Eligible project-related costs.* In addition to costs needed for the project itself, the following project-related costs are eligible for assistance from the Fund:
(1) Costs for planning and design and associated pre-project costs. A State that makes a loan for only planning and design is not required to provide assistance for completion of the project.
(2) Costs for the acquisition of land only if needed for the purposes of locating eligible project components. The land must be acquired from a willing seller.
(3) Costs for restructuring systems that are in significant noncompliance with any national primary drinking water regulation or variance or that lack the technical, financial, and managerial capability to ensure compliance with the requirements of the Act, unless the systems are ineligible under paragraph (d)(2) or (d)(3) of this section.
(d) *Ineligible systems.* Assistance from the Fund may not be provided to:
(1) Federally-owned public water systems and for-profit noncommunity water systems.
(2) Systems that lack the technical, financial, and managerial capability to ensure compliance with the requirements of the Act, unless the assistance will ensure compliance and the owners or operators of the systems agree to undertake feasible and appropriate changes in operations to ensure compliance over the long-term.
(3) Systems that are in significant noncompliance with any national primary drinking water regulation or variance, unless:
(i) The purpose of the assistance is to address the cause of the significant noncompliance and will ensure that the systems return to compliance; or
(ii) The purpose of the assistance is unrelated to the cause of the significant noncompliance and the systems are on enforcement schedules (for maximum contaminant level and treatment technique violations) or have compliance plans (for monitoring and reporting violations) to return to compliance.
(e) *Ineligible projects.* The following projects are ineligible for assistance from the Fund:
(1) Dams or rehabilitation of dams.
(2) Water rights, except if the water rights are owned by a system that is being purchased through consolidation as part of a capacity development strategy.
(3) Reservoirs or rehabilitation of reservoirs, except for finished water reservoirs and those reservoirs that are part of the treatment process and are on the property where the treatment facility is located.
(4) Projects needed primarily for fire protection.
(5) Projects needed primarily to serve future population growth. Projects must be sized only to accommodate a reasonable amount of population growth expected to occur over the useful life of the facility.
(6) Projects that have received assistance from the national se t-aside for Indian Tribes and Alaska Native Villages under section 1452(i) of the Act.
(f) *Ineligible project-related costs.* The following project-related costs are ineligible for assistance from the Fund:
(1) Laboratory fees for routine compliance monitoring.
(2) Operation and maintenance expenses.

§ 35.3525 Authorized types of assistance from the Fund.
A State may only provide the following types of assistance from the Fund:
(a) *Loans.* (1) A State may make loans at or below the market interest rate, including zero interest rate loans. Loans may be awarded only if:
(i) An assistance recipient begins annual repayment of principal and interest no later than one year after project completion. A project is completed when operations are initiated or are capable of being initiated.
(ii) A recipient completes loan repayment no later than 20 years after project completion except as provided in paragraph (b)(3) of this section.
(iii) A recipient establishes a dedicated source of revenue for repayment of the loan which is consistent with local ordinances and State laws or, for privately-owned systems, a recipient demonstrates that there is adequate security to assure repayment of the loan.
(2) A State may include eligible project reimbursement costs within loans if:
(i) A system received approval, authorization to proceed, or any similar action by a State prior to initiation of project construction and the construction costs were incurred after such State action; and
(ii) The project met all of the requirements of this subpart and was on the State's fundable list, developed using a priority system approved by EPA. A project on the comprehensive list which is funded when a project on the fundable list is bypassed using the State's bypass procedures in accordance with § 35.3555(c)(2)(ii) may be eligible for reimbursement of costs incurred after the system has been informed that it will receive funding.
(3) A State may include eligible planning and design and other associated pre-project costs within loans regardless of when the costs were incurred.
(4) All payments of principal and interest on each loan must be credited to the Fund.
(5) Of the total amount available for assistance from the Fund each year, a State must make at least 15 percent available solely for providing loan assistance to small systems, to the extent such funds can be obligated for eligible projects. A State that provides assistance in an amount that is greater than 15 percent of the available funds in one year may credit the excess toward the 15 percent requirement in future years.
(6) A State may provide incremental assistance for a project (e.g., for a particularly large, expensive project) over a period of years.
(b) *Assistance to disadvantaged communities.* (1) A State may provide loan subsidies (e.g., loans which include principal forgiveness, negative interest rate loans) to benefit communities meeting the State's definition of ''disadvantaged'' or which the State expects to become ''disadvantaged'' as a result of the project. Loan subsidies in the form of reduced interest rate loans that are at or above zero percent do not fall under the 30 percent allowance described in paragraph (b)(2) of this section.

(2) A State may take an amount equal to no more than 30 percent of the amount of a particular fiscal year's capitalization grant to provide loan subsidies to disadvantaged communities. If a State does not take the entire 30 percent allowance associated with a particular fiscal year's capitalization grant, it cannot reserve the authority to take the remaining balance of the allowance from future capitalization grants. In addition, a State must:
(i) Indicate in the Intended Use Plan (IUP) the amount of the allowance it is taking for loan subsidies;
(ii) Commit capitalization grant and required State match dollars taken for loan subsidies in accordance with the binding commitment requirements in § 35.3550(e); and
(iii) Commit any other dollars (e.g., principal and interest repayments, investment earnings) taken for loan subsidies to projects over the same time period during which binding commitments are made for the capitalization grant from which the allowance was taken.
(3) A State may extend the term for a loan to a disadvantaged community, provided that a recipient completes loan repayment no later than 30 years after project completion and the term of the loan does not exceed the expected design life of the project.
(c) *Refinance or purchase of local debt obligations.*—(1) *General.* A State may buy or refinance local debt obligations of municipal, intermunicipal, or interstate agencies where the debt obligation was incurred and the project was initiated after July 1, 1993. Projects must have met the eligibility requirements under section 1452 of the Act and this subpart to be eligible for refinancing. Privately-owned systems are not eligible for refinancing.
(2) *Multi-purpose debt.* If the original debt for a project was in the form of a multi-purpose bond incurred for purposes in addition to eligible purposes under section 1452 of the Act and this subpart, a State may provide refinancing only for the eligible portion of the debt, not the entire debt.
(3) *Refinancing and State match.* If a State has credited repayments of loans made under a pre-existing State loan program as part of its State match, the State cannot also refinance the projects under the DWSRF program. If the State has already counted certain projects toward its State match which it now wants to refinance, the State must provide replacement funds for the amounts previously credited as match.
(d) *Purchase insurance or guarantee for local debt obligations.* A State may provide assistance by purchasing insurance or guaranteeing a local debt obligation to improve credit market access or to reduce interest rates. Assistance of this type is limited to local debt obligations that are undertaken to finance projects eligible for assistance under section 1452 of the Act and this subpart.
(e) *Revenue or security for Fund debt obligations (leveraging).* A State may use Fund assets as a source of revenue or security for the payment of principal and interest on revenue or general obligation bonds issued by the State in order to increase the total amount of funds available for providing assistance. The net proceeds of the sale of the bonds must be deposited into the Fund and must be used for providing loans and other assistance to finance projects eligible under section 1452 of the Act and this subpart.
(f) Application of *interest earned on fund accounts.* Interest earned on fund accounts may be used to provide financial assistance for debt service, capital expenditures, operations, treatment facilities or be retained to grow SRF balances. Such assistance may only be provided to support eligible systems, projects and costs identified in §35.3520 and may be provided pursuant to or in connection with one of the eligible types of financial assistance identified in this Part.

§ 35.3530 Limitations on uses of the Fund.

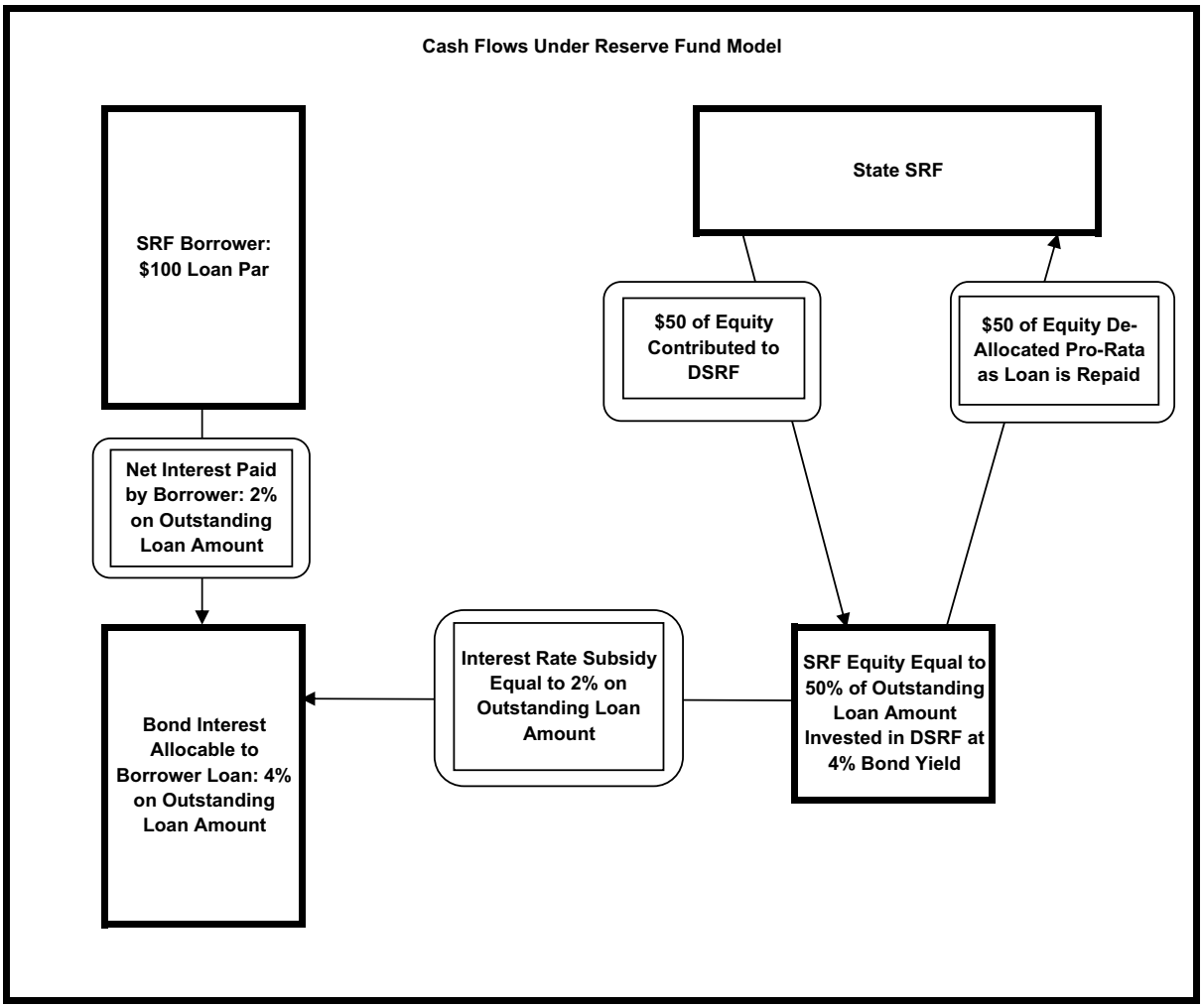
(a) *Earn interest.* A State may earn interest on monies deposited into the Fund prior to disbursement of assistance (*e.g.*, on reserve accounts used as security or guarantees). Monies deposited must not remain in the Fund primarily to earn interest. Amounts not required for current obligation or expenditure must be invested in interest bearing obligations.
(b) *Program administration.* A State may not use monies deposited into the Fund to cover its program administration costs. In addition to using the funds available from the administration and technical assistance set-aside under § 35.3535(b), a State may use the following methods to cover its program administration and other program costs.
(1) A State may use the proceeds of bonds guaranteed by the Fund to absorb expenses incurred issuing the bonds. The net proceeds of the bonds must be deposited into the Fund.
(2) A State may assess fees on an assistance recipient which are paid directly by the recipient and are not included as principal in a loan as allowed in paragraph (b)(3) of this section. These fees, which include interest earned on fees, must be deposited into the Fund or into an account outside of the Fund. If the fees are deposited into the Fund, they are subject to the authorized uses of the Fund. If the fees are deposited into an account outside of the Fund, they must be used for program administration, other purposes for which capitalization grants can be awarded under section 1452, State match under sections 1452(e) and (g)(2) of the Act, or combined financial administration of the DWSRF program and CWSRF program Funds where the programs are administered by the same State agency.
(3) A State may assess fees on an assistance recipient which are included as principal in a loan. These fees, which include interest earned on fees, must be deposited into the Fund or into an account outside of the Fund. If the fees are deposited into the Fund, they are subject to the authorized uses of the Fund. If the fees are deposited into an account outside of the Fund, they must be used for program administration or other purposes for which capitalization grants can be awarded under section 1452. Fees included as principal in a loan cannot be used for State match under sections 1452(e) and (g)(2) of the Act or combined financial administration of the DWSRF program and CWSRF program Funds. Additionally, fees included as principal in a loan:
(i) Cannot be assessed on a disadvantaged community which receives a loan subsidy provided from the 30 percent allowance in § 35.3525(b)(2);
(ii) Cannot cause the effective rate of a loan (which includes both interest and fees) to exceed the market rate; and
(iii) Cannot be assessed if the effective rate of a loan could reasonably be expected to cause a system to fail to meet the technical, financial, and managerial capability requirements under section 1452 of the Act.
(c) *Transfers.* The Governor of a State, or a State official acting pursuant to authorization from the Governor, may transfer an amount equal to 33 percent of a fiscal year's DWSRF program capitalization grant to the CWSRF program or an equivalent amount from the CWSRF program to the DWSRF program. The following conditions apply:
(1) When a State initially decides to transfer funds:
(i) The State's Attorney General, or someone designated by the AttorneyGeneral, must sign or concur in a certification for the DWSRF program and the CWSRF program that State law permits the State to transfer funds; and
(ii) The Operating Agreements or other parts of the capitalization grant agreements for the DWSRF program and the CWSRF program must be amended to detail the method the State will use to transfer funds.
(2) A State may not use the transfer provision to acquire State match for either program or use transferred funds to secure or repay State match bonds.
(3) Funds may be transferred after one year has elapsed since a State established its Fund (*i.e.*, one year after the State has received its first DWSRF program capitalization grant for projects), and may include an amount equal to the allowance associated with its fiscal year 1997 capitalization grant.
(4) A State may reserve the authority to transfer funds in future years.
(5) Funds may be transferred on a net basis between the DWSRF program and CWSRF program, provided that the 33 percent transfer allowance associated with DWSRF program capitalization grants received is not exceeded.
(6) Funds may not be transferred or reserved after September 30, 2001.
(d) *Cross-collateralization.* A State may combine the Fund assets of the DWSRF program and CWSRF program as security for bond issues to enhance the lending capacity of one or both of the programs. The following conditions apply:
(1) When a State initially decides to cross-collateralize:
(i) The State's Attorney General, or someone designated by the Attorney General, must sign or concur in a certification for the DWSRF program and the CWSRF program that State law permits the State to cross-collateralize the Fund assets of the DWSRF program and CWSRF program; and
(ii) The Operating Agreements or other parts of the capitalization grant agreements for the DWSRF program and the CWSRF program must be amended to detail the method the State will use to cross-collateralize.
(2) The proceeds generated by the issuance of bonds must be allocated to the purposes of the

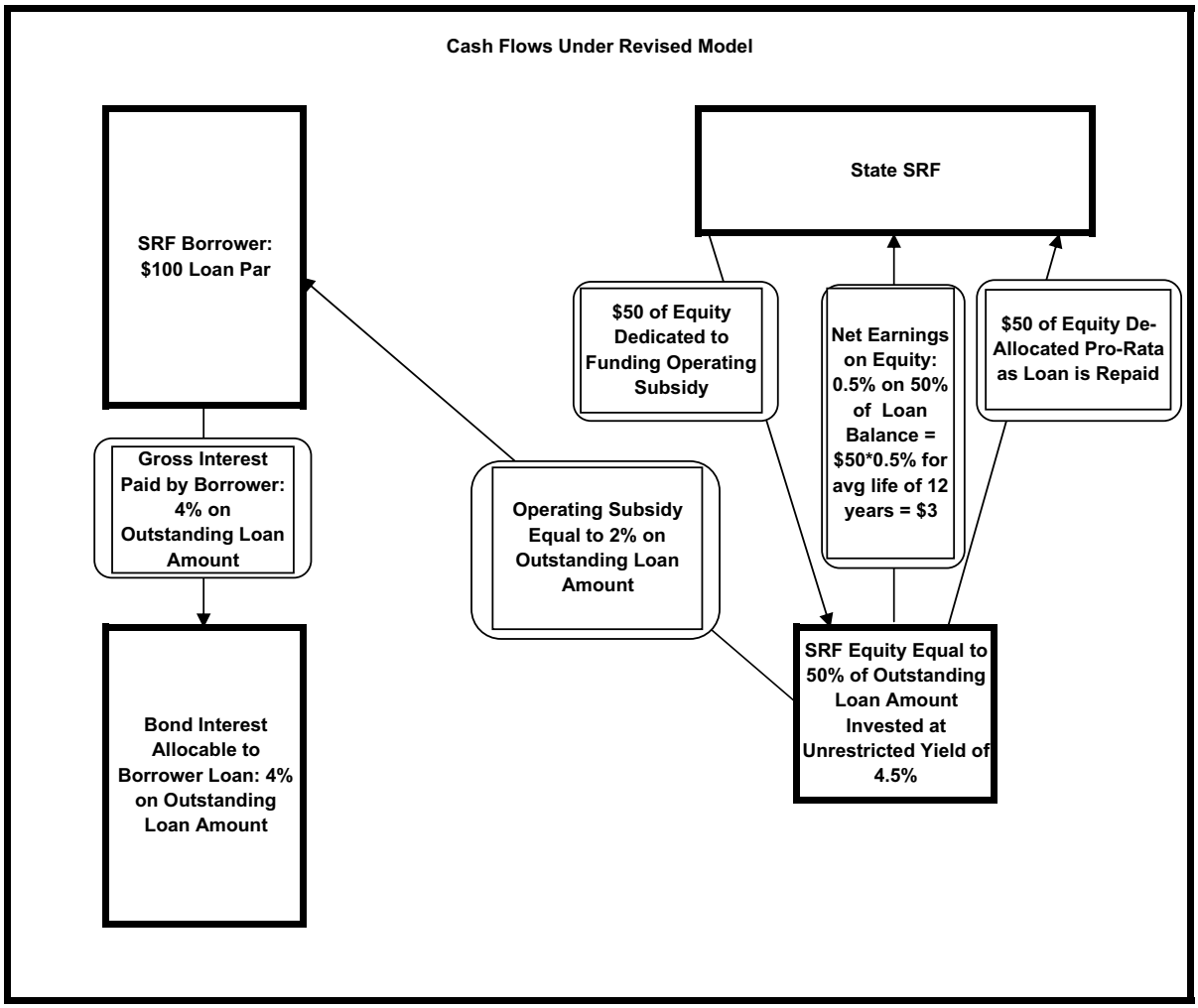
DWSRF program and CWSRF program in the same proportion as the assets from the Funds that are used as security for the bonds. A State must demonstrate at the time of bond issuance that the proportionality requirements have been or will be met. If a default should occur, and the Fund assets from one program are used for debt service in the other program to cure the default, the security would no longer need to be proportional.

(3) A State may not combine the Fund assets of the DWSRF program and the CWSRF program as security for bond issues to acquire State match for either program or use the assets of one program to secure match bonds for the other program.

(4) The debt service reserves for the DWSRF program and the CWSRF program must be accounted for separately.

(5) Loan repayments must be made to the respective program from which the loan was made.


Cash Flows Under Reserve Fund Model
SRF Borrower: $100 Loan Par
State SRF
$50 of Equity Contributed to DSRF
$50 of Equity De-Allocated Pro-Rata as Loan is Repaid
Net Interest Paid by Borrower: 2% on Outstanding Loan Amount
Interest Rate Subsidy Equal to 2% on Outstanding Loan Amount
SRF Equity Equal to 50% of Outstanding Loan Amount Invested in DSRF at 4% Bond Yield
Bond Interest Allocable to Borrower Loan: 4% on Outstanding Loan Amount


Cash Flows Under Revised Model
SRF Borrower: $100 Loan Par
State SRF
$50 of Equity Dedicated to Funding Operating Subsidy
Net Earnings on Equity: 0.5% on 50% of Loan Balance = $50*0.5% for avg life of 12 years = $3
$50 of Equity De-Allocated Pro-Rata as Loan is Repaid
Gross Interest Paid by Borrower: 4% on Outstanding Loan Amount
Operating Subsidy Equal to 2% on Outstanding Loan Amount
Bond Interest Allocable to Borrower Loan: 4% on Outstanding Loan Amount
SRF Equity Equal to 50% of Outstanding Loan Amount Invested at Unrestricted Yield of 4.5%

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

APR 25 2007

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

Mr. A. James Barnes
Chair, Environmental Financial Advisory Board
United States Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Dear Mr. Barnes:

Thank you for your letter of March 20, 2007, to Administrator Johnson on the Environmental Financial Advisory Board's report that explores the use of captive insurance as a financial assurance tool in the Agency's waste and remediation programs. My staff and I appreciate all of the work the Board has done on this important topic, and recognize the Board's consultation with a broad range of interested parties. EPA greatly appreciates the Board's inclusion of State and EPA staff in many of its meetings on this topic. We find that the Board's input on captive insurance, as well as other issues, is extremely valuable as we consider moving forward with improvements to the RCRA financial assurance requirements.

In response to its charge, the Board presented several important findings and recommendations on captive insurance that the Agency will take under advisement. Consistent with the Board's findings with regard to the use of the financial test for financial assurance purposes, the Board found that the use of independent credit analysis is a cost-effective mechanism for demonstrating the financial strength of a captive insurer. We note that the Board will also examine the issue of ratings as it looks at commercial insurers.

With respect to the Board's earlier recommendations on the financial test, I recently directed my staff to initiate the Agency's Action Development Process (ADP) to more fully analyze possible regulatory options concerning the RCRA Subtitle C financial test. By entering into the ADP, EPA is acknowledging that the current financial test does present a number of issues that need to be explored. One of the options that will be analyzed through this process is the recommendation from the Board that EPA include an independent ratings requirement to Alternative I of the current financial test. Although initiating the ADP is the first step in pursuing regulatory alternatives, a possible outcome of the process could be to address these concerns through implementation assistance rather than pursuing regulatory changes.

EPA appreciates the expertise and experience that the Board brings and values the insights it can provide. EPA looks forward to receiving the findings in response to the other questions presented to the Board.

Sincerely,

Susan Parker Bodine
Assistant Administrator

ENVIRONMENTAL FINANCIAL ADVISORY BOARD

JAN 5 2007

Honorable Stephen L. Johnson
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

Dear Administrator Johnson:

The Environmental Financial Advisory Board (EFAB) has created a workgroup on Non-Point Source to address issues concerning the local capacity to finance projects and actions needed to implement watershed plans, including Total Maximum Daily Loads (TMDLs), especially where Federal or State funding is not available. The workgroup held a roundtable on a variety of issues on March 9, 2006 in Washington, D.C., funded by EPA's Office of the Chief Financial Officers and the Office of Wetlands, Oceans and Watersheds. Enclosed is EFAB's report summarizing the roundtable and providing recommendations for enhancing sustainable watershed finance.

Commendably, EPA has taken a watershed approach to many of its programs including planning, infrastructure and public education and information. It has assisted thousands of watershed groups to develop plans and implement projects. It has created programs such as the Targeted Watershed Grants program to demonstrate important watershed-wide tools such as water quality trading. It has made the watershed approach one of the pillars of its Sustainable Finance initiative.

EFAB believes that it also makes sense to address financing issues on a watershed basis, to take advantage of trading and other opportunities and to focus on the most important priorities to achieve improved water quality, whether through traditional infrastructure or improvements to address stormwater or other nonpoint sources.

Most watersheds that have undertaken planning to meet water quality, habitat, and other goals face daunting challenges in financing both infrastructure and other projects and actions needed to achieve goals in a reasonable time frame. Federal, State, and traditional local funds are usually adequate to cover only the most urgent priorities and sometimes not even all of those.

The report takes that view that, while there are no easy choices, there are a number of current and developing innovative finance tools that may be used to help fill the gap that watersheds face. Some of the tools are well established, such water and sewer rate increases and special districts for flood control and management of septic tanks and stormwater. Others are innovations such as special purpose financing as in Maryland's Bay Restoration Fund and transfer of development rights. Potential future tools include payments for and markets in ecosystem and other intergenerational services.

Critical to the success of any whole watershed financing mechanism will be the choice of the right collaborative governance approach to reach agreement across multiple jurisdictions and among government, business, utility, nonprofit and citizen organizations on the best mix of finance tools to implement the watershed plan or other needed projects. The report recommends that EPA strongly encourage the use of collaborative approaches to achieving sustainable watershed finance and educate potential participants in their use.

The recommendations contained in the report urge EPA to further knowledge and development of whole watershed sustainable finance approaches. In particular, the report urges EPA to assist in the development and dissemination of innovative finance mechanisms, collaborative governance approaches, ecosystem services markets and appropriate watershed-wide implementing entities. To demonstrate some of these recommendations, we recommend that EPA assist in funding one or more demonstration projects that use a collaborative governance approach to implement one or more innovative financing mechanisms.

We thank you for the opportunity to present these recommendations and look forward to your response. We will be glad to answer questions or do further work as you may request.

Sincerely,

A. James Barnes
Chair

A. Stanley Meiburg
Designated Federal Official

Enclosure

cc: Ben Grumbles, Assistant Administrator for Water
Lyons Gray, Chief Financial Officer

Environmental Financial Advisory Board

Sustainable Watershed Finance

January 2007

Printed on Recycled Paper

EFAB Sustainable Watershed Finance Report

Executive Summary

The goal of clean water for every use, human and environmental, is a firm and long-standing national priority. Substantial progress has been made through implementing the Clean Water Act and other authorities, but much remains to be done. Over 40% of assessed waters do not meet water quality standards. The causes include failing or inadequate wastewater and septic systems, runoff from streets, parking lots, factories, lawns, farms, forests and emissions from power plants and vehicles. Among the obstacles to clean water is the enormous cost of cleaning up existing discharges, restoring damaged ecosystems and preventing current and future pollution from reaching the nation's waters.

Federal and State grant and loan programs, especially the Clean Water and Safe Drinking Water Revolving Funds and the various programs under the Farm Bill, coupled with state, local, and private funding, have gone a long way toward achieving the goal and will play a considerable part in making future progress. But there is a significant gap between the capacity of those programs and the needs identified for both wastewater facilities construction and improvement and actions needed to eliminate or prevent nonpoint sources (NPS) of pollution. It is unlikely that federal or state funding will fill this gap in an acceptable timeframe, so it will be incumbent on the residents, governments and businesses in each basin and watershed to finance a significant portion of the costs of necessary actions, as they have to a considerable extent in the past.

The United States Environmental Protection Agency's (EPA) policies for sustainable infrastructure finance include full cost pricing and a watershed approach. Many of the challenges to meet water quality goals, including Total Maximum Daily Load (TMDL) requirements, are best approached from a watershed perspective, so the analysis of finance needs should incorporate that perspective.

To illuminate the challenging financing issues watershed managers and groups face in closing the watershed finance gap, a roundtable on Sustainable Watershed Finance was co-hosted by the Environmental Financial Advisory Board (EFAB) and the Office of Wetlands, Oceans, and Watersheds (OWOW) in Washington, D.C. on March 9, 2006. The purpose of the roundtable was to explore some of the key questions that will affect the success of innovative methods for financing watershed protection and restoration.

Speakers and participants shared perspectives on a variety of issues related to increasing local capacity to finance needed improvements.

1. Uses of State Revolving Funds and other Federal Programs

The presentations by EPA officials made several points clear:

- Many Federal funding programs support watershed protection;
- The Clean Water State Revolving Fund (SRF) Program and other Federal programs are already financing a wide variety of NPS solutions;

- There is enormous flexibility in both Clean and Drinking Water SRF's to finance almost any needed improvements, both point and non-point; but,
- There is little likelihood that the SRF's will be capitalized at a high enough level for them to finance more than the highest priority waste treatment and some non-point infrastructure; and
- TMDL allocations under the Clean Water Act will be a strong driver for watersheds to meet water quality requirements, making financing an increasingly critical need in the coming years.

2. Principles for allocating the costs of watershed improvements among users and beneficiaries

If there is interest at the local level in raising revenue to finance the costs of. watershed improvements, there are many complex challenges in fairly and equitably allocating these costs among the various users and beneficiaries and across jurisdictions, but there are also some sound principles under which watersheds could raise money through taxes, fees, or other charges in ways that would be politically acceptable.

Among the principle sources of potential revenue, user fees are generally preferred, because they are perceived as avoidable, fair, equitable, and efficient. User fees enjoy these advantages, however, only where there are cost-effective means for excluding non-payers from using the service. Tax options, including sales, income and ad valorem taxes, benefit assessments and entrance fees all present their own difficulties.

Sustainable financing of watershed improvements should strive to be fair and equitable, produce adequate funds, be politically acceptable, provide incentives for efficient fund use and for efficient use of environmental services and avoid free riders.

Another challenge is finding fairness in determining who should pay, the beneficiaries of better water quality, those whose activities cause degradation, those who can afford pay, or the general public.

The provision of ecosystem services by watersheds, including clean and sufficient water, waste absorption capacity, flood control and habitat for native plants and animals can be a basis for determining the allocation of costs and burdens. Some are more fairly protected by broad based government programs, while others can be the subject of market or other payments.

Future generations have an intense interest in how we manage watershed resources and ways should be explored to create a forward market for intergenerational services that would have the lowest life cycle costs. As a first step, a number of entities are exploring emerging markets for ecosystem services to serve multiple, environmental, habitat and resource conservation needs. It is likely that

interest in markets and other ways of paying for ecosystem services will increase significantly in the next few years.

3. Collaborative Governance

The best chance of enacting new or increased charges, taxes or fees is where there is agreement among the various groups of payers across multiple jurisdictions, sectors and interests. All to be charged must be represented so they have a chance to negotiate the burdens that will fall on their constituency. There are examples of collaborative governance approaches that show promise for how agreements might be reached and implemented. The lessons learned can readily be incorporated into collaborative approaches needed for sustainable watershed finance. Important components of a collaborative governance approach are (1) a respected convener to bring people together, (2) a neutral forum, such as a university center to provide expert assistance to the convener and members of the collaborative team and (3) a sponsor such as a governor, agency, or alliance of organizations to call for and support the process.

Some of the practical political considerations that need to be addressed for any successful process are:

Keep it simple and transparent;
Connect the actions needed and their costs to the beneficiaries and those responsible;
Share the financing costs among the broadest possible group of payers;
Incorporate clear lines of accountability;
Seek sources of revenue that are the most sustainable; and
Make sure any new financing mechanism is embraced by key advocacy groups.

4. Innovative Finance and Market Methods

There is a broad and growing variety of innovative finance or market tools that a collaborative local team may choose among. They include:

Leveraging the funds available through innovative use of SRF's;
Special purpose financing like Maryland's Bay Restoration Fund;
Special district financing, such as septic tank management partnerships and ecosystem service districts;
Water or wastewater rate increases, like New York City's financing for improving in its reservoirs' watersheds, and the local utility financing of streamside planting to reduce temperatures in the Tualatin river in Oregon.
Watershed assessments, allocated on the basis of relative benefits and contributions;
Tax base sharing;
Transfer of development rights, as in the Cuyahoga and Deschutes watersheds;
Tax increment financing, to help pay for land protection programs that benefit watershed health and increase property values on properties within the watershed;

Integrated services financing, through long term bonds issued by a watershed based utility to finance infrastructure and other services via the integrated design of a full range of environmental and other services needed by both present and future generations;
Market based programs, to put together consumers of agricultural and forest products or ecosystem and restoration services with producers of those products and services; and
Supplemental environmental projects, where in lieu of fine or penalty for an environmental violation a source could pay into a revolving fund or other mechanism.

See the list of Innovative Finance and Market Methods in Section 5 of the Discussion of Issues for fuller descriptions of these tools.

5. Potential Implementing Entities

Once there is agreement on who will pay and what type of traditional or innovative finance mechanism will be used, an entity to issue bonds, collect and distribute revenues, leverage other sources of funds and accounting to all stakeholders must be designated or established. Potential entities include water, wastewater or other public utilities, public authorities, redevelopment districts, special service districts and multi-jurisdictional entities created by intergovernmental agreements. Selection of the appropriate entity will depend on the functions that are to be assigned to it. Some of these may be the responsibility of a decision-making, multi-jurisdictional governance entity and others of an implementing entity.

Recommendations

Expand Knowledge and Foster Use of Collaborative Governance Approaches. EPA should foster use of collaborative governance approaches for achieving sustainable finance in all watersheds, using the many forums that EPA hosts or participates in. EPA should disseminate success stories that demonstrate the use of collaborative governance principles and techniques in achieving successful financing outcomes.

Disseminate innovative finance tools. EPA should designate an environmental finance center to maintain a directory of innovative finance and market techniques. EPA and the environmental finance centers should disseminate information about these successes and model techniques.

Encourage ecosystem services markets. EPA should partner with nn i varsity *research* centers and others to determine whether and to what extent ecosystem service values can be used to make local taxing, fee or other revenue raising systems more equitable, fair and acceptable to payers. EPA should work with the Department of agriculture and other organizations which are exploring how to pay for and make markets in ecosystem services to determine how loans and grants from both agencies can be used to leverage payments for markets in these services.

Leverage existing finance tools. EPA should continue to review its existing superb financing tools under the Clean and Safe Drinking Water Acts to determine how they might be leveraged with local efforts to obtain additional funds and markets to help close the funding gap.

Track sustainable finance implementing entities. EPA should, with the assistance of the EFCs and EFAB, develop a compendium of the potential entities that would be appropriate to implement whole watershed finance strategies agreed upon.

Initiate demonstration projects. EPA should fund or otherwise assist several watershed scale demonstration projects that incorporate sustainable finance techniques, and that use collaborative governance approaches.

5

Background

Implementation of the Clean Water Act (CWA) has made tremendous progress since 1972 in removing billions of tons of pollution, but the nation has a long way to go to meet the CWA's goals. Forty percent of assessed rivers and streams, 45 percent of assessed lakes and 51% of assessed estuary square miles do not meet basic water quality standards.

The U.S. Environmental Protection Agency (EPA) and other Federal agencies provide substantial funding and financing. Safe Drinking Water Act (SDWA) and CWA capital grants for state revolving loan programs (SRFs) are important sources for local drinking and wastewater infrastructure. Other programs include the Farm Bill, Section 319 grants for nonpoint source (NPS) pollution and smaller programs, such as targeted watershed grants. Despite this commitment of Federal dollars and matching or complementary state contributions, the gap between what funding is available and the overall need is huge and the cost of addressing polluted runoff and achieving ecological watershed goals is daunting.

According to EPA, NPS pollution remains the nation's largest source of water quality problems and the main reason that so many of our surveyed rivers, lakes, and estuaries are not clean enough to meet basic uses such as fishing or swimming. Nevertheless, most of the funding for water quality improvement has gone to address point sources, given the large capital expenditures needed for treating sewage and industrial wastes. Since adoption of the Clean Water Act, Congress has appropriated about $70 billion for investment in clean water infrastructure. State and local governments has invested many billions of dollars more. Still, it is estimated that, over the next two decades, the United States needs to spend hundreds of billions of dollars to replace or improve existing wastewater infrastructure systems. While there is no agreed estimate on the cost of addressing nonpoint sources, it is certain that many additional billions will also be needed, and, in many watersheds, addressing NPS will be the major cost of restoring water quality.

Total Maximum Daily Load (TMDL) allocations required for all water bodies not meeting water quality standards, will be an increasing driver for reducing pollution from both point and nonpoint sources. Implementation plans devised to meet these allocations will highlight the work remaining to be done to achieve the nation's water quality goals. These plans have led and will lead to increasing public expectations that pollution sources be abated and that funding or financing be provided where past actions, on-going prevention, redesign of systems causing pollution and other avoidance and restoration activities fail short. It should be noted that there are funding and financing issues related to the collection and analysis of data for the completion of TMDL allocations. To the extent data is unavailable, it becomes harder to identify the precise problem that needs financing to solve. Paying for data is traditionally the role of government, permittees, responsible parties, universities and volunteers. A robust watershed financing approach will need to include payments for collecting and analyzing data.

At the same time, available funding through EPA for both point and nonpoint sources is in decline. While the Farm Bill is likely to continue to pay for beneficial improvements to address agricultural nonpoint sources, Federal and state programs for other nonpoint sources are unlikely to make up the shortfalls. While a variety of measures have been successful in improving water quality, the

financing gap is a significant barrier to the continued work necessary to maintain and improve our waterways.

These conclusions are reflected at a regional scale. In the draft report entitled A Strategy to Restore and Protect the Great Lakes, the President's Great Lakes Regional Collaboration (GLRC) identified over $20 billion in investments necessary to begin work on high priority restoration opportunities in the next five years, with 85% of the funds dedicated to capital costs. Green infrastructure capital costs, to address non-point sources and ecosystem restoration, were identified at $1.75 billion and traditional infrastructure capital costs were identified at $18.25 billion. The Great Lakes Protection Fund has found that innovative financing methods will be required to enable these investments to be made, even assuming that the Federal Government will contribute as much as $11 billion of the total. The potential needs at the state and local level total some $9 billion dollars.

Most efforts of watershed managers and groups have been expended on seeking outside grants, loans and other forms of public and private assistance to pay for the substantial cots of projects needed to achieve watershed health. These efforts are worthwhile and need to be pursued to the fullest extent, in order to reduce the burden on local residents.

But even with every state, federal and private funding option employed, it is clear that those responsible for meeting watershed health goals will need to finance a significant portion of the cost of needed improvements on their own. With the general public largely resistant to increased taxation, there is a need to develop innovative market and financing mechanisms that will generate the funds to finance the actions necessary to improve water quality while maintaining the necessary political support for this effort.

EPA has adopted as one of the four pillars of sustainable water quality infrastructure the idea of full cost pricing, meaning that local resources will ultimately have to be depended upon to finance needed water quality improvements, principally through fees and charges. While EPA's policy does not apply to nonpoint sources, the same logic would dictate that local resources need to be mobilized to pay for or make the improvements required to meet TMDL's and other watershed health goals.

EFAB Roundtable

To illuminate the challenging financing issues watershed managers and groups face, a roundtable was co-hosted by the Environmental Financial Advisory Board (EFAB) and the Office of Wetlands, Oceans, and Watersheds in Washington, D.C. on March 9,2006. The jpurpose of the roundtable was to explore some of the key questions that will affect the success of innovative methods for financing watershed protection and restoration.

Among the questions posed to the participants of the Roundtable were:

- What types of new fees and charges or new markets for avoiding polluting activities are acceptable to the public?

- How far can charges like water and sewer fees be raised to pay for more than traditional/infrastructure investments?

  Can charges or markets be effectively and fairly linked to sources and benefits?

Summary of Roundtable

Charge

Diane Regas, Director of EPA's Office of Wetlands, Oceans, and Watersheds (OWOW), charged the participants to think about how to move forward on implementing watershed plans and commitments to achieve Clean Water Act and community water quality goals. Financial mechanisms should be realistic and based on collaboration among stakeholders. What are models of governance that maximize leveraging at the watershed level? What market-oriented solutions lead to sustainable approaches? What goods and services can be built into markets to achieve sustainable financing of watershed goals? How can one build capacity and sustainability into watershed efforts? She urged participants to maintain the dialogue among all stakeholders; everyone has an interest in doing this well.

OWOW considers three components essential to sustainable watershed funding: (a) hydrological focus, (b) collaboration, and (c) a strategic or scientific approach using.a geographic framework for rational plans and mechanisms to assess progress and adjust actions.

Ms. Regas and James Hanlon, Director of the Office of Wastewater Management, pointed out that the watershed approach is one of the four pillars of sustainable water infrastructure. Being based on cooperation among all stakeholders, it allows efficiency and effectiveness not otherwise available and affords opportunities to both provide critical water services and protect watersheds.

Discussion of Issues

1. Uses of State Revolving Funds and other Federal Programs

The presentations by EPA officials made several points clear:

- Many Federal funding programs support watershed protection;
  The Clean Water SRF Program and other Federal programs are already financing NPS efforts to a significant extent;
  There is enormous flexibility in both Clean and Drinking Water Revolving Funds to finance almost any needed improvements, both point and nonpoint; but,
  There is little likelihood that the SRFs will be capitalized at a level for them to finance more than the highest priority waste treatment and some nonpoint infrastructure.

Georg Ames emphasized that a "community quilt" approach to watershed finance, patching together a variety of national, state, local and private sources, is likely to be the most successful way to make progress. This approach allows for the most efficiency in finance as well. Fore example, where an SRF makes a loan to a municipality that has done a thorough analysis of sources of pollution, it may be far cheaper to achieve needed load reductions by negotiating with land owners to use best management practices upstream. The municipality could off-lend to those owners, which will be more cost-effective than upgrading the facility. This kind of thing is possible through the SRF, but has rarely been done to date.

The SRFs can be used to make investments that leverage additional financing from local sources. For example, the Safe Drinking Water SRF is capable of providing start up funds for some innovative watershed market and financing programs in watersheds, through the Source Water Protection Program. Peter Shanaghan, Director, Office of Groundwater and Drinking Water, pointed out that these can be applied to a variety of activities, including (a) loans to water systems for land/conservation easements to protect drinking water sources, (b) implementing voluntary, incentive-based source water protection measures, (c) development of own-source water protection programs to build capacity to implement and oversee these programs.

He gave examples in Des Moines, Iowa, where a company that runs a drinking water utility collaborates with agricultural users upstream on controls to lower levels of nitrates in water bodies, and in Illinois, where a drinking water investor-owned utility had a project with the State to trade upstream sediment control to allow discharge of solids downstream that reduces twice as much discharges of solids.

Mr. Ames and Stephanie vonFeck of the Office of Wastewater Management stressed TMDL allocations under the Clean Water Act will be a strong driver for watersheds to meet water quality requirements, making financing an increasingly critical need in the coming years. TMDLs are accompanied by implementation plans, which, while not technically required to be implemented, provide a pathway toward meeting water quality standards and the other goals of the Act. There is a compelling role for the use of financial or market incentives that produce innovative, cost effective approaches to achieving these goals.

2. Principles for allocating the costs of watershed improvements

The presentations of John Boland, Johns Hopkins University; and Josh Farley, Gund Institute for Ecological Economics, are summarized extensively below both because they point out many of the complex challenges in fairly and equitably allocating the costs of watershed improvements among the various users and beneficiaries and across jurisdictions, but also because they suggest some sound principles under which watersheds could raise money through taxes, fees or other means that would be politically acceptable.

Mr. Boland pointed out that watershed-level programs are some of the most straightforward, effective, and efficient means of accomplish ecosystem protection. But they present the most

complex and challenging means of raising funds needed for ecosystems protection. What is good about watershed programs also makes them challenging to finance. Watersheds only rarely match political boundaries; most regulatory and financial institutional arrangements are at the wrong scale or in the wrong place. Watershed pollution sources are diffuse; responsibility for them cannot easily be established. Free riders-nonpayers-cannot be excluded from the benefits. Effective ecosystem protection measures may also conflict with private property rights.

Mr. Boland stated that the objectives of a financing strategy include (s) sufficient resources to carry out the program, (b) sustainability (current financing strategy should not jeopardize ability to raise enough funds in the future), (c) efficiency (the financing strategy should promote economic efficiency, (d) equity (equals are treated equally), (e) fairness (financing method should be regarded as fair by most affected persons), (f) political acceptability (sufficient political support at all levels to assure implementation), and (g) lack of perverse incentives (should not encourage free riding and counterproductive action, inefficient uses of resources, etc.).

Mr. Boland then reviewed several sources: taxes, user fees, and voluntary contributions of money, property, and services. In general, people like user fees, which are perceived as avoidable; fair, because they are tied to services rendered; equitable, because they fall only on service receivers; and efficient, because properly configured they can provide an appropriate incentive for use of the service.

User fees enjoy these advantages, however, only where the associated service is excludable, that is, there are cost-effective means for excluding nonpayers from using the service. In the absence of excludability, the user fee becomes a voluntary payment, inviting free riders and eliminating many advantages (efficiency, equity, and fairness) of this funding source. This is a challenging problem.

Another issue is distinguishing between sources and instruments. "Financing instrument" refers to the means used to connect monetary sources (the ultimate payers) to sinks (project costs). Financing instruments can reallocate costs and associated risks over space and time; for example, borrowing reallocates costs overtime, and broadly based taxes reallocate costs over space. "Financing source" refers to the identity of the ultimate payers of the cost. Identification of financing source and the choice of a financing instrument are related decisions, but not identical.

Some tax and fee options:

Broadly based taxes (e.g., sales and income taxes) are inequitable for watershed problems, because the financing source is different from the beneficiaries, raising resistance and diminishing incentives for efficient use of funds.

Ad valorem taxes (e.g., special watershed taxing district) require benefit measures for equity and fairness, but not all benefits accrue to locals, raising resistance and moderately reducing incentives for efficient use of funds.

- *Benefit assessments*'require benefit measures and may correlate well with local benefits, but not all benefits accrue to locals. The process of setting such an assessment is often transparent and improves the incentive for efficiency.

- ***Entrance fees/license fees for recreational services* correlate well with benefits, provided** they are limited to recreational services. Funding of other benefits is inequitable and may be seen as unfair and create pressure to skew improvements to recreation services.

Voluntary options include:

- Cash contributions and property contributions are usually not sufficients sustainable as a funding source and may be targeted, restricting the scope of improvements.
- In-kind contributions are not sufficient as a funding source, but may build community support helping sustainability; however, they have limited applicability.

In summary, sustainable financing of watershed improvements must:

- Be fair and equitable (e.g., user fees and voluntary contributions)
- Produce adequate funds (e.g., taxes)
- Be politically acceptable (e.g. user fees and voluntary contributions)
- Provide incentives for efficient funds use (sometimes user fees and Voluntary contributions)
- Provide incentives for efficient use of environmental services (sometimes user fees)
- Avoid free riders (taxes and sometimes user fees)

Josh Farley presented further insights on equitable financing of watershed projects. Approaches include beneficiary pays, polluter pays, those who can afford pay, and government pays for public goods, but fairness in these approaches is difficult to determine.

Environmental services often have a wide geographic distribution from local to global. Determining who benefits according to receipts is very complicated. One example of beneficiaries paying is the nine million paying customers of the New York City water utility, who are paying for watershed protection measures by upstream farmers and others. Another is payments by the Costa Rican government of $70 a year per hectare to certain farmers to protect upstream forests or to allow forests to regroup. In Colombia, the Colombia-Cauca irrigation cooperative pays upstream landowners to preserve the watershed.

How much should beneficiaries pay? On the supply side, they should pay as much as they need to continue supply of those services or the lower limit of upstream landowners' opportunity costs, On the demand side, the most that beneficiaries are willing to pay is the upper limit of what the benefits are worth to them. Nature provides services regardless of income; yet, economists try to decide the value of ecosystem services only in terms of income. One could base it on a democratic principle of one person, one vote, but most economists use a plutocratic approach of one dollar, one vote.

The spatial distribution of impacts on watersheds is also broad: impacts may come from afar (e.g., mercury and acid rain emissions) or locally or regionally (e.g., phosphorous and nitrogen emissions or deforestation). Direct damage may be caused by such activities as channelization of water bodies or direct point source emissions. It is difficult, therefore, to implement the "polluter pays" solution. A first step might be to get rid of perverse subsidies-such as massive subsidies for agricultural production and logging in national forests and on royalties on fossil fuel extraction-but that is not going to happen very soon.

One example of the polluter pays model is "cap and trade": giving polluters permits to pollute, which they can trade. On the supply side, price is determined by supply and, therefore, by democratic processes. The equitability of "cap and trade" raises issues of the equity of revoking property rights and/or privileges. It is easier to regulate waste absorption capacity, but it is also harder to monitor.

Markets require excludability, and prices require feedback loops. Most ecosystem services, however, are inherently non-excludable, making direct markets impossible, and have no feedback loops, making pricing difficult.

Some ecosystems services (e.g., recreation; waste absorption, for which there are an abundance of cap and trade emission schemes; and structural elements of ecosystems, such as water use rights and tradable development permits) can be made excludable. It is easier to make unowned waste absorption capacity excludable than to revoke/change existing property rights.

The less excludable a resource, the more transaction costs and free riding occur. The more transaction costs, the greater is the efficiency of government intervention. Examples in which natural resources have been made excludable are all cap and trade schemes (e.g., carbon dioxide markets in Europe) and charging for use of a resource (e.g., flood control; clean water for non-consumptive uses; recreation, although congestion can occur; and waste absorption capacity).

Mr. Farley summarized his points on excludability of resources as follows:

- Excludable rival resources (rival resources are exhausted by use) include market goods (e.g., irrigation and drinking water, waste absorption capacity of forests and lands) and constitute a natural area for non-governmental financing.

  Non-excludable rival resources include open access regimes (tragedy of the commons), such as waste absorption capacity (requires governmental regulations to create markets by making the resource excludable).

  Excludable non-rival resources include recreation and patented information, for example, on pollution control technology (requires government financing).

Non-excludable non-rival resources include pure public goods, such as information, most ecosystem services (flood control, clean water for non-consumptive uses) and require government financing.

Mr. Boland and Mr. Farley also talked about delivering resource to future generations. The challenge in business is to create a "forward market" for intergenerational services. In addition, there are designs with zero cost, for example, facing a school to the south to capture solar heat.

Mr. Farley noted that intergenerational financing is difficult. How much will future generations pay for long-term debts incurred today? In addition, all we know about what future generations will want is what *we* want now. All we can do is rule out the worst and look at the best possibilities. The only way future generations will pay is through debt financing, which is perfectly reasonable, when benefits occur over multiple generations.

Hank Patton of World Steward responded that a powerful way to bring science to answer the question of what future generations, will want is to use life cycle assessment to assist in determining the full costs of the things we want today and give bond trustees the ability to determine that future generations would want those investments that have the lowest life cycle costs.

1. Ecosystem Services Valuation

It was an assumption made in planning the workshop that ecosystem services valuation might play a significant part in sustainable watershed finance, by helping to adjust feels, charges or taxes to take account of the differing contributions to problems or benefits received by different stakeholders in the watershed, especially landowners. While it appears that making these adjustments is theoretically possible and perhaps could contribute to making needed increases in revenues more palatable to stakeholders, the complexities arid uncertainties involved at this stage of development of the science make it challenging. Further research is needed.

Mr. Farley said that, if something is non-excludable like ecosystem services, it might be possible to put a vlaue on those benefits and create some kind of mechanism to pay for them that is fair and equitable. The elements of ecosystem structure that create those services are rival and excludable, which allows the possibility for creating those mechanisms. Many of the benefits are easy to measure. For example, if one deforests a watershed, new infrastructure costs (e.g., storm water management) will be phenomenal. It is easy to estimate a huge tax to create that storm water control. Ecosystems tend to provide many services cost-effectively, there is no constant flow of new money going in.

A number of entities are exploring emerging markets for ecosystem services to serve multiple environmental, habitat and resource conservation needs. These include universities, private businesses, nonprofit organizations, and governmental agencies, here and abroad, including the U.S. Department of Agriculture. The U.S. Forest Service, within that Department, has been especially active in looking for opportunities for private forest landowners to be paid for conservation activities

that benefit watersheds while providing income in addition to sustainable tree harvesting. Forest Trends, a non-profit organization, publishes extensively on the issues and opportunities for markets in ecosystem services. Projects in Colombia, Costa Rica and elsewhere have brought together municipal water suppliers, businesses that rely on clean water and forest landowners, who receive payments to protect their forests rather than exploiting them in ways that damage water quality or availability. In New York, farmers, forest landowners and municipalities in the upstate watersheds of the City of New York's reservoirs are receiving payments, investments, and assurances, mostly paid for by the users of the City's water supply system, in order to protect the water quality of the streams flowing into the reservoirs.

It seems likely that interest in markets and other ways of paying for ecosystem services will increase significantly in the next few years. EPA, with its long experience in encouraging trading for water quality improvements and in measuring water quality values through its monitoring and TMDL programs, is well positioned to participate in both the development and implementation of these markets. The flexibility afforded by the SRFs and the farm programs provides an enormous opportunity for the Federal government to leverage markets in ecosystem services, providing avenues for more efficient and effective means of producing water quality (with significant air quality, habitat and soils benefits), at a great savings to taxpayers and rate payers, compared to the costs of providing these services through engineered solutions.

2. Collaborative Governance

One of the hardest aspects about local financing is the difficulty of reaching agreement among the various groups of payers. Transparency and accountability are very important. There needs to be a sense that the money to be raised is needed and will be efficiently used to address the highest priorities. Adding to the challenge is the need to achieve agreement across multiple jurisdictions, sectors, and interests.

The best chance of enacting new or increased charges, taxes or fees is where democracy works best, that is: all to be charged are represented, have a chance to negotiate the burdens that will fall on their constituency, have a say in how, when and where any new charges will be implemented, and will not be surprised by any changes after they have agreed. .

Achieving agreement on these issues is hard to do in our fractionated world, but there are some examples of collaborative governance approaches that show promise for how agreements might be reached and implemented to assess new or increased charges to pay the financing costs of watershed an related community improvements.

Greg Wolf, National Policy Consensus Center, talked about how collaborative governance attempts to solve problems at regional and community levels, such as a watershed, by multiple governmental bodies (Federal, state, county, city, district, etc.) And non-governmental entities and citizens. A collaborative governance network consists of a sponsor (leader, agency, community group, business, etc.); a convener (e.g., governor, legislator, mayor, civic leader, etc.); and a neutral forum (e.g.

university, civic organization, etc.). Through collaborative governance, sponsors identify and raise an issue or opportunity and assess which sectors should participate. Leaders convene all stakeholders, who adopt the collaborative governance system as a working framework for action. Conveners and participants frame or reframe the issue for further deliberation. The neutral forum designs and conducts a quality process for participants to negotiate their interests and integrate resources. A written agreement among all parties establishes accountability and spells out individual and collective actions.

This process is based on transparency and accountability, equity and inclusiveness, effectiveness and efficiency, responsiveness, forum neutrality, and consensus processes. Not following these principles could derail the process later. At the regional level, this system creates and determines the objectives, policies, and kinds of investments needed to solve the problem across jurisdictional and other lines. At the community level, public, private, nonprofit, and citizen groups leverage resources and implement the agreed actions as community-based projects.

Mr. Wolf described the example of the Lower Columbia Solutions Group, which was sponsored by the governors of Oregon and Washington and the Director of the Council on Environmental Quality for collaborative decision making on sustainable dredge material disposal in the lower Columbia River area, a source of contention between environmental and industry groups in the two states. A collaborative team was organized using a respected state legislator as the convener. The effort led to high-level regional agreements that produced a charter and collaborative governance system to address the issue. Individual teams reached agreements on specific alternative disposal solutions.

Jeff Edelstein, a Maine facilitator, described the Casco Bay/Sayco Bay Interlocal Stormwater Working Group, listing the factors for success of the group, including taking a problem based approach, using a respected convener, providing neutral facilitation, process management, research and technical expertise, involving all appropriate parties, avoiding excess formality and obtaining adequate seed funding for the process*

Panelist and participants emphasized that collaborative approaches must be used to solve the conundrum of having to raise local revenues for needed and often well accepted projects and actions, through means, like taxes, fees and assessments that are generally politically unpopular. Successful adoption and implementation of new financing measures are more likely with consensus-based agreements that are worked out by all affected interests and jurisdictions and implemented fairly and equitably.

Charles Evans, Special Assistant to the Secretary in the Maryland Department of Natural Resources provided a useful list of some of the practical political considerations that must be satisfied for adoption of innovative financing at the state level and will have resonance at the local level as well:

- Keep it simple;
  Connect the actions needed and their costs to the beneficiaries and those responsible;
- Share the financing costs among the broadest possible group of payers;

- Seek sources of revenue that are the most sustainable; and,
- Make sure the new financing mechanism is embraced by the environmental and other key advocacy groups that have the ability to defeat proposed financing measures.

5. Innovative Finance and Market Methods

A collaborative governance team or other entity or group that can make politically achievable recommendations for raising money to finance watershed improvements or for making markets in watershed services, has a broad variety of innovative finance or market tools to choose among. And the listing is growing longer. Following are brief descriptions of some of the more interesting ones that were discussed at the Roundtable or uncovered by subsequent research.

Leveraging the funds available through innovative use of SRFs

Stephanie vonFeck listed some innovative financing ideas, including:

- A Watershed Revolving Fund (EFABs proposal for an Environmental Revolving Fund could find application in the watershed context);
- Conduit lending (municipal borrowers from SRF lend to individuals or nonprofits to undertake projects);
- Sponsorship (user fees for NPS);
  Matching SRF loans with other Federal programs (e.g., Clean Water Act 319 nonpoint source funding and various Farm bill programs);
- State financial management (e.g., very creative arbitrage rebate rules in New York); many other innovations are "bubbling up" from the states, particularly in Ohio;
- Portfolio financing (funding in stages, phases, and segments); and
- Septic tank management partnerships

Special purpose financing: Maryland's Bay Restoration Fund

Dan Nees, Maryland Environmental Finance Center; Bob Summers, Director for Water Management Administration^in the Maryland DNR, and Charlie Evans described development of Maryland's "flush fee" as an innovative approach to funding the State's Chesapeake Bay Restoration Fund. A 2000 agreement among the states of Pennsylvania, Maryland, Virginia and the District of Columbia and later included New York, Delaware, and West Virginia was the original impetus; each state had agreed to cap load allocations for nitrogen and phosphorus at certain levels. In Maryland, however, it had not been possible to get a line item in the State's budget for wastewater treatment plants, so an alternate source of funding was needed.

Funding had to come directly and indirectly from those who contributed to the problem and those who loved and benefitted from the Bay. An innovative and complicated "flush fee" system was developed in which Maryland households are charged $2.50/month on sewer bills and each commercial and industrial user pays an equivalent dwelling unit charge based on wastewater flow.

Users of septic systems, holding tanks, or other on-site sewage disposal systems pay $30/year, of which part covered planting of cover crops and upgrades to failing septic systems, providing direct benefits to rural areas. Funded in this way, the Bay Restoration Fund will allow Maryland to achieve more than one-third of the necessary additional nutrient reductions by upgrading wastewater treatment plans with enhanced nutrient removal and on-site sewage disposal systems within 1,000 feet of tidal areas and planting cover crops on agricultural land.

A key element in eventual acceptance of the flush fee was the large percentage of citizens willing to pay for perceived services and benefits. Political acceptability Was also gained because the tax was simple, connected directly to benefits, involved a broad base for collection, and was embraced by the environmental community, which c6mmunicated the viability of the program to the public.

The Maryland flush fee is unique because it was based on a cooperative, multi-state scientific evaluation of the water quality benefit and nutrient reduction requirements for the Bay. The enabling legislation received broad, bi-partisan support; all nutrient-rich wastewater generators are paying the fee, including homeowners; and it included for the first time a fee paid by owners of on-site sewage disposal systems. A key byproduct of the process was collaborated created among all State agencies to get the Governor's approval.

The other states who signed the 2000 agreement are not setting up similar fees, because it appeared politically impossible. These state view Maryland's "flush fee" as a tax they are reluctant to impose and are focusing on existing programs to reach their agreed goals.

Special district financing. On a watershed level, septic tank management partnerships can be created to establish a special district that takes over maintenance of decentralized on-site systems so they fail at a lower rate. James White, Executive Director, Cuyahoga River Remedial Action Plan, proposed that the Great Lakes and other nationally supported watershed strategies call for mandatory or highly incentivized, sequential formation of watershed-based stewardship organizations (e.g., watershed conservancy districts) with authority and capabilities to raise funds. This mechanism would provide equitable regional benefits on a watershed basis and a non-regulatory structure. There would be an incentive-based sliding scale for Federal/local matching ratios to increase the motivation to create a local conservancy district. Fund-raising authority would be based on a standard drainage unit for single-family households and multiples thereof. He termed it the "pizza equivalency", that is, households would pay the equivalent of a pizza for the family every quarter. This could raise as much as $20 billion in 20 years.

Similarly, Geoffrey Heal of Columbia University and others have proposed to create ecosystem service districts to improve the efficient provision of watershed services necessary for human welfare, financed by government programs or local taxes.

A more complex, but perhaps more equitable means of raising money for watershed financing might be a watershed assessment on all beneficiaries and pollution sources, allocated on the basis of relative benefits and contributions. The assessment might be increased if there were clear evidence

of runoff or excess volume of water use attributable to the property or increases in property value from benefits of upstream improvements, It might be decreased by the value of allocable ecosystem services or by improvements made from restoration projects and best management practices. The assessment could be allocated via the property tax or a universal water fee.

Water fees for watershed protection. Several speakers indicated that water fees were among the most logical sources of new financing for watershed improvements. New York City's landmark agreement to preserve the ability of the watersheds of its Catskill mountain reservoirs in order to protect their water quality and avoid multibillion dollar filtration costs was financed by a rate increase on the nine million users of the City's water system. The increased revenue paid for improvements in public infrastructure, acquisition of land from willing sellers, and implementing best practices by farmers and working forest landowners.

Mr. Shanaghan pointed out that if watersheds include drinking water utilities, the utilities will become strong advocates for watershed protection. Karl Morgenstern described how the Eugene Water and Electric Board (EWEB) increased water rates to leverage partner contributions and grant funding for specific projects to address the contributions of agricultural and forest activities, especially pesticides, and septic systems to water quality degradation in the watershed.

In the Tualatin River watershed in the Willamette Basin, the Oregon Department of Environmental Quality made water quality trading a part of the local water quality agency, Clean Water Services'watershed-based NPDES permit to meet temperature standards through paying upstream owners for stream bank vegetation restoration and other measures that will reduce river temperatures. The fees for sewage treatment were used for watershed improvements that were more cost effective than other treatment options.

Tax base sharing. Some form of tax base sharing among neighboring municipalities responsible for improving water quality of shared watersheds may encourage collaborative planning and coordinated action. Tax base sharing has the potential to reduce the fiscaf burden that each municipality must pay for water quality protection, while creating a regional funding stream that may be more effective in addressing watershed issues. • Noted examples of tax base sharing include the Twin Cities region in Minnesota and Hackensack Meadows District in New Jersey.

Transfer of Development Rights (TDR). A method of exchange between landowners in designated areas for development rights and development restrictions, TDR programs create a market for environmental protection by restricting development in "receiving areas" and requiring that development rights be purchased from "sending areas". Used often to guide growth away from sensitive environmental or aesthetic resources, TDRs are in wide use throughout the United States. Adaptability to the local context is one of the greatest strengths of a TDR program. In Deschutes County, Oregon, a Transfer of Development Credits program was established with the goal of reducing the number of septic systems in the sending area and transferring potential development to a Neighborhood Planning Area. After generating enough credits, a planned subdivision has been constructed. The program is noted as a success for preventing groundwater pollution, and

consequent pollution of the Deschutes River. Other ecosystem benefits include protection of wildlife habitat, lower threat of wildfire and air quality improvements.

Tax Increment Financing (TIF). Often used in Urban Renewal Areas, TIF funds are captured from increasing property tax values in a specific area and often used to finance public investment. TIF funds have been used for brownfield remediation projects, sometimes with significant water quality benefits. TEF has also been used to capture the value created on nearby properties by the public acquisition of open space for water protection and other ecological purposes. TIF might be used to help pay for land protection programs that benefit watershed health and increase property values on properties within the watershed.

Integrated services financing. Hank Patton described a new concept for regional or watershed based financing that would rely on issuing long term bonds through a watershed based utility to finance infrastructure and other services via the integrated design of a full range of environmental and other services needed by both present and future generations. Investments contracted for by the utility using the bond proceeds would be measured by life cycle assessment based standards adopted by the state to assure that the services are fully sustainable over the long term. Teams of bidders would compete to come up with an integrated set of services that best fit the standards and the particular needs of the watershed or region. Debt service and profit for the winning team would come from fees paid by the recipients of the services provided. Experts and government officials in several states are actively looking at the concept.

Market based programs. Mr. Morgenstern described EWEBs market-based approach on regional agricultural buyers and processors, where demand exceeds supply. It has established a system that provides growers easy access to regional markets (increasing efficiency) and support to transition to meet demands. It seeks to change behaviors through markets to reduce chemical use and protect drinking water. He said they were developing four marketplaces: food, water, restoration or ecological, and temperature (driven by TMDLs). For restoration, priority areas are identified in the watershed and restoration early fully funded for growers in that area. For water and temperature marketplaces, a grower who puts in a more efficient irrigation system can reap benefits by trading their water right to someone else or by leasing it or, if they need more water, by trading or paying for someone else or by leasing it or, if they need more water, by trading or paying for someone else's water right. EWEB is looking at trading credits with farmers to develop riparian habitat and lower temperature in exchange for their discharge.

In the longer term, transactions in these marketplaces could generate small fees that could help pay for the financing of other watershed improvements.

Supplemental environmental projects. Federal, state and local governments have access to miscellaneous funds, which in some circumstances can be bleneded with other funds to help finance or write down the cost of projects. An example is the supplemental environmental project (SEP), a project or payment for an environmental improvement, in partial reduction of a fine or penalty for an environmental violation. Instead of going into the Federal, state or municipal treasury, the fluids

are kept in the community where the violation occurred. There is an increasing interest in using SEPs to help solve a variety of problems, ranging from environmental justice to renewable energy. While these are occasional sources, there are many that relate to water quality and could become part of the community quilt of financing that watersheds need to sew. At present, only between 6% and 15% of environmental violations lead to SEPs.

6. Potential Implementing Entities

While the structure and powers of watershed implementing entities is crucial to the success of watershed finance, there was not time for much discussion at the Roundtable. Potential entities include public authorities, public utility or redevelopment districts, special service districts, intergovernmental agreements, etc. There will be one or more mechanisms that can be adapted to do the functions that might be agreed upon by the watershed jurisdictions and interests. Among the functions any entity might have are the following:

- Adopting and updating the watershed plan so that it meets Federal and state requirements;
- Prioritizing the projects, activities and other steps in the plan;
- Identifying and obtaining all available Federal, state and private grants, loans and other resources to meet the plan's objectives;
- Leveraging or integrating government resources with other investments in the watershed, for example transportation, housing, economic development, and other infrastructure investments, and business, volunteer and government activities that affect or can improve the watershed;
- Identifying the gaps in resources available;
- Agreeing on additional sources of revenues;
- Collecting revenues, issuing financial obligations such as bonds, disbursing or lending bond receipts, paying bond obligations, etc; and,
- Accounting for and reporting to revenue payers, community at large, and investors.

Some of these maybe the responsibility of a decision making, cross jurisdictional governance entity; others are more appropriate for an implementing entity and some, like integration of investments, are responsibilities of both. The governance group could become the board of the implementing entity or could stay separate. Watershed managers and groups attempting to create a sustainable finance system would benefit from a detailed analysis of the pros and cons of the different entities with respect to each of these functions.

Recommendations

1. Expand Knowledge and Foster Use **of Collaborative Governance Methods**

While recognizing that partnerships must be formed at the watershed level, EPA should foster use of collaborative governance approaches for achieving sustainable finance in all watershed in the many forums that EPA hosts or participates in, such as the Watershed Academy, the Environmental Finance Centers, and other outreach and training programs hosted by others. These tested approaches are suitable for all financing needs in the watershed, including both wastewater treatment, stormwater and other nonpoint sources. Knowledge sharing should build on existing collaborative approaches being used successfully in many watersheds to build agreements on problems, plans, priorities and projects, adding those elements crucial for success in using local resources to finance projects or use markets to eliminate problems or substitute good practices. Existing watershed groups should be encouraged to add parties and use robust governance approaches to identify to create the financing and marketing techniques appropriate to filling the funding gap. EPA should collect and disseminate success stories that demonstrate the use of collaborative governance principles and techniques in achieving successful financing outcomes. EPA and the Environmental Finance Centers should use outreach and training programs to bring together parties with normally opposing viewpoints, such as watershed groups and utilities and encourage them to work together on sustainable finance methods. EPA and its sister Federal agencies should identify and support neutral forums at universities and elsewhere that will design and conduct a quality collaborative governance processes for watersheds wishing to use a collaborative governance approach.

2. Disseminate Innovative Finance Tools

EPA should designate an environmental finance center to maintain a directory of innovative finance and market techniques that have been successfully employed in watersheds and other contexts or which have been developed but not actually implemented because of local or other factors. It should at a minimum include the list of tools from section 5 above. EPA and the environmental finance centers should disseminate information about these successes and model techniques through the Academy, a sustainable watershed finance summit, workshops, EFAB Guidbook and tool box, websites, state-EPA agreements, publications and presentations.

3. Encourage Ecosystem Services Markets

EPA and other Federal agencies should partner with university research centers and NGOs working on valuing and making markets in ecosystem services to determine whether and to what extent ecosystem service values can be used to assist in sustainable watershed financing, for example, by making local revenue raising systems more equitable, fair and acceptable to payers. EPA should work with the Department of Agriculture and other organizations which are exploring how to pay for and make markets in ecosystem services to determine how loans and grants from both agencies

can be used to create payments for and markets in these services. EPA should disseminate successful examples and promising approaches as suggested in Recommendation 2.

4. Leverage Existing Finance Tools

EPA should continue to review its existing superb financing tools under the Clean and Safe Drinking Water Acts to determine how they might be leverage with local efforts to obtain additional funds and markets to help close the funding gap. Further, it should explore how funding available through programs such as the Source Water Protection program and the National Estuary Program can be used to assist the local collaborative efforts needed to develop financing and marketing strategies. Agreements with other agencies, especially the Department of Agriculture, should be expanded toward the same end.

5. Identify Sustainable Finance Implementing Entities

EPA should, with the assistance of the EFCs and EFAB, develop a compendium of the potential entities that would be appropriate to implement the finance strategies agreed upon by the watershed collaborative governance teams, including factors to evaluate in choosing one or the other. Utilities that encompass one or more watersheds should be encouraged to develop capacity to finance local projects to supplement loans and grants available from other sources.

6. Initiate Demonstration Projects

EPA should fund or otherwise assist several watershed scale demonstration proj ects that incorporate sustainable finance techniques, such as those described in Innovative Finance and Market Methods above, and that use collaborative methods such as those described in Collaborative Governance, above. Some existing innovative grant programs, such as Section 319, Brownfields and Targeted Watershed Grants might be drawn on for this purpose.

While no single model will fit all situations, one or more of the projects might employ the following model:

- The grantee would use a collaborative governance approach (see Recommendation #2) to work with existing watershed and other groups and with regional and basin-wide interests to identify appropriate sponsors, conveners and participants for a team approach to address the financing and implementation of priority projects in the watershed. The team would include representatives from existing watershed groups, utilities the finance sector, business, municipal governments, nonprofit organizations (e.g., habitat restoration groups, land trusts), state and federal agencies, and organizations from outside the watershed, as appropriate.

- The grantee would work with political leadership at the State, Federal and local levels to sponsor the process and appoint a local convener.

The grantee would assist the convener to appoint members of the team and to hold meetings to reach agreement on the priority projects to be financed, the innovative finance tools to be used, the precise geographic areas to be covered and the methods and implementing entities, public and private to be employed.

The team would also develop agreements on how to leverage their own and outside resources to create maximum benefit

The project would employ financing information tools like *Ptan2Fund*™ and the *Directory of Watershed Resources*, developed by the EFC at Boise State and modified for the particular geographic areas as part of the grant.

With those tools and others, the grantee would identify all the possible sources of existing funding and financing to accomplish projects identified in watershed plans and the gap needing to be filled by innovative, watershed based financing strategies.

The grantee and the collaborative team would attempt to reach agreement on the most appropriate innovative finance tools to be employed to close the gap (see the partial list in issue #5, above).

The team would stay in place for as long as needed to assist in implementation of the agreement, make mid-course corrections, solve implementation problems and oversee the evaluation of the project.

Reports at each stage and progress conferences with all the grantees and others pursuing similar strategies would foster learning and develop best practices.

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

MAR 1 2007

OFFICE OF
WATER

Mr. A. Stanley Meiburg
National EPA Liaison
Centers for Disease Control and Prevention
1800 Clifton Road, N.E. – MS E-28
Atlanta, GA 30333

Dear ~~Mr. Meiburg~~ Stan:

Thank you for your letter of January 5, 2007, to the Environmental Protection Agency (EPA). Your letter included the Environmental Finance Advisory Board's (EFAB) report, "Sustainable Watershed Finance," that summarized its Sustainable Watershed Finance Roundtable held in March 2006. One of the central questions that the Agency faces is how to finance watershed protection and restoration efforts. Your work has brought together some of the best minds to help advance our thinking on innovative watershed finance solutions.

Before turning to your recommendations to EPA included in the report, I want to express EPA's continued commitment to developing innovative mechanisms to fund watershed protection and restoration. EPA continues its investment in the Clean Water and Drinking Water State Revolving Funds. In recent years, the Clean Water State Revolving Fund (CWSRF) program has provided about four billion dollars annually to fund water quality protection projects for wastewater treatment, non-point source pollution control, and watershed management. The Office of the Chief Financial Officer's (OCFO) Environmental Finance Program, the Environmental Finance Center Network (EFC), and the Office of Wetlands, Oceans, and Watersheds' (OWOW) Sustainable Finance Team have conducted finance workshops, developed funding databases, and produced finance planning tools to build the capacity of State, Tribal, and other watershed organizations to develop innovative finance mechanisms.

In 2007, several activities are planned that will disseminate watershed finance tools to key stakeholders. EPA will sponsor "Paying for Sustainable Water Infrastructure," an unprecedented meeting that will bring together stakeholders from all levels of government and the private sector to explore creative methods to finance sustainable water infrastructure. EPA, along with the University of Maryland Environmental Finance Center, will conduct a national web cast on innovative finance tools to educate State/Tribal and Local governments about available resources to reduce

stormwater runoff and implement other watershed protection and restoration measures. EPA will also launch "Developing a Sustainable Fundraising Plan," an Internet-based tool to teach watershed groups successful finance planning methods. Finally, EPA will produce an on-line prioritization tool that will help public and private watershed organizations decide what activities are in the greatest need of funding.

With regard to the specific recommendations contained in the EFAB report, my responses follow.

- *EFAB Recommendation #1:* Expand Knowledge and Foster Use of Collaborative Governance Approaches. EPA should foster the use of collaborative governance approaches for achieving sustainable finance in all watersheds, using the many forums that EPA hosts or participates in. EPA should disseminate success stories that demonstrate the use of collaborative governance principles and techniques in achieving successful financing outcomes.

  EPA Response: Through its National Estuary Program, Targeted Watershed Grants, and other programs, EPA has fostered collaborative governance as an approach to environmental protection and restoration. The flexible and collaborative nature of these programs has allowed them to develop many innovative approaches to complex problems. EPA will promote cooperative approaches to watershed finance at its forums, such as the upcoming Paying for Sustainable Waters Infrastructure conference.

- *EFAB Recommendation #2:* Disseminate Innovative Finance tools. EPA should designate an environmental finance center to maintain a directory of innovative finance and market techniques. EPA and the environmental finance centers should disseminate information about these successes and model techniques.

  EPA Response: EPA agrees that providing a single repository of accessible information on innovative watershed finance and market techniques makes sense. EPA will explore this idea, including where such a repository of information should be located. As you know, the OCFO Environmental Finance Program already has a website with a compendium of environmental finance tools. This website could be enhanced to include new collaborative watershed finance tools.

- *Recommendation #3:* Encourage Ecosystem Services Markets. EPA should partner with university research centers and others to determine whether and to what extent ecosystem service values can be used to make local taxing, fee or other revenue raising systems more equitable, fair and acceptable to payers. EPA should work with the Department of Agriculture and other organizations which are exploring how to pay for and make markets in ecosystem services to determine how loans and grants from both agencies can be used to leverage payments for markets in these services.

EPA Response: EPA agrees that ecosystem markets should be explored as a means to achieving cost-effective solutions to water pollution challenges. For example, EPA's Clean Water State Revolving Loan Fund and National Estuary Programs worked together to help the City of Port Townsend, Washington meet its storm water management objectives by purchasing wetlands that protect a natural storm water management system as well as a wildlife refuge. EPA will explore partnering with universities and federal agencies to further advance ecosystem services markets in the future.

- *Recommendation #4:* Leverage Existing Finance Tools. EPA should continue to review its existing superb financing tools under the Clean and Safe Drinking Water Acts to determine how they might be leveraged with local efforts to obtain additional funds and markets to help close the funding gap.

  EPA Response: EPA will continue promoting innovative uses of its State Revolving Loan Funds (SRFs) to extend fund resources to achieve the greatest possible environmental results. New approaches to leveraging the SRFs will be disseminated through conferences and other venues, as well as OWOW's finance website. For example, EPA recognizes Clean Water SRF innovations that advance EPA goals of performance and water quality protection through its annual Performance and Innovation in the SRF Creating Environmental Success (PISCES) Awards. The PISCES Awards acknowledge and promote innovative projects that increase the sustainability of wastewater infrastructure across the nation. Likewise, EPA's Drinking Water SRF provides awards for sustainable public health protection. These awards recognize innovative uses of the fund that have resulted in source water protection and system capacity building.

- *Recommendation #5:* Track Sustainable Finance Implementing Entities. EPA should, with the assistance of the EFC's and EFAB, develop a compendium of the potential entities that would be appropriate to implement whole watershed finance strategies agreed upon.

  EPA Response: EPA will explore working with EFAB and the EFCs to develop a compendium of entities which would be appropriate to implement watershed finance strategies.

- *Recommendation #6:* Initiate Demonstration Projects. EPA should fund or otherwise assist several watershed-scale demonstration projects that incorporate sustainable finance techniques, and that use collaborative governance approaches.

  EPA Response: As it develops its workplans and grant RFPs in the future, EPA will consider how the Agency can fund or otherwise support watershed-scale demonstration projects that incorporate sustainable finance techniques and that use collaborative governance approaches.

I appreciate EFAB's Non-Point Source Financing Workgroup's efforts to foster innovative watershed finance solutions. I welcome any additional thoughts about my responses to your recommendations or EPA's role in fostering sustainable watershed financing. If you have any questions, please contact me or have your staff call Craig Hooks, Director, Office of Wetlands, Oceans and Watersheds, at (202) 566-1146.

Sincerely,

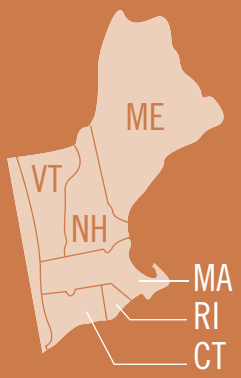
Benjamin H. Grumbles
Assistant Administrator

Environmental Finance Center Network

EFCN
environmental finance center network

New England Environmental Finance Center

at the University of Southern Maine



In This Report

New England Environmental Finance Center

The New England Environmental Finance Center at the University of Southern Maine (New England EFC) primarily serves the six states of the U.S. Environmental Protection Agency's (EPA's) Region 1: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. The purpose of the New England EFC is to further the joint goals of EPA and the Muskie School of extending creative approaches to environmental protection and management, especially respecting the associated "how-to-pay" questions. In particular, the center works to advance the understanding and practice of smart growth throughout New England; to build local capacity to handle related issues; and to develop and apply techniques that go beyond compliance with government regulations. Recent programs of the center are additionally focusing on local approaches to mitigating and adapting to the challenges of global climate change.

Through 2007, the New England EFC accomplished the following:

- Developed new products about water infrastructure forecasting, low-impact development, futures scenarios, smart growth leadership, and other areas.
- Completed work with the Maine Governor's Steering Committee to Implement Recommendations on Maine's Natural Resource-Based Industries. Oversaw significant progress in implementation of more than 95 percent of the recommendations for action.
- Completed the first phase of work in chairing the Maine Governor's Council on Maine's quality of place, including release of a new *Action Plan to Promote Sustainable Prosperity and Quality Places*.
- Completed the launch of new initiatives to help local communities mitigate and adapt to global climate change.

Completed Projects & Initiatives

Low-Impact Development Assistance

The center completed several low-impact development (LID)-related programs in 2007, with a focus on overcoming financial and other barriers to widespread use of the approach. For example, an LID fact sheet, *Promoting Low Impact Development in Your Community*, is now available, aimed at promoting basic understanding of the approach and overcoming local barriers to implementation. It includes a short introduction to the approach, and two "Top 5" lists for promoting LID in communities: one focused on general efforts and one focused on revising local land use regulations. A compendium of *Selected LID Projects in New England* is also available.

Water Infrastructure Forecasting

At the request of the state of New Hampshire, the New England EFC conducted a detailed evaluation of water infrastructure forecasting methods and needs, tailored to New Hampshire's specific financial context. The New England EFC conducted literature reviews and customized financial analysis for top-down and bottom-up methods of water infrastructure forecasting. The New England EFC provided recommendations about options available to state officials, including sets of pros and cons for various approaches they might take, and immediate next steps.

Futures Scenarios

Scenario planning has been described as the art of storytelling applied to the future. It is a method for learning about the future by understanding the nature and impact of the most uncertain and important driving forces affecting the future. It is usually a group process that encourages exchanging knowledge and developing mutual understanding of the central issues important to the future of a town, region, or business. The approach involves crafting a number of diverging stories by extrapolating uncertain and heavily influencing driving forces.

Through 2007, the New England EFC...

- Completed three new case studies on Smart Growth Leadership.
- Produced six new publications on a range of topic areas.
- Oversaw implementation of more than 70 recommendations for the state of Maine to preserve its natural resource-based industries.

The stories have the dual purpose of increasing knowledge and widening the observers' perceptions of possible future events.

In 2007, the New England EFC produced a report evaluating whether scenario planning with film would be helpful in New England. For parties that might raise or contribute funds to support this type of initiative, the paper takes some necessary first steps of considering 1) possible approaches to structuring the first several scenarios, 2) possible content, 3) appropriate geographic scale(s) to be represented, 4) potential audiences, and 5) likely costs and administration.

Members of the New England EFC discussing steps needed to address a New England policy matter.

Sam Merrill, Director of the New England EFC.

Smart Growth Leadership

In 2007, the New England EFC completed three new case studies documenting smart growth efforts in Portland, Maine; South Burlington, Vermont; and Westwood, Massachusetts. These products contribute to a growing library of such studies, all of which focus on types of leadership that are necessary to make smart growth developments a reality. In 2008, the New England EFC will assemble the collection of these efforts into a train-the-trainer manual on the topic.

Maine's Natural Resource-Based Industries

In 2007, the New England EFC completed work chairing the Governor of Maine's Steering Committee to Implement the Recommendations of the 2003 Blaine House Conference on Maine's Natural Resource-Based Industries. The Steering Committee reported to Governor John E. Baldacci that it had made significant progress in implementing more than 95 percent of the recommendations for action at the Blaine House Conference; the New England EFC's work on this project is complete.

Maine's Quality of Place

The Brookings Institution asserted that Maine's "quality of place" is not just an economic asset of increasing value for Maine, but it is Maine's chief asset. In 2007, New England EFC staff began chairing and staffing the governor's new initiative to protect Maine's quality of place. After many public meetings and much research, the Maine State Planning Office, under the leadership of the New England EFC, released an initial report, *People, Place, and Prosperity*, which describes this work and provides a set of recommendations for the state of Maine to protect and build on its quality of place.

Environmental Finance for Affordable Housing

In spring 2007, New England EFC staff published an article in the magazine of the Federal Reserve Bank of Boston on relationships between environmental finance and affordable housing. The article provided case studies of innovative public/private partnerships and creative use of conservation land acquisition to leverage funds for affordable housing and made recommendations on ways that additional communities in New England could provide more affordable housing.

Presentations

New England EFC staff gave numerous presentations in 2007; one such presentation was a talk about how to identify funding sources for urban river revitalization projects, at an Urban Rivers Conference hosted by EPA, and another was a talk about "Systems Thinking and Sustainability" delivered to senior managers at the Maine Department of Transportation.

Ongoing Projects & Initiatives

Next Communities Initiative

From model ordinances to financial instruments, a wide variety of smart growth tools are now available to local land use decision-makers and stakeholders. The piece of smart growth that the Next Communities Initiative (NCI) addresses is the effective use and implementation of these tools at the local government level. NCI is training motivated community leaders and lay planners to make smart growth-oriented change happen in their cities and towns. The first step involved developing a three-day workshop series for citizen leaders to: 1) learn that change toward more sustainable land use is both desirable and possible; 2) gain an understanding of the intricacies and subtleties of local government and politics; and 3) explore obstacles to smart growth and how they can be overcome at the local level. The workshop has been delivered many times at venues around New England, and delivery continues into 2008.

The curriculum now exists as three eight-hour, highly interactive and experiential sessions:

> **Session 1:** Participants come to understand sprawl not as a technical problem, but as (in Maine terms) a "wicked" problem: one that is ill-defined, features a lack of consensus on its causes, and lacks obvious solutions that involve challenging trade-offs and often fierce, value-based opposition. Participants gain insights to become informed leaders in the discussion of sprawl and advocates of solutions that seek a wider public good without undue injury to private interests and concerns. Participants leave the session with a mindset that smart growth is an objective worthy of pursuit, and they are ready to explore how to navigate change through the local political system.

Session 2: This session educates individuals about local government processes, both formal and informal. It helps those interested in changing local land use policies understand the twists and turns of local government, what motivates and constrains it, how to mobilize and support a town's opinion leaders and citizens, and how to navigate the system to effect change.

Session 3: Conflict often comes with change. This session teaches community leaders basic skills to deal constructively with conflict over both basic values and perceived interests. It prepares them to treat both personal and social conflict in the community setting. It also includes a final capstone game where the skills, ideas, and information learned in the previous sessions are applied to a practical case.

Watershed Finance Directory Updates

The New England EFC continued its support of an online *Directory of Watershed Resources*. The tool has been expanded to include hundreds of federal, state, and private funding sources specific to New England. Program focus areas, URLs, due dates, and contact information for these funding sources are updated on an ongoing basis.

New Projects & Initiatives

Growing Together

Building on the success of the Center's DVD on Consensus Building, *Growing Together*, a new project is underway to create a concise but detailed guidance document to help communities move from acknowledging the need for a consensus-building process around smart-growth issues to actually implementing the process. The document will be more directive than the DVD. It will also be more prescriptive and training-oriented than other sources not at the local level by laypersons. The guidance document will be disseminated to smart-growth relevant organizations/agencies in all New England states.

Climate Change

Because of the societal imperative to reduce carbon emissions, in 2007 the New England EFC began developing programs that will help local communities respond to these challenges. The first of these efforts was a publication called *Greenhouse Gas Allowances Through RGGI: How to Use the Revenue*? that evaluated how the New England states should move forward with the Regional Greenhouse Gas Initiative. The document analyzes fiscal benefits of several policy alternatives and makes recommendations about how new funds from a carbon cap and trade auction should be used at the state level.

Moving forward, work is underway on two new documents:

- **Readiness for Sea-Level Rise: A Planner's Prescription**. This paper examines what exactly towns in coastal New England must do to start planning for rises in sea level. It will identify standard parts of a comprehensive plan and provide a wide range of fiscal implications for new berms, dikes, or other structures that may be called for; replacement costs for inundation damage; and types of relocation the town might consider. It will also walk through actions towns might take now to make adequate financial resources available for these processes once they begin.

- **Sizing Up the (Dry for Now) Terrain: Economic Implications of Climate Change in Coastal New England**. Changing sea levels will collide with other changes in the forms and function of economic activities along the New England coast. The intersection between changing socioeconomic uses of the coast and changing sea levels and geomorphologies is being explored in a foundational report that uses detailed economic data on coastal regions developed by New England EFC Faculty Associates for the National Oceanic and Atmospheric Administration (NOAA). The report will set the stage for further research and outreach to address the issues identified.

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Performance Measures

As a result of the ongoing activities and accomplishments of the New England EFC, outcomes have included the following:

- In support of the New England EFC's work on Maine's quality of place, in late 2007 the Governor of Maine offered these remarks about the council, of which the New England EFC is Chair: "When I appointed the council last spring, I knew Maine's quality of place was important to our future … Thank you Dick, members of the council, and staff — your work offers a blueprint to make economic development more effective and efficient, preserve the quality of life in Maine, and present opportunity to Maine people."

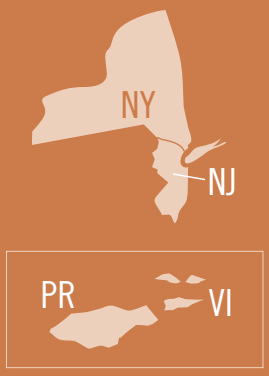
- Professor Richard Barringer, of the New England EFC University of Southern Maine's Muskie School of Public Service was named the 2007 recipient of the national Elmer B. Staats Public Service Career Award. The Staats Award, presented by the National Association of Schools of Public Affairs and Administration, is considered to be among the most prestigious teaching honors in the public administration discipline. It is awarded to a faculty member whose career exemplifies a commitment to inspiring students to pursue public service careers. Much of Professor Barringer's work in the six years leading up to the award has been to advance the interests of the New England EFC.

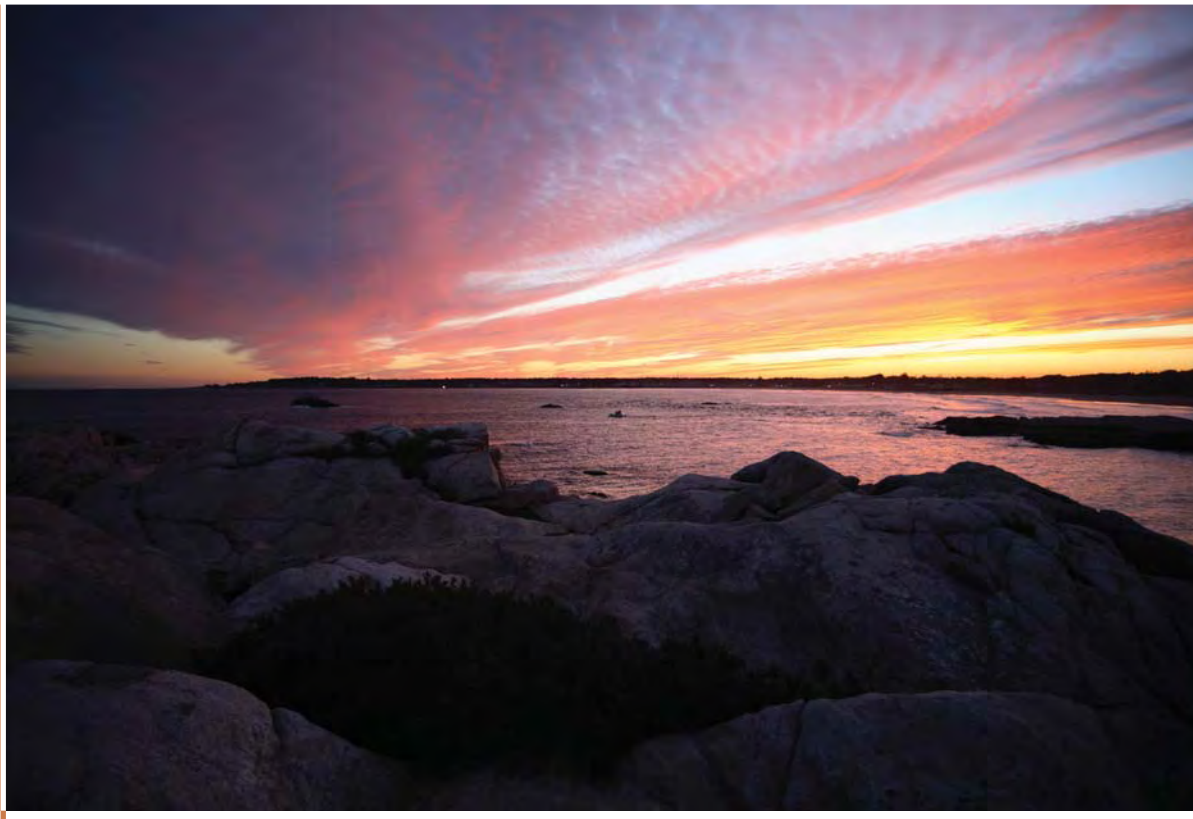
- The New England EFC's program expanded its reach in 2007 through actively distributing its products and fostering their use via the Internet. For example, the New England EFC distributed more than 700 copies of the award-winning DVD *Growing Together* to interested constituent groups. The DVD is mailed with guidelines for hosting public discussion groups about the video's content as it relates to local development issues. The New England EFC is aware of dozens of towns in New England that, in an effort to provide alternatives to sprawl, have used the video to initiate public conversations of this type.

- Traffic on the New England EFC Web site increased roughly 20 percent per quarter during the year, tracked as number of sessions, page visits, and downloads of all types.

Environmental Finance Center

at Syracuse University





In This Report

Background & Summary

The Environmental Finance Center at Syracuse University (Syracuse EFC), located at the Syracuse Center of Excellence in Environmental and Energy Systems in Syracuse, New York, generally serves the two states and two territories of EPA's Region 2: New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands. The primary purpose of the Syracuse EFC is to enhance the administrative and financial capacities of state and local government officials and the nonprofit and private sectors as they endeavor to improve environmental quality and enhance environmental infrastructure.

The Syracuse EFC continues to establish working collaborations with government officials and other local decision-makers, as well as nonprofit and private sector programs that provide technical assistance. These collaborations fall into three main categories: the Public Management and Finance Program (PMFP), Building Sustainable Communities, and a partnership with the Syracuse Center of Excellence in Environmental and Energy Systems.

The primary functions of the PMFP continue to be facilitating partnerships within the technical assistance community, providing public outreach and education related to environmental improvements, and offering training to local government officials and technical assistance providers. Areas of application include asset management, capital improvement planning, collaborative governance/leadership, conflict resolution, problem solving, solid waste, source water protection, water and wastewater, and other environmental improvements.

New Syracuse EFC headquarters (USGBC LEED Platinum building).

A Syracuse EFC training event (Mark Lichtenstein, EFC Director, and Robert A. McNary, Empire State Economic Development Corporation).

Other functional, programmatic services provided by the Syracuse EFC during 2006 and 2007 included extensive work in the broader arena of Building Sustainable Communities, including sustainable approaches to environmental stewardship, social equity, and economic development, with a focus on cost containment. The intent of the Building Sustainable Communities Program is to offer process facilitation, public outreach, policy research, engagement, training, education programs, and direct and indirect technical assistance. This entails more intensive collaboration with Syracuse University's Maxwell School faculty and with other institutions and organizations, such as: the EFC Network (EFCN); GreeningUSA, Inc.; the National Recycling Coalition, Inc.; the New York State Association for Reduction, Reuse and Recycling, Inc.; the State University of New York (SUNY) College of Environmental Science and Forestry; The Syracuse Center of Excellence in Environmental and Energy Systems; Syracuse EnSPIRE Program (Office of Environment and Society); other Syracuse University departments and schools; and the U.S. Green Building Council, Inc.

The third major area of involvement has been developing a substantial partnership with the Syracuse Center of Excellence in Environmental and Energy Systems, created by the state of New York and funded by the state, EPA, the U.S. Department of Energy, and private sector sponsors. This partnership has been particularly useful for enhancing the strength of the Syracuse EFC in the areas of water resources, green building, and sustainable community design.

Background & Summary

Through 2007, the Syracuse EFC realized a number of major program successes, including the following:

- Began outreach and education efforts specifically focused on sustainable infrastructure improvements and water quality issues as they affect New York State's Lake Ontario near-shore areas.
- Became more involved with sustainability planning for the city of Syracuse and Onondaga County, New York, through involvement as members of the Syracuse Sustainable Design Assessment Team (SDAT) task force. SDAT projects in the works in the coming year include a low-income/affordable green housing summit that the Syracuse EFC is taking a lead in developing.
- Expanded the EFC's reach by beginning a project focused on sustainable energy in a private community in the U.S. Virgin Islands. The intent is to replicate the project in other communities in Region 2 and elsewhere.
- Initiated development of a comprehensive Infrastructure and Asset Management Academic Program.
- Continued to promote green building.
- Assisted with the launch of a major neighborhood redevelopment project in Syracuse — the Near Westside Initiative, focused on sustainability in some of the poorest urban census tracts in America.
- Developed community handbooks on financing green building projects and managing wastewater.
- Worked with four groups of graduate students on practical capstone projects.
- Began work, in collaboration with researchers at Cornell and Syracuse universities, on a project to quantify carbon sources and to develop user-friendly tools to help municipalities, counties, and states make carbon-based decisions.
- Broadened the EFC's capabilities for providing technical assistance and training and became better known throughout the region, through the relationship with the Syracuse Center of Excellence, thus expanding the opportunities for building relationships in communities.

Completed Projects

Syracuse Center of Excellence in Environmental and Energy Systems Partnership

In August 2006, the Syracuse EFC changed its formal and historic alignment from the Maxwell School of Syracuse University to the Syracuse Center of Excellence in Environmental and Energy Systems (CoE), hosted by Syracuse University. While the Maxwell School is still a key partner of the Syracuse EFC, this new collaborative relationship with the Syracuse CoE will assist the EFC with its intent to more aggressively promote sustainable development and expose the EFC's service partners (e.g., local governments and others) to leading developments in clean and renewable energy, indoor environmental quality, and water resources.

The Syracuse CoE is actually a federation of more than 170 partners, including businesses, community groups, economic development agencies, research organizations, and the state and federal government. Most importantly, 11 other academic institutions are equal members of the federation.

In total, more than $190 million in private and public funds have been committed to the Syracuse CoE enterprise. This includes a New York State commitment of more than $44 million and more than $96 million in private and foundation investments. It also includes more than $30 million in federal resources secured by Congressman James Walsh. Collaboration between the Syracuse EFC and the Syracuse CoE will further maximize and leverage the impact of the existing funds for each organization.

"Capstone" Projects

In collaboration with the Maxwell School's Center of Environmental Policy and Administration, the Syracuse EFC engaged Syracuse University's Maxwell School Master of Public Administration student teams (27 students) in four four-week intensive research and development capstone projects:

- **Emergency Preparedness in Rural Communities:** As part of the team, prepared miniature case studies comparing and contrasting two communities during two different natural disasters. This project was co-sponsored with New York State U.S. Department of Agriculture (USDA) Rural Development (RD) office and was intended to better inform USDA RD of the steps that municipalities should take to improve their disaster response plans.

- **Leadership in Energy and Environmental Design (LEED) in Upstate New York: An Exploration of Barriers, Resources and Strategies:** Focused on identifying barriers (including perceived financial ones) and strategies to assist localities with building green capital projects. This Syracuse EFC-conceptualized project also involved the U.S. Green Building Council's (USGBC's) upstate New York chapter. The project resulted in the production of a user-friendly *Green Building Field Guide* for local governments and other New York State organizations interested in developing green and sustainable buildings that could qualify for USGBC's LEED Green Building Rating System.

- **Rural Water and Wastewater Infrastructure Management: Moving Small Communities Forward:** Worked with USDA RD to evaluate the current state of asset management among rural communities. The team evaluated the real and perceived challenges of implementing an asset management system, evaluated asset management software, and made policy recommendations for multiple layers of government.

Community Assistance

- **Chenango County, New York, Source Water Project:** Assisted with the Source Water Protection Project in Chenango County, which took a watershed management approach and

Through 2007, the Syracuse EFC...

- Worked with 27 students in Syracuse University's Master of Public Administration program on capstone projects.
- Provided technical assistance to nine communities.
- Collaborated with other organizations to produce eight events.
- Gave nine domestic and international presentations.
- Led or designed 11 trainings or events.
- Engaged in four green building projects.

was based on the notion that communities working proactively to protect their health and resources will prevent contamination of their drinking water sources. The EFC created a booklet on source water protection in cooperation with the Chenango County Health Department to be distributed to citizens and municipalities in the county. The EFC sponsored and facilitated public meetings and Water Operators Council meetings in Chenango County.

- **Oswego County, New York, Solid Waste Management Financial Systems:** Worked with Oswego County to help facilitate public input into a yearlong process of evaluating alternative management and financing models for its integrated solid waste management system. Some options included moving toward a public-private partnership, full privatization, enterprise accounting, and other management and/or financing models. The county chose enterprise accounting and consolidation.

- **Town of Cortlandville, New York:** Consulted with representative of Citizens for Aquifer Protection and the Economy regarding a local dispute over aquifer protection and economic development.

- **New Jersey:** Consulted with U.S. Senator Menendez's office staff regarding funding options, technical assistance availability, and other resources regarding the testing of municipal and private wells in a New Jersey county in his district.

- **Village of Holly, New York:** Initiated meetings with the village of Holly following a request for assistance. Similar to other rural communities in upstate New York, local leaders were, and continue to be, faced with deteriorating infrastructure and economic diversity. Following a review of available — although dated — engineering reports, the EFC, along with community stakeholders, developed a point specific strategy to address immediate infrastructure inventory needs and engage regional potential partners in both economic recovery, and infrastructure strategies.

Collaboration and Program Development

- **Adirondack Ecological Center:** Participated in a meeting intended to explore potential project collaborations in the sustainable development area for the Adirondack Mountain region of New York State.

- **Energy Fair:** Assisted with an energy fair at the Museum of Science and Technology in Syracuse, attracting hundreds of attendees.

- **EPA Sustainable Infrastructure Conference:** Joined with EFCs from Regions 4, 6, and 10 to host an EFCN exhibit at this 2007 event in Denver.

- **Great Lakes Protection Fund:** Led a collaboration of EFCs, including Regions 1, 5, and 10, along with the National Policy Consensus Center at Portland State University, to develop an extensive proposal for the Great Lakes Protection Fund to fund the development of innovative financing and planning tools for communities in the Great Lakes Basin, particularly in the water and wastewater area. The proposal was not funded, but the process created potential for other collaborative projects.

- **"I Live NY" Event:** Attended this invitation-only event hosted by the New York Governor's wife, focused on making New York State a more desirable place to live and addressing the problem of the "brain-drain" of young people in the state. The Syracuse EFC was invited to have a presence at the event and represent the U.S. Green Building Council because of its involvement in green building and its expertise in creating sustainable communities.

Syracuse EFC Associate Director Sara J. Pesek at "I Live NY Event," Cortland, NY.

- **International/National Organizations:** Met with numerous international/national organizations with the intent of developing collaborative projects. Some examples include the Grass Roots Recycling Network, and the National Recycling Coalition with a new Zero Waste training program; the Jane Goodall Institute, with potentially new education programs; and the U.S. Green Building Council on a number of joint projects as detailed in this report.

- **"Journey to Jobs" Workforce Development Event:** Participated in this event, promoting sustainable workforce development in the upstate New York region. Additionally, the Syracuse EFC has been actively involved in a number of working groups focused on workforce development.

- **"Mayfest":** Supported a major presence at Syracuse University's Mayfest. Hundreds of central New York region high school students toured exhibits hosted by local sustainability groups.

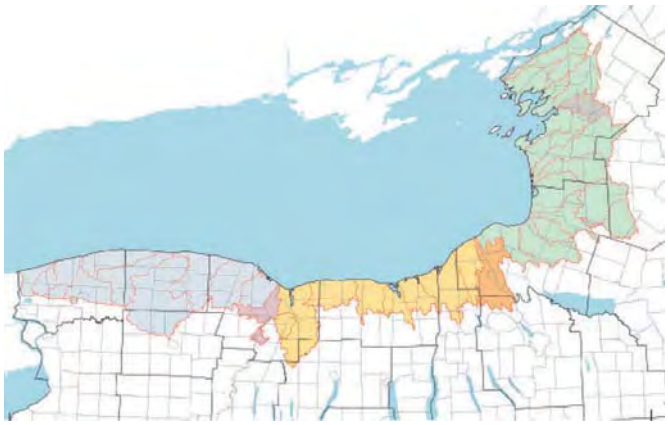
- **New Jersey Organizations:** Worked with the mayor of the towns of Peapack and Gladstone, New Jersey, who helped the Syracuse EFC establish contacts in the region. This connection resulted in meetings with the New Jersey State League of Municipalities, the New Jersey Department of Environmental Protection Commissioner, the New Jersey Environmental Infrastructure Financing Program, and the New Jersey Highlands Commission, where the Syracuse EFC presented an overview of the EFCN and the Syracuse EFC's capacities.

- **State Revolving Fund National Conference:** Attended and hosted a small exhibit at this 2007 event in Denver.

- **Upstate New York Organizations:** Met with numerous local organizations such as the Central New York Small Business Technology Development Office, Cornell Cooperative Extension, FOCUS Greater Syracuse, SUNY College of Environmental Science and Forestry, and many others to develop programs like Link CNY, Accelerate 2007 and 2008, the Sustainable Design Assessment Team, and others.

- **USDA Technology Assistance and Training Grant:** Developed a comprehensive and successful grant proposal in conjunction with the Lake Ontario Coastal Initiative. The focus was to get "boots on the ground" in various communities along the Lake Ontario coast to help with implementing components of EPA's sustainable infrastructure strategy, with a particular emphasis on the near-shore water quality issues facing Lake Ontario coastal communities. Also completed another similar grant application for the 2008-2009 fiscal year.

- **Water/Wastewater Energy Efficiency Grant:** Worked with Red Oak Consulting on a successfully awarded New York State Energy Research and Development Authority grant proposal that will provide education and outreach to communities regarding energy efficiency and conservation in water and wastewater systems. The Syracuse EFC will collaborate with Red Oak in implementing this project by providing training and outreach activities to utilities/municipalities across New York State, including helping to host energy specialty conferences around the state.



Lake Ontario Coastal Zone communities targeted by Syracuse EFC for technology assistance and training

Facilitation

- **Citizen's Campaign for the Environment Survey:** Connected this organization with experts for the purpose of performing a survey on fish consumption from Onondaga Lake, New York.

- **Climate Change Panel Discussion:** Facilitated a major discussion on climate change with three noted faculty members from Syracuse University and the SUNY College of Environmental Science and Forestry; more than 30 students and community members attended.

- **Climate Change "Teach-in":** Co-sponsored the local showing of a national event, "The 2010 Teach-in." This event explored the potential technical, financial, and economic implications of climate change; approximately 50 people attended.

- **Community Workforce Portal Development:** Participated as a member of an interdisciplinary team designing a community Internet portal for the purposes of workforce development. The Syracuse EFC brought the perspective of technical and financial expertise needed in a sustainable community.

- **Electronics Recycling Consortium:** Participated on a steering committee with members from IBM, the International Association of Electronics Recyclers, and businesses involved in

electronics recycling, with the intent to develop a grant proposal to New York State to promote cost-effective electronics recycling.

- **EPA "Four Pillars" Briefing:** Prepared a short briefing paper for EPA Region 2 officials regarding the Syracuse EFC's activities and the region's needs relating to the four pillars of sustainable infrastructure (Better Management, Full-Cost Pricing, Efficient Water Use, and Watershed Approaches to Protection).

- **New York Conference of Mayors and Municipal Officials (NYCOM):** Participated on the planning committee for the NYCOM Public Works School.

- **Onondaga Nation Land Rights Collaborative Education Series:** Participated as a member of a committee planning a series of yearlong events exploring the issue of Native American land rights, specifically focusing on environmental stewardship issues (the Onondaga Indian Nation Land Rights Collaborative Education Series). This work culminated in an event with more than 60 people in attendance.

- **Sustainable Intermodal Transportation Facility Planning Focus Group:** Developed and facilitated this public brainstorming forum for the Syracuse CoE, with more than 100 people in attendance to discuss the potential development of an Intermodal transportation center in downtown Syracuse.

Green and Sustainable Building Projects

The Syracuse EFC has taken a proactive role in the area of green building education, including health and ecological benefits and the financial costs and benefits of green construction.

- **New York State Association for Reduction, Reuse, and Recycling Annual Conference:** Helped sponsor, design, and facilitate a workshop track focused on green buildings and related finance and cost-savings issues and gave the opening remarks at this fall 2006 event, at which more than 150 people attended, including local government officials. The Syracuse EFC continues its partnership with this organization.

- **Student Sustainable Exhibit Design Project:** Facilitated a group of six students from Syracuse University's Industrial Design department as they designed a "sustainable exhibit" for the 2007 U.S. Green Building Council's "Greenbuild" conference in Chicago. Syracuse EFC staff worked with the students to develop construction and material guidelines for the design and guided them as they discovered how to incorporate sustainability into their studies. The exhibit was a display of how the exhibit industry can reduce its carbon footprint by reducing materials used for exhibit construction, reducing freight costs, and making intentional decisions with regards to material use and production techniques. This project will be expanded on for "Greenbuild 2008" in Boston.

Sustainable exhibit at Greenbuild Chicago (2007).

International Presentations

- Presented programs on human resource management, asset management, and sustainable infrastructure management to two separate large contingents of Chinese municipal officials and facilitated a meeting with the New York State Department of Environmental Conservation in Albany for one of those groups.

- Developed and presented a program on sustainable infrastructure management to a group of Indian federal and regional officials hosted by the New York State Environmental Facilities Corporation.


Syracuse University Industrial Design students and their sustainable exhibit at Greenbuild Chicago (2007).

- Designed and presented a program on solid waste management for Vietnamese federal officials.

Domestic Presentations

- **Annual Joint Water Resources Symposium:** Gave the keynote address ("How Do We Fund Our Projects? Financial Planning to Provide Essential Services Consistently, Reliably, and Cost Effectively") at this event of the New York State chapter of American Water Works Association and New York Water Environment Association; more than 250 attendees attended the two-day technical conference.

- **The Creative Core's GreenTeam:** Building a Sustainable Central New York: Gave a presentation at a FOCUS Greater Syracuse Core Group meeting in 2007 with 40 attendees.

- **Joint EPA Regions 1 and 2 Conference on Sustainable Water/Wastewater Infrastructure:** Collaborated with EPA Regions 1 and 2 to develop this first of five national Sustainable Infrastructure Conferences. The Syracuse EFC director presented at this Groton, Connecticut, event. A major focus was on the merging of clean and renewable energy innovations with sustainable water and wastewater projects at the local level ("Connecting the 'Watts to Drops'"). About 150 local government and other participants attended. The Syracuse EFC also helped by facilitating a focus group in New York State to assist the EPA with planning the event, creating the agenda, and selecting speakers.

- **Incentives to Promote Development of "Green-Collar" Jobs:** Invited to participate on a 2007 panel hosted by the New York State Assembly. More than 40 people were in attendance.

- **New Jersey State League of Municipalities:** Gave a presentation at this organization's annual conference in Atlantic City.

- **New York Conference of Mayors Public Works School:** Presented a session on asset management in 2006 and sustainable infrastructure in 2007; more than 80 local government officials attended.

- **Positive Transformation Now!:** Gave a presentation at a FOCUS Greater Syracuse Core Group meeting in 2006 with 45 attendees.

- **Southern Tier Flooding Public Meeting:** Presented at this public meeting hosted by USDA RD Community Assistance representatives in Tioga County, New York. This workshop was designed to educate community leaders in the southern tier of New York State who had experienced the effects of the devastating floods of June 2006 (a federal disaster area). Representatives from the New York State Environmental Facilities Corporation, the New York Rural Water Association, RCAP Solutions, and the Syracuse EFC provided information regarding respective services in an effort to help these leaders make decisions regarding the repair and maintenance of their water and wastewater systems.

- **Syracuse Post Standard Editorial Board Meeting:** Discussed Syracuse EFC activities and sustainable community principles.

Training

- **Sustainable Infrastructure:** Provided training at a multi-day event in 2006 in Syracuse, including tours of water and wastewater facilities. The training featured the four pillars of sustainable infrastructure, the Water Environment Federation's "Water is Life" and "Infrastructure Makes it Happen," and Pennsylvania State University's "Liquid Assets" programs.

- **Managing Infrastructure for Sustainable Economic Development:** Directed and hosted a day-long training event in Syracuse in 2007, focusing on how closely infrastructure is related to economic development in communities. The training concentrated on providing practical tools to understand community assets, manage infrastructure, and continue to address the needs and wants of communities. The event featured presentations by the EPA Region 2 sustainable infrastructure liaison, an executive of New York State's Economic Development agency, and the director of the Boise State EFC, located in Region 10.

- **USDA RD and Sustainable Infrastructure:** Developed, hosted, and facilitated a one-day event in 2006 in Syracuse for New York's USDA RD program; more than 50 people attended.

- **Collaborative Environmental Dispute Resolution:** Designed and conducted a three-day environmental dispute program for Syracuse University's Program on the Analysis and Resolution of Conflicts. This project included a major simulation regarding locating a low-level radioactive waste disposal site and attracted 32 attendees. A shortened version of the program was also presented to more than 100 students.

- **Economics of Climate Change Technology Workshop:** Received a grant to host a major one-day technical workshop for about 30 federal economists from EPA, the U.S. Department of Energy, USDA, the Food and Drug Administration, and other organizations in Washington, D.C. that are leading in the area of climate change modeling.

- **National League of Cities Training Event:** Helped organize this training event at Syracuse University and presented to more than 50 city officials from across the country (from communities ranging from 8,000 to 2.8 million people) on strategic management and planning, sustainable infrastructure management, and building sustainable communities.

- **Sustainability Summits:** Helped lead a collaborative effort to promote the building of sustainable communities in New York State through two major events held in Syracuse:

  – *New York State Sustainability Summit/LinkCNY:* Co-sponsored New York State's first exposition/conference on sustainability, held at the Onondaga County convention center in 2006, which attracted more than 1,000 people. Technical workshops and plenaries covered topics such as green buildings, energy conservation, energy pricing, greening of schools, and technological innovations. The Syracuse EFC moderated and helped develop the structure for the event, which was showcased through a number of television, radio, and newspaper media outlets.

  – *Accelerate 2007:* Assisted in the development of the program, co-facilitated the steering committee, and co-sponsored the event with four other community partners, which attracted approximately 1,200 attendees. The Syracuse EFC also helped secure the very popular "Toyota Hybrid Experience" exhibition and successfully targeted high school and college students for volunteer work and attendance at this event. Media outlets such as the *New York Times* were in attendance. Plans are underway for next year's follow-up event, Accelerate 2008, for which the Syracuse EFC will take an even larger role by co-chairing two educational program tracks.

accelerate 2007
New Ideas in Technology, Manufacturing, Energy & the Environment

- **Environmental and Energy Systems Symposia:**

  – *Design With Nature:* Assisted the Syracuse CoE with design and implementation of this 2006 event, featuring Congressman James Walsh and internationally known speakers, such as renowned author L. Hunter Lovins from the Rocky Mountain Institute.

  – *Building Innovations for Climate Change:* Assisted the Syracuse CoE with design and implementation of this 2007 event, which surveyed the latest ideas and advancements in the growing field of sustainable design. Topics covered by internationally recognized speakers included high-performance buildings and environmental and energy systems research and development. A highlight of the event was a talk by the Honorable Susan Roaf, from the Oxford City Council (England), addressing climate change through innovative urban master planning.

  – *Developing Sustainable Practices: Strategic Planning, Operations, & Management:* Facilitated this half-day workshop targeted toward businesses and attended by 30 people.

Honorable Susan Roaf, Oxford City Council (UK), Environmental and Energy Systems Symposium (2007).

Ongoing Projects & Initiatives

Clean and Renewable Energy

- **Energy Master Plan, Town of Fabius:** In conjunction with the Central New York Regional Planning and Development Board and Syracuse CoE, the Syracuse EFC is helping this Onondaga County, New York, town develop an Energy Master Plan.

- **Syracuse Green Power Facility:** The Syracuse EFC director was appointed to a Local Development Corporation (LDC) and will be involved with planning a new renewable power plant to be built in Syracuse. The director chairs the finance committee of the LDC.

- **U.S. Department of Energy Solar Initiative Grant:** The EFC is helping the city of Syracuse and the Clean Communities Program of Onondaga County write two grant proposals to foster growth of solar energy research and companies in upstate New York.

Green and Sustainable Building Projects

The Syracuse EFC has taken a proactive role in the area of green building education, including health and ecological benefits and the financial costs and benefits of green construction.

- **Green & Sustainable Schools and Green Building Conferences:** Assisting with major events promoting sustainability in schools and green buildings generally, such as two events held in 2007 that highlighted research showing increased productivity of students and staff and the economic case for building green schools.

- **Fulton Companies:** Actively helping this central New York-based international company plan to develop sustainably, including building new, green facilities, by facilitating a number of meetings with state and local economic development and elected officials, green building technical assistance providers, and researchers (in the carbon sequestration field), and assisting the company hire student interns.

Community Assistance

- **Saddle River Region, New York:** Working with residents of the Saddle River region who are experiencing well-water contamination issues.

- **Town of Fort Covington, New York:** Began an asset management approach to encourage incremental improvements in Fort Covington's water system, in cooperation with the New York State Health Department.

- **Town of Wayne, New York:** Facilitating discussions with municipal leaders and technical assistance providers as they consider wastewater treatment options. The municipal leaders are currently in the process of surveying town residents to determine current sentiment and knowledge of such systems. Upon completion of this survey, municipal leaders, technical assistance providers, and the Syracuse EFC will conduct an engineering feasibility study.

Town of Wayne, NY (depicting density of development around lakes).

- **Villages of Saranac Lake and Lake Placid, New York:** Working with the Central Upstate New York GreenTeam to help these Adirondack communities base their economic and business development strategies on sustainable principles.

Collaboration and Program Development

- **Advisory Board:** Created a PMFP Advisory Board consisting of technical assistance providers and state and local government officials. The board is actively working to develop the PMFP's programs and training events, such as an EPA Region 1 and 2 Joint Sustainable Infrastructure Conference,

Technical Assistance Partnership Forums and a multi-day training program.

- **Asset Management Workshop Series:** Began discussions to develop this workshop series based on dialogue and experience with local representatives and technical assistance providers. For example, the EFC facilitated a planning meeting involving the New York Associations of Towns, the New York Conference of Mayors and Municipal Officials, the New York Rural Water Association, the New York State Environmental Facilities Corporation, the New York Water Environment Association, and USDA, to discuss the need and support for an asset management workshop series.

- **Creative Core "GreenTeam":** Helped form, and currently co-facilitate, this business attraction group as part of a larger regional branding effort: "NY's Creative Core. Real. Smart. Green." It is a task force representing business, government, economic development, academic, and nonprofit leaders from a regional swath stretching from New York's southern border near Binghamton up through New York's Canadian border in the north. The objective of the group is to promote and encourage sustainable and smart economic growth throughout this region, focusing and building on new and existing green innovations and technology. The Syracuse EFC is working with this team on a number of current efforts, including:

  – *Business Attraction Study:* A study to provide a marketing analysis of three core technology sectors (healthy buildings/sustainable design, energy, and water quality), and multiple sub-sectors. For each sub-sector, the team will complete an integrated search of international businesses/market leaders, suppliers, expansion/relocation considerations for business, an analysis of the central upstate New York region's asset inventory, and an identification of competition facing the region. The study will also include an analysis of strengths, weaknesses, opportunities, and threats.

  – *Inventory of Tech Assets:* Development of a preliminary map to plot and categorize the region's "clean/green" tech assets, with ongoing additions.

  – *Clean and Renewable Energy Regional "Parks":* Promotion of four current regional development target areas: Onondaga County Carrier location, Cortland County, Oswego County's Riverview Business Park, and Seneca County's Seneca Army Depot. Three recent announcements indirectly reflect the work of the GreenTeam:

  a $14-million to $17-million biofuels plant locating in Cortlandville; a National Grid grant to Riverview for further energy development; and a $38-million green Hope Lake Lodge Resort and Indoor Water Park at Greek Peak in Cortland County. The Syracuse EFC also participated in a focus group to brainstorm the incorporation of cutting-edge renewable energy concepts in the Riverview Business Park.

- **Environmental Management Systems (EMSs):** Developing knowledge capacity of EMSs in general with the intent to promote their use as a finance tool for a variety of organizations.

- **New York Governor's Regional Office:** Collaborating with the governor's regional office regarding regional sustainability issues and helped incorporate the office onto the GreenTeam.

- **Infrastructure Management Academic Program:** Researched educational programs in the United States and around the world that teach sustainable infrastructure management and beginning to develop a center based on best practices. An effective educational program would incorporate civil engineering principles, public management, policy analysis, and public financial management. Not only do managers need these skills, but they must also have excellent communication and interpersonal skills to successfully interact with everyone, from municipal policy-makers to contractors working on capital projects. The Syracuse EFC is working on developing the following activities, which could be generated and supported by the educational program/center:

  – Providing training to local government representatives in strategic management to demonstrate how watershed/ecosystem approaches, regionalization/consolidation/intermunicipal cooperation, and conservation produce long-term benefits when approached collaboratively.

- Providing training in capital improvement planning (focusing on asset management practices) coupled with public relations skills to build community capacity to successfully implement full-cost pricing. This training would include hands-on work in asset management, rate analysis, and other sustainable infrastructure focused software.

- Implementing widespread public outreach on the value of water, true costs of services (such as wastewater), and the realities in current/future cost structures to continue to affect a cultural shift. This outreach could be accomplished through presentations (at professional conferences, public meetings, and other appropriate venues), articles (submitted to trade journals, newspapers, magazines), televised media, and focused educational programs targeted to specific audiences.

- Providing direct community assistance to implement asset management practices, including providing software-based analyses in asset plans and rate structures, developing and implementing customized public relations campaigns, and providing ongoing community technical support.

- Working with technical assistance partners to develop alternative state-specific solutions to the growing problem of household affordability concerns.

- Convening forums involving key decision-makers to discuss viable policy changes (building on the work of the EFAB workgroup in the area of affordability).

- **Infrastructure and Asset Management Academic Program:** Initiated the development of an academic program focused on sustainable infrastructure management principles. Researched existing programs and moving forward with the design of the academic course plan.

- **Local Economic Development Support:** Actively support local economic development organizations, such as being involved with the Accelerate 2007 event, Journey-2-Jobs workforce development efforts, and the Green & Sustainable Schools event. Additional joint activities are being planned.

- **Listserv:** Distributing PMFPTalk, a listserv providing local government leaders and technical assistance providers (TAPs) a means to submit questions or disseminate information. It is primarily promoted and utilized as a tool for community members to obtain answers to questions they have about issues of water rates, water systems, wastewater treatment, finance programs, and technology.

- **New York State Water/Wastewater Infrastructure Co-Funding Workshops:** Participated in the planning for these events, and the EFC associate director served as a panel member and speaker at different events throughout the state, discussing asset management. The program will be continued in 2008.

- **University Sustainability Efforts:** Increased involvement in related endeavors including helping lead the coordination of other key organizations at Syracuse University and the SUNY College of Environmental Science and Forestry to build a cohesive and synergistic program on sustainability that is transferable to other organizations in the region. This project includes issues such as transportation, socially responsible investment policies, waste reduction and reuse, curriculum development, energy, and green building. Syracuse University made a major commitment to sustainability, including pursing the U.S. Green Building Council's LEED certification for all new major construction projects, and changing its investment strategies. This project also includes creating new working partnerships within varied disciplines such as industrial design and environmental systems engineering. These relationships allow for a greater degree of collaboration on community projects that require additional expertise and offer students more opportunities for engagement.

Facilitation

- **FOCUS Greater Syracuse:** Helping this central New York nonprofit group that focuses on sustainable communities to promote 82 goals related to environmental stewardship, social equity, and economic development.

- **Greenhouse Gas Committee, Onondaga County Resource Recovery Agency (OCRRA):** Joined with other local experts on a special advisory board assisting OCRRA with regional climate neutrality strategies.

- **Onondaga Community College Sustainability Task Force:** Appointed by the college president to a position on a task force to help plan for regional sustainability initiatives.

- **Sustainable Design Assessment Team Project (SDAT):** Currently helping to facilitate an interdisciplinary group in

Sustainable Design Assessment Team Project.

central New York, which designed a unique program to evaluate sustainable indicators. Helped conceptualize a successful American Institute of Architects grant proposal, targeted toward building a sustainable Syracuse region. The Syracuse EFC now sits on the local steering committee and was active in a series of charrettes, focus group meetings, and a town hall meeting, which included hundreds of participants. SDAT projects in the works in the coming year include a low-income/affordable green housing summit that the EFC is taking a lead in developing.

- **Syracuse University Sustainability Steering Committee:** Advising this group, which was charged by the Syracuse University president with developing a plan for Syracuse University's compliance with the University President's Climate Commitment initiative.

- **University Sustainability Action Coalition:** Participating as a co-founding member and helping to facilitate this group, which is active with over 50 students, faculty, staff, and community members from the central New York area. Among a number of other efforts, members of the group are helping two SUNY campuses and Syracuse University with their climate change commitments.

- **"Water is Life" Program:** Serve as chairperson of the "Water Is Life" and "Infrastructure Makes It Happen" joint education program in New York State and will speak at panels about educational outreach material available to communities for water/wastewater infrastructure concerns.

- **Water and Wastewater Education and Outreach Committee:** Assisting with implementing a statewide outreach campaign focusing on drawing high school students into the water industry. Investigated options for creation of the "Straight from the Tap" campaign and solicited potential corporate sponsors on behalf of the committee.

Promoting Green and Sustainable Building Projects

The Syracuse EFC is helping the Syracuse CoE take the lead on promoting green buildings through a number of initiatives. The USGBC, based in Washington, D.C., is recognized as leading the green building movement in the United States. The USGBC's president resides in Syracuse and has developed a very strong personal and professional relationship with the Syracuse EFC and the Syracuse CoE (sitting as a CoE Board member). The Syracuse EFC's interest is in the cost-effective nature of building green. The intent for the Syracuse EFC is to develop models and programs that can be replicated with other organizations and in local communities focused on educating about the financial benefits of sustainable construction and design.

- **Central New York Peace Council:** Helping this nonprofit organization renovate an old building based on USGBC green building standards, particularly assisting with financial options.

- **Emerging Green Builders (EGB):** Assisted the USGBC Upstate Chapter form the first EGB group in New York State, which now includes 60 students. The Syracuse EFC continues to facilitate the group.

- **General Green Building Promotion:** Assisting the Syracuse CoE in facilitating a major exhibit at the USGBC's annual conventions: Denver 2006 (approximately 14,000 attendees) and Chicago 2007 (approximately 23,000 attendees). Syracuse EFC staff will continue to participate in future Greenbuild events (Boston 2008) as well as local and regional green building conferences such as the SUNY College of Environmental Science and Forestry's annual Green Building conference.

- **Green Building Financing:** Actively researching and promoting financing options for green building through the work of research assistants. The Syracuse EFC is publishing a green building field guide for distribution around New York State as a resource for communities.

- **LEED-New Construction (NC) Training:** Training staff in the USGBC's LEED NC building certification program.

- **LEED-Neighborhood Development (ND) Review Committee:** Participating as members of a national review

panel for the new beta version of the LEED ND certification program.

- **Sustainable Syracuse City Schools Project:** Engaging with a number of facets of the nearly $1-billion, 10-year school capital project in the city of Syracuse, which will result in LEED-certified city schools.

Training

- **Technical Assistance Partnership (TAP) Forums:** Organized six forums covering various water and wastewater technical topics. These forums were targeted toward local government officials and TAPs, with an average of 20 to 30 attendees. Additional forums are being planned.

- **Wastewater Panels:** Participating in a unique series of training events, the "Panels on Wastewater for Local Representatives," which were developed in collaboration with the New York State Department of Environmental Conservation (NYSDEC), the New York Rural Water Association, and the New York Water Environment Association (NYWEA). Participated in planning meetings for the four sessions in the fall of 2006 and presented at sessions from 2006 to 2007. As a follow-up to this successful program, NYSDEC, NYWEA, and the Syracuse EFC published a *Handbook on Wastewater Management for Local Representatives* in February 2007.

Expansion

- **New Jersey Outreach:** Accelerated efforts to develop activities in New Jersey and will continue to build on these efforts and to identify potential partners and projects in New Jersey.

- **Puerto Rico Water Projects:** Researching environmental challenges and opportunities for developing projects in Puerto Rico.

- **U.S. Virgin Islands Wind Energy Project:** Working with a private resort in the U.S. Virgin Islands that is interested in developing more sustainable practices and helping facilitate the involvement of a local public utilities authority, a U.S. Department of Energy-supported energy efficiency program, the Syracuse CoE, and the University of the Virgin Islands. The intent is to evaluate energy efficiency measures and the use of renewable (decentralized) energy generation to mitigate energy disruptions as a result of tropical storms, which cause sewage overflows into the Atlantic Ocean. This project also includes working with the local water/electricity utility (government authority) to develop concepts such as distributive energy. The Syracuse EFC would like to use findings from this project to replicate it elsewhere.

New Projects & Initiatives

Clean & Renewable Energy

- **Clean and Renewable Energy Financing:** Planning to acquire the services of a graduate assistant who can research innovative financing options to assist organizations and communities with developing and encouraging growth of new businesses in the alternative energy field.

Collaboration & Program Development

- **Carbon Calculator:** In collaboration with researchers at both Cornell and Syracuse universities, helping lay the groundwork for a project to quantify carbon sources and to develop user-friendly tools to help municipalities, counties, and states make carbon-based decisions. The intent is that these tools will result in the development of public policy to reduce net carbon dioxide emissions and address economic and financial efficiencies in the process.

- **Near Westside Initiative:** Assisting in the launch of a major neighborhood redevelopment project in Syracuse. The Near Westside Initiative is a collaborative effort to restore the Near Westside area of Syracuse, which includes some of the poorest census tracts in America, into a neighborhood of choice for residents of all incomes. The Syracuse CoE will lead efforts to incorporate green technologies in the project. As part of this effort, the project will be used to evaluate the LEED-ND rating system proposed by USGBC. This LEED-ND project in Syracuse is one of only a few projects of its kind in the country.

- **SUNY Oswego Sustainability Efforts:** Exploring and embarking on collaborations with SUNY Oswego. One project is assisting the school with meeting its recent climate change commitment. The Syracuse EFC director was the keynote speaker at SUNY Oswego's kick-off Sustainability Summit.

Performance Measures

As a result of the ongoing activities and accomplishments of the Syracuse EFC, outcomes have included the following benefits to communities and individuals:

Stakeholder Outreach and Education

The Syracuse EFC's public outreach process has developed a reputation for enhancing the public's understanding of sustainable infrastructure and development projects. Technical assistance providers, municipal officials, and other community leaders have found that involving the Syracuse EFC as a neutral third party to facilitate a discussion is a positive method to disseminate accurate information and address legitimate stakeholder concerns. For the 2006-2007 period, this added value is exemplified by the many requests that have been received from communities and other technical assistance organizations to provide facilitation and outreach on subjects ranging from public finance to building sustainable communities.

Another illustration of the effectiveness of the outreach program is the increase in the number of requests for Syracuse EFC staff to participate on invitation-only committees and taskforces.

Program Evaluations

Consistently, community representatives and technical assistance providers highly rate the Syracuse EFC training events and facilitations in terms of both format and content. One method we use to evaluate our efficacy is through pre- and post-surveys around training events. We have also received input regarding the value of the training through the PMFP Talk listserv.

A local nonprofit, Greening USA, presented the EFC director with an award that read:

> *"In Recognition of Your Outstanding Effort in Organizing and Starting the Process for the Syracuse Sustainable Assessment Team Facilitated by the American Institute of Architect."*

> *"The session was relevant to my community because you took the time to listen to concerns of the participants and were interested in learning more about current projects we have going on in the area of water and wastewater. I appreciate that you are taking the time to hear what is happening "on the ground" so that you can adapt training and outreach activities in the next year to be focused on areas of particular need and interest to the Lake Ontario communities".*

Bill McVea, Mayor,
Village of Fairhaven, NY

> *"The program was very interesting and the presenters made themselves available for personal interaction. These smaller interactive group sessions really allow conference attendees to ask questions specific to their locale and get a professional answer. This is not a format that I have seen at other conferences, and I find it really adds to the learning experience."*

Merrit Ackles, Conservation Board,
Town of Hamlin, NY

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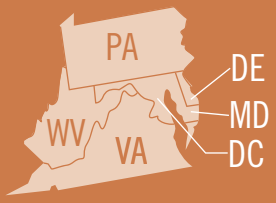
Environmental Finance Center

at the University of Maryland



In This Report

Background & Summary

The Environmental Finance Center at the University of Maryland (Maryland EFC), located at the National Center for Smart Growth Research and Education, chiefly serves the five states of EPA's Region 3: Maryland, Virginia, Delaware, Pennsylvania, and West Virginia, as well as the District of Columbia. The primary purpose of the Maryland EFC is to assist communities in identifying innovative and equitable means of paying for environmental protection efforts.

In particular, the center promotes ways to manage the cost of environmental activities through technical assistance, training and curriculum development, and outreach activities such as workshops, charrettes, and conferences.

Through 2007, the Maryland EFC accomplished the following:

- Started the successful Web site, *Foodtrader.org* to connect local farmers with local buyers.
- Continued to deliver training and information on watershed-based financing.
- Investigated new and innovative uses of funding sources and emerging markets.
- Assisted communities, local governments, and watershed organizations with capacity development.

- Developed efficient and effective outreach and education tools for reaching a broad clientele with information about innovative, sustainable environmental finance approaches.
- Expanded our reach through our work with state and federal agencies operating in the region, as well as nongovernmental partners.
- Strengthened the connection to departments at the University of Maryland that are essential to program expansion and wider recognition of the EFC's mission, including the Institute for Governmental Service, the College of Agriculture and Natural Resources, the School for Public Policy, and the National Center for Smart Growth Research and Education.

Completed Projects & Initiatives

Community Financing for Local Land and Water Protection

In Virginia, the Maryland EFC worked with the Shenandoah Resource Conservation and Development Council (RC&D) on an innovative project designed to assist Shenandoah Valley communities in developing financing strategies for natural resource protection. The EFC held leadership dialogues with local officials in the counties of Augusta, Rockingham, Page, Shenandoah, Frederick, Warren, and Clarke and the municipalities of Harrisonburg, Waynesboro, Staunton, and Winchester to identify each jurisdiction's primary natural resource financing challenges. From these dialogues, three critical areas of concern emerged: stormwater management, rural land conservation, and greenways.

The Maryland EFC planned and completed three financing charrettes around each of the key topics identified. All three events were well attended, and feedback from evaluations indicated that the information received at the events was extremely helpful to all communities. Although efforts in stormwater management are already underway in the region following the charrette, there were two specific areas where additional assistance was requested — specifically, in land preservation and greenway efforts.

The EFC identified pilot communities within the Shenandoah Valley toward which it will direct additional assistance, working further with Augusta and Shenandoah counties on land conservation financing and with the city of Staunton on greenway issues.

In the area of financing land conservation, the Maryland EFC met with administrative staff and members of the Board of Supervisors in Virginia's Augusta and Shenandoah counties in April 2007. The purpose of these meetings was to assist pilot communities in prioritizing conservation goals and developing a sustainable financing strategy for a purchase-of-development-rights program. As a result of these efforts, these communities were able to 1) set a target number of farms/acres to preserve, 2) estimate the cost per acre of acquiring development rights and how those prices would be set, 3) determine the administrative needs of the potential program and a realistic goal of how many transactions could be closed annually, and 4) identify the fiscal needs of the potential program and possible revenue streams. Due to the direct assistance received from the Maryland EFC, these counties have all the information necessary to proceed as greater local support is garnered.

Through 2007, the Maryland EFC...

- Provided technical assistance to nearly two dozen counties, municipalities, and watershed organizations.
- Provided natural resource policy analysis at the state level in Delaware and Maryland.
- Gave a dozen presentations throughout the region on financing as it relates to issues such as stormwater management, green infrastructure, and natural resource protection.
- Offered a national webcast on watershed financing, reaching more than 200 participants.
- Hosted four charrettes, each attended by approximately 50 participants.
- Attended 15 events regarding subjects such as low-impact development, urban greening and forestry, green building, and nutrient trading.
- Produced four documents on topics including capacity development, decentralized stormwater controls, and financing the Chesapeake Bay restoration effort.
- Offered 17 training sessions on wastewater and drinking-water systems management to more than 150 attendees.

Based on continued community interest following the greenways charrette, the Virginia city of Staunton's Frontier Trail was selected as a pilot project. In addition, a Greenway Action Plan, focusing on available financing options, is currently under development. The information gathered as a part of the research process for the action plan will be leveraged through a Greenway Resource Center, a clearinghouse of greenway information that has been added to the existing Maryland EFC Web site, offering this information and assistance to a wider audience. Existing program partners, such as the Shenandoah RC&D, the Valley Conservation Council, and local governments, will link to this resource and further increase the reach of this information.

Stormwater Financing Initiative

The Maryland EFC Stormwater Financing Initiative sought to help communities gauge their capacity to implement wet-weather management strategies. This program convened a team of experts to work with local officials to develop a framework for financing extensive stormwater management programs as part of the state permitting processes. This initiative is designed to provide communities with the tools and resources they need to effectively finance and implement their wet-weather management programs.

The initiative targeted two communities, the Wissahickon watershed in southeastern Pennsylvania and Anne Arundel County, Maryland. For each project, the technical assistance and outreach program comprised four primary tools or components. The first was a series of leadership dialogues with community leaders and water resource managers. The purpose of these discussions was to develop a detailed understanding of the stormwater management issues facing pilot communities related to stormwater management. The second component included capacity surveys to better gauge the resource needs necessary to implement wet-weather management programs. Using the results of the information gathered, the Maryland EFC project team, in partnership with community leaders, organized and conducted stormwater financing forums, which formed the basis for the comprehensive, interactive event that will provide the foundation for community decision-makers and managers as they work toward advancing their stormwater programs. Finally, the EFC project team will use the results of the forum, the surveys, and the dialogue sessions to provide recommendations on how these communities can develop and implement sustainable financing programs to support their wet-weather management priorities. These recommendations are included in the formal final reports presented to the pilot communities.

Financing Septic Upgrades in Delaware's Inland Bays

The Maryland EFC, working in partnership with the Delaware Department of Natural Resources and Environmental Control (DNREC), completed a project designed to generate creative financing options to support low- and moderate-income owners of septic system in complying with proposed septic regulations designed to improve operations and maintenance of septic systems as well as support nutrient reduction goals for the Inland Bays watershed.

The proposed regulations include two primary components: 1) inspection and pump-out requirements for all systems and 2) performance requirements for all new and replacement systems, effective 2015. Costs faced by septic owners include an estimated $325 to $600 every three years to meet pump out and inspection requirements. Inspections are also expected to trigger repair and replacement of malfunctioning systems at a cost of $10,000 on average. Replacement of substandard systems with new nutrient reducing technologies will cost homeowners an additional $3,500 to $6,000. These units will require service contracts to provide routine maintenance that will add an estimated $200 to $500 annually to the overall cost. With an estimated 19,000 septic systems in the watershed (up to 8 percent of which are owned by low-income populations, and up to 67 percent of which are owned by moderate income populations), financing assistance is a significant concern.

Potential solutions to reduce costs and offer assistance discussed at a statewide forum hosted by the Maryland EFC in October included developing a septic utility district, developing

low-interest loan programs working through private banks and credit unions, and expanding subsidy programs to assist with inspection and maintenance costs. The Maryland EFC presented a white paper report outlining results of the project and recommending next steps for implementation and financing to DNREC in December 2007.

Financing Chesapeake Bay Tributary Strategies

The Maryland EFC conducted a study on behalf of the state of Maryland that developed a framework for a sustainable financing strategy for the implementation of the state's nutrient reduction commitments under the Chesapeake Bay 2000 Agreement. Accounting for existing programs and initiatives in place in 2006, the state will need approximately $5.3 billion of additional revenue to reach these goals. This study was designed to provide state officials with recommendations for organizing and structuring future bay restoration financing efforts and serves as a follow-up to the Chesapeake Bay Watershed Blue Ribbon Finance Panel that was charged under Directive 03-02 with identifying funding sources to implement the tributary strategies.

Undertaking this project consisted of a number of core tasks: developing an analysis template; conducting research, with a focus on leadership interviews; analyzing findings; and publishing a final white paper report featuring key recommendations related to financing the tributary strategies. The tributary strategies divide the challenge of meeting nutrient reduction requirements into specific industries or sectors that impact the bay watershed. The core program areas identified are wastewater, urban runoff, agriculture, and air deposition.

The Maryland EFC developed a research and analysis template to ensure a thorough and consistent assessment of each of the four areas. This template directed team members to investigate the scale of the problem, existing sources of program funding, the current regulatory framework, and the present institutional capacity. Next, the Maryland EFC conducted a thorough literature review related to the costs associated with implementing the tributary strategies and the corresponding Chesapeake 2000 nutrient and sediment reduction agreements. This information served as the foundation for an ongoing series of informational leadership interviews. The Maryland EFC then analyzed the four core areas in terms of identifying the scale of the problem, including current funding and financing efforts; identifying and leveraging new revenue sources; the role of federal, state, and local regulatory programs; and developing and building institutions.

The Maryland EFC developed a series of finance strategy recommendations for full implementation of the tributary strategies based on this analysis. These recommendations included opportunities for leveraging new and existing revenue sources, clarifying regulatory and policy framework, expanding institutional capacities, and investing in performance, as well as case studies from other communities across the country that have successfully implemented similar programs. All of the analysis

and recommendations developed as a result of this study have been provided to Maryland state officials, as well as the Chesapeake Executive Committee, in the form of a white paper report entitled *Chesapeake Bay Financing Strategy*. The Maryland EFC delivered this report to the Maryland Department of Natural Resources in September 2007, and a protocol for further dissemination of the report is under development.

Learning From Successful Watershed Organizations: The Maryland EFC sought to meet the watershed financing needs of community leaders and local officials on a broader scale as well, and thus developed a base curriculum on watershed financing geared for this audience in 2007. The EFC produced a focus piece on six successful watershed organizations, showcasing how these organizations have achieved success in expanding budgets, membership, and influence on local decision-making. The materials also include a description of financial tools, as well as a collection of case study examples on how various finance tools are applied by nonprofits and local and state governments to support watershed protection activities. The materials served as the core of a watershed finance training in fall 2007.

Ongoing Projects & Initiatives

Financing Source Water Protection

The Maryland EFC, in partnership with leaders from others in the EFC national network, has been participating in a new EPA-lead collaborative effort to facilitate source water protection across the country. The work of this coalition of organizations is focused on the protection of the quality and quantity of drinking-water sources such as lakes, streams, rivers, and aquifers, as well as on the land needed to recharge those bodies of water.

The collaborative works to bring together its collective expertise to develop useful recommendations about what is needed to protect sources of drinking water. Partner organizations work together to package and disseminate source water protection recommendations in ways that are useful to those in land use planning or management.

Maryland's EFC is leading the collaborative's work on developing a Web-based source water protection financing clearinghouse. This clearinghouse will be designed to provide information on developing strategies for financing resource protection efforts as well as case studies of how plans have been implemented successfully. The ultimate goal will be to incorporate an interactive calculator tool that will enable communities to assess the costs, benefits, and cost savings of a variety of source water protection activities. An advisory committee of collaborative members has been assembled to guide this process. To date, the Maryland EFC has developed a framework document for the financing information and potential case studies to be included in the Web-based resource. Ultimately, the work of this group will help integrate drinking-water protection into a broad range of community decision-making processes related to land-use planning; road, sewer, and water projects; farming and industry; development; and waste disposal.

Capacity Development for Communities and Watershed Organizations

The EFC continues its efforts to reach local decision-makers regarding the benefits of sound environmental management by providing general technical assistance to local governments, resource protection organizations, and others interested in finding new and innovative ways to pay for environmental restoration and protection activities in their watersheds.

Cacapon Watershed, West Virginia: The Maryland EFC initially began work with the Cacapon and Lost Rivers Land Trust in 2005 as a part of an EPA-funded program designed to help communities and organizations in Region 3 overcome barriers to implementing and financing their watershed protection efforts. At that time, the Maryland EFC hosted a financing charrette for the trust designed to help identify a sustainable financing strategy for preserving lands identified a conservation priorities. One of the core next steps identified in the charrette process was the need for the trust to develop a strategic plan that would function as a set of organizational priorities guiding the efforts of the trust over the next several years. The plan would also answer questions regarding the identity of the trust, its goals, and its criteria for success, as well as address its role in the community and identify potential partners. In 2007, the Maryland EFC followed up on these efforts, working with the trust and colleagues with the National Park Service's Chesapeake Watershed Assistance Program to conduct a strategic planning retreat. The resulting strategic plan for the organization is under development.

New River Valley, Virginia: Faced with concerns about impending growth and the urban-rural interface issues that accompany it, the communities of Virginia's New River Valley came together to work collaboratively to introduce and promote the concept of green infrastructure planning, assist communities in the region in incorporating these techniques, and coordinate these activities across the region to create implementation efficiencies and work effectively in conjunction with one another. This effort is being led by the New River Valley Planning District Commission and the Conservation Fund. As part of its ongoing participation with these communities, the Maryland EFC has been invited to participate as a part of the project's advisory committee, guiding the group's activities, providing input on project direction, and presenting information to the group on green infrastructure financing considerations. As a green infrastructure plan for the region becomes formalized, the Maryland EFC will assist in the development of a financing strategy for its implementation.

Wastewater and Drinking-Water Systems Management: Water utility systems managers are routinely faced with a number of challenging decisions. They must set rates, develop budgets, and manage assets in a manner that considers immediate operational requirements and long-range systemic improvements, as well as consumer needs, expectations, and attitudes. Avoiding capital improvements to save money or making choices based on what is most politically expedient can be tempting but often threatens the long-term sustainability of a system. A variety of financial training sessions have been offered by the Maryland EFC training manager through the Financial Management and Capacity Training program. These sessions are intended to help systems managers successfully navigate this decision-making process and develop financing strategies designed to ensure the sustainability of their systems. The 17 sessions offered in 2007 focused on subjects such as asset management, budgeting, and capital improvement planning.

New Projects & Initiatives

The Environmental Leadership Program

On February 1, 2007, the EFC made great strides in its efforts to broaden and strengthen its position at the university with its move to the National Center for Smart Growth Research and Education (NCSG). NCSG, which was created in 2000 as an affiliation of four schools and colleges at the University of Maryland[1] conducts a broad range of land use research and education, locally, statewide, nationally, and internationally. The EFC will remain an independent operating unit within NCSG, but the merger will enable both centers to offer a much wider range of services and allow the two centers to work collaboratively on issues such as land use planning, natural resource preservation, and urban growth issues.

The Maryland EFC is leveraging the resources of the university and its new relationship with NCSG, as well as the expertise and experience of similar institutions and organizations across the region, even further with the development of a program designed to foster the development of effective, inspired

leadership on a variety of environmental issues. The essence of leadership is to move people from ideas to action, and the Maryland EFC's Environmental Leadership Program will provide leaders from a variety of disciplines and professions with the resources they need to affect change in their community.

The Environmental Leadership Program will be implemented as part of NCSG's existing leadership program, and will build on NCSG's successful education and outreach efforts. In partnership with the University of Maryland's Office of Professional Studies, the Maryland EFC will be developing education programs that focus on the key issues related to environmental finance, including the capacity of communities, institutions, and leaders to develop sustainable environmental initiatives. The program will initially focus on four core areas: 1) environmental finance, 2) nonprofit leadership and administration, 3) social marketing, and 4) water and wastewater systems fiscal management. The EFC will offer certificate programs consisting of both credit and non-credit courses and will leverage cutting-edge educational design and implementation strategies.

Web-Based Tool to Promote Locally Grown Produce

Presently, consumers who wish to buy locally grown food often have a hard time locating a steady source; at the same time, small farms that want to sell to residents have limited access to potential buyers, especially at the exact time of harvest. To rectify this situation, the University of Maryland EFC created a central hub on the Internet to connect buyers and sellers.

Launched in May 2008, the Web site, called *Foodtrader.org*, lists all locally grown food and specialty items available from small farms in Maryland and Delaware. It allows consumers a wide selection of nutritious and fresh food, easily, on a regular basis, and at reasonable prices. Farmers have seen a steady increase in demand for their products because of the new consumers found

at *Foodtrader.org*, the Web site attracted nearly 500 members in just a few months of operation. One of the first purchases was for 82,000 peaches, distributed for the first day of school in the city of Baltimore.

Foodtrader.org builds on the previous success of *Agtrader.org*, which was created to buy, sell, and trade livestock, hay, compost, manure, and commodities. Also launched in May 2008, it has enlisted more than 150 farms.

The EFC Network is now working with the Maryland EFC to develop similar Web sites for New York, Maine, Kentucky, North Carolina, and New Mexico. Each state will have a Web site exclusively for their state, but these sites will connect to each other on a shared harvest network. The EFC Network is expecting to host a conference in 2009 that will promote locally grown foods.

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[1] The NCSG is an affiliation of the School of Architecture, Planning and Preservation; the School of Public Affairs; the College of Engineering; and the College of Agriculture and Natural Resources at the University of Maryland.

Performance Measures

As a result of the ongoing activities and accomplishments of the Maryland EFC, outcomes have included the following benefits to communities and individuals:

- The seven counties and four municipalities in Virginia's Shenandoah Valley that gained access to technical assistance on the issues of stormwater management, land preservation, and greenway planning now have a better understanding of the components of successful natural resource protection implementation and financing programs as they prepare to move forward with their local plans, as well as a heightened awareness of the regional impacts of their local efforts. In addition, the city of Staunton has committed to making implementation of their Greenway Action Plan a priority, and the research conducted and materials assembled for the development of that plan is available on a significantly larger scale as a part of a greenway clearinghouse on the Maryland EFC Web site.

- The recommendations developed as a part of the Stormwater Initiative will enable the two pilot communities to develop sustainable financing strategies that support their wet-weather priorities. In addition, the stormwater financing forums held provided decision-makers and stormwater managers from other communities with a solid foundation on which to advance stormwater programs in their own localities.

- The white paper outlining financing options for the proposed septic legislation in Delaware will help the state and its three counties to develop programs that improve water quality while addressing the needs of impoverished communities in the state. These financing options will be of relevance for disenfranchised communities throughout the region facing similar challenges.

- The state of Maryland is considering the policy implications of the finance strategy recommendations that will enable full implementation of the tributary strategies. These recommendations include opportunities for leveraging new and existing revenue sources, clarifying regulatory and policy framework, expanding institutional capacities, and investing in performance, as well as case studies from other communities across the country that have successfully implemented similar programs.

- The source water financing Web site under development at the Maryland EFC will provide users with guidance on developing an appropriate financing strategy for source water protection activities in their communities, as well as examples of successful efforts from across the country. Working on source water issues in conjunction with the Source Water Collaborative enables the Maryland EFC to draw on the expertise of other participating agencies and organizations, as well as expand the reach of our efforts to include their constituencies.

- The development work the Maryland EFC has conducted with watershed organizations improves the institutional capacity and sustainability of these organizations, as well as expands the impact of their resource conservation efforts in their watersheds. The capacity training offered to local governments improves the overall management and efficiency of wastewater and drinking-water systems, while still protecting water quality and human health.

Environmental Finance Center

at the University of North Carolina

In This Report

Background & Summary

The Environmental Finance Center at the University of North Carolina at Chapel Hill (UNC EFC), located within the School of Government, operates across the country but mostly serves the eight states of EPA's Region 4: North Carolina, Georgia, Kentucky, Tennessee, South Carolina, Alabama, Mississippi, and Florida. The primary purpose of the UNC EFC is to enhance the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways. The UNC EFC provides a bridge between students and faculty in the university who work principally on environmental financing, management, and planning tools, and the governments whose job is to use these tools for the public interest.

In particular, the center works to assist communities; provide training and policy analysis services; and disseminate tools and resources on topics such as environmental cost accounting, rate setting, and developing sustainable cost recovery and institutional management systems.

One of the UNC EFC's major roles is increasing the capacity of other organizations to address the financial aspects of environmental protection. For this reason, and to support the leveraging of resources, the UNC EFC does most of its training in a collaborative manner, partnering with established organizations that have environmental, but not necessarily financial, expertise.

Through 2007, the UNC EFC accomplished the following:

- Completed more than 75 training events.
- Developed several new financial tools for local government water managers.
- Worked toward enhancing cooperation among funding organizations within two states.
- Surveyed more than 90 percent of water utilities in two states.

Completed Projects & Initiatives

Paying for Sustainable Water Infrastructure Conference

This national conference, held in Atlanta, Georgia, on March 21-23, 2007, brought together 650 professionals from across the United States and abroad to discuss innovative ways to finance water infrastructure. The EFC played a major supporting role before and during the conference. Jeff Hughes, the EFC director, led one of the four conference tracks, designing sessions and moderating events for the "State and Local Innovations" track. During the several months following the conference, Hughes also met with a national group to focus on policy implications that arose from the conference proceedings. Stacey Isaac Berahzer, the EFC project director, helped with planning, coordinating exhibits/posters, and securing contributing sponsors.

Jeff Hughes serving on the conference panel as the lead for the "State and Local Innovations" track.

Water and Sewer Needs and Capital Finance Strategies in Appalachia

The Appalachian Regional Commission (ARC) contracted with UNC EFC to carry out a water and wastewater infrastructure needs and gap assessment in the 410-county Appalachian region. The main purpose of the project was to provide policymakers and local officials with detailed information on future water and sewer investment requirements and financial strategies to meet those needs given the fiscal capacity of individual communities. In 2006, the UNC EFC presented the final report to the ARC, as well as across the country at various environmental events.

In addition, the UNC EFC participated in the U.S. Environment and Public Works Senate Committee Field Hearing in Marietta, Ohio, on April 20, 2006. EFC Director Jeff Hughes served on a panel reporting on infrastructure finance issues in Appalachia to Senator Voinovich. Forty-five individuals provided written comments on the issue.

Through 2007, the UNC EFC...

- Reached more than 1,000 people through its first newsletter.
- Attracted more than 500 people to a new stormwater listserv.
- Delivered more than 75 presentations at various training events.
- Co-sponsored or assisted in organizing more than 25 training events.
- Organized and hosted more than 15 training events on funding for local governments.
- Provided technical assistance to more than 40 communities.
- Trained more than 6,500 people.
- Taught more than 230 hours.

Stormwater Implementation Group Workshops

The purpose of these seminars was to improve the implementation of stormwater programs in North Carolina. Attendees consisted of local and state government officials and other key stakeholders involved in stormwater implementation. Approximately 40 individuals from 20 counties attended these monthly work sessions. The sessions addressed many questions facing North Carolina communities about Phase II and other state stormwater programs. The EFC coordinated these meetings and conducted many of the presentations for the participants. For example, the EFC taught on areas such as financing for stormwater projects and implementation of the statewide model stormwater ordinance (a document written by the EFC).

Water Operator Recognition and Retention

The purpose of this project was to identify successful methods of retaining water operators and marketing these best practices in the form of case studies to other systems to improve operator

retention. In an attempt to gauge water operator job satisfaction, the UNC EFC and the North Carolina Rural Water Association conducted a survey of more than 300 water operators, receiving a response rate of approximately 40 percent. Survey questions addressed satisfaction with the operator's current position and his/her ideas of how operator recognition and rewards could be improved. The operators' comments were shared with other utilities in the form of board training events at several communities, including the city of Porterdale, Georgia.

Stormwater Management Symposium

The EFC assisted DeKalb County, Georgia, with its first annual symposium on stormwater. The event was geared toward county residents and how their activities affect stormwater. As a co-sponsor, the center served on the planning committee and provided input on the content of the symposium. The center also taught a session on the costs involved in maintaining and repairing individual septic tanks, as well as the finances involved in building and maintaining stormwater best management practices at the subdivision level.

Economic Subcommittee of the Environmentally Superior Hog Waste Technology Determination Advisory Committee

From July 1, 2005, to March 1, 2006, UNC Professor Richard Whisnant, past director of the UNC EFC, facilitated a subcommittee that developed potential criteria for determining the economic feasibility of new technologies for addressing hog waste pollution in North Carolina.

2007 Annual Southeast Watershed Roundtable

The UNC EFC sat on the planning committee of this roundtable, called "Sustaining Our Water Infrastructure Through Watershed-Based Approaches," held in Georgia in fall 2007. The UNC EFC also presented a half-day workshop on funding resources as a pre-conference event. Though held in Georgia, this southeastern event was attended by professionals from more than 10 states.

Applied Environmental Finance Course

In fall 2006, UNC EFC's Jeff Hughes taught this half-semester course to 14 Masters of Public Administration students at UNC. The curriculum covered many areas of environmental finance.

Water Capital Finance Course

Each January, the UNC EFC holds a two-day Water Capital Finance Course for utility staff, consultants, and state officials, covering a range of water and sewer capital planning issues. Approximately 65 people attended the course in the last two years. During the 2007 workshop, attendees were surveyed about the financial management challenges facing their utilities and the financial management policies that have been adopted by their systems. Participants used hand-held keypads to answer the survey questions, and their answers were instantly compiled and projected on screen to stimulate discussion, which added a very interactive component to the workshop.

Two-day Water Capital Finance Course held in January.

Stormwater Finance and Management Course

Each June, the EFC holds an annual stormwater training. The goal of the course is to provide local government managers, finance directors, planners, and public works officials with an in-depth introduction to planning and funding stormwater programs and utilities. About 50 people attend the two-day class each year.

South Carolina Stormwater Forum: Finance Sessions

In 2007, the EFC assisted in the planning of the first South Carolina Stormwater Forum event. The University of South Carolina's Institute for Public Service and Policy Research hosted the forum to bring together key partners to learn more about the Phase II National Pollutant Discharge Elimination System (NPDES) permit requirements and to explore best practices in financing and minimum control measures. The EFC provided guidance on the planning of the event and presented sessions on funding of stormwater projects.

Water Rates and Revenue 201 Course

About 45 utility officials and consultants attended a day-long water rates course, co-sponsored by the UNC EFC. Jeff Hughes delivered a presentation on rate structures and sat on a panel discussion. The EFC also assisted by preparing the agenda and advertising the course. Afterward, the UNC EFC made the PowerPoint presentations of the various speakers available on the EFC Web site.

National Capacity Development Program Workshop

The UNC EFC led a panel discussion on "Asset Management Application for Small Systems" at EPA's national workshop in Denver in 2007. This session involved presenting the audience of technical assistance providers with several case studies on asset management needs at various communities, and then guiding the discussions on how these case study communities could benefit from and apply asset management. The EFC was also able to provide information on operator recognition and retention practices from the center's research in Georgia and North Carolina.

Annual Georgia Environmental Conference

This is a new conference that Georgia's Chamber of Commerce introduced two years ago. An estimated 450 professionals representing a mix of state and local government professionals and the state's business sector have attended. The EFC has been very involved in the first two years that the conference was offered. During the first conference, the center coordinated and taught a panel session on the financing of local government water and sewer projects. The panel was followed by a discussion between water suppliers and their commercial/industrial customers on how water and sewer rates are designed. During the second conference, the EFC was part of a panel session that covered various financing options for water quality improvements at the watershed level.

Urban Water Consortium Web Conference

A team of EFC staff held an online conference of 11 members of the statewide North Carolina Urban Water Consortium, focusing on water rates and financial information analyses. The EFC also created a password-protected Web page exclusively for members of the consortium. The Web page contained several tools that involved EFC analysis of the rates of this select group of utilities. The EFC analyzed rate information for these larger utilities and compared this information to the center's statewide survey. For example, the "Historical Residential Rates Comparisons Tool" available on the Web page is an interactive tool that the utilities were able to use to examine how their residential water and sewer rates have changed since 1986. Rate changes for any bill from selected years to 2007 are compared to rate changes from other utilities, inflation, the Consumer Price Index, and the Construction Cost Index.

Asset Management Conference

The EFC organized a two-day asset management conference, co-sponsored by the EPA Headquarters Wastewater Program. Forty-eight participants from North Carolina and Virginia attended this high-profile event.

Other Conferences

The UNC EFC acted as a co-sponsor or helped organize several other events in the last two years:

- Southeast Stormwater Association (SESWA) — Stormwater Utilities and National Pollutant Discharge Elimination System (NPDES) Permitting Seminar
- Environmental Conflict Resolution Conference
- Water Sessions — Municipal/County Administration
- Environmental Finance Overview for Community Developers
- Safe Drinking Water — Where Science Meets Policy
- Financial Leadership for Utility
- Essentials of Municipal Government
- Water Resources Research Institute Annual Conference
- National Water Leadership
- Small Systems Management Workshop
- Water Resources for Local Government
- School of Government Annual Budgeting Course
- State Revolving Fund/Council of Infrastructure Financing Authorities
- Utility Management Policy Workshop

- Georgia Water Resources Conference
- Capital Planning, Budgeting, and Finance Workshop
- Municipal and County Administration Course: Section 2
- Financial Leadership for Utility Managers
- North Carolina Rural Water Association Conference and Exhibition
- National Capacity Development Workshop
- Community Development Academy

In addition, the UNC EFC presented at 35 additional events.

Direct Technical Assistance to Communities

In 2006 and 2007, the UNC EFC provided direct technical assistance to approximately 46 communities. The following are a few examples of the types of assistance provided:

- **Corinth, Mississippi:** In light of the major damage caused in Region 4 by Hurricane Katrina, the EFC sent a team of two staff members to Mississippi to assist in the redevelopment of water resources. The EFC assisted the Corinth Gas and Water Department (CGWD) in assessing a plan to replace its ground water source with water from the Tennessee-Tombigbee Waterway. More specifically, CGWD asked the EFC to gauge the perceptions of the five nearby utilities regarding the surface water project and to study some project impacts. Accordingly, the EFC staff met with various representatives and stakeholders from these utilities to discuss the project. EFC also conducted an analysis of utility expenditure and ground water usage to determine potential impacts for the utilities if they choose to purchase surface water. The EFC also prepared a spreadsheet model that allows Corinth to set rates according to different financing scenarios for the project.

- **Yadkin Valley Sewer Authority, North Carolina:** In January 2006, the UNC EFC met with officials from the Elkin, Jonesville, and Ronda municipalities to provide support to the new regional Yadkin Valley Water and Sewer Authority. Based on this meeting, the EFC began to play an ongoing role in this authority. EFC involvement began with a review of the authority's bylaws. The EFC met with the town managers to help create a peer group for future policy survey questions and compared and recommended customer service policies for the new sewer authority. The center worked with the authority to compare salaries in 2005 and 2006 with the number of customer connections. It also assisted the authority with publicity by creating a Web page on the EFC Web site that is dedicated to the authority. More recently, the UNC EFC provided guidance to the authority on how to serve customers outside municipal boundaries based on laws and other communities' policies and helped to draft the authority's mission statement.

- **Southeast Rural Community Assistance Partnership (RCAP):** The UNC EFC assisted the Southeast RCAP by providing a summary of the legal/statutory framework for setting impact fees in South Carolina.

- **Roanoke Rapid, North Carolina:** The EFC assisted the CEO of Roanoke Rapids Sanitary District, North Carolina, in evaluating the formula it uses to calculate water/sewer impact fees compared to their peers in the state.

- **Onslow County Water and Sewer Authority (ONWASA), North Carolina:** The EFC provided the executive director of ONWASA with a list of comparably sized utilities based on number of connections, distribution system pipe mileage, data pulled from a rate survey, and the "Water 2030" study. EFC staff members also conducted a three-hour water leadership retreat/work session for elected officials from governments throughout Onslow County, North Carolina. The session involved 30 participants and took place in Jacksonville, North Carolina. Later, the EFC worked with the utilities planning manager for ONWASA to explore options for developer participation policies.

- **Porterdale, Georgia:** In April, 2007, UNC EFC staff attended the council meeting of the small city of Porterdale, Georgia, to provide the council with background information on stormwater utilities and how they function.

- **Pine Knoll Shores, North Carolina:** On April 27, 2006, EFC staff visited the community of Pine Knoll Shores, North Carolina, and delivered a two-and-a-half hour work session to 35 attendees. The session focused on issues related to working with private water systems. The EFC also presented an Excel model that the community can use in its ongoing negotiations.

- **North Carolina Department of Environment and Natural Resources (DENR), Division of Water Quality:** The EFC assisted the division by matching communities with stormwater utilities, based on a variety of different sources, with their NPDES permit status.

- **Mount Shores Community, Murrayville, Georgia:** The EFC worked with the water operator for the Mount Shores community near Gainesville on exploring the community's options for funding a project to dig a second well and obtain a new storage tank. The EFC provided a spreadsheet with information on various funding options in Georgia.

- **Belmont, North Carolina:** The EFC worked with the town manager of Belmont regarding the city's impact fee formula in context of the law and its peers' practices.

- **Starke, Florida:** The EFC conducted a rate analysis for this town, in collaboration with the Southeast RCAP.

- **Fifth District of North Carolina:** The EFC provided advice on water and wastewater funding to city and county managers in the Fifth District of North Carolina.

- **Pink Hill, North Carolina-Board Training:** EFC staff traveled to the town of Pink Hill to train nine members of the town's staff and board. The three-hour session was part of UNC EFC's Water Leadership Program.

- **Troutman, North Carolina:** The EFC assisted the finance director of the town of Troutman by compiling examples of fire protection capacity fees.

- **Henderson, North Carolina:** The EFC assisted town officials by analyzing the rate structure and customer service policies to deal with bill delinquency and affordability for water and sewer service.

- **Jacksonville, North Carolina:** EFC staff helped the plant operator at the facility compare county public utilities directors' salaries in 2005 and 2006 to salaries at other utilities according to utility size, as measured by the number of customer connections.

- **Marshall, North Carolina:** The EFC assisted the mayor in analyzing the town's rate structure for affordability and other issues, as well as providing guidance on customer deposit policies.

- **Elk Park, North Carolina:** The EFC assisted this community and the Region D Council of Governments by collecting and summarizing municipal ordinances for serving "outside" customers. EFC staff also provided guidance on discrimination in rate making.

- **Orange County, North Carolina:** EFC staff worked with the county attorney and stormwater manager to produce a memo that outlines the community's options in setting up solid waste franchises.

Ongoing Projects & Initiatives

North Carolina Landfill Status

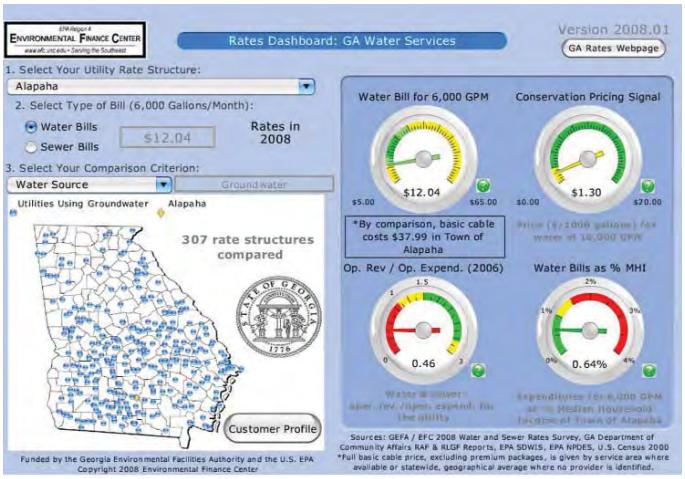
The UNC EFC has been working with the North Carolina DENR Division of Waste Management by providing policy and data analyses related to the state's landfills. This work includes quantitative analysis, spatial analysis using Geographic Information Systems (GIS) and Google Maps, and training to ensure that DENR staff has the ability to update all resulting models and tools for future analysis. The quantitative work involves evaluating population projections and real estate trends surrounding landfills and calculating capacities for the landfills within North Carolina. GIS helps identify watersheds and wasteflows, which, when combined with landfill capacity maps, provides a mechanism for developing creative ways of visualizing the status of North Carolina's landfills. This process is helpful to policymakers.

Rates Dashboard Tools

The UNC EFC designed several interactive Rates Dashboard tools to help utility managers and local officials analyze residential water and sewer rates of North Carolina and Georgia utilities against multiple characteristics, including utility finances, system characteristics, customer base socioeconomic conditions, geography, and history. Rates data are collected from more than 350 local governments and nonprofit utilities in an annual rates survey.

Georgia Stormwater Committee and Conference

The EFC has been actively involved in monthly meetings of the stormwater committee of the Georgia Association of Water Professionals. The committee discusses current stormwater issues, including legislation and best management practices. UNC EFC staff provides the perspective of financial



A screen shot of one of the new interactive water and sewer rates dashboard tools.

management at regular meetings. The center also assisted in the planning of a one-day stormwater water and watershed management workshop, and will lead a session of the funding of stormwater projects during this workshop.

Drought Management Resources

With the severe drought that affected the southeast part of the country in 2007, the UNC EFC has been involved in several regional drought meetings hosted by the North Carolina League of Municipalities and Department of Pollution Prevention and Environmental Assistance. The EFC has presented strategies for encouraging conservation, while preparing for the potential consequent financial impacts.

Georgia Utility Finance and Management Taskforce

The EFC was invited to be part of this taskforce, which was formed under the Georgia Association of Water Professionals. The group is examining ways to assist water and sewer utilities across Georgia with their financial management. The EFC shares various financial research and tools with the group, such the EFC-created Rates Dashboard, as well as asset management tools, including EPA-generated tools such as the Check-up Program for Small Systems (CUPSS).

New Projects & Initiatives

Southeast Regional Water Quality Assistance Network

Under the Targeted Watersheds Grants Program, the UNC EFC spearheaded a proposal that included the Southeast Watershed Forum, SESWA, the Stormwater Engineering Group, and the Stream Restoration Institute at North Carolina Statue University (NCSU), along with Auburn University in Alabama, to work with other local and state organizations to build a Southeast Regional Water Quality Assistance Network to help local watershed organizations and communities protect, maintain, and restore water quality in a 10-state region. The proposal was selected as one of six awardees from a pool of more than 100 applicants nationwide.

Financially Sustainable Water Infrastructure Initiative

The purpose of this initiative is to equip system managers, operators, and staff with the tools to evaluate system financial health, to educate the utility board and the public, and to overcome political barriers to making the system financially sustainable. During 2006, the UNC EFC made progress in identifying demonstration communities in two different southeastern states. Work has begun with these communities in North Carolina and Mississippi. The center also conducted a statewide water and wastewater rate survey for the state of Georgia as a subset of this project. The overall initiative is a collaborative effort with Boise State University in EPA Region 10.

Funders Forums

The UNC EFC started a North Carolina Funders Forum group in 2006, organizing and facilitating quarterly meetings of different funding organizations in the state. The concept was embraced, and the participants exchanged valuable information about their individual programs. In 2007, the EFC initiated a Funders Forum in the state of Georgia as well. Again, participants were very enthusiastic and plan to meet on a quarterly basis. These meetings present a great opportunity for the EFC to facilitate some level of coordination among funders in each state, as well as to share information regarding models from other states' programs.

Monroe County, Florida — Subcommittee on Innovative Financing

The UNC EFC has begun work on funding options for wastewater improvements to the Subcommittee on Innovative Financing, which is charged with studying financial options for improving the Florida Keys' water quality.

Boiling Spring Lakes, North Carolina — Red-Cockaded Woodpecker Protection

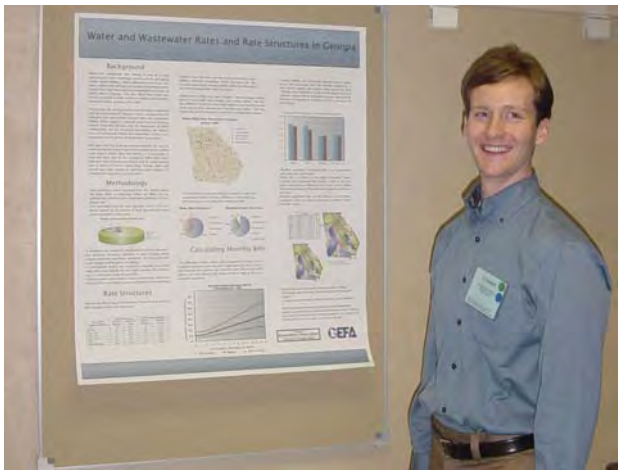
The Red-Cockaded Woodpecker is a priority species on the National Endangered Species List, as well as in the North Carolina Wildlife Action Plan, which is designed for the conservation of the state's most endangered resources. Currently, residents of Boiling Spring Lakes must engage in a lengthy process with the Fish and Wildlife Service (FWS) to obtain a building permit if their property is located within a nesting cluster of the woodpeckers. UNC EFC staff is helping the city and the FWS develop a mitigation plan for the woodpeckers that will be most cost-efficient for both the city and its residents.

Georgia Water Rates Survey

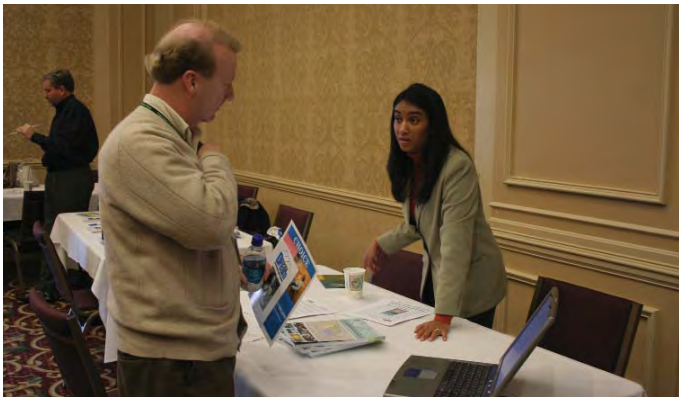
During 2006, the UNC EFC worked with the Georgia Environmental Facilities Authority to outline a statewide water rates survey for Georgia. The two organizations were able to obtain buy-in and support from several of the state's leading water interests groups, resulting in a very high response rate of 78 percent. The UNC EFC has been asked to do a similar survey in 2008.

Stormwater Listserv and Water Operators Listserv

In 2006, the UNC EFC created the Stormwater Listserv for stormwater professionals throughout the region. The listserv has about 530 members and has been very active.



The UNC EFC's Andrew Westbrook with a poster showing the results and analysis of the 2007 Georgia Rates Survey, in Athens, GA.



Stacey Isaac Berahzer explains results of Georgia's water and sewer rates survey to community representatives in Augusta, GA.

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As a result of the ongoing activities and accomplishments of the UNC EFC, outcomes have included the following:

- **Awards.** The UNC EFC spearheaded a proposal that was awarded one of the six nationally competed capacity-building Targeted Watersheds Grants, out of a pool of more than one-hundred applicants.
  - The UNC EFC's Project Director, Stacey Isaac Berahzer, was presented with an award for "Commitment to Excellence" for the assistance that she and the UNC EFC have provided to the "Paying for Water Conference" that took place in Atlanta in March 2007.

Stacey Isaac Berahzer receives award for the UNC EFC's efforts for the Paying for Water Conference.

- **Feedback.** Users of the North Carolina Rates Dashboard tool sent e-mails to the EFC that included the following:

> "*This is a great visual tool…I immediately had a link to it placed on our new website so that anyone (especially Board members) could access and compare.*"
>
> "*It is a great tool and fun to use!*"
>
> "*…let me commend you and your staff on the rates dashboard. I think that is a great tool and allows us to provide great information to our elected boards.*"

Attendees of the 2006 Water and Sewer Infrastructure Funding Strategies sessions provided feedback that included the following:

> "*Very good class. Got several ideas for addressing projected rate increases.*"
>
> "*Very informative and will be extremely useful for our community.*"
>
> "*You did an outstanding job putting together the Water and Sewer Infrastructure Funding Strategies seminar! We all learned a lot. It was really interesting.*"
>
> "*I just wanted to let you know that I truly enjoyed the Water/Wastewater Leadership class. The classes were so lively. They truly consisted of dialogue, not monologue.*"

Participants of "Managing and Funding Local Government Stormwater Enterprises," the 2006 and 2007 Stormwater Management Course, provided remarks, including the following:

> "*Good course and content of information.*"
>
> "*Excellent coverage. Enlightening about various topics. Nice open floor approach. Jeff has great amount of enthusiasm for subject matter.*"
>
> "*Great workshop! Everything was very organized, nice. Good speakers…*"
>
> "*It is easy to understand the concept of ERUS and billing but it is very useful to hear about the practical applications: i.e., unexpected problems and related solutions.*"
>
> "*This was a very good course – it covered the topics that I was interested in.*"
>
> "*Very good program for all Phase II applications.*"
>
> "*Overall, very pleased with the course and would recommend attendance to anyone new to stormwater utilities or considering a utility.*"
>
> "*… Presenters prepared useful information and were well informed on topic.*"

One new user of the North Carolina Water Listserv gave feedback about the resource, including the following:

> "*I appreciate your prompt responses to my questions. I'm glad to have found this listserv. I think it is a great resource.*"

After UNC EFC trained nine members of the town of Pink Hill's staff and board, the following message was received from a board member:

> *"... the Board was thoroughly impressed and they felt that it was very beneficial. ... the Town solved a problem that they were having with a customer by referring to the manual and the training that they received."*

After presenting at the Small Systems Management training, someone sent the following comment to the center:

> *"I attended the Water System Management training yesterday in Louisburg. That was one, if not the best, training seminars I have ever attended. The speakers were EXCELLENT! … I learned that I've got a bunch to get caught up on!!! Keep up the good work! Thanks!"*

Participants from "Finding the Money to Turn Great Ideas Into Real Community Projects" at the Southeast Watershed Roundtable provided the following comments provided via the evaluation forms:

> "*Good overview of potential funding sources*"
>
> "*Good explanation of how different funding works; case studies by presenters*"

- **Program Expansion.** The UNC EFC has been able to expand its network in the state of Georgia, working more closely with state agencies such as the Georgia Environmental Facilities Authority and the Environmental Protection Division, as well as individual small communities in the mountains of northern Georgia.

  The UNC EFC is also increasing its breadth of training events to include more stormwater topics. The targeted watershed grant will allow the center to delve even deeper into stormwater issues, because a holistic watershed-wide approach will be the focus of this project.

  The center has also increased its ability to present data in simple, yet interactive and appealing ways via the dashboard tools. Use of such tools adds to the impact of the center's various data collection and analysis efforts.

Environmental Finance Center

at the University of Louisville

In This Report

Background & Summary

The University of Louisville Environmental Finance Center (Louisville EFC), located within the Center for Environmental Policy and Management in the Department of Urban and Public Affairs, principally serves the eight states of EPA's Region 4: Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Florida. The primary purpose of the Louisville EFC is to provide technical assistance and training to communities in how to avoid or otherwise manage, potential economic vs. environment conflicts and in financing efforts to maintain or improve environmental conditions.

In particular, the center works to develop more environmentally and economically sustainable alternatives to uncontrolled and unfocused spatial expansion of human settlements and to improve the efficiency of environmental infrastructure service delivery. The EFC's efforts incorporate issues regarding civic participation in environmental decision-making and environmental justice. The Web site, http://cepm.louisville.edu, serves as host to the majority of the EFC's publications and technical assistance documents.

This report covers activities and accomplishments from January 2006 through December 2007. During these 24 months, the Louisville EFC staff accomplished the following:

- Created and published numerous practice guides, articles, reports, and working papers.
- Gave presentations at diverse conferences and workshops.
- Co-sponsored a regional conference.
- Conducted many interactive workshops.

Completed Projects & Initiatives

Reports

The Louisville EFC completed the following reports, which were funded under grants and contracts outside of the core EFC grant funding:

- Heberle, L. (2006). Connecting Smart Growth and Brownfield Redevelopment.
- Norton, C. (Forthcoming, in print). Jeffersonville (Indiana) Main Street: Clark County, Indiana Land Use Survey.
- Norton, C. (2006). Planning and Zoning in Louisville Metro and Its Effect on Affordable Housing. State of Metropolitan Housing Report 2006.
- Norton, C. (2007). The Impacts of Transportation Policy on Affordable Housing. State of Metropolitan Housing Report 2007.

Practice Guides

The Louisville EFC completed the following practice guides:

- #14. *Do You Want Utilities With That? Avoiding the Unintended Economic Consequences of Poorly Planned Growth on the Provision of Water and Sewer Service.*
- #15. *Military Base Sustainable Best Practices: Energy Conservation Systems That Save Municipalities Money.*
- #16. *Farmland Preservation: The Benefits of Saving Our Agricultural Land and Resources.*
- #17. *Development Impact Fees as Planning Tools and Revenue Generators.*
- #18. *Sustainable Hazards Mitigation.*
- #19. *Green Conferences.*

Publications

The Louisville EFC completed the following publications; those indicated with an asterisk (*) were funded under grants and contracts outside of the core EFC grant funding:

Through 2007, the Louisville EFC...

- Posted six new practice guides.
- Published five articles, four reports, and four working papers.
- Gave 22 presentations at 13 conferences and workshops.
- Co-sponsored a regional conference in cooperation with EPA Regions 4 and 5 reaching over 190 individuals.
- Conducted 26 interactive workshops ranging from 50 to 150 in attendance.

- Cairns, K. and Lacy, P. (2006). What We Need Is Here: Land Conservation in Kentucky. Sustain: A Journal of Environmental and Sustainability Issues. (14) 50–60.
- Heberle, L. and Wernstedt, K. (2006). The Mythology of Sustainable Brownfields Regeneration. Local Environment: Special Edition Sustainability and Brownfields. Vol. 11, No. 5.*
- Lambert, T. L. and P.B. Meyer. (2006). Ex-Urban Sprawl As a Factor in Traffic Fatalities and EMS Response Times in the Southeastern United States. Journal of Economic Issues, Vol XL, No. 4.
- Wernstedt, K.R., Meyer, P.B., Alberini, A. and Heberle, L. (2006). Incentives for Private Residential Brownfields Development in the U.S. Urban Areas. Journal of Environmental Policy and Management. XXXXIX (1).*
- Wernstedt, K.R., Alberini, A., and Meyer, P.B. (2006). Attracting Private Investment to Contaminated Properties: The Value of Public Interventions. Journal of Policy Analysis and Management. XXV (2).*

Flyover shot of Clark County Land Use. Photo credit: Keith Mountain.

Working Papers

The Louisville EFC completed the following publications:

- Heberle, L.C., Bates, D.C., Coffin, S.L. (2007). Plots Against the American Dream? The Social Construction of Sprawl as an Environmental Problem and Smart Growth As a Solution!
- Houlihan, A. (2007). The Impacts of Zoning on the Provision of Affordable Housing.
- Cairns, K. (2006). Ecological Economics and Community Participation: Priceless!
- Lambert, T.L. and Meyer, P.B. (2006). Fringe Residential Development and Emergency Medical Services Response Times in the United States.

Technical Services

The Louisville EFC completed technical service to Louisville's Air Pollution Control District's Fine Particle Task Force and served on Health and Final Report subcommittees. The report was issued January 2008.

Conferences

The Louisville EFC co-sponsored and was invited to assist in the planning and implementation of the EPA Region 4 and 5 collaborative conference, Sustainable Redevelopment in the Ohio River Valley, held in Louisville, Kentucky, October 1-3, 2007. This conference dovetailed with courses taught by faculty at four institutions, including the University of Louisville, regarding planning, design, environmental policy, and environmental engineering. The EFC will host the proceedings of the conference.

Ongoing Projects & Initiatives

Brownfields Institute

This thee-year project, funded under grants and contracts outside of the core EFC grant funding, began in October 2005 and is designed to increase community participation in brownfields redevelopment in distressed neighborhoods. The area selected for this grant is the Park Hill Corridor in Louisville, Kentucky. During this time, the Louisville EFC hosted 24 workshops (average attendance was 40), helped the city of

Sustainable Redevelopment in the Ohio River Valley. Photo credit: Lauren Heberle.

Louisville leverage additional brownfields funds and economic development funds through grants from EPA and other federal agencies (close to $2 million), and began assisting the city in establishing a community participation plan for the city-driven master planning process of the Park Hill Corridor. A Web site of the project can be visited at: www.redefiningbrownfields.org. This project will continue to build our capacity to address environmental justice and community participation in environmental decision-making issues and develop techniques that will assist community agencies and organizations in these areas.

Mobility and transportation questions, January 2006. Photo credit: Liz Dumbaugh Martin.

EPA's Environmentally Responsible Redevelopment and Reuse Initiative

The Louisville EFC continues to work with EPA's Environmentally Responsible Redevelopment and Reuse Initiative (ER3). The Louisville EFC and ER3 now have a Memorandum of Cooperation. In Washington, D.C., Louisville EFC director Lauren C. Heberle met with the ER3 network to plan participation in a pilot project in Muskegon

Mobility and transportation questions, January 2006. Photo credit: Liz Dumbaugh Martin.

Continuing planning and public participation, March 2006. Photo credit: Liz Dumbaugh Martin.

Heights, Michigan. She presented information on EFCN resources available for the pilot. Dr. Muskegon participates in monthly or bimonthly conference calls to assist in the pilot projects ER3 has selected. Her assistance is focused on suggesting funding resources and strategies for redevelopment and sustainable development models.

Market Barriers to Green Development

The Louisville EFC is participating in EPA Region 5's series of workshops and working subcommittees, including the Private Financing Subcommittee and the Communications Subcommittee, charged to identify the barriers to green development and evaluate and suggest methods to overcome those barriers. The working groups expect to produce databases of information and written reports based on evaluative findings.

Sustainable City Workshop Series

This series, co-sponsored along with the Urban Design Studio, is designed to raise local communities' awareness of sustainable practices. With the ultimate goal of providing a catalyst to move Louisville and the region toward a sustainable model for the nation, each forum in the series focuses on different aspects of sustainable practice and has different audiences. The first two forums were targeted to a general audience, and covered sustainable gardening and landscaping, as well as designing a sustainable home. Other forums slated for the spring and early summer of 2008 aim to enlighten professionals in areas of architecture, planning, development, banking, and other sectors.

Louisville Climate Change Committee

Louisville EFC Director Lauren Heberle serves as a committee member on Louisville's Climate Change Committee, part of the Green Cities Partnership. The committee and subcommittees are charged with establishing a list of proposed recommendations of broad actions and policies to the city and community that can allow Louisville and the region to engage in addressing climate change due to greenhouse gasses. The work on this committee is expected to expand as they decide what resources the EFC might offer in terms of technical assistance and education.

American Sociological Association: Greening the Meeting

The Louisville EFC has been asked to assist the American Sociological Association on an ongoing basis in developing green practices at both the organizational level and at its national and regional meetings. This project involves developing a practice guide for greening academic conferences as well as conducting phone consultations with event planners and organizational leaders. This technical assistance activity will allow us to develop materials that can be used by conference organizers in other settings as well.

EPA/German Bilateral Working Group on Redevelopment of Contaminated Sites

The Louisville EFC continues to serve on the U.S. Regional and Local Land Revitalization Planning Team, part of Phase 4 of EPA's U.S. and German Bilateral Working Group on Redevelopment of Contaminated Sites.

Louisville Green City Partnership

The Louisville EFC continues to provide support for the Louisville Green City Partnership (GCP) Initiative. This is a collaboration between Metro Louisville, the University of Louisville, and the Jefferson County Public Schools to engage in

joint efforts toward greening institutional practices. The EFC staff serves to provide expert advice on a variety of issues, from recycling to energy efficiency, depending on the partnership's focus. Currently the EFC is assisting on the Climate Change Committee and the University Green Budget Committee. The EFC has also made itself available to the new director of the GCP to help connect with other "green" initiatives in the region.

SMARTe (Funded Outside the Core Grant)

The Louisville EFC continues to support SMARTe, the new brownfields electronic information system being developed by the EPA Cincinnati lab and the Interstate Technology and Regulatory Council (ITRC), which has been working on the regulation of land and the impact on (re-)development. One facet of the lab's work, paralleling its ITRC involvement, has been a bilateral agreement with the German Environment Agency (UBA) on the revitalization of contaminated lands of all sorts. SMARTe is a computer software to guide reclamation and redevelopment decision-making that was developed as one facet of the bilateral project (with comparable software in Germany). The EFC staff has worked with the lab team on the activities of the bilateral working group, contributing primarily to valuation of redevelopment options, developing a logic for calculating development costs and another for valuing the community-wide benefits of regeneration. The staff has regularly participated in meetings of the bilateral group.

Regeneration Technical Assistance

The Louisville EFC continues ongoing technical assistance on area-wide approaches to urban regeneration, working with environmental and economic development offices and nonprofit development organizations in the metropolitan areas of Louisville, Kentucky; Cincinnati, Ohio; Indianapolis, Indiana; Worchester, Massachusetts; Burlington, Vermont; Pittsburgh, Pennsylvania; New York, New York; and Charlotte, North Carolina, all of which contacted the EFC for consulting services.

In addition, the staff continues to reach out to local and regional communities, agencies, and organizations to provide information about sustainable development, environmental finance, environmental justice, community involvement, and land use assessments.

New Projects & Initiatives

Sustainable Campuses

The Louisville EFC is exploring opportunities to help regional university and college campuses assess and implement sustainable practices in several areas: operations, purchasing (consumption), building and design, waste management, energy consumption, and wastewater and stormwater management.

New Practice Guides

The Louisville EFC is examining a number of topics to develop new practice guides, including:

- Cost-saving energy efficiency incentives in the Commonwealth of Kentucky that could be easily implemented throughout the state, with implications for other southeastern states in Region 4.
- Organizational and financial integration approaches and structures that municipal governments can use to remove barriers to public sector support of sustainable development practices.
- Financial mechanisms for funding green projects, including what financing currently exists and what creative new uses are currently in practice that local and state governments can use; will possibly include private financing options.
- Options to help business office property management companies engage in greener operations, focusing on environmentally sustainable practices as well as incentives and funding mechanisms.
- Smart Growth tools across the nation, including how effective these growth tools are in deterring urban sprawl, the cost of implementing such methods, and the current political environment in Region 4 states.

Contact Information

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Performance Measures

As a result of the ongoing activities and accomplishments of Louisville EFC, outcomes have included the following benefits to communities and individuals:

- Leveraged core grant funding and received more than $350,000 in additional grants and contracts.
- Increased use and downloads of our practice guides, reaching a broad national and international audience.
- Helped the city of Louisville leverage our collaborative efforts in the Park Hill Corridor community participation project to more than $2 million in additional grants and loans for that area of the city.
- Continued to receive calls from the local and regional press requesting our assistance regarding environmental policy issues.
- Continued to receive requests for staff at speaking engagements for local organizations.

Great Lakes Environmental Finance Center

at Cleveland State University

In This Report

Background & Summary

The Great Lakes Environmental Finance Center (GLEFC), based in the Maxine Goodman Levin College of Urban Affairs at Cleveland State University, mostly serves the six states of EPA's Region 5: Ohio, Michigan, Indiana, Illinois, Wisconsin, and Minnesota. The primary purpose of the GLEFC is to assist communities and states in developing innovative, cost-effective, and high-quality financing strategies for environmental improvement and sustainable economic development.

In particular, in its 11 years of operation, the GLEFC has provided technical assistance, outreach services, and training in a broad array of issues in environmental finance, including urban redevelopment in environmentally challenged neighborhoods; water quality and distribution; sanitary and stormwater management; capital budgeting and finance; air quality, such as clean diesel emissions efforts; and sustainable environmental systems.

The GLEFC draws on Levin College research staff experts and faculty members in the fields of public management and finance, capital planning and finance, economic development, environmental planning, public administration, real estate, and city and regional planning. The leadership and staffing of the GLEFC is shared with Levin College's Center for Public Management. The GLEFC has initiated partnerships with Levin College faculty members to broaden the EFC's base of expertise and expand its capacity. These GLEFC faculty fellows have been successful in adding value to the staff and project teams. The GLEFC also utilizes specialists from outside the university, including private consultants, experts from the nine university-based EFCs in the network, and other specialists.

Completed Projects & Initiatives

Nuts and Bolts of Urban Redevelopment for Local Communities Training

The GLEFC, in collaboration with EPA Region 5, the U.S. Department of Housing and Urban Development, and the Northeast–Midwest Institute, sponsored a week-long training session for local development professionals on financing the redevelopment of areas containing environmentally contaminated properties. The session attracted more than 50 participants.

Ohio Department of Development, Clean Ohio Revitalization Fund (CORF) Focus Groups

The GLEFC conducted focus groups in each of Ohio's economic regions to revisit the CORF program administrative/grant application rules and grant dissemination rules, following the fourth round of grant making. The focus groups attracted more than 350 participants and examined the perceptions of program participants on the mission, the administrative and application process, and grant decision rules. The GLEFC analyzed the results of the focus groups to redesign the CORF application, rules for allotting points for priority ranking of applications, and the decision rules for grant funding allocation.

East Cleveland Lead Ordinance

The GLEFC assisted the city of East Cleveland in developing a model ordinance for inspecting for the presence of lead in residential units in the city. The ordinance allows for multimedia inspections by city employees in different departments (e.g., separate inspections by health, fire, police, building departments) in units with a profile (e.g., age of building, condition, degradation) that would suggest potential lead contamination.

NPDES Phase II Annual Reporting

The GLEFC staff provided technical assistance in preparing the annual report for the city of Amherst, Ohio, and the village of Sheffield, Ohio, to address compliance with Section 4.3 of its NPDES stormwater discharge permit for small municipal separate storm sewer systems. The annual reports compared the annual actual outcomes of the city's and village's stormwater management program (SWMP) against the level of activities projected prior to the start of the year. Based on this analysis, The GLEFC staff prepared an annual report for each community that described progress made toward achieving measurable SWMP goals during the current reporting cycle and activities the city and village would undertake in the upcoming permit year. This type project occurs each year for a series of cities/villages.

Through 2007, the GLEFC...

- Attracted nearly 700 people to training/forum sessions.
- Gave 15 presentations at meetings and conferences.
- Hosted five training sessions on stormwater regulations.
- Produced videos on NPDES-related training.
- Provided technical assistance to 15 communities about environmental and economic development finance.
- Published an academic journal article on the design of environmental public policy programs.

Northeast Ohio Regional Sewer District (NEORSD) Rate Base Capacity Analysis

The GLEFC conducted an analysis of economic and demographic trends to determine the ability of the NEORSD's rate base to pay future rate increases anticipated for the operating and capital needs of the sewer district in greater Cleveland.

Journal Publication

The GLEFC published an article in *Environmental Practice Journal* called "The Use of Focus Groups for Design and Implementation of Collaborative Environmental Programs." The article describes the use of focus groups as stakeholders participating in collaborative program development in the design of state level public policy programs. The article is based on projects conducted for the National Oceanic and Atmospheric Administration and CORF.

International Relations

The GLEFC made a presentation to a group of Council of World Affairs visitors to Cleveland from Chile, India, Jordan, Nigeria, Serbia, Turkey, and Zambia. The presentation covered environmental policies and regulations affecting local governments, environmental awareness in education, marketing and city planning, and approaches to solving urban environmental problems.

Urban Redevelopment Forum

The GLEFC convened three Urban Redevelopment Forums to share successful experiences in the remediation of environmentally contaminated properties in Ohio in partnership with the Ohio Brownfield Finance Partnership. The forum brought together developers, environmental engineers, lawyers, commercial bankers, environmental insurance executives, public development officials, and public finance professionals to review pending projects.

Infrastructure Special Assessment Reallocations

The GLEFC staff assisted several cities in determining how to reallocate water or sewer utility special assessments placed on parcels that have been split, combined, or platted. The balance due by the parcel owner is distributed among newly created child or platted parcels based on proportional benefit. Staff completed 20 special assessment reallocations.

Ongoing Projects & Initiatives

Market Barriers to Sustainable Development

The GLEFC participates in the ongoing Chicago (EPA Region 5)-based program Market Barriers to Sustainable Development to explore the barriers to green residential and commercial development. The GLEFC's role has been to explore the public finance implications of, and the market influence on, credit quality. In addition, the GLEFC is proposing to develop a series of white papers to support the continuing dialogue of the regional Market Barriers to Green Development Committee. The white papers will provide applied research and best practice data and information to guide committee members in identifying and reviewing viable market-driven alternatives in sustainable development. The topics of the white papers will be drawn from the dialogue of committee meetings and conference calls, as well as from interviews with members of the committee and focus-group-type sessions. The interviews/focus group sessions will focus on drawing out information and data needs of the committee but will also evaluate the needs of a national audience for sustainable development.

Media Relations

The GLEFC is in a continuing dialogue with Tom Ott of the *Cleveland Plain Dealer* on the concept of regional government and governance. The dialogue over 18 months has resulted in a series of articles exploring the impact of service consolidation on increasing the efficiency of local government.

New Projects & Initiatives

Clean Ohio Small Communities

CORF is among the most successful environmental remediation grant funding programs in the United States. Participation in CORF has been limited to Ohio's larger and medium-sized cities, due to the volume of the application and the technical requirements for CORF. While the large and medium cities are the central component of the market for brownfields grants, many small cities in Ohio have significant needs in environmental remediation. The GLEFC is assisting the Ohio Department of Development/CORF in the development of a

strategy for engaging Ohio's smaller communities in a dialogue to address their environmentally challenged properties. The GLEFC efforts with the CORF project for small communities will include:

- Facilitating the development of a strategic plan for communicating with and increasing the participation of small communities in the CORF program.
- Identifying small communities with environmentally challenged commercial and industrial properties.
- Identifying best practices in small community environmental remediation.
- Engaging Ohio's small communities in a dialogue on environmental assessment.
- Designing a technical assistance approach to engage Ohio's small communities in the CORF program.

Training Consortium

In spring 2007, the GLEFC convened regional stormwater training providers to collaborate on training needs and resources for the northeast Ohio region. Since the initial meeting, this group has agreed to meet regularly to coordinate training efforts. The outcome of the initial series of meetings was a six-month training calendar. As a result, the training consortium has begun to develop a training curriculum and schedule and provide training for locally elected and appointed officials. The training consortium will provide:

- High-quality training.
- High-priority training at a frequency that meets local demand.
- Training that allows local officials to understand and meet environmental reporting requirements.

Contact Information

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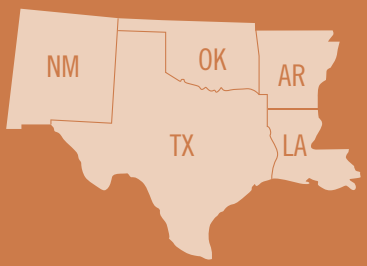
Performance Measures

As a result of the ongoing activities and accomplishments of the GLEFC, outcomes have included the following:

- 110 Google alerts citing the work and staff of the GLEFC. The GLEFC monitors how other organizations cite and use its work in the conduct of their programs.
- Repeat clients for local government technical assistance.
- Repeat high-level work with the Ohio Department of Development/CORF, including program evaluation and program analysis.
- Recommendations from CORF that its applicants use the GLEFC for technical assistance.
- Publication of the fourth in a series of academic publications on the design of public policy programs through the use of focus groups.
- Implementation of the land bank strategy, developed by the GLEFC, in the city of Cleveland and Cuyahoga County, Ohio.

Environmental Finance Center

at the New Mexico Institute for Mining and Technology



In This Report

Background & Summary

The Environmental Finance Center at New Mexico (NM EFC), located at the Institute for Mining and Technology largely serves the five states of EPA's Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. The primary purpose of the NM EFC is to assist state, local, and tribal governments in meeting environmental infrastructure needs and achieving regulatory compliance through state and local capacity building and technical information transfer. Capacity building includes enhancing technical, managerial, and financial capabilities to achieve consistent and sustainable regulatory compliance and to promote and develop sustainable infrastructure.

In particular, the center works to:

- Examine alternatives or innovative approaches to meet regulatory compliance and achieve sustainable infrastructure.
- Empower communities to act as the "drivers" and decision-makers for their own projects.
- Present funding alternatives for various types of projects.
- Act as a bridge between federal, state, local, and tribal governments.
- Analyze issues or projects as a neutral entity.
- Gather stakeholder input.
- Encourage examination of state or federal programs that inhibit sustainable infrastructure, and offer suggestions of possible approaches that have been used elsewhere.

Through 2007, the NM EFC accomplished the following:

- Developed tools to assist small communities, including an asset management guide, a guide on cost estimating for capital projects, and a resource guide for complying with the arsenic standard.
- Analyzed leak detection technologies for use by water systems.
- Assisted the New Mexico Environment Department in qualifying communities for drinking-water loan funding.
- Promoted asset management concepts at the national, regional, state, and local level.
- Worked toward improved compliance and increased protection of public health in tribal drinking-water systems.
- Worked with state and local communities to increase water system technical, managerial, and financial capacity.

Through 2007, the NM EFC...

- Performed 194 capacity assessments for New Mexico water systems.
- Developed an MSAccess database of all leaks occurring in the Albuquerque Bernalillo County Water Utility Authority distribution system over the past nine years.
- Held 20 training events for community water systems in New Mexico, attracting more than 400 participants representing 111 community water systems, seven state agencies, 19 tribes, and three private companies in New Mexico.
- Distributed more than 300 *Construction Cost Estimating Guides*.
- Distributed more than 400 *Asset Management Guides*.
- Developed three asset management inventory databases for New Mexico communities.
- Completed more than 20 GIS maps for New Mexico communities in support of asset management and capacity development.
- Assisted more than 35 communities with examining options for compliance with the new Arsenic Rule.
- Performed 50 capacity assessments for Texas water systems.
- Held eight training events for tribal water operators and managers, attracting more than 175 participants, including representatives from water systems from 20 of the 21 tribes in New Mexico, one tribe in Texas, and 11 California tribes.
- Assisted 46 tribal water systems in the preparation of consumer confidence reports.
- Administered 10 tribal operator certification exams.
- Assisted in the collection of chemical and radionuclides compliance samples for more than 40 tribal water systems.
- Mailed more than 300 tribal training calendars to tribal water operators.
- Performed 10 multiple barrier evaluations (similar to sanitary surveys).
- Gave one or more presentations at 16 conferences, with a total audience of more 1,000 participants.

Completed Projects & Initiatives

Evaluating Technology

In 2007, the NM EFC completed the Independent Analysis of Fluid Conservation System Leak Detection Technology for Albuquerque Bernalillo County Water Utility Authority. The three-part report covered a historical analysis of main water line breaks throughout the distribution system, an evaluation of passive leak detection technology in the field, and an analysis of a head-to-head comparison of passive and active leak detection methods.

The historical analysis of main line water breaks (Phase 1) identified areas in the water distribution system that were susceptible to a high frequency of leaks. This information helped the authority identify areas in which to focus its leak detection efforts, improve leak repair response times, and prioritize main line replacement programs. Phase 2 of the report, the leak detection technology evaluation, helped the authority decide how best to deploy this technology in the field to maximize its capabilities. Phase 3 was a comparison of passive and active leak detection technologies deployed in the field. The results of this report provided the costs, benefits, and success rates associated with each leak detection technology. Overall, the findings in these reports will help the authority design a leak detection strategy based on achievable goals and effective technology. To review the reports please visit: http://nmefc.nmt.edu/LeakDetection.php.

Training Tribal Managers

The NM EFC developed and presented a three-day training in California for tribal utility managers for the Indian Health

Service. The training covered asset management, capital planning and budgeting, utility rate setting, and integrating utility management with economic development. The NM EFC has been asked to present the training again in 2008.

Promoting Better Water Management

In 2006, the New Mexico Water Infrastructure Investment Team tasked the NM EFC with conducting a pilot study for three New Mexico communities. The purpose of the pilot study was to develop a process that could be used to assist New Mexico's drinking-water and wastewater systems in implementing new administrative and management procedures to adapt to the regulatory water quality and water quantity challenges of the future. The three activities selected for the pilot study were asset management, water audits, and financial planning. The goal of the project was to direct systems toward long-term sustainability.

The NM EFC worked with three communities to pilot the approach. The EFC completed the pilot study in April 2007, presented the case studies at conferences throughout New Mexico, and then developed an asset management manual for water and wastewater systems, with a focus on the needs of smaller systems.

In addition, the NM EFC subcontracted with the New Mexico Rural Water Association and the Rural Community Assistance Corporation to complete water audits and five-year financial plans for the three communities. With the help of the NM EFC, these organizations also developed manuals for water auditing and financial planning.

Aiding Water and Sanitation District Organization

Forming a Water and Sanitation District (W&SD) in New Mexico can be a lengthy, complex, and expensive process. The NM EFC developed a manual to help communities, engineers, attorneys, and technical assistance providers to better understand the steps involved and make thoughtful and informed decisions about the need for a district. The manual is not intended to replace legal advice, but rather to help communities gain an overall understanding of the process. In fact, legal counsel is required in the later phases of forming a W&SD. The manual includes a flow chart, which was developed to help illustrate the process.

Assisting Arsenic Compliance

In partnership with Sandia National Laboratory and the University of New Mexico, the NM EFC completed a project providing direct assistance to water systems in New Mexico that are potentially affected by the Arsenic Rule. Approximately 90 public drinking-water systems in New Mexico have arsenic levels that are expected to exceed the standard of 10 ppb. The project provided free water sample testing by Sandia National Laboratories, assistance in identifying compliance alternatives, and assistance in determining potential funding sources for the project. The project team prepared a report, *Summary of Resources Available to Small Water Systems for Meeting the 10 ppb Arsenic Drinking Water Limit*, which it distributed in paper and CD format to all potentially affected systems.

In order to assist communities with understanding the various arsenic compliance options, the NM EFC analyzed EPA's Arsenic Removal Technology Demonstration Program's Published Reports for the Round 1 Arsenic Removal Technology Demonstrations (http://epa.gov/nrmrl/wswrd/dw/arsenic/index.html). Each report's information regarding treatment technology, arsenic removal success, problems encountered during the demonstration, and overall costs for the treatment was tabulated for easy comparison.

Under separate funding, the NM EFC will summarize the Round 2 Arsenic Removal Technology Demonstrations Reports in the same manner. Ultimately, the EFC will develop a searchable database to allow users to compare water systems' water quality and quantity data to the technologies that were tested to find potential treatment technologies for any system.

Identifying Alternatives for Small Public Water Systems in Texas

The NM EFC, under a subcontract from Parsons Corporation, an engineering company, worked as part of a team to identify and analyze alternatives for small public drinking-water systems that were not in compliance with drinking-water regulations. The project team included Parsons and the University of Texas Bureau of Economic Geology and was funded by the Texas Commission on Environmental Quality. The NM EFC conducted capacity assessments of water systems in central Texas in 2006 and the area surrounding Lubbock, Texas, in 2007. These assessments evaluated the ability of the water systems to implement compliance alternatives. This project built

on previous efforts in 2004 and 2005. The EFC conducted approximately 50 assessments and also identified systems to receive additional technical assistance.

Ongoing Projects & Initiatives

Supporting Tribal Water Systems

Currently, EPA Region 6 has oversight responsibility for 82 public water systems representing 30 Native American tribes. The NM EFC has been working with these systems in the areas of managerial, financial, and technical capacity development since 1996. In the period 2006-2007, the NM EFC continued its efforts to assist tribal water systems in providing safe drinking water and in improving public health protection. The NM EFC continued to focus assistance on maximizing the use of each of the barriers to prevent contamination (source, treatment, and distribution). The NM EFC performs a wide variety of activities under the tribal water system assistance program. Some of the major activities are highlighted below.

Compliance Monitoring and Technical Assistance

- The NM EFC provides technical assistance regarding a variety of compliance-related issues via phone, e-mail, fax, and scheduled onsite visits. Types of assistance include coordinating sample collection activities as required by Safe Drinking Water Act (SDWA) regulations, working with operators in collecting compliance monitoring samples and in using proper sample collection procedures, and helping resolve drinking-water quality problems.

- The NM EFC performs Multiple Barrier Evaluations, which are similar to Sanitary Surveys, on ground water systems to identify potential health and safety concerns with tribal water systems.

- The NM EFC designs and implements special studies to assist water systems in identifying water quality problems, including testing free and total residual chlorine and collecting bacteriological samples at locations representative of the three barriers (source, treatment, and distribution).

- The NM EFC works with water operators who are interested in conducting their own "in-house" analyses of water samples for nonregulatory purposes through equipment loans, training, and guidance.

Preparing for sampling and analysis.

Managerial and Financial Capacity Building

The NM EFC assists tribal utility departments with setting utility rates, drafting by-laws, developing appropriate utility ordinances, and creating utility budgets.

Public Education and Outreach

The NM EFC provides assistance to tribal water systems in developing and implementing public awareness/education campaigns through displays and presentations, educational brochures, and participation in environmental, health, and water fairs.

Voluntary Plan Review

The NM EFC offers a voluntary plan review service for new or upgraded tribal water systems prior to construction. This service is an independent review of the plans from an operational and regulatory perspective.

Information Management Activities

To help in ensuring adequate clean water and safe drinking water, the NM EFC assists EPA Region 6 in identifying and surveying new water systems, new sources, new treatment systems, and changes in population or system classification. In addition, the NM EFC assists EPA Region 6 in maintaining the Safe Drinking Water Information System database, ensuring that each water system is inventoried accurately in terms of contacts, facilities, and monitoring schedules.

Training

The NM EFC provides trainings on a variety of water-system-related topics that are not provided by other agencies and for which managers and operators have expressed a need. Training is done one on one or in a small group setting, and the NM EFC strives to make the classes interactive and fun, including the use of multimedia to engage the participants. All trainings are approved for continuing education units and are designed to increase tribal operator competency as well as to increase the number of certified operators at tribal drinking-water systems. Training topics include multiple barrier evaluation, SDWA regulations, disinfection, Consumer Confidence Reports, and the Total Coliform Rule.

Certifying Water Operators

The NM EFC administers the Tribal Water Operator Certification Program in EPA Region 6 with guidance from the Tribal Utility Advisory Committee. The NM EFC processes applications for certification, reciprocity, and certificate renewals, and administers the examinations. The NM EFC developed a database to track this information. The certification examinations are given quarterly, and information concerning deadlines for applications is in the tribal calendar, produced annually under this program. The NM EFC also provides operators access to training materials and a computer to prepare for the examination.

Building Water System Capacity

Building water system capacity (technical, managerial, and financial capabilities) has been a major focus of the NM EFC since the capacity development requirements were added to the SDWA in 1996. This effort involves four major activities: 1) technical information gathering and transfer, 2) asset management, 3) capacity development assistance to states and local governments, and 4) assistance to and participation in the EFC Network. This program has offered many activities and showed many accomplishments over the past two years, including five specific activities, described as follows:

Minimum Standards for Water System Planning Documents

While interviewing drinking-water systems for capacity assessments and in subsequent capacity data analysis, the NM EFC staff noted that water systems of all sizes lacked management and planning documents, particularly long-range plans. NM EFC staff were concerned that existing guidance documents and templates could deter small, volunteer-run water systems from creating their own management and planning documents due to general unfamiliarity with terminology and utility business practices.

In response, the NM EFC developed a handbook designed to help drinking-water systems, regulators, and technical assistance providers gain a greater understanding of the many management issues and plans applicable to water systems, and outline the elements to include in such plans. The handbook provides suggestions for policies and procedures such as employee development, bookkeeping, and customer cut-off, as well as plans such as drought contingency and emergency water supply. In total, the handbook provides basic information and recommended elements for 37 management issues and planning documents, including a chapter on asset management planning.

The working title of the handbook is *Minimum Standards for Water System Planning Documents*. The NM EFC distributed a draft to federal and state agencies, as well as a handful of water systems for review. Comments on the review draft were received in December 2007, and a final document is expected soon.

Revision of Arkansas Department of Health's Guidelines for Preparing a Long Range Plan

In 2007, the Arkansas Department of Health (DoH) requested that the NM EFC revise the *Guidelines for Preparing a Long Range Plan*. The plan is a requirement for water systems under Arkansas law; however, the requirement has not been strictly enforced. The Arkansas DoH wanted to better enforce the requirement while also making the document more useful to the systems. Therefore, the Arkansas DoH requested that the NM EFC revamp the guidelines so that they would include a focus on asset management and sustainability, as well as be easy to follow for the water systems. The NM EFC reviewed the existing document and revised it for DoH to incorporate into its system.

Cost Estimating Guide

The NM EFC developed a guide for estimating the cost of water, wastewater, roads, and building capital projects. Communities in New Mexico are required to prepare an Infrastructure Capital Improvement Plan, submitted annually to the Local Government Division of the state. The plan must

include estimated costs for proposed infrastructure projects. The guide was designed to provide information on estimating cost of capital projects to communities that do not have the expertise or resources available. The NM EFC developed the guide in 2000 and updated the costs in 2006 and 2007. The NM EFC presented interactive workshops across the state to assist communities in estimating capital projects.

Community Development Block Grants (CDBGs) Asset Management and Rate-Setting Training

The NM EFC presented workshops on developing asset management plans and utility rate setting for communities preparing applications for CDBGs throughout New Mexico. Regulations adopted by the board include an additional 10 points for communities that develop an asset management plan and include a review of utility rates based on that plan. The workshops are interactive, with the participants working on various aspects of asset management during the training. These trainings will continue in the future as more systems become interested in asset management.

Asset Management Activities

- The NM EFC sponsored a visit to New Mexico by Peter Hebden who works for the New Plymouth Council of New Zealand. Mr. Hebden is the asset manager for the water and wastewater utilities in New Plymouth and has been working in the area of asset management for more than 10 years. He is extremely knowledgeable regarding on-the-ground techniques to make asset management successful. New Plymouth Council has an extremely advanced asset management program. During his visit, Mr. Hedben met with the Albuquerque Bernalillo County Water Utility Authority and the city of Los Alamos. He also spent considerable time with the NM EFC staff discussing asset management techniques used in New Plymouth.

- The NM EFC attended the EPA Advanced Asset Management Training held in Albuquerque, New Mexico, on March 14 and 15, 2007. This training was presented by Steve Allbee, Duncan Rose, and Doug Stewart. The NM EFC also assisted the Rocky Mountain Section of the American Water Works Association in promoting the workshop and inviting attendees. The workshop drew approximately 45 attendees.

- The EFC assisted the Department of Finance and Administration in developing language for the CDBG applications, including points for developing asset management plans and generating a rate based on the plan.

- The NM EFC director was asked to make a presentation at the Institute of Public Works Engineering International Conference in Cairns, Australia. The presentation discussed activities underway in New Mexico in asset management. The conference was an excellent opportunity to meet asset managers from all over the world and discuss their successes, challenges, and advice for systems as they begin asset management.

- The NM EFC is participating in EPA's Check Up Program for Small Systems (CUPSS) workgroup. This program will assist small communities in creating an asset management plan. It is a tool they can use for inventory purposes as well as guiding them through the five core questions of asset management. The NM EFC will assist in the beta testing of CUPSS on two systems in New Mexico.

Assessing Water System Capacity

The NM EFC continues to work with the New Mexico Environment Department–Drinking Water Bureau (NMED-DWB) to refine the New Mexico capacity assessment questionnaire and perform assessments. During the period 2006-2007, the NM EFC completed 67 capacity assessments and 15 assessment updates on drinking-water systems in New Mexico for the purposes of the Drinking Water State Revolving Fund and technical assistance evaluation. Over the course of the project since 2005, NM EFC completed 194 capacity assessments and updates throughout New Mexico.

Valle Grande

The NM EFC analyzed selected quantitative and qualitative data from the capacity assessments in the autumn of 2006. From this analysis, the NM EFC recommended new and enhanced technical assistance approaches for NMED-DWB to consider. Because of this analysis, the NM EFC developed and delivered training on utility rate-setting based on an asset management program. The analysis also revealed a lack of water system management plans (such as long-term water supply, source water protection, preventative maintenance, and emergency response).

Facilitating Water Project Funding

During the period 2006-2007, the NM EFC reviewed environmental documents for three water utility projects for the New Mexico Finance Authority's (NMFA) State Drinking Water Revolving Loan Fund (DWRLF) to determine if the projects were in compliance with the State Environmental Review Process. Based on the reviews, the NM EFC drafted two Environmental Assessments and one Categorical Exclusion document for the projects, which enabled the NMFA to approve funding. The NM EFC also worked with the NMFA to draft guidelines to assist the NMFA with spending Tier Two funding generated by the DWRLF. The NM EFC will continue to work with NMFA in 2008 and beyond on this type of work.

Developing Self-Assessment Manuals

In 2007, and continuing into 2008, the Iowa Department of Natural Resources contracted with the NM EFC to review the existing *Self-Assessment Manual for Iowa Water System Viability*. The NM EFC is developing and producing revised versions of the manual that will ultimately comprise six unique documents, one of each of the following for both existing water systems and new water systems: Community Water Systems, Non-Community Non-Transient Systems, and Transient Non-Community Systems. The NM EFC will test the new forms to ensure the water systems are able to understand and interpret the questions as intended by visiting with water systems in Iowa and reviewing the manuals with them.

Implementing Asset Management for the Albuquerque Bernalillo County Water Utility Authority

The Albuquerque Bernalillo County Water Utility Authority (ABCWUA) is in the process of developing and implementing an asset management program. The authority owns and operates the water and wastewater treatment facilities that serve the city of Albuquerque and the surrounding county. After the authority's board passed a resolution to undertake asset management, the board designated asset managers and formed a steering committee to guide the process. The NM EFC has been working with the authority to provide assistance and advice as it moves forward with the asset management program.

New Projects & Initiatives

Asset Management for Communities

Espanola and Las Vegas are two medium-sized communities in northern New Mexico. Both communities received funding from NMED's Clean Water State Revolving Loan Fund Program for construction activities related to their wastewater treatment facilities. As part of the loan agreements, the NMED included language requiring each of these communities to develop an asset management program. To meet the NMED requirements, the NM EFC was asked to assist these communities in the preparation of their plans. One of the key attributes of a successful asset management plan is the direct involvement of the utility itself in the process; if the process of asset management is owned by the utility, it is much more likely that asset management will be implemented. These entities will be doing asset management plans for both water and wastewater systems, through a series of meetings and workshops facilitated by the NM EFC.

Strategic Leak Detection

The NM EFC is proposing to work with the Albuquerque Bernalillo County Water Utility Authority on an initiative to develop a strategic leak detection program on the distribution system. Several approaches will be employed, including fixed-based metering with integral leak detection, passive leak detection, active leak detection, and an assessment of fire hydrant leakage. Part of the effort will involve an investigation of the Economic Lower Level of Leakage for the authority so that the amount of potential water savings can be determined. The effort will also involve developing a guidance document that can be used by systems throughout the state to determine the various techniques that might be most appropriate for that type of system.

Water Loss Analysis for New Mexico

In 2008, the NM EFC will be working on a project to evaluate water loss and potential water savings throughout New Mexico. The report will compile and evaluate estimated water loss from the water distribution systems throughout New Mexico. It will also outline the potential savings a water system could ultimately achieve through leak detection and water loss management. The paper will complement and be based on prior work the NM EFC has completed in capacity assessment, leak detection analysis, and asset management. The paper will bring together the concepts of asset management and leak detection strategies as well as cost/benefit analysis of leak detection and water loss. Quantifying and comparing water loss data for water systems throughout the state could help decision-makers determine how best to utilize funding to minimize water loss in drinking-water utilities.

Utility Rate-Setting Guide

A number of studies have indicated that water user rates in small communities are not adequate to meet the financial needs of the system. For several years, the NM EFC has been conducting rate-setting workshops using the Show Me Rate-Maker software developed by the Missouri Department of Natural Resources. Experience with these workshops indicates that many small systems are lacking the specific knowledge and expertise to set adequate user rates. Emerging regulations requiring systems to prove the adequacy of their rates and to incorporate asset management into the process to be eligible for funding has brought this issue to the fore. In the coming year, the NM EFC will develop a *Water Rate-Setting Guide* similar to the *Asset Management Guide and Cost Estimating Guide*. The intent of this guide will be to provide background information on financial issues relevant to rate-setting (e.g., guidelines on operating expenses, reserves, coverage ratios, and operating ratios) as well as step-by-step instructions for setting a water rate that meets the financial needs of the system and a resource list for other publications, tools, and assistance.

Technical Assistance to Brownfields Communities

The EFC in Louisville, Kentucky, submitted a proposal to EPA for a grant to provide technical assistance to brownfields communities. The NM EFC was one of the Louisville EFC's subcontractors on this project. The proposal focused on community involvement and brownfields finance, though activities would also touch on public health and economic development simply as a result of the nature of brownfields.

If the proposal is awarded, the EFCs will be able to offer a wide array of services to governmental entities, nonprofit organizations, and brownfields stakeholders. These services could include community outreach; development of a brownfields inventory; assistance to communities in understanding the brownfields cleanup process; assistance in marketing properties; and assistance in working with lenders, investors, developers, and insurers to form partnerships to fund brownfields cleanup.

Water System Mapping

The NM EFC is proposing to work with the New Mexico Department of Finance and Administration on a project to provide basic mapping information to water systems within the state. This effort would be the first step toward an asset inventory, which is the first step in asset management. This mapping effort would also provide valuable information to the NM Environment Department in coordination with its sampling and sanitary survey programs and could prove very important in the event of an emergency. This effort will be coordinated with the seven Councils of Government in the state. These entities might be able to provide support to the water systems that receive mapping assistance so that the maps can be updated in the future.

Sustainability Initiative

At the headquarters and regional level, EPA has been heavily focused on the need for long-term sustainability in our environmental infrastructure, particularly water and wastewater infrastructure. To kick off this initiative, the EPA sponsored a conference on Paying for Water Infrastructure in Atlanta, Georgia. The NM EFC presented a workshop at the conference and has been an active participant in the follow-up meetings to discuss the results of the conference and next steps.

At the regional level, the NM EFC has been working within EPA Region 6 in the development of the regional sustainability efforts. Regions 6 and 8 will be working together to organize a conference on sustainability. In addition, the NM EFC was involved with Region 5 and 7's sustainability workshop. The NM EFC presented a workshop on asset management and participated in the Asset Management/Environmental Management Systems track throughout the conference.

Within New Mexico, the NM EFC has been leading a steering committee to develop a series of workshops on sustainability. The workshops will include discussions on funding issues, small systems, and barriers to sustainability. The intent is to have very focused workshops that conclude with action steps. The NM EFC expects sustainability to be a major focus area for the coming years.

Contact Information

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Performance Measures

As a result of the ongoing activities and accomplishments of the NM EFC, outcomes have included the following benefits to communities and individuals:

- The training provided to water system personnel has had many positive benefits, including increased compliance with drinking-water regulations and increased knowledge. Specific feedback from trainings includes the following:
  - *"Excellent. Enjoyed the training. Walking out with more knowledge than when I came in! Feel confident after this training."* (April 2007 Consumer Confidence Report Training)
  - *"Everything was very informative. It will provide many useful tools to implement with my utility when I return. All speakers were professional and educated in all topics."* (August 2007 Utility Management Training)
  - *"You all did a great job in your presentations, not boring and great classroom involvement-interaction."* (August 2007 Utility Management Training)
  - *"The whole training was very informative and valuable."* (February 2007 Total Coliform Rule Training)
  - *"I thought the training was excellent. I like the combination of lecture and activities."* (February 2007 Total Coliform Rule Training)
- Based on the work of the NM EFC, many communities were able to make positive changes related to improved operations, improved compliance, or improved management. Three specific examples are highlighted below:
  - **Asset Management:** The NM EFC assisted three small communities in developing asset management plans. The three communities achieved different successes depending on their specific situation. The communities provided the following feedback regarding the asset management process.
    - *"It's been great. It was a very helpful process and we can now use the Preliminary Engineering Report to plan replacement and loop lines. The discussions on criticality helped to change our point of view."*
    - *"It's been very helpful. It's opened our eyes to things that are taken for granted or overlooked. The inventory will be very useful to the village overall. It will help with presenting information to funding agencies. The process was useful to the village and most importantly to our customers."*
    - *"Having a single map of the system and an inventory database allowed the board members, who were volunteers and did not have the time to search through historical records, to easily locate existing water lines and plan for new lines in the future."*
  - **Albuquerque Bernalillo County Water Utility Authority (ABCWUA) Leak Information and Leak Detection:** The ABCWUA has been able to use the database of information provided by the NM EFC regarding leaks within the authority's system to prioritize pipes for replacement. This information is aiding in the overall asset management program and in the capital improvements program. The ABCWUA has also been able to use the leak detection efforts to develop a strategic leak detection approach for the authority. The work in that project allowed the authority to determine which techniques best suit the system and where, when, and how they should be deployed.
  - **Arsenic Outreach:** Based on the work of the NM EFC, some communities were able to determine that the best compliance option was to connect with a larger system and cease to operate as an independent system. This consolidation will assist the system and its customers by eliminating the need to install expensive equipment that will require a much higher-level operator to run. This consolidation has taken place already in some cases and is in progress in other cases. The NM EFC was able to assist some communities in receiving exemptions for the arsenic rule. These exemptions will allow the systems additional time to comply with the rule. The purpose of the additional time is not to delay the process, but rather to allow the systems to use more recent data regarding treatment systems, their costs, and effectiveness in the investigation of which option will be the best for them.
- The NM EFC has continued to expand the services it provides beyond the "usual" clients and activities. For example, the NM EFC has been working with the state of Iowa on

its capacity assessment self-evaluation documents and has begun discussions with the state of Kansas on developing asset management training materials. The NM EFC has also expanded its program to EPA Region 8. This new effort will allow the NM EFC to bring its expertise to six additional states. The NM EFC has been working with the Albuquerque Area Office of the Indian Health Service for several years, but recently expanded to serving areas outside of Albuquerque. The NM EFC assisted the national training program by presenting a three-day water system management course in California. The NM EFC has been asked to conduct the course again in another area of the country. In terms of new work efforts, the NM EFC teamed up with the Louisville EFC in Region 4 to propose work on assistance to brownfields communities. This effort allowed the NM EFC to expand its efforts beyond local officials. The NM EFC has also expanded its reach by responding to requests to assist others outside the region on asset management. The NM EFC has distributed many of its asset management guides to states and local governments outside Region 6. The NM EFC has also presented several workshops and conference presentations to states and local governments outside Region 6.

- The most notable area in which the NM EFC's work has had a direct impact on the actions of others is in the area of asset management. The NM EFC has been actively promoting asset management and its potential benefits within the state of New Mexico for several years. These efforts included presentations to NM legislative committees, presentations and discussions with state agencies, participation in the Water Infrastructure Investment Technical Team, training for water systems in conjunction with the CDBG Program, and presentations to groups, such as the Governor Financing Officers Association. During the 2006 to 2007 timeframe, the results of these efforts have started to become apparent. The CDBG program has included criteria to give 10 points to communities that are actively engaged in asset management and who use asset management to set their rates. Given the competitive nature of CDBG applications, the 10 points is a strong incentive for communities to consider developing an asset management plan.

The NMED has begun to put requirements within its Clean Water State Revolving Fund (CWSRF) awards for asset management. These requirements are some of the first, if not the first, in the nation. The NM EFC is working with NMED and two communities in developing the asset management plans required as a condition of the CWSRF loans. These two communities, along with others in the state who are currently involved in asset management activities, will form the nucleus of an asset management "users group" in New Mexico.

Several state agencies and the New Mexico Legislature are working on funding criteria that would apply to all state funding programs for water and wastewater infrastructure. One of the criteria being investigated is asset management. This investigation lead to the pilot project that the NM EFC completed on three communities in New Mexico to demonstrate the effectiveness of asset management for smaller communities. Currently, there is a committee of state agencies working on criteria for funding that is likely to include asset management as criteria.

New Mexico is quickly becoming recognized as a leader in the promotion of asset management for water and wastewater infrastructure. New Mexico has been discussed at the national CDBG meetings and at national water meetings, such as the Council of Infrastructure Financing Authorities, where it was mentioned by one of the keynote speakers.

Environmental Finance Center

at Dominican University of California

In This Report

Background & Summary

The Environmental Finance Center at Dominican University of California (Dominican EFC), located at the School of Business and Leadership, mainly serves the four states and two territories of EPA's Region 9: California, Nevada, Arizona, Hawaii, and the Tribal Lands and the Trust Territories of Guam and American Samoa. The primary purpose of the EFC is to promote sustainable communities through cleaner business, by advancing pollution prevention, source reduction, and energy conservation. The Dominican EFC works with the private and public sectors to: 1) encourage industry to implement sustainable business practices, 2) educate and encourage consumers to choose green business products and services, and 3) help communities and government promote sustainable business.

The Dominican EFC pursues its mission through numerous tools including:

- Green business development
- Business incubation
- Finance programs
- Facilitation and mediation
- Local economic development
- Symposia and workshops
- Research publications and reports
- Hands-on assistance to small business

Through 2007, the Dominican EFC accomplished the following:

- Completed the new move to Dominican University.
- Attended numerous meetings and conferences.
- Worked with several counties to help them develop green business programs.
- Worked with the Torres Martinez Tribal Solid Waste Collaborative to eliminate green waste dumping.
- Placed a number of environmentally favorable posters in several TV shows encourage environmentally friendly products on TV.
- Organized the first-ever Biodiesel Roundtable.
- Held two successful African American Hair Care Roundtables.

Completed Projects & Initiatives

EFC Relocation

In May 2007, the EFC moved from California State University to its new home at Dominican University of California. Dominican University is an independent university of Catholic heritage located 12 miles north of the Golden Gate Bridge in Marin County, California. At Dominican, the EFC works closely with the faculty and students of the "Green MBA" program. Green MBA graduates receive a Master of Business Administration degree in Sustainable Enterprise. Scholars and students seek solutions that promote financial viability, ecological sustainability, corporate social responsibility and social justice.

Biodiesel Roundtable

According to EPA, reducing emissions from diesel engines is one of the most important air quality challenges facing the country. Even with more stringent heavy-duty highway and nonroad engine standards set to take effect over the next decade, millions of diesel engines already in use will continue to emit large amounts of nitrogen oxides, particulate matter, and air toxics, which contribute to serious public health problems.

Biodiesel is an EPA-approved alternative fuel touted for its environmental benefits, including reducing emissions. Diesel vehicles require little, if any, retrofitting to burn biodiesel. A 2006 study conducted by the U.S. Department of Energy's National Renewable Energy Laboratory found that for large vehicles, burning a mixture of 20 percent biodiesel to 80 percent petroleum diesel, known as B-20, reduced emissions of particulate matter by 16.4 percent, carbon monoxide by 17.1 percent, and total hydrocarbons by 11.6 percent.

Participants at the Biodiesel Roundtable.

Through 2007, the Dominican EFC...

- Attended three meetings for the Western Regional Pollution Prevention Network.
- Attended 15 meetings for green business programs throughout California.
- Hosted three all-day roundtables, one for biodiesel, two for African American Hair Care.
- Attended 14 pollution prevention meetings.
- Attended seven pre-biodiesel roundtable meeting with EPA and other stakeholders.
- Provided technical assistance to seven communities.
- Developed new facilitation tools for stakeholder roundtables.
- Attended six conferences on recycling, green business, and conservation.
- Developed a science summary and ingredient analysis report of African American hair care products.
- Attended 15 nail salon meetings.

On January 16, 2008, the Dominican EFC organized the first ever Biodiesel Roundtable, bringing together more than 50 representatives from industry (including haulers, producers, distributors, and users), regulators, public agencies, and community-based organizations. The mission of the roundtable was to identify and resolve obstacles for California communities to produce and use biodiesel derived from waste grease (used cooking oil). The roundtable also included 15 Green MBA students, who helped facilitate and record their individual workgroups.

Using and producing biodiesel from waste grease in California is a complex issue. The goal of this working roundtable was to engage all participants in a series of interactive exercises, to share their expert and experiential knowledge of the issue, to integrate these perspectives of the issues, and then to identify original and practical ways to resolve the obstacles that

currently impede production and use of biodiesel derived from cooking oil. Ultimately, attendees generated nearly 70 suggestions, which gained broad buy-in and support from participants and can serve as a basis for seeking additional resources for promoting biodiesel in the state.

African American Hair Care Roundtable

Recent studies have found that chemicals in hair care products can adversely affect human health and the environment. To address this concern, the California State Legislature passed the Safe Cosmetic Act (SB484) in 2005. This act requires cosmetic manufacturers to disclose to the Department of Health Services (DHS) ingredients in their products known by the state to cause cancer or birth defects. It also authorizes DHS to investigate the health impacts of chemicals in cosmetics that are linked to cancer or birth defects.

The same year the act was passed, EPA Region 9 asked the Dominican EFC to undertake the Pollution Prevention and African American Hair Salon Project to determine how to reduce exposure to and use of toxic chemicals by African American hair salon owners, employees, and clients in California. The $9 billion California cosmetology industry constitutes the largest professional licensee population in the nation; it includes more than 200,000 cosmetologists.

The project focused on three product areas: relaxers, hair dyes, and conditioners with estrogenic hormones. The health issues identified included precocious puberty in children, increased rates of breast cancer, increased risk of bladder cancer, and permanent hair loss. The project found that information on ingredients for salon formulations was difficult to obtain and that scientific research data on the health impacts of relevant ingredients, while limited for cosmetic ingredients in general, were virtually nonexistent for African American hair products.

As part of this project, the EFC conducted informational interviews with stylists and salon owners, collected information on salon products and practices, analyzed products and processes, identified key stakeholders, and convened an African American Hair Salon Roundtable in 2007.The purpose of the roundtable was to discuss concerns raised within the health and environmental communities about ingredients found in ethnic hair care products and to review the science behind the potential impacts and current policy. The event provided an excellent opportunity for salon owners, workers, health and environmental advocates, policymakers and regulators, and product manufacturers to share and exchange information addressing these concerns and to work collaboratively.

After the roundtable, the EFC prepared a science summary and ingredient analysis of African American hair care products, set up a listserv to share information, invited additional participants to join the network, and now continues to maintain and moderate the listserv. With assistance from the Bayview Hunters Point Health & Environmental Assessment Taskforce and EPA Region 9, the Dominican EFC convened a follow-up meeting to the roundtable with the stakeholders. In addition, the EFC oversaw development of fact sheets and talking points for the stakeholder community.

Ultimately, the project recommends immediate action to publicize the hazard of current products and to promote less hazardous hair treatments and procedures to the African-American population. This outreach should be done in partnership with the State Board of Cosmetology, the California Department of Health Services, the Black Owned Beauty Supply Association (BOBSA) and knowledgeable salon owners to maximize the effectiveness of the health message.

Web Site Update

The Dominican EFC updated its Web site to ensure that all reports and available information were current throughout 2007 and 2008. For example, the EFC updated information on Green Business Certification Programs to assist states and counties in developing their own programs. In addition, the EFC redesigned the Web site "look" and structure to allow users to better access the EFC's material and projects.

Presentations/Conferences

The EFC's staff attended and participated in a wide variety of meetings and conferences, including the following:

- EFC directors' meeting in San Francisco (August 2007).

- EFC directors' meeting in Washington, D.C. (March 2008).
- Annual Western Regional Pollution Prevention Network (WRPPN) conference in San Diego in October 2007 (as steering committee member).
- Golden Gate Pollution Prevention Committee (as co-chair) throughout the San Francisco Bay Area.
- California Resource Recovery Association's Annual Meeting in San Pedro, California.
- Northern California Recycling Association's Annual Meeting in San Jose, California.
- San Francisco Green Festival in conjunction with the Green MBA program from Dominican University (speaker and attendee) in San Francisco.
- California Healthy Nail Salon Collaborative Quarterly meetings throughout the San Francisco Bay Area.
- California Healthy Nail Salon Collaborative, Policy Subcommittee meetings, and conference calls throughout the San Francisco Bay Area.
- Hand-in-Hand Hair Show in Oakland, California.
- Torres Martinez Solid Waste Collaborative bi-annual meetings in Riverside County, California.
- Coachella Valley Association of Governments Solid Waste Collaborative in Riverside County, California.
- City of Los Angeles, Green Business Program Development meetings in Los Angeles.
- Bay Area Green Business Program meetings (monthly) in Oakland, California.
- Greening Dominican University Taskforce in San Rafael, California.
- U.S. Composting Council Annual Conference in San Jose, California.

Ongoing Projects & Initiatives

WRPPN Conference Session Development

The Dominican EFC continued to work with WRPPN, headquartered in Reno, Nevada. WRPPN is a strategic alliance involving local, state, federal, and tribal pollution prevention programs throughout EPA Region 9 to improve communication and information dissemination among network members to maximize efficiency of pollution prevention implementation. As a member of the WRPPN Steering Committee, the EFC helps determine the network's annual direction and develops and facilitates several sessions at the annual conference. The EFC's staff attends two WRPPN planning meetings annually to help develop the annual pollution prevention conference, help assess WRPPN's performance, and promote the organization to the pollution prevention community of Region 9.

For the October 2007 WRPPN Conference, the EFC developed and led sessions on global climate change and California chemical policy and arranged for a speaker on green business development. In addition, the EFC arranged for four students from the Dominican University of California's "Green MBA" program to attend the conference. WRPPN serves as the Region 9 hub of the pollution prevention community.

California Green Business Program Coordination

The Dominican EFC continued its role as the Western Regional Green Business Program Coordinator to promote, develop, and institutionalize multimedia pollution prevention and resource conservation in Region 9 businesses while ensuring consistent growth and continuity for regional green business programs (GBPs). In partnership with the Bay Area GBP, other GBPs located outside the Bay Area, and the California EPA, the Dominican EFC:

- Assisted start-up GBPs in Los Angeles and Santa Barbara.
- Provided basic information and presentations on GBPs throughout the region, such as Los Angeles, Santa Barbara, and Riverside counties.

- Helped the California GBP Coordinator at the California Department of Toxic Substances Control develop presentation materials on GBPs for interested agencies and organizations.
- Continued to host a GBP resource Web site.
- Assessed the feasibility of using Bay Area universities in the certification and re-certification process.
- Arranged for Dominican University Green MBA interns to assist with GBPs as needed.
- Attended regular meetings of the Bay Area GBP coordinators.

In addition, the EFC is working closely with the city of Los Angeles as it develops its GBP. The EFC has participated in three meetings in Los Angeles, one meeting in San Francisco, and three conference calls to provide consultation with the Environmental Affairs Department, the City Council, the Environmental Affairs Commission, and the Mayor's Office on the development and direction of the program. The proposed program is currently under review by the city of Los Angeles Office of the Budget and is expected to be launched in the next fiscal year.

The county of Santa Barbara is moving ahead on developing its GBP. Santa Barbara has set up a steering committee, is meeting with potential program partners, and is drafting Memoranda of Understanding between partner agencies, with the EFC available for consultation.

Working with the Green MBA program at Dominican University, the EFC helped set up a program where students would work with the San Francisco GBP to assist restaurants that were interested in green business certification. This program was launched in part because of the extraordinary success of the San Francisco GBP, which currently has a backlog of more than 300 businesses. As a result of this initiative, the EFC is also working with GreenLA (a consortium of Los Angeles area environmental organizations), Environmental Defense, and Los Angeles Trade Tech (a local community college), to explore how Trade Tech students can be used for green business certification in Los Angeles.

California Nail Salons Initiative

A consortium of health and environmental nonprofit organizations formed the California Healthy Nail Salon Collaborative in 2005 out of growing concern for the health and safety of nail salon and cosmetology workers, owners, students, and clients in California. Composed of public health and environmental advocates, nail salon workers and owners, and community-based groups, this statewide collaborative seeks to proactively address the environmental health issues facing the nail salon community through an integrated approach employing policy advocacy, research, and outreach and education strategies.

The Dominican EFC continued to serve as a member of the California Healthy Nail Salon Collaborative, exploring opportunities for nail salon owners to undertake source reduction, pollution prevention, and energy conservation. In addition, the EFC continued to serve as a member of the National Nail Salon Network. The EFC shared the results of its hair salon initiative with collaborative participants and exchanged information on new initiatives and best practices. As a result, the EFC set up "Building Bridges," a task force of the collaborative focusing on reaching out to multi-ethnic communities and the hair care sector.

In addition to attending regular Nail Salon Collaborative meetings, the Dominican EFC staff served on the Research and Policy Subcommittees and participated in subcommittee conference calls in preparation for full collaborative meetings as well as a meeting with an industry representative. The EFC helped plan a legislative hearing held by State Senator Carol Migden, focusing on nail salon issues. Dominican EFC staff also participated in conference calls of the Healthy Nail Salon National Alliance on November 19, 2007.

The EFC helped set up a program to train biology and nursing students at Dominican University of California to work with nail salon owners and workers to improve worker health and safety. The program relies on staff and materials from the Asian Law Caucus, which developed a six-module program covering chemicals and ventilation, preventing aches and pains, infection protection, and workers' rights. Ten students participated in the first training, held on February 15, 2008. This is an ongoing effort and will enable the students to do outreach in their communities.

Tribal Waste Reduction

The Torres Martinez Reservation in California's Riverside County has been the dumping ground for large amounts of illegal waste. With increased development in the Coachella Valley, where the reservation is located, the volume of solid waste illegally dumped on the reservation has been growing, particularly construction and demolition debris and green waste from off-reservation sources. The illegal dumps have resulted in serious problems with toxic run-off into waterways and spontaneous fires spewing dioxin and other carcinogenic toxins and contaminants into the air.

At the request of EPA staff and with the encouragement of the Torres Martinez Solid Waste Collaborative, the Dominican EFC conducted an assessment of the problem regarding illegal dumping of golf course green waste on the reservation. The EFC identified 130 golf courses in the region and contacted each one to determine how they managed their green waste. Through this process, the EFC helped the collaborative publicize their "No Dumping" campaign to golf course superintendents. In addition, the EFC conducted outreach to the Golf Course Superintendent Association and identified at least one hauler engaged in illegal dumping practices.

Currently, EPA is allocating considerable resources throughout Riverside County to publicize the penalties, impacts, and consequences of illegal dumping. Accordingly, the EFC noted that the business community could use help identifying waste haulers engaged in legal disposal practices. Toward that end, the Dominican EFC has begun to work with the collaborative, EPA, and the Riverside County Illegal Dumping Task Force to explore the feasibility of developing a certification program for legal waste haulers that are interested in adopting more environmentally sound practices.

Dominican EFC staff attended two meetings of the Torres Martinez Solid Waste Collaborative and participated in a videoconference with the Coachella Valley Association of Governments Solid Waste Collaborative.

Following this initiative, the EFC will continue to work with the Torres Martinez Tribe to evaluate the feasibility of establishing facilities for processing green waste into fertilizer and renewable energy, and processing construction and demolition debris into reusable building material. The project goal is to provide the information necessary for the tribe to decide whether to develop a small pilot project that could be scaled up in the future.

Four Dominican University Green MBA student interns are working with the EFC on this project to design and implement a technology feasibility study. Using the critical thinking methodology taught at the Green MBA program, they will design a research plan and timeline. Part of this process will include furthering the students' understanding of the higher purpose of the tribe and assessing needs as a way to frame appropriate technology/enterprise opportunities. Working with the EFC, the students will identify available waste streams, technologies that can process the waste streams, and potential barriers and opportunities. The EFC will then make recommendations as to which technologies are suited to the tribe's needs.

Studio Sector Technical Assistance

This project continues efforts to "green" the television industry by promoting environmentally friendly behavior and products in television shows. In the period 2004-2005, the EFC proposed to adopt the private sector concept of "product placement" to place environmentally beneficial behavior (in television shows). Examples included having actors bring cloth bags to the grocery store, recycle soda cans, use worm bins, and consider how to properly dispose of a computer monitor and other electronic waste accumulating in their closets.

Since that time, the EFC has been working to penetrate the television industry and develop relationships to promote product placement for the environment in mainstream shows. In

the period 2006-2007, the Dominican EFC attended a number of meetings with various industry stakeholders and, as a result, developed a partnership with a professional product placement firm. The EFC has also developed a partnership with a set-decorating business in Los Angeles, which provides set props and graphic materials to all major hospital shows on the three major networks: ABC, NBC, and CBS. In 2007, the EFC placed a number of environmentally favorable posters in several TV shows such as Scrubs, Grey's Anatomy, and ER.

The EFC is also providing general guidance and interview subjects for a documentary filmmaker who is currently shooting a film on green business and helping a local filmmaker green her production, which will be shot in Oakland, California, and other Bay Area locations.

The EFC attended the "Hollywood Goes Green" conference in December 2007, which served as an opportunity to network and publicize the EFC's efforts. Building on contacts made at that conference, the EFC met with the executive director of ReelGreen Media to review partnership opportunities. In addition, the EFC advised a Green MBA student who is developing a business plan to help green the television and movie industry.

Greening Dominican University

The Dominican EFC began working with the Greener Dominican Task Force (GDTF) to develop a plan to green the Dominican University campus. The GDTF includes faculty from the Business and Environmental Studies programs, as well as faculty from other departments, staff, administrators, and students interested in exploring the potential for green opportunities and programs at Dominican. After participating in several task force meetings, the group recognized the value of the EFC's participation and appointed EFC Director Sarah Diefendorf to the position of co-chair.

With assistance from the Dominican EFC as well as students and faculty in the Green MBA program, the GDTF prepared a green statement, laying out the guiding principles of the GDTF. The task force also developed a list of sustainability goals and objectives for the university, a template for its strategic development, and short-, medium-, and long-term goals providing clear steps for incorporating these changes to implement the university's commitment to environmental sustainability.

GDTF is a recognized subcommittee of the University's Campus Utilization Policy Committee (CUPC). It has one voting member on the CUPC. To solicit support and input from the campus community for the task force efforts, the Dominican EFC, with assistance from Green MBA students and faculty, prepared a presentation to the CPUC explaining the goals and objectives of the GDTF. The EFC will present the GDTF plan to other campus bodies, such as the Board of Trustees, the Alumni Association, and the Faculty Council, to build support for greening the university.

The EFC anticipates that as the effort builds, the task force will achieve additional outcomes, such as incorporating integrated pest management into university landscaping practices, improving campus recycling, reducing energy use, and adopting a broad environmental management system-type environmental policy approach. The campus's green statement and sustainability plan outline can be found on the university Web site: www.dominican.edu.

New Projects & Initiatives

African American Hair Salon Initiative

In 2008, the Dominican EFC hopes to develop a Healthy Hair Show that would showcase natural, healthier approaches to African American hair care, as well as nail and other personal care. The hair show will be held in partnership with the California Healthy Nail Salon Collaborative.

Biodiesel Clearinghouse Web Site

Based on the outcome of the Biodiesel Roundtable, the EFC plans to develop a biodiesel clearinghouse Web site as part of the new Center for Sustainability at Dominican University. The clearinghouse will be an open and unbiased system of electronic information sharing among researchers, producers, fleet managers, regulators. In addition, following the EFC's successful roundtable, a Senator from Guam who is interested in developing a biodiesel program for the island contacted the Dominican EFC, which the EFC will pursue.

International Projects

Working with Dominican University Green MBA faculty, the EFC helped establish the Center for Sustainability in 2007. In 2008, the EFC's executive director will take a leadership role within the center, which will include being responsible for vetting all university sustainability projects. Two of the international projects the center will pursue in 2008 include the following:

Lubumbashi, Congo - Urban Sustainability: The center has been invited by partners in Lubumbashi to send EFC staff, Green MBA students, and key faculty to support the development of capacity building for urban sustainability in Lubumbashi, the twelfth fastest growing city in the world. Copper mining is driving rapid urbanization without infrastructure or sustainability planning.

Capetown, South Africa: Teach With Africa: EFC staff and the Center for Sustainability will work with the organization Teach With Africa to bring EFC staff, Green MBA students, and faculty to support this innovative program for AIDS orphans, adding sustainability to the curriculum and helping students develop projects in urban sustainability.

Contact Information

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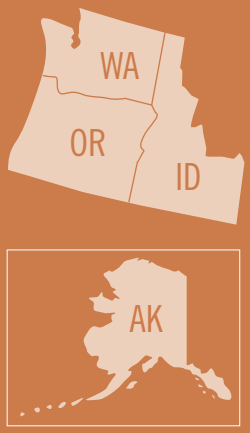
Growing Green Business Programs: In 2000, when EPA Region 9 asked the Dominican EFC to act as the West Coast regional coordinator for green business programs so that as the concept spread, the individual programs would remain consistent with each other and that the standards and requirements would remain rigorous and meaningful. Since then, the EFC has helped grow green business programs in the states of Arizona and Hawaii and within the counties of San Francisco, Sacramento and San Diego, California.

Receiving Requests for Follow-on Work: As a result of the EFC's work in California on the Los Angeles Green Business Program, the mayor's office asked the EFC to consult on attracting green technology to Los Angeles. Likewise, because of the Dominican EFC's long-term reputation with developing green business programs throughout the region, the EFC is routinely asked to assist in creating new programs. Thus, the EFC is beginning discussions with Fresno County and has received another request from Humboldt County. In addition, Trade Tech, a Los Angeles community college, asked the Dominican EFC to explore the development of curriculum that would train culinary and auto shop students in green business practices. And as a result of the EFC's work with the Torres Martinez Tribe, the EFC was asked to explore other opportunities for green business in the Riverside area and will also explore other potential land uses for the tribe, including a solar farm. Finally, since the biodiesel roundtable, the EFC has received multiple requests for follow-up roundtables. In response, the EFC is exploring the feasibility of separate stakeholder meetings that would focus on various topics identified by the initial roundtable and would bring together specific regulators to discuss barriers to biodiesel production.

Making a Difference With Diverse Audiences: From the Los Angeles mayor's office to a small African American Hair Salon in Oakland, the EFC has worked to disseminate information on green business practices to diverse audiences. Salon workers have expressed their gratitude for this effort. As a frequently overlooked segment of the population, they are excited at the prospect that they are at the beginning of a movement that can promote better worker health and safety and provide a positive impact on the environment and their community. In addition, the EFC has also been asked to assist a small African American hair care product manufacturer in developing a less toxic product line. The product manufacturer had attended the roundtables and was deeply affected by the information that was presented.

Environmental Finance Center

at Boise State University



In This Report

Background & Summary

The Environmental Finance Center at Boise State University (Boise State EFC), located within the Department of Public Policy and Administration in the College of Social Science and Public Affairs, primarily serves the four states of EPA's Region 10: Alaska, Idaho, Oregon, and Washington. The primary purpose of the Boise State EFC is to build financial analysis tools that apply to both macro- and micro-environmental finance challenges, and that help decision-makers understand environmental compliance issues. The EFC has developed software in response to community demand for user-friendly tools for generating empirical information for improved decision-making. In addition, the EFC offers training and technical assistance on the use of these tools.

In particular, the center works to build management and financial capacity within the regulated community for the purpose of establishing and maintaining sustainable environmental systems. Drinking water systems, wastewater treatment systems, and watershed management and restoration systems are essential to public health and environmental protection, as well as community economic success and enhancing the quality of life. Building the capacity of communities to handle "how to pay" issues has a transformational effect that improves decision-making, leading to sustainable environmental quality. The goal of the Boise State EFC is to help communities provide the best environmental services to the most people at the least cost for the long term.

The Boise State EFC provides the following services:

- Develops and delivers educational programs including workshops, conferences, training seminars, and formal education programs to expand the capacity and ability of public sector leaders and managers to address and resolve environmental finance dilemmas.
- Prepares and disseminates practical guides, handbooks, and reports on finance and management issues relative to the public sector and environmental system needs.
- Helps local and tribal governments and other public water and wastewater systems to increase their use of alternate approaches to environmental financing, particularly those that provide alternatives to traditional taxation methods.
- Continues its initiatives in becoming a leading regional center in developing improved public management and innovative environmental finance techniques.
- Conducts analysis on key issues relative to environmental finance and environmental policy in Region 10.

Through 2007, the Boise State EFC accomplished the following:

- Developed the Web-based Plan2Fund™-OPT (Objective Prioritization Tool) decision-making model.
- Renovated the center's Web site to improve information transfer to our national and regional clients.
- Introduced EFC Training on Demand, a new approach to delivering training, designed to offer advantages for reaching small community officials and reducing the carbon footprint associated with training.
- Conducted a fact-finding tour of Idaho communities for EPA's Local Government Advisory Board.
- Launched a new satellite EFC in EPA Region 7.
- Moved closer to the release of a breakthrough financial management and analysis tool — the Financial Dashboard for Sustainable Infrastructure.

Completed Projects & Initiatives

Plan2Fund-OPT

In working with watershed restoration stakeholders, the EFC discovered the need to develop a computer-based tool that groups could use to determine priorities for implementation plans. Plan2Fund-OPT provides a sound methodology for prioritizing objectives in an implementation plan. OPT is a breakthrough for the EFC because it uses the DotNetNuke Internet framework, which allows the model and the user's data to be secured in a password-protected file on the EFC's Internet server. OPT encourages stakeholders to achieve consensus on the decision rules they will use in evaluating competing objectives of a plan, the system of assigning scores based on the decision rules, and the relative importance of the decision rules in ranking objectives. EPA's Office of Wetlands, Oceans, and Watersheds (OWOW) funded the development of OPT as a Web-based computer model, following the successful test of an Excel spreadsheet methodology with the Chehalis Basin Watershed Council (Washington). This new tool represents the third computer-based model developed by the EFC for financial implementation of strategic plans, after Plan2Fund and the Directory of Watershed Resources. All three are designed to minimize the time and energy of stakeholder groups on their journey from planning to implementation of strategic nonpoint pollution control and capital improvement plans. Plan2Fund-OPT was released at the 2007 National River Rally in Stevenson, Washington. EFC Director Bill Jarocki conducted a "hands-on" workshop on Plan2Fund-OPT in Washington, D.C., for local watershed organizations as part of a full-day conference on watershed planning hosted by OWOW.

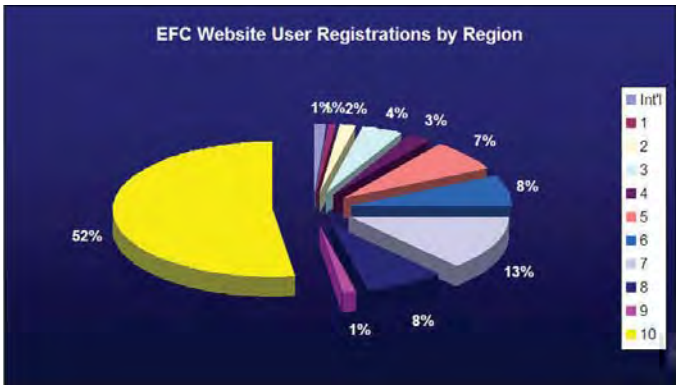
Renovated EFC Web Site

The EFC's renovated Web site (http://efc.boisestate.edu) benefits those seeking information about environmental finance and puts the control of content and design in the hands of the EFC staff rather than university Internet technology staff. With this improved Web site, the EFC staff is well positioned to meet the demands of the next generation of Internet users, who are accustomed to more dynamic Internet environments. The DotNetNuke design allows EFC staff to create information presentation components as needed rather than waiting for third-party assistance. The Web site now incorporates video and other multi-media presentations. The EFC's monthly

Through 2007, the Boise State EFC...

- Expanded to include a satellite office in Kansas City to provide direct service to the Region 7 states of Kansas, Iowa, Nebraska, and Missouri.
- Logged 38,000 air miles in providing EFC training, technical assistance, and presentations in 2007.
- Attracted 1,946 people as registered users to the EFC Web site, representing 52 states and territories, and 18 foreign countries.

Environmental Finance News can now be composed and sent directly to registered users of the Web site. Casual visitors are encouraged to register in order to receive access to the EFC's computer-based financial analysis tools and other services. Registration information offers details about EFC customers — geographic as well as professional. Most importantly, the renovated Web site provides a platform for the development and use of Web-based software tools. Over the next few years, the EFC will be modifying its various environmental finance tools for Web-based use.



EFC Training on Demand

Over the past 10 years, the EFC has learned that for those responsible for environmental systems — water and wastewater operations and pollution control activities — receiving training on how to finance and manage multi-million-dollar investments is a necessity. But, finding the time to attend

training events is often difficult for officials and operators, or, the training needed is not available at the time they need it. Another problem is the expense of traveling long distances to get to the training they need. In response to these problems, in 2007 the EFC created Training on Demand, found at: http://efc.boisestate.edu/efc/EFCTraining/tabid/140/Default.aspx. Training on Demand gives anyone using the EFC's Web site the ability to receive training on environmental finance and management when they want it. Users can pick a topic, a time, and a date (daytime, evening, or even Saturday workshop) for an Internet web conference workshop. Along with the benefit of convenience, the computer-to-computer workshops will reduce the energy expended in traveling to training sites, reducing the EFC's carbon footprint. Training workshops on watershed finance, rate setting, asset replacement financing, capital project funding, and other topics related to environmental finance and management are available through the Training on Demand program. Once a workshop is presented, it is posted on the EFC Web site. This will give users the opportunity to review the presentation or, if they missed the event, they will have more flexibility to receive training based on their schedule. Either way, with the "live" Training on Demand or the recorded Training on Demand, EFC clients have the option to fit training workshops into their busy schedules.

EPA Local Government Advisory Committee Tour of South-Central Idaho Communities

In September 2007, the EPA's Local Government Advisory Committee (LGAC) convened its meeting in conjunction with the Environmental Council of the States (ECOS) in Sun Valley, Idaho. In addition to presenting information to LGAC and ECOS, the EFC was invited to organize and facilitate a tour of several small communities and environmental facilities in southern Idaho. The purpose of the tour was to provide an opportunity for committee members, federal and state agency officials, and small community officials to interact and to discuss challenges of regulatory compliance. Marc Longley, system operator for Idaho's Hulen Meadows and Cold Springs subdivisions, led a discussion of the burdens faced by nonmunicipal public water systems with part-time homeowner association board members. At every location, local officials discussed the specific actions taken to meet regulatory requirements, the importance of these actions to the health of the community and the environment, and the relationship of the jurisdiction (or business) with state and federal agencies. One of the key outcomes of the meetings and the tour was the recognition of the need for the network of EFCs and the assistance they can provide to small communities. The EFC will produce a final report of the tour event for the LGAC in 2008.

Castleford Mayor Rita Ruffing presenting to LGAC.

City of Dietrich presentation for LGAC tour.

Satellite EFC in EPA Region 7

In 2007, Boise State University launched the first satellite office. The satellite brings the services and tools of the Boise State EFC to the states of Iowa, Kansas, Missouri, and Nebraska. This innovative approach to providing the capabilities of the EFC Network was developed by senior managers of EPA Region 7 and the Boise State EFC. The EFC had a track record of providing service to the states in the region through a variety of contracts and grants. The goal of the satellite EFC is to continue the work of the Boise State EFC and to eventually replicate permanent services through a local university in Region 7. The satellite EFC has assisted the Water Partnership of Northwest Missouri in its efforts to create and finance an 11-county water system. The satellite has also begun work with the Iowa Department of Natural Resources to add Iowa funding programs to the Directory of Watershed Resources. Boise State EFC Director Bill Jarocki facilitated a track of the Region 5 and 7 Sustainable Infrastructure Summit in St. Louis. The

EFC Web site was expanded to provide outreach, service, tools, and information to communities in Region 7. Taking advantage of the EFC's direct linkage with the satellite operation, Training on Demand workshops have been ordered by Region 7 states in early 2008.

EFC Director Bill Jarocki presents to the water partnership of northwest Missouri.

Idaho Rural Water Association Statewide Finance and Grant Writing Workshop Series

The Boise State EFC traveled the state of Idaho once again in 2007 in partnership with the Idaho Rural Water Association to offer regional training workshops on the topics of utility financial management and grant writing. The workshop series took the training team to the Idaho cities of Orofino, Coeur d'Alene, Boise, Twin Falls, Chubbuck, and Moscow. These full-day sessions focused on EFC computer tools and how they could be used to implement financial management principles. The Idaho State Board of Operator Licensing approved the class series for system operator continuing education unit requirements.

Conferences and Speaking Engagements

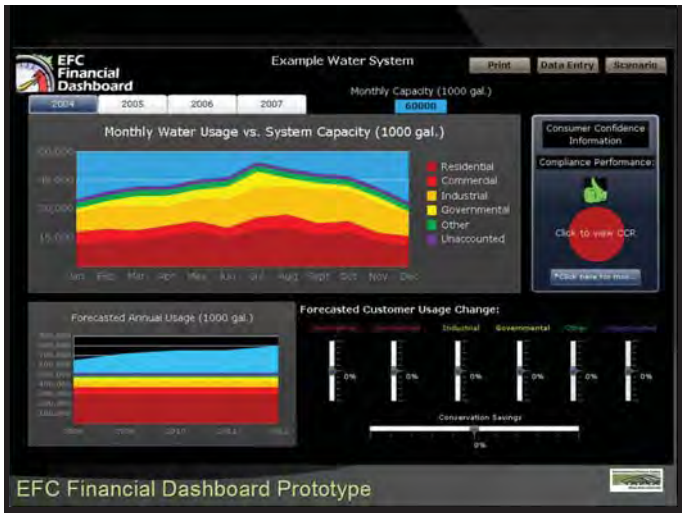
The Boise State EFC participated in conferences and other engagements in the following capacities:

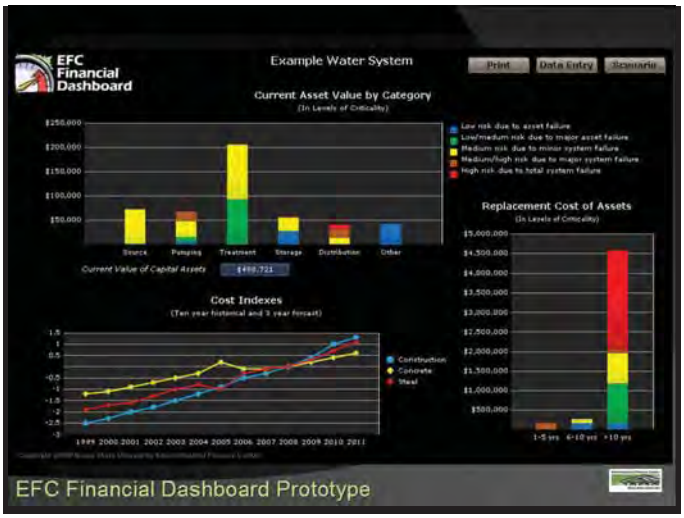
- Offered the keynote address at the Seventh CECIA-IAU (Centro de Educación, Conservación e Interpretación Ambiental — Universidad Interamericana de Puerto Rico) Biennial Symposium on Potable Water Issues in Puerto Rico: Science, Technology and Regulation — Asset Management and the Water Distribution System.
- Assisted the Syracuse EFC by presenting the workshop "Reinvesting in the Public's Investment" at the Managing Infrastructure for Sustainable Economic Development Conference at East Syracuse, New York.
- Introduced the EFC Network to environmental justice practitioners at the "2007 Environmental Justice and Air Pollution Workshop" in San Francisco, California.
- Served as the featured speaker at the 2007 Washington State Lake Protection Association, providing information about the EFC's software tools for macro-environmental finance.
- Served as the moderator for the small communities track of the 2007 Sustainable Infrastructure Forum in St. Louis, Missouri.
- Provided training to city clerks, financial officers and treasurers at the 2007 Idaho City Clerks Treasurers and Finance Officers Association (ICCTFOA) Conference in Boise.
- Presented two workshops at the Northwest Community Development Institute in Boise: "Infrastructure and Community Development," and "Public Finance Strategies."
- Presented the workshop: "The Financial Dashboard: A Better Way to Understand Financial Capacity" at the national conference of the Rural Community Assistance Partnership in Long Beach, California.
- Assisted the city of Heyburn, Idaho, in developing a user-fee structure for the drinking water system.
- Delivered a training workshop on macro-environmental finance tools—Plan2Fund, Plan2Fund-OPT, and the Directory of Watershed Resources—to Idaho and Montana watershed protection professionals at the EPA-sponsored "Watershed Planning for Action" workshop in Bozeman, Montana.

Ongoing Projects & Initiatives

Sustainable Infrastructure Financial Dashboard Technology

The Boise State EFC has developed software tools for determining the financial management capacity of environmental systems. Beginning with Ratio8, then through the use of Capacity Tracker, and more recently, the Financial Analysis Calculator for Exemptions, the EFC has endeavored to translate financial and management data in ways that assist decision-makers in providing the best environmental services at the least cost. In 2005, the EFCs at the University of North Carolina, the University of Maryland, and Cleveland State University joined the Boise State EFC in a project to develop improved methods for fostering sustainable infrastructure. The EFC's role in this project is to produce a new tool for recognizing the effect of financial and management capacity changes. This work is leading to the development of a Financial Dashboard, which is expected to be completed in the summer of 2008 for national distribution. Essentially, the Dashboard is designed to give decision-makers rapid feedback regarding the effect of their decisions (or indecision) on environmental facilities. The indicators will be dashboard-type displays of gauges (similar to instrument panels in automobiles) where current and projected conditions can be easily interpreted. The EFC expects to develop three dashboard panels: one for financial indicators, a second for operational indicators, and a third for strategic indicators. The overall goal of the project is to produce a user-friendly Web-based interface for "what if" scenarios.





Alaska State Revolving Fund Financial and Management Capacity Analysis

Since 2001, the EFC has worked with the state of Alaska Department of Environmental Conservation to offer third-party finance and management capacity reviews of applicants. The EFC performed capacity reviews for both the Alaska Clean Water Fund and the Alaska Drinking Water Revolving Fund. In 2007 the variation on the theme was the move toward using a computer-based analysis tool similar to that developed by the EFC for the Washington Department of Ecology. The new Alaska State Revolving Funds analysis model interprets user input data to detect trends in financial indicators. The model also provides a summary report for EFC staff to use when considering whether to recommend loan conditions that the state of Alaska might impose that increase the probability of repayment and improve finance and management capacity.

Newman Lake and Chehalis Basin Watersheds — Stakeholder Group Assistance

EFC Director Bill Jarocki provided direct assistance to two watershed restoration organizations in the state of Washington. Newman Lake, in northeastern Washington near Spokane, is one of the most popular recreational lakes in the region. Natural resource extraction, along with the cumulative effects of land development, has led to an increased loading of nutrients in the lake and resulting algae growth. In 2007, the community participated in developing a Total Maximum Daily Load draft implementation strategy. At the request of the Washington Department of Ecology, the EFC facilitated multiple stakeholder meetings and led the community through a sometimes contentious public hearing process. The EFC will continue to work with the stakeholders in 2008 to create a self-

Newman Lake stakeholders meeting.

sufficient organization capable of developing a strategic implementation program designed to improve the greater Newman Lake watershed.

The EFC also provided assistance to the Chehalis Watershed Basin in northwestern Washington. This watershed basin — composed of three large counties — has challenged the stakeholders to creatively apply techniques for strategic plan development and implementation finance. Since 2005, the Chehalis Basin stakeholders and the EFC have enjoyed a close working relationship. This partnership has created a laboratory for the development of Plan2Fund OPT and practical advice on how to improve the EFC's Plan2Fund strategic planning and implementation finance computer model. At the end of 2007, the EFC provided the basin with a methodology for determining the optimal organization structure for implementation success. The EFC expects to be involved in the design of implementation finance strategies for both groups using the suite of tools developed for that purpose: Plan2Fund, Pland2Fund OPT, and the Directory of Watershed Resources.

Rich Subdivision Community Water System

Where does a small nonmunicipal community water system turn when it has a uranium contamination problem and a lack of customer willingness to address the challenge? The Rich Subdivision in Canyon County, Idaho, turned to the EFC for help after signing a consent order with the Department of Environmental Quality (DEQ) to deal with the issue. The EFC met with community members, the consulting engineer, DEQ regional office staff, neighboring systems, and technology vendors to move the system to an affordable solution. EFC staff also examined the system's bylaws and financial records to determine short-term actions that would improve management and financial capacity. At the beginning of 2008, the EFC will facilitate the Rich Subdivision's annual business meeting to assist the Board of Directors in convincing community members that investing in uranium removal technology is their top priority. To the DEQ, this project has underscored the value of the EFC in providing an unbiased approach that maximizes the potential for problem resolution without the strong-handed intervention of the regulatory agency.

EFC staff meets with the board of directors of the Rich Subdivision Water System.

Environmental Finance E-Newsletter

Since 2004, the EFC has provided a quarterly environmental financing newsletter that includes information on micro-finance issues, such as utility finance and rate setting, and macro- financing issues, such as watershed finance issues. The newsletter includes information on upcoming events, success stories, grant deadlines, specific resources, and agency programs, and provides information to a broad range of stakeholders interested in protecting the watershed.

In 2007, the center began to produce the E*nvironmental Finance News* newsletter on a monthly basis, rather than quarterly. The EFC will continue to e-mail the newsletter to target groups including past workshop attendees, watershed groups, and local governments; currently the e-mail database contains more than 2,000 addresses. The newsletter will also be available on the center's Web site.

New Projects & Initiatives

Washington WIRA Implementation Planning Assistance

As more and more Water Resource Inventory Areas (WRIAs) in Washington State complete watershed assessments, their focus is shifting from identifying water quality problems to debating solutions. But many watershed organizations are finding that with reduced budgets and shrinking resources, meeting the needs of the watersheds is becoming more difficult. With limited resources, the need to coordinate efforts and leverage funding sources is increasing. Many watershed organizations lack the capacity, however, to successfully identify and leverage various funding programs.

The EFC will work with the Washington Department of Ecology to provide assistance and training to WRIAs in Washington that have completed their watershed plan and are moving to Phase Four implementation of plan watershed improvements. WRIAs for Washington State were formalized under WAC 173-500-040 and authorized under the Water Resources Act of 1971, RCW 90.54. The Washington Department of Ecology was given the responsibility for the development and management of these administrative and planning boundaries. These boundaries represent the administrative underpinning of this agency's business activities. The original WRIA boundary agreements and judgments were reached jointly by Washington's natural resource agencies (Ecology, Natural Resources, Fish and Wildlife) in 1970. The center will work directly with WRIAs identified by the Department of Ecology and provide training on the tools and resources available from the EFC, including advanced assistance where needed.

Plan2Fund Enhancements

The Boise State EFC has developed tools to assist watershed groups in developing a funding strategy for watershed restoration activities. One of these tools, Plan2Fund, assists watershed groups in identifying the funding needed for implementation of watershed restoration activities. Plan2Fund walks users through estimating the costs of the tasks in their plan, assessing any local match, and determining the additional funding needed to meet the watershed goals.

Last year, with funding from EPA's Sustainable Finance Team, the EFC developed a run-time version of Plan2Fund and made several enhancements, which included improvements to the report and budget functions, as well as the addition of a grant tracking function. In the process of working with watershed groups that were using Plan2Fund, the EFC received feedback and suggestions. To address these issues and to improve the functionality of Plan2Fund, the EFC will make additional enhancements and improvements to Plan2Fund. Some of these enhancements include:

- Simplifying and improving flexibility of the budget sheets.
- Linking task program page to budget pages for easy navigation.
- Providing links for easy navigation through data.
- Changing priority section to integrate new prioritization function.
- Adding performance reporting section to record and track results.
- Adjusting reports to include more useful information and change layout to matrix to reduce the length of the reports.

In FY 2008, the center will convert Plan2Fund to a Web-based model, which will allow it to completely dovetail with Plan2Fund OPT.

Contact Information

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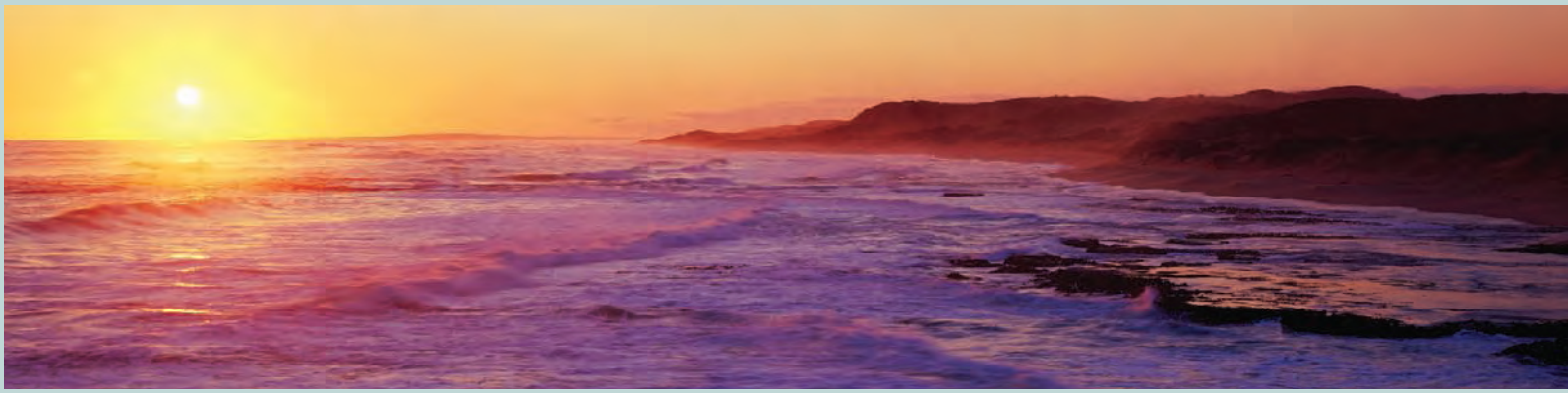

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