Public Health Benefits of the Green Project Reserve

Factsheet Purpose and GPR Overview

This factsheet focuses on the public health benefits of typical Green Project Reserve (GPR) projects, discussing key lessons learned from the American Recovery and Reinvestment Act (Recovery Act). This factsheet is intended for owners, managers and operators of water systems; technical assistance providers and state personnel.

The GPR was established under the Recovery Act in 2009 and has continued in 2010 and 2011 through the Drinking Water State Revolving Fund (DWSRF) base program. While energy efficiency, water efficiency, green infrastructure and environmentally innovative projects have always been eligible under the DWSRF program, the GPR helps dedicate funding for these types of projects. In most cases, these GPR projects have the dual benefit of simultaneously improving public health protection and enhancing the long-term sustainability of the system.

How Do GPR Projects Create Public Health Benefits?

GPR projects can have immediate and direct public health benefits by helping systems ***improve*** drinking water quality. Additionally, GPR projects can have a longer-term benefit of helping systems ***protect*** drinking water quality. For example, many GPR projects funded under the Recovery Act were intended to ***improve*** water systems' abilities to ***maintain or achieve compliance with current or future regulations***, which are designed to minimize adverse effect on public health.

Many GPR projects funded under the Recovery Act were designed to ***protect*** drinking water quality by ***improving a system's long-term capacity and sustainability***. The Safe Drinking Water Act—which focuses on public health protection—emphasizes that systems with technical, managerial and financial capacity are better able to plan for, achieve and maintain compliance with applicable drinking water regulations.

GPR projects can create important cost savings by shifting systems towards using resources more efficiently and reducing water losses and energy use. GPR costs savings are particularly important because systems can utilize the savings now or in the future for other high priority investments that directly maximize public health protection.[1]

GPR Projects Can Improve Water System Capacity		
Improved financial stability resulting from reduced energy or operational costs	***Improved source water adequacy*** resulting from reduced demand on existing sources	***More informed operating or rate setting decisions*** resulting from more accurate or detailed system data

[1] EPA 2010 GPR Guidance.

Direct Public Health Benefits From Improved Water Quality

Many GPR projects ***maintain and enhance drinking water quality***. These projects may focus on source water protection or improvements to distribution systems and treatment processes. In particular, these common GPR projects promote public health protection by helping systems ***achieve or maintain compliance with current or future regulations***.

The following examples show how select GPR eligible projects may directly support Safe Drinking Water Act ***public health protection goals***. Each description illustrates the specific ways seen under the Recovery Act that GPR projects may ***improve water quality***.[2]

Pipeline replacement (extreme cases of leakage)

- Reducing leaks improves water pressure, ***reducing the likelihood of pathogen or contaminant intrusion***.
- Less corroded pipes have less biofilm growth and ***improve the effectiveness of chemical disinfectants***.

Treatment process selection

- Treatment processes that reduce water use may allow systems to ***avoid the need for sourcing from lesser quality water supplies***.
- Enhanced or optimized treatment can reduce the wastewater and sludge generated during treatment and ***minimize disposal and recycling issues that create public health challenges***.

Pump and/or motor replacement

- Well-maintained pumps are better at ***maintaining water pressure and preventing water shortages***.
- Optimized pump operation for feeding chemicals, pumping sludge and cleaning filters can ***improve consistency of water treatment and water quality***.

Storage tank replacement

- Improved storage capacity can ***ensure an adequate supply of treated water*** and may also ***improve water pressure*** throughout the distribution system.
- New storage tanks will have less corrosion and opportunities for biofilm growth and ***improve the effectiveness of chemical disinfectants***.
- Properly sized storage tanks with shorter hydraulic residence times can ***reduce stagnant water***. Stagnant water increases disinfection byproducts which may adversely affect public health.

Storage tank solar powered mixers

- Solar powered mixers improve water circulation in storage tanks, ***reducing the likelihood of stagnant water***.
- Improved mixing in a storage tank may reduce the chance of short-circuiting water through the tank, which is especially important if the tank is being used ***in the disinfection process***.

Source water protection

- Source water protection reduces contamination at the source, which both ***improves water quality and reduces need for treatment***.
- Less pollution at the source can ***improve the performance and longevity of filters and other equipment***.

On-site hydroelectric power

- Hydroelectric power generators can capture energy from pipe flow or from water coming out of storage. Generators that replace pressure reducing valves can more effectively maintain water system pressure and thereby ***reduce the risk of pathogen or contaminant intrusion***.

[2] Projects are ranked relative to the number of projects of that type funded under the Recovery Act.

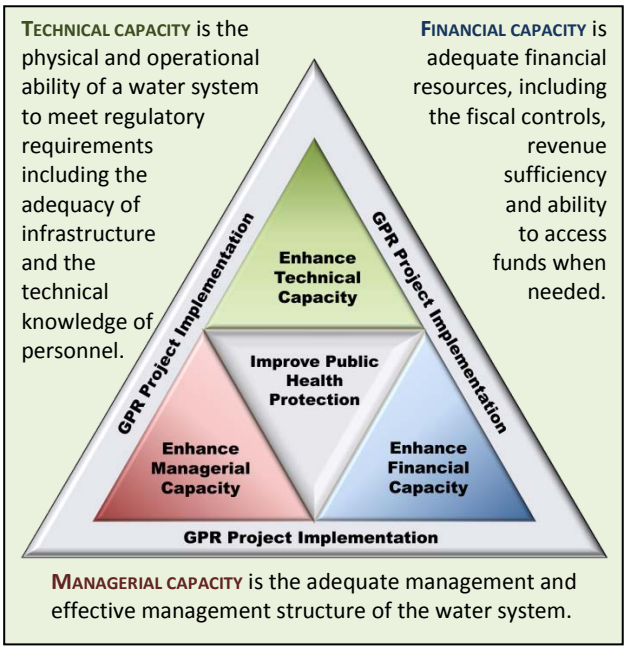
Public Health Benefits Resulting From Improved Water System Capacity

EPA's Infrastructure Sustainability Policy[3] encourages systems to:

*"pursue water infrastructure investments that are **cost-effective** over their life cycle, are **resource efficient** and are **consistent with community sustainability goals**"*

and also to

*"employ effective utility management practices, including consideration of alternatives such as natural or "green" systems and potential climate change impacts, to **build and maintain the technical, financial and managerial capacity necessary to ensure long-term sustainability**"*



Many GPR projects contribute to sustainable water infrastructure by building technical, managerial and financial capacity, which is critical to ***protecting*** drinking water quality. Through conservation efforts, leak detection and protection of water sources, GPR projects can increase the amount of high quality drinking water available to consumers. Projects that reduce water consumption also reduce wear and tear on water system infrastructure, thereby reducing future maintenance issues and costs. Cost savings may also result from installation of energy efficient devices, pump system optimization and on-site green power generation. These cost savings can be utilized for ***achieving and maintaining compliance with applicable drinking water regulations***.

The following examples illustrate the specific ways that ***system capacity may be improved*** by GPR project components.[4]

Water meter replacement or metering in previously unmetered areas

- Meters can help inform system operators making decisions on ***efficient water management, infrastructure investments and rate setting for revenue sufficiency***. Advanced metering technologies may also ***reduce system labor costs*** and help systems quickly ***identify leaks and water losses***. Customers can use information from meters and rates to make ***responsible decisions on the quantity of water they use***. (technical and financial benefits)

SCADA (Supervisory Control and Data Acquisition)

- Computer systems that monitor and control water system infrastructure (e.g., pumps, wells, surface water intakes, treatment, distribution system) may help systems more quickly ***identify issues that can affect water quality*** and ***adequate supply*** and also ***inform operating and treatment decisions***. (technical capacity benefits)

Leak detection studies and equipment

- Leak detection equipment can ***inform targeted pipe rehabilitation and replacement plans*** and ***reduce management burdens, water loss and treatment demands*** and can improve the consistency of water quality. (managerial and financial capacity benefits)

On-site renewable energy

- Renewable energy—including wind, solar, geothermal and micro-hydroelectric power generation—can ***reduce a system's energy costs, contributing to a more financially stable system in both the short- and long-term***. (financial benefits)

[3] Clean Water and Drinking Water Infrastructure Sustainability Policy. Available online at: http://water.epa.gov/infrastructure/sustain/Clean-Water-and-Drinking-Water-Infrastructure-Sustainability-Policy.cfm

[4] Projects are ranked relative to the number of projects of that type funded under the Recovery Act.

Variable Frequency Drives

- Variable Frequency Drives (VFDs) can reduce electricity use and ***provide financial savings that can then be applied to enhancing system capacity and public health protection***. (financial benefits)
- VFDs on pumps provide water more consistently, without the pumps turning on and off as often. This reduces wear and tear on the equipment and may ***increase reliability and the life of the equipment***.

Water efficient devices

- Efficient end-use devices such as showerheads, toilets and other plumbing fixtures can help ***lessen water use, reduce water treatment demands and result in financial savings***. Reduced demand may also help ***conserve existing source waters and limit the need for developing new water sources***. (technical and financial benefits)

On-site green infrastructure

- Green infrastructure—including porous pavement, bioretention, trees, green roofs and other practices, including constructed wetlands—may ***reduce heating and cooling costs and reduce flooding impacts at the facility***, resulting in costs savings and increased property value. (financial benefits)

Reclamation, recycling, and reuse

- Reclaimed, recycled or reused water can be used to ***replenish existing source waters or be used as an alternative source of water to meet existing or future water supply needs***. (technical capacity benefits)

Planning for climate change adaptation

- Climate change planning may ***help water systems identify and prioritize limiting issues*** (e.g., components or system operations) which could prevent the system from providing adequate water, both in quantity and quality, on a consistent basis. (technical capacity benefits)

Project life cycle cost minimization

- By minimizing the capital costs and operating costs over a project's lifetime, water systems can ***increase investment for other high-priority projects or reduce the need for rate increases***. (financial benefits)

How Can Water Systems Document and Communicate the Benefits of GPR Projects?

Water systems should document and share water quality and public health protection improvements of GPR projects with state personnel and customers. Sharing successes with customers will help build an understanding of the true value of the service and the resource that the water system is providing. Cost-saving and sustainable aspects of projects may increase public support for future infrastructure investments. Some simple ways that systems can explain the benefits of GPR projects include measuring and documenting:

- Improvements in water quality or achieved or sustained compliance with drinking water regulations.
- Energy efficiency gains per unit of water treated or delivered.
- Water efficiency gains comparing water withdrawn from the source per unit of water delivered.
- Reduced cost per million gallon of water treated.

These benefits can be communicated in annual Consumer Confidence Reports (CCRs) and by other means. Systems may also want to communicate the benefits of GPR projects through collaboration with local media and organizations (e.g., radio, newspapers, schools, stores, community groups and social media).

Updates on project progress and benefits can help maintain community interest and support for GPR projects and other infrastructure investments. Water systems can do this by following up on projects and showing that the originally planned benefits of the project are being attained over time.