MASSACHUSETTS
CLEAN WATER TRUST

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Annual Green Bond Report

SEPTEMBER 2021

Office of the State Treasurer | Massachusetts Clean Water Trust
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A Note from the Treasurer

As Chair of the Massachusetts Clean Water Trust (the Trust) Board of Trustees, and in keeping with the Commonwealth's and the Trust's policy of openness and transparency, I am pleased to submit the 2021 annual Green Bond Report, the fourth report of its kind. To date, the Trust has completed six Green Bond issuances totaling approximately $1.1 billion to support 266 local water infrastructure projects.

In 2021, the Trust completed its first ever issue of Sustainability Bonds. Sustainability Bonds finance projects that meet the same standards as the Green Bonds but have the additional impact of serving communities that have socio-economic challenges. The 44 projects funded highlight the Trust's commitment to serving disadvantaged communities throughout the Commonwealth. This innovative designation provides investors with Environmental, Social, and Corporate Governance (ESG) mandates, an opportunity to invest in bonds that help and assist these kind of communities within our state.

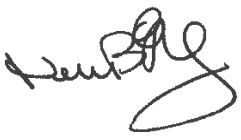
According to Bloomberg Intelligence, ESG investments are on track to exceed $53 trillion by 2025 and will likely continue to grow into the future. In the US, according to the Climate Bond Initiative, Sustainability Bonds went from $1.9 billion in 2019 to $12 billion in 2020. The Trust is one of the first to leverage the Sustainability Bonds designation for water infrastructure through the State Revolving Fund program. US municipalities are in a strong market position to issue Green and Sustainable Bonds, and as this marketplace continues to mature, issuers must commit to transparent and accurate reporting for the bond label to continue to instill investor confidence. The Trust commits to this through consistent reporting now and in the future.

With its AAA credit rating by all three major credit agencies, the Trust provides low interest loans to local governments and other eligible entities for water infrastructure projects across the Commonwealth. These vital projects enhance ground and surface water resources, ensure the safety of drinking water, protect public health, and develop resilient communities. Since its establishment, the Trust has financed approximately $8.1 billion for nearly three hundred borrowers, serving 97% of the Commonwealth's population. The impact of these investments may not always be visible to the public, but it is felt in every glass of water poured, in restored water bodies, and in homes and businesses that receive safe and reliable water.

We are pleased to contribute to this innovative marketplace and stay committed to improving our communications. We ask that you let us know if there are any additional ways that we can meet your information needs. Your feedback is much appreciated and always welcome.

Finally, I am deeply thankful to the staff of the Trust and our program partners, the Massachusetts Department of Environmental Protection and EPA Region 1, for their tireless work and commitment to the communities of the Commonwealth, especially in these unprecedented times. The Trust continues to manage well despite the hurdles of COVID-19, continuing to innovate while remaining dedicated to its mission.

Sincerely,



Deborah B. Goldberg
Treasurer and Receiver-General
Commonwealth of Massachusetts
mass.gov/treasury

Introduction to the Trust

The Massachusetts Clean Water Trust (the Trust), in collaboration with the Massachusetts Department of Environmental Protection (MassDEP), helps communities build or replace water infrastructure that enhances ground and surface water resources, ensures the safety of drinking water, protects public health and develops resilient communities. It accomplishes these objectives by providing low-interest loans and grants to cities, towns, and water utilities through the Massachusetts State Revolving Funds (SRFs). The SRF programs are partnerships between the United States Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts. SRFs function similar to an environmental infrastructure bank by financing water infrastructure projects in cities and towns across the Commonwealth.

The Trust and MassDEP administers two SRFs, the Clean Water and Drinking Water SRFs. The Clean Water SRF (CWSRF) was established in 1987 under the Clean Water Act and the Drinking Water SRF (DWSRF) was established in 1996 under the Safe Drinking Water Act. The Trust manages the flow of funds to borrowers while MassDEP manages project development and oversight.

SRFs receive funding from the EPA in the form of annual capitalization grants, supplemented by state matching grants and the repayment of loans. When loans to local governments are paid back, the funds are then loaned out again, which is how the fund "revolves."

The Trust uses a "leveraged model" to provide funding in excess of the federal and state grants. Bonds are issued in the capital markets and are secured by borrower repayments and reserve funds. The proceeds from bonds are used to provide capital for new below market rate loans to borrowers for water infrastructure. This model has allowed the Trust to finance approximately $8.1 billion in water infrastructure projects from nearly $2.7 billion in federal grants and state matching funds.

The Trust is administered by a three-member board of trustees that is chaired by the Treasurer of the Commonwealth. The Secretary of the Executive Office for Administration and Finance and the Commissioner of MassDEP serve as trustees. The Board of Trustees approves all financial commitments and program decisions during monthly meetings. All Board of Trustee materials can be found on the Trust's website along with all pertinent investor information, including this report.

About this Report

This report is separated into three sections. The first section, "The Trust's Bonds," details the Trust's process for issuing Green Bonds and Sustainability Bonds. This section covers program specific project categories, how projects are selected and an overview of how the Trust operates. The second and third sections provide full project descriptions from the Trust's latest Series 23 issuance, organized by the CWSRF and DWSRF programs. The appendices at the end of this report list all loans by Green Bonds and Sustainability Bonds series that are still being funded. Additional information such as the percent of project funding drawn, and loan numbers are included. Readers should note that the main report sections are organized by projects that, in certain cases, were financed by multiple loans spanning multiple bond series.

Full project descriptions in this report are limited to Series 23 Bonds. For full descriptions of projects financed in previous bond series, please review previous editions of the Green Bond Report, the Trust's Annual Reports, or the specific bond series official statements. All reports and documents may be found on the Trust's website under "Investor Resources": www.mass.gov/orgs/the-massachusetts-clean-water-trust

Why the Trust's Bonds are Green

The Boston Harbor Project, the Massachusetts Water Resources Authority and the Trust

The cleanup of the Boston Harbor is an excellent example of the types of projects the Trust finances. Even though the project was completed well before the "Green Bond" label was in use, this massive undertaking provides investors an historical context for why the Trust's Bonds are Green Bonds. Projects detailed in this and previous reports are often smaller parts of a larger effort completed by communities with the goal of providing infrastructure that delivers reliable and safe services while also maintaining conservation efforts and improving the environmental impact.

In the 1980's, the Boston Harbor was one of the dirtiest urban harbors in the country and was considered a blight for the nation. The International Capital Market Association's (the ICMA) Green Bond Principles notes that proceeds must "contribute to environmental objectives such as: climate change mitigation, climate change adaptation, natural resource conservation, biodiversity conservation, and pollution prevention and control." Through approximately $1.2 billion of subsidized loans from the Trust and an overall project cost of $4.8 billion, the Massachusetts Water Resources Authority (MWRA) turned Boston Harbor into one of the nation's greatest environmental achievements.

A Harbor of Shame

The Boston Harbor was on the receiving end of three centuries of untreated sewage from the ever-expanding City of Boston, as well as the communities and industries that settled along the Charles, Mystic and Neponset rivers. By the 1980s, the flow of wastewater from 2.2 million people in 43 communities and 5,500 businesses in the metro area far exceeded the design capacities of the two outdated wastewater treatment plants.

The system was discharging an estimated 350 million gallons of untreated wastewater and digested sludge a day into the harbor. Due to combined sewer overflows (CSOs), an occurrence where a system conveys wastewater and stormwater in the same pipe, nearly 3 billion gallons a year of partially treated or raw combined sewage was flowing into the harbor and its tributaries. The harbor was polluted, smelled and was filled with partially treated or untreated sewage that floated on the surface and washed ashore. These conditions lead to constant beach closures, bans on swimming and fishing and caused severe damage to the harbor's ability to support a healthy ecosystem.

The Boston Harbor Case (1986)

Amendments to the Federal Water Pollution Control Act of 1972 (the Clean Water Act) created the National Pollutant Discharge Elimination System (NPDES) which created a regulatory regime for legally discharging pollutants directly into waterbodies. In 1986, consolidated lawsuits from the Environmental Protection Agency (EPA) and the Conservation Law Foundation ruled that the MWRA was in violation of its NPDES permit.

The United States District Court ruled that the MWRA must build a new wastewater treatment plant with primary and secondary treatment processes to stop discharging scum and sludge into the harbor and resolve the CSO problem. This ruling led to the Boston Harbor Project (BHP). The MWRA spent approximately $3.8 billion modernizing its wastewater collection and treatment system. It spent nearly $1 billion correcting CSOs throughout Boston and the surrounding metro area.

Source: Massachusetts Water Resources Authority (MWRA)

Boston Harbor Project (1989-2000)

Beginning in 1989, the MWRA began working to meet court ordered standards. It immediately halted the discharge of floating pollution such as grease oil, scum, and plastics, and with the 1991 opening of the Fore River pelletizing plant, ended sludge discharges in the harbor. Between 1991 and 1997, the Deer Island Primary Treatment Plant substantially increased its primary treatment capacity and upgraded the plant to include secondary wastewater treatment which substantially improved the quality of discharged wastewater.

In 1998, MWRA completed system consolidation with a tunnel bored below the harbor connecting the northern and southern wastewater systems and decommissioned the old Nut Island Treatment plant. Finally, in 2000 engineers bored a 9.5-mile-long outfall tunnel used to discharge treated wastewater deep into the Massachusetts Bay. This final project resulted in the end of discharges from the Deer Island Treatment Plant in the Boston Harbor. During this time, the Trust financed $672.8 million in projects for wastewater treatment, conveyance, and improvement and rehabilitation projects through the CWSRF. These subsidized funds helped the MWRA complete these vital projects and to do so at a reduced project cost.

Combined Sewer Overflow Control Plan (1994-2015)

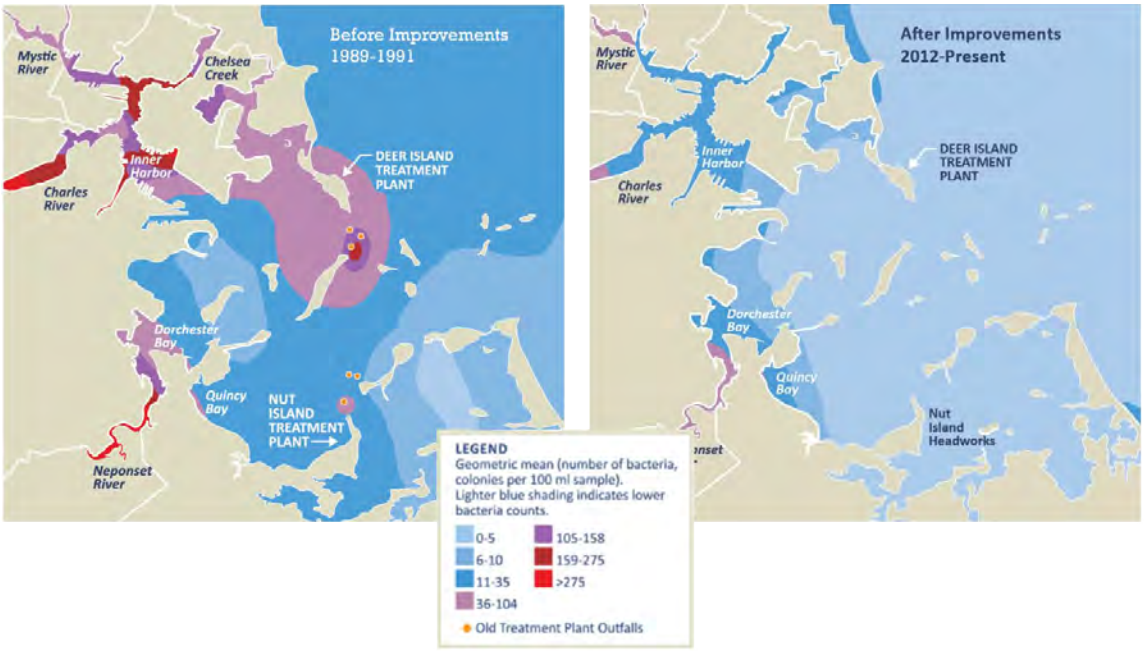
The court ordered MWRA to meet 184 milestones to reduce CSOs and protect the harbor's water quality. MWRA spent $906.6 million, $533.7 of which was financed by the Trust, on 82 construction contracts, 33 engineering contracts and 10 technical assistance and planning contracts to meet the court's milestones. In 1985, there were 84 active stormwater outfalls that discharged into the harbor and its tributaries. By 2015, MWRA had eliminated 34 active outfalls and nearly eliminated five more by undergoing massive sewer separation projects.

Hundreds of miles of new storm sewers and sanitary sewers were installed through densely packed urban neighborhoods requiring cooperation with multiple levels of government and homeowners. These projects reduced the amount of stormwater being transported to treatment facilities during wet weather events and greatly reduced the amount of untreated water being discharged into the harbor and tributary rivers.

Environmental Impact

The MWRA is still cooperating with the United States District Court on ensuring compliance with NPDES permit requirements. The environmental impact of these investments may take decades to fully quantify. However, the following milestones are definitive evidence that these projects have had an enormous impact on the environment and the ecological quality of the Boston Harbor.

- **Scum, sludge and untreated wastewater** are no longer discharged in the harbor
- **Treated wastewater** is significantly improved with decreased solids, pathogens and nutrients. Further, aggressive pretreatment and enforcement has led to a decrease in the number of organic compounds detected such as pesticides and volatile organic compounds (benzene, ethylene glycol, formaldehyde, etc.)
- **Harbor water clarity** has increased with large decreases of metals, pathogens and other pollutants
- **CSO volume** has been reduced by approximately 2.7 billion gallons annually and 93% of current CSOs receive treatment
- **98% of CSO discharges** into the Charles River have been eliminated



"The lighter the blue the better"

Source: Massachusetts Water Resources Authority (MWRA)

The Deer Island Treatment Plant has made significant advances in renewable energy projects while being upgraded. Since 2002, treated water flowing to the bay outfalls has spun hydroelectric generators that produce 6 million kilowatt hours (kWh) annually. Methane produced from treatment process can be used to generate steam power. Wind turbines and solar panels have been installed on the grounds and around the plant to generate additional power. Deer Island Treatment Plant generates nearly a quarter of its own energy onsite. This will be an ever-improving metric as more efficient systems are introduced in the future.

MWRA and Green Bonds

Since Congress authorized the CWSRF in 1987 and the DWSRF in 1996, the Trust has financed over $2 billion in MWRA projects for the improvement or maintenance of its wastewater, stormwater and drinking water systems. The MWRA has made up nearly 25% ($250.5 million) of the $1.1 billion in loans funded by the Trust's Green Bonds. The efforts detailed above are presented as one project but are in fact a series of smaller projects similar to those detailed in this report. The Boston Harbor cleanup was not one single massive project but was instead numerous smaller projects that with incremental improvements become a unified whole with extraordinary results.

These projects reduce pollution, conserve valuable natural habitats, produce energy with renewable resources and promote sustainable water treatment operations in line with ICMA's Green Bond Principles. Projects funded through the Trust's Green Bonds have impact and are essential to the health of our environment and communities. Not all projects financed by the Trust have the environmental impact or address problems as severe in nature as the Boston Harbor, but all projects found within this Green Bond Report have the same goal: preserving natural resources, preventing pollution, and providing efficient well-run water utilities that serve local communities of the Commonwealth.

Source: Massachusetts Water Resources Authority (MWRA)

Source: Massachusetts Water Resources Authority (MWRA)

Section 1 | The Trust's Bonds

In 2021, the Trust successfully issued two series of bonds - Series 23A Green Bonds and Series 23B Sustainability Bonds. This was the Trust's sixth issuance of Green Bonds, but the first issuance of Sustainability Bonds. The sections below will describe the Trust's approach to the Green Bonds and how the Trust has adopted the International Capital Market Association (the ICMA) Green Bond Principles (2018) framework for project selection. Further, this section details how Sustainability Bonds are designated and their distinction from Green Bonds. Finally, the section will describe how the Trust maps projects to United Nations Sustainable Development Goals (the "UN SDGs")

Series 23 has departed from how the Trust has traditionally issued Green Bonds. With Series 23, the Trust made the decision to include all projects associated with the issuance. Previous practice limited project disclosure to those directly funded through bond proceeds. It did not include projects that were pledged to secure the Trust's bonds and not funded directly through bond proceeds. Series 23 includes all projects whether they were bond funded or funded by Trust equity. Tables found in this report that detail the number of projects or loans for previous issuances reflect the policy that was in place at the time of issuance, and should be considered individually.

Finally, project categories detailed in Sections 2 and 3 of this report will be accompanied by historical project funding and number of projects. The funding totals utilized for the categories are based on historical information reported in the EPA's CWSRF and DWSRF National Information Management System (NIMS) Reports. NIMS information is current as of federal fiscal year 2020. Historical information for Clean Water and Drinking Water projects begins with the program formation of 1989 and 1996 respectively. Project descriptions highlighted in gray in Sections 2, 3 and Appendix A are projects that meet the sustainability bonds criteria.

Green Bonds

Since 2015, the Trust has issued over $1.1 billion of its bonds as Green Bonds in compliance with the federal Clean Water Act and the Safe Drinking Water Act. Consistent with the "Green Bond" classification, the proceeds are dedicated to projects that promote pollution prevention, sustainable water, wastewater management, energy efficiency or other environmentally sustainable purposes in alignment with ICMA's *Green Bond Principles*. The Green Bonds were issued to finance 328 loans for 266 water infrastructure projects through the CWSRF and DWSRF programs.

Green Bonds Issued			
Series	**Year**	**Issue Amount**	**Total Loans**
Series 18	2015	$228,155,000	81
Series 19	2016	207,805,000	66
Series 20	2017	207,350,000	51
Series 21	2018	163,460,000	38
Series 22	2019	191,610,000	44
Series 23A	2021	141,945,000	48
Totals		**$1,140,325,000**	**328**

Sustainability Bonds

The Trust issued Sustainability Bonds due to the projects' adherence to the environmental standards of the federal Clean Water Act and the Safe Drinking Water Act and the designation of certain borrowers as "Disadvantaged Communities" under the acts. These projects represent communities that are identified as the most disadvantaged in relation to other communities in the Commonwealth.

The purpose of labeling the Bonds as Sustainability Bonds is to allow investors to invest directly in bonds that finance projects in Disadvantaged Communities and are environmentally beneficial projects that meet ICMA's Green Bond Principles, Social Bond Principles (2020), Sustainability Bond Guidelines (2018) and the United Nations Sustainable Development Goals. Projects designated as "Sustainability Bonds" are made up exclusively from Disadvantaged Communities ranked as Tier 3 according to the Trust's Annual Affordability Calculation as detailed below.

Sustainability Bonds Issued			
Series	**Year**	**Issue Amount**	**Total Loans**
Series 23B	2021	$209,495,000	44
Totals		**$209,495,000**	**44**

The Trust's Disadvantaged Community Program

The Clean Water Act and the Safe Drinking Water Act define a disadvantaged community as a municipality identified by a state's affordability criteria. SRFs are required to provide subsidy to disadvantages communities calculated as an annual percentage of the CWSRF and DWSRF capitalization grant. Massachusetts chooses to award this subsidy in the form of loan forgiveness which reduces the principal obligation that has to be repaid on eligible loans. Additionally, the Trust applies further loan forgiveness through a state matching component in addition to the federal requirement.

The Affordability Calculation is based on an Adjusted Per Capita Income (APCI) metric. This approach identifies communities that are the most in need of additional financial assistance to construct needed infrastructure improvements. In addition to allowing the Trust to determine financial need, the metric uses transparent sources of data that are publicly available. Pursuant to EPA guidance, the criteria must be based upon income, unemployment data, population trends, and other data determined relevant by the state. The Trust and MassDEP use the following formula to calculate the affordability tiers.

Adjusted Per Capita Income (APCI) = PCI * Employment Rate * Population Change	
Per Capita Income *(as listed on the most recent data tables of the Massachusetts Department of Revenue)*	Per Capita Income is a widely accepted metric of an ability to afford the cost of infrastructure projects.
Employment Rate *(as listed on the most recent calendar year data tables of the Massachusetts Department of Revenue)*	The percentage of the workforce employed. Higher employment rates suggest that a community has more residents able to afford the cost of infrastructure than a community with lower employment rates.
Population Change	The percentage of gain or loss, according to the Census data, in a municipal population between 2000 and 2010 Increase in population suggests that the community is experiencing growth, which provides a larger rate payer base to support infrastructure costs. Loss of population suggests negative growth and leaves fewer taxpayers and rate payers to absorb the burden of the infrastructure cost.

Based on the APCI formula described above, the Trust calculates APCI for the state and its 351 individual municipalities annually. Communities that fall below the Commonwealth's APCI are assigned into the three (3) affordability tiers based on a community's APCI as a percentage of the Commonwealth's APCI. The table below shows how the tiers are broken down.

Disadvantaged Community Tier Designation	
Tier 1	APCI equal to or more than 80% of the State APCI, but less than 100% of the State APCI
Tier 2	APCI equal to or more than 60% of the State APCI, but less than 80% of the State APCI
Tier 3	APCI less than 60% of the State APCI

Project Selection

The Trust's loan process is dictated by an annual list of projects the Trust commits to finance called the Intended Use Plan (IUP). MassDEP compiles two IUPs annually, one for each SRF program. Project eligibility is determined by the Clean Water Act and Safe Drinking Water Act for the CWSRF and DWSRF, respectively. Projects that apply for financing are selected during an annual solicitation process.

MassDEP engineers review detailed project specifications and rank them using an established set of criteria that measures the severity of the problem, the sensitivity of the environmental hazard, the public health risk, and the appropriateness of the proposed solution. MassDEP compiles the annual IUPs using this rigorous selection process that establishes the Commonwealth's priorities for the upcoming year.

For CWSRF projects, the program emphasizes watershed management priorities, stormwater management, green infrastructure and encourages communities to undertake projects with meaningful water quality and public health benefits. The DWSRF program emphasizes compliance with federal and state water requirements to protect the public health while addressing the Commonwealth's drinking water needs.

Project Funding

The Trust, MassDEP and EPA have entered into a Revolving Fund Operating Agreement for the CWSRF and the DWSRF. These agreements establish rules, procedures, and activities to be followed by the EPA and the Trust in administering federal grants. To date, the Trust has been awarded approximately $1.7 billion in federal grants and $318.9 million in state matching funds for the CWSRF program. Approximately $602.9 million in federal grants and $115.2 million in state matching funds have been awarded to the DWSRF program. Additionally, the Commonwealth appropriated $30 million for funding or securing financing solely for local community septic management programs.

Project Categories

The SRF programs fund a wide range of projects. Eleven categories of projects are eligible to receive CWSRF assistance and six categories are eligible to receive DWSRF assistance. For the purposes of this report, the Trust has consolidated similar and related categories and omitted categories with no current projects to streamline the report's contents. Below, the Trust has provided an overview of the categories listed within this report.

Clean Water Categories

Wastewater Treatment Projects

These projects involve the maintenance, upgrade or construction of wastewater treatment facilities. A wastewater treatment facility receives all the sewage from a municipality or utility district service area then treats the water before releasing it back into the environment in accordance with National Pollutant Discharge Elimination System permits. The goal of these projects is to reduce or eliminate pollutants and nutrients found in wastewater for cleaner water ways.

The Community Septic Management Program (CSMP)

The CSMP provides loans to the Commonwealth's cities and towns for assisting homeowners with the repair or replacement of failed septic systems. These projects are categorized as non-point source (NPS) projects. These projects help to eliminate contamination from failing septic systems which are a leading source of groundwater pollution causing contaminated drinking water, tainted shellfish beds, weed choked lakes and ponds, and polluted beaches.

Infiltration/Inflow (I/I) and Sewer System Rehabilitation Projects

These projects involve removing infiltration and inflow (i.e. water other than wastewater) from a sewer system, including construction associated with I/I rehabilitation. I/I is when groundwater or stormwater enters a dedicated wastewater or sanitary sewer system either by direct connections or through damaged parts of sewer pipes. I/I increases the flow to wastewater treatment facilities and leads to back-ups or overflows of the system. Sewer system rehabilitation and I/I correction projects are concerned with removing sources of water that are either illicitly being added to a sewer system, or from sources entering via defective pipes or utility access holes. Eliminating I/I and replacing sewer systems reduces the occurrences of overflows, meaning less untreated wastewater is released into the environment.

Collector and Interceptor Sewer Projects

These projects involve the physical conveyance of wastewater. Collector sewers gather wastewater from the source. Interceptor sewers convey wastewater to a treatment facility. Extending capacity in an existing sanitary sewer system can help mitigate issues in communities that have insufficient infrastructure to meet local demand. These projects are generally implemented in conjunction with other project categories such as combined sewer overflow correction which separates stormwater and wastewater collection systems to reduce untreated water being released into surface water bodies.

Combined Sewer Overflow (CSO) Correction Projects

These projects involve the reduction of untreated water discharged from combined sewer systems. Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. During wet weather events, the combined sewer systems can reach capacity and the excess overflows into surrounding waters, creating a combined sewer overflow (CSO). CSO correction projects work to reduce the amount of untreated water discharged from combined sewer systems. The elimination of CSOs is an EPA and Commonwealth priority goal that will reduce the amount of untreated wastewater that is released into the local environment.

Non-Point Source (NPS) Sanitary Landfill

These projects involve the reduction of NPS pollution from landfills by capping, installing leachate collection systems or repairing insufficient or damaged landfill systems. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into ground and surface waters.

Stormwater Infrastructure

These projects involve techniques for managing stormwater to prevent or reduce non-point source pollutants from entering surface waters or ground waters. This includes designing and installing Stormwater Management Systems for conveying, collecting, storing, discharging, recharging or treating stormwater. These systems aim to reduce the overall impact of excess water on an existing system during wet weather events.

Planning Projects

These projects involve developing plans to address water quality and related public health problems. Infrastructure management tracking, capital investment schedules and the adoption of best management practices are also objectives. For example, comprehensive wastewater management plans provide strategies for addressing wastewater treatment and disposal issues in a city or town. Integrated municipal stormwater and wastewater resource management planning assists municipalities with meeting requirements that arise from distinct wastewater and stormwater programs. Fiscal sustainability and asset management planning assists communities with maintaining replacement schedules and forecasting capital needs.

Drinking Water Categories

Drinking Water Treatment Projects

These projects involve the upgrade, maintenance, and construction of water treatment facilities. These projects are meant to improve the overall quality of drinking water and are targeted at removing specific pollutants that are known health risks. Treatment plant upgrades can impact the overall efficiency of a plant's energy consumption. Replacing equipment at the end of its useful life will improve overall system efficiency. New pumping and filtering equipment are designed with energy efficiency in mind.

Drinking Water Transmission and Distribution Projects

These projects involve the infrastructure that brings raw water to treatment facilities and the infrastructure that conveys treated water for consumption. This includes everything from large transmission mains from reservoirs to the service lines that provide treated water to homes and businesses. Lines at the end of their useful life can lead to inefficiency in water transmission. Older pipes, made of lead or cast iron, can be severe health risks when corrosion occurs. Upgrades to pumping and booster stations make the transmission process more energy efficient and improve the overall efficiency of the system.

Drinking Water Source and Storage Projects

These projects involve two distinct categories. Source water projects are related to untreated water sources – such as rehabilitating surface water in a reservoir or drilling and maintaining wells. Storage projects deal with infrastructure for maintaining and storing treated water before it is distributed into a system.

Drinking Water Planning and Design Projects

These projects involve the activities needed to plan, design and/or study drinking water infrastructure. Such projects are essential for maintaining and improving the key infrastructure that protects public health and water quality.

United Nation Sustainable Development Goals Project Mapping

The United Nation Sustainable Development Goals (UN SDGs) are 17 goals adopted as part of the 2030 Agenda for Sustainable Development. The goals were adopted by all United Nations Member States in 2015. The UN SDGs are meant to provide a blueprint for combating poverty, spurring economic growth and improving health and education while ensuring both climate and environmental sustainability. In reference to the ICMA's Green and Social Bonds: A High-Level Mapping to the Sustainable Development Goals (June 2020), the Trust intends for the proceeds from the designated bonds to be used in a manner that is expected to be consistent with the following UN SDGs.

Mapping Green Bonds

Consistent with the "Green Bond" classification, the proceeds from the Green Bonds will be dedicated to projects that promote pollution prevention, sustainable water and wastewater management, energy efficiency or other environmentally sustainable purposes in alignment with ICMA's Green Bond Principles (2018). While the Trust intends for projects financed with Green Bonds to adhere to the applicable UN SDGs as detailed below, the Trust does not guarantee that such criteria will ultimately be met, either in substance or with respect to any particular timelines set forth in the UN SDGs.

Goal 6: Ensure availability and sustainable management of water and sanitation for all

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all

6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.b Support and strengthen the participation of local communities in improving water and sanitation management

Goal 12: Ensure sustainable consumption and production patterns

12.2 By 2030, achieve the sustainable management and efficient use of natural resources

12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

Programs	Project Category	UN SDG Alignment
CWSRF Eligible Projects	Wastewater Treatment	6.3, 6.4, 12.4
	Community Septic Management Program	6.3, 6.b, 12.4
	Collector and Interceptor Sewers	6.3, 6.4, 14.1
	Combined Sewer Overflow Correction	6.3, 6.b, 12.2, 14.1
	Infiltration/Inflow and Sewer System Rehabilitiation	6.3, 6.b, 14.1
	Non-Point Source Sanitary Landfill	6.3, 6.b, 12.2, 12.4, 14.1, 14.2
	Stormwater Infrastructure	6.3, 6.b, 12.2, 14.1, 14.2
	Planning	6.3, 6.4, 6.5, 6.b, 12.2, 14.1
DWSRF Eligible Projects	Drinking Water Treatment	6.1, 6.4, 6.5, 12.4
	Drinking Water Transmission and Distribution	6.1, 6.4, 12.2
	Drinking Water Source and Storage	6.1, 12.2, 12.4
	Drinking Water Planning and Design	6.1, 6.4, 6.5, 6.b, 12.2, 12.4

Mapping Sustainability Bonds

Projects financed as Sustainability Bonds will generally adhere to the UN SDGs as detailed above as well as the UN SDGs detailed below. In addition, the projects financed by the Series 23B Bonds will be located in Tier 3 Disadvantaged Communities based on the Affordability Calculation previously described, which is determined at the time of project approval. The Trust does not guarantee that such criteria will ultimately be met, either in substance or with respect to any particular timelines set forth in the UN SDGs.

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

Goal 10: Reduce inequality within and among countries

10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all

Project Deep Dive • Town of Pepperell

Pepperell Wastewater Treatment Plant Upgrade
Series 23A Loan Amount: $4,511,146

Project Summary

The northern flowing Nashua River, whose watershed encompasses 538 square miles in 32 communities in north-central Massachusetts and southeastern New Hampshire, was plagued for over a century by industrial waste and under treated sewage pumping into the river from the cities dotting the branching river. This culminated into the river being stagnant, highly odorous, and unfit for recreation or consumption. Clean up efforts in the 1960's and the passage of the Clean Water Act began the process of cleaning the river with the goal of making it cleaner and safe.

These efforts included the construction of wastewater treatment plants. While the river has seen vast improvements, it is currently listed as impaired in the Massachusetts Integrated List of Waters due to exceedances of bacteria and phosphorus Total Daily Maximum Loads (TMDLs) attributed to discharges from wastewater treatment facilities and stormwater runoff.

The Town of Pepperell operates the Pepperell Wastewater Treatment Plant (WWTP), originally constructed in 1975 to ensure Pepperell and the Town of Groton were properly treating wastewater that was being discharged into the river. The WWTP discharges water that has been treated to remove solids, clarified, exposed to ultraviolet (UV) disinfection, and then finally discharged into the river. Sludge and other solids are disposed of offsite. MassDEP and EPA require hundreds of analytical reports annually to meet the current effluent discharge requirements.

The Clean Water Act prohibits discharging pollutants through a controlled source or "point source," in this case the WWTP, into a water body unless they have a National Pollutant Discharge Elimination System (NPDES) permit. These permits specify what the EPA has determined as an acceptable level of pollutants that can be discharged into a specific water body through a point source. These permits must be re-issued every five (5) years. Requirements for meeting NPDES standards have increased over time and can require permit holders to increase their level of filtering or adjust their infrastructure. In this case, Pepperell is required to not exceed a TMDL of 1 milligram per liter of total phosphorus.

Pepperell, in response to newly proposed requirements associated with their NPDES permit, initiated WWTP Upgrades, which is being financed as part of the sale of the Series 23A Bonds. This project involved a new, smaller, force main and influent pump with variable frequency drives (VFD) to allow more efficient pumping at low and average flows. An existing dewatering feed (with grinder) and grit pump were replaced with new pumps on VFDs and premium motors.

New heating, ventilation, and air conditioning (HVAC) systems in the process building bring the building up to current codes and improve overall HVAC efficiency. Process building improvements also include new windows, high efficiency natural gas boiler, and lighting upgrades. A new aeration main and distribution piping and new dissolved oxygen and blower on/off controls are included. This allows the facility to reduce the load of the blowers, saving energy. Finally, the Supervisory Control and Data Acquisition system was upgraded to modern specifications. Completing these upgrades will bring Pepperell into compliance with their more recent NPDES permit.

Future Activities

Beyond these upgrades, Pepperell, has committed to undertaking a number of measures to reduce the amount of untreated water being discharged into the Nashua River. Pepperell has joined the Merrimack River Stormwater Coalition – which pools resources to streamline NPDES activities, will complete street cleaning and catch basin cleaning to reduce contaminants and ensure system efficiency. Finally, in the future the Town has proposed completing a sanitary sewer survey to confirm current condition and prioritize resource for future capital improvements. These activities are on top of public outreach and local regulation changes meant to decrease pollution.

Environmental Project Results

Treated water and plant improvement help ensure that the Nashua River continues on its path to recovery. The river maintains it classification as being suitable for recreation and safe for wildlife through many segments of the river. Further, this project and other efforts related to stormwater improvements, future construction efforts and membership with a coalition of communities that coordinate to improve the Nashua River, display Pepperell's commitment to improving this valuable natural resource.

Section 2 | Clean Water State Revolving Fund Projects

Wastewater Treatment Projects

Wastewater treatment projects are eligible for SRF assistance under the Clean Water Act for facilities that provide, or are being upgraded to provide, secondary or advanced wastewater treatment. Water treatment facility upgrades or improvements can vary widely depending on the age of the infrastructure in question. These facilities are governed under National Pollutant Discharge Elimination System (NPDES), which determines the level of water treatment required to discharge wastewater. Many of the upgrades help facilities meet environmental and public health requirements. Upgrades include replacing inefficient mechanical equipment, upgrading pollutant removal systems, or updating water storage facilities to reduce odor.

Wastewater Treatment Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$2,537,035,671	341	$147,494,137	11

Series 23 Wastewater Treatment Impact

- **Greater Lawrence Sanitary District** has developed an Organics to Energy program to upgrade Wastewater Treatment Facility to achieve co-digestion of organic food waste to produce enough electricity to virtually remove its reliance on the electrical grid and gas storage will further reduce the district's reliance on natural gas.
- **Brockton, Fall River, Fitchburg, Haverhill, Marion, and Pittsfield** completed wastewater treatment upgrades to comply with National Pollutant Discharge Elimination System (NPDES) permit requirements. Upgrades reduce contaminants such as nitrogen from being discharged from wastewater treatment systems.
- **Fall River, Greater Lawrence Sanitary District, and Pittsfield** projects reduced contaminants being introduced into the Mr. Hope Bay, Merrimack and Spicket Rivers, and Housatonic River Area respectively.
- **Fitchburg, Gardner, Greater Lawrence Sanitary District, Massachusetts Water Resources Authority, and Pepperell** projects resulted in upgrading wastewater infrastructure that will increase the plant and process efficiency that will reduce energy consumption and reduce costs.

Borrower	Project Description	Amount
Brockton	**Wastewater Treatment Plant (WWTP) Upgrade** This project enabled the Brockton Advanced Water Reclamation Facility (AWRF) to comply with its National Pollutant Discharge Elimination System (NPDES) permit biological nutrient removal requirement toachieve effluent total nitrogen (TN) of 450 lbs./day seasonally, equivalent to 3 mg/L on an 18 MGD average flow basis. These improvements were demonstrated in a full-scale pilot process train that has been operational for two full nitrogen-removal seasons. This project upgraded the AWRF's other six aeration basins and other AWRF improvements as necessary to support the process upgrade.	**$5,412,841**
Fall River	**Wastewater Treatment Facility (WWTF) Improvements** The City of Fall River's Wastewater Treatment Facility (WWTF) required rehabilitation and upgrades to maintain reliable operation and performance. EPA indicated its intent to include a nitrogen limit in the City's next National Pollutant Discharge Elimination System (NPDES) permit. Mt. Hope Bay is listed as impaired. Fall River's wet weather discharges and operational Sanitary Sewer Overflows (SSOs) contribute to its impairment. Recent air quality regulations (Title V) necessitated shut down of the WWTF incinerator causing liquid sludge to be trucked off site for disposal, dramatically increasing disposal costs. Administrative facilities were ineffective and undersized for current needs and were upgraded along with the site's electrical and security infrastructure.	**$21,018,115**
Fitchburg	**Fitchburg Wastewater Treatment Facility Secondary Systems Upgrade** The Fitchburg Easterly WWTF is a secondary treatment facility with average annual flows of about 9.8 MGD. This project includes elements to significantly improve discharge permit compliance. These include: upgrades to the secondary treatment system with a biological selector zone to increase peak flow capacity, provide biological nutrient removal and improve permit compliance; replacement of existing primary and secondary sludge pumps, aeration blowers, pipes, valves, fine bubble diffuser, clarifier mechanisms, surface repairs to existing concrete aeration and clarifier tanks; installation of two new emergency generators; and instrumentation and electrical improvements; and modifications to the existing flood protection berm.	**$1,691,026**
Gardner	**Gardner Sludge Dewatering Replacement Project** This project was for the removal of two existing belt filter presses and replacement with two centrifuges. The project included structural upgrades to the building, replacement of the polymer feed system and other ancillary support equipment including piping and pumps. These upgrades provide operational efficiency leading to cost savings and better wastewater treatment.	**$6,333,060**
Greater Lawrence Sanitary District (GLSD)	**Organics to Energy** In June 2013, Greater Lawrence Sanitary District (GLSD) developed the Organics to Energy Feasibility Study outlining a three-phase program of Wastewater Treatment Facility upgrades recommended to achieve co-digestion of organic food waste with the facility's wastewater sludge. In October 2014, the GLSD began Phase 1 improvements intended to control digester foaming incidents, thereby allowing the anaerobic sludge digestion operation to be expanded to co-digestion in Phase 2. 9Phase 2 included a Biogas metering system upgrade, addition of a waste blending tank and mixing system to facilitate acceptance of organic material, addition of high-pressure digester feed pumps to handle organic material and a pilot testing program for operating the co-digestion system. Phase 3 included the installation of additional digester gas storage and combined heat and power (CHP) processes. If successful, GLSD will have the potential to produce enough electricity to virtually remove its reliance on the electrical grid and the additional gas storage included in Phase 3 will further reduce GLSD's reliance on natural gas.	**$25,290,070**

Borrower	Project Description	Amount
GLSD	**Combined Sewer Overflow Abatement Program** The Greater Lawrence Sanitary District (GLSD) provides wastewater treatment for the communities of Lawrence, Methuen, Andover, North Andover, and Salem NH at its Wastewater Treatment Plant (WWTP) in North Andover. Wastewater from the member communities is conveyed to the GLSD WWTP via three main interceptors owned and operated by GLSD. The Riverside Pump Station conveys interceptor discharge to the WWTP. When the Riverside Pump Station is overwhelmed during wet weather conditions, combined stormwater and sewage discharges to the Merrimack and Spicket Rivers through five permitted CSO outfalls located along the interceptors. The June 2009 Final Long Term CSO Control Plan and Environmental Impact Report (FLTCP/FEIR) identified four phases of improvements needed to the GLSD infrastructure to comply with CSO discharge requirements. Phase 2 will involve increasing the energy efficiency and pumping capacity of the Riverside Pump Station. The work to be completed includes rebuilding the pumps with larger impellers to increase pumping capacity, replacing the motors with new premium efficiency motors, installing new variable frequency drives, replacing the electrical switchgear, and upgrading the heating and ventilation system.	**$8,739,493**
Haverhill	**Haverhill Wastewater Treatment Facility (WWTF) Improvements** This project included improvements to the Wastewater Treatment Facility's (WWTF's) secondary treatment system with aeration blowers and sludge pumps/piping, as well as appurtenant electrical upgrades. These improve the ability to meet the National Pollutant Discharge Elimination System (NPDES) permit limits. The improvements involved upgrades to the city-wide Supervisory Control and Data Acquisition (SCADA) system, the WWTF and pump stations, two significant pump stations to address repeated mechanical issues and an odor control biofilter to mitigate impacts on abutting residents.	**$7,408,631**
Marion	**Wastewater Treatment Plant & Collection System Improvements** The objective of this project is to address regulatory required upgrades at the Town's Wastewater Treatment Plant (WWTP) and improve the overall operations. This is to be achieved by reducing the volume of Infiltration and Inflow (I/I) entering the collection system, addressing improvements at the WWTP as required by the Town's final National Pollution Discharge Elimination System (NPDES) permit and complete wastewater pumping station improvements to address aging equipment.	**$7,002,294**
Massachusetts Water Resources Authority (MWRA)	**Wastewater Treatment Plant and Sewer Improvements** This project included upgrades to the Deer Island Wastewater Treatment Plant automation and central control systems as well as improvements and upgrades to several existing interceptors and pump stations that are in need of replacement and/or modernization. The project extends current asset life and improves system operability.	**$2,350,379**
Pepperell	**Pepperell Wastewater Treatment Facility (WWTF) Upgrade** This project involved a new, smaller force main and influent pump with a variable frequency drive (VFD) to allow more efficient pumping at low and average flows. The existing dewatering feed (with grinder) and grit pump was replaced with new pumps on VFDs, premium motors and a Supervisory Control and Data Acquisition (SCADA) system upgrade. New HVAC in the process building brought the building up to current codes and improved overall HVAC efficiency. Building improvements included new windows, a high efficiency natural gas boiler, and lighting upgrades. A new aeration main and distribution piping with upgraded controls were added. This allows the facility to reduce the load of the blowers and saving energy.	**$4,511,146**

Borrower	Project Description	Amount
Pittsfield	**Wastewater Treatment Plant (WWTP) Nutrient Removal** This project upgrades the WWTP to achieve compliance with National Pollutant Discharge Elimination System (NPDES) permit limits and an Administrative Order issued by the EPA. The project optimized the nitrogen removal process and resulted in reductions of phosphorus and aluminum discharges to the Upper Housatonic River Area of Critical Environmental Concern and remediated documented nutrient enrichment in the downstream Wood's Pond impoundment. Four major component projects are necessary to achieve compliance: Tertiary Treatment Upgrade, Sludge Dewatering Upgrade, Nitrogen Removal Upgrade (Phase I) and Secondary Clarifiers Upgrade. The project components are consistent with the plant needs and energy efficiency improvements identified in the recently updated WWTP Facilities Plan.	**$57,737,082**

Community Septic Management Program

The Community Septic Management Program (CSMP) provides loans to the Commonwealth's cities and towns for assisting homeowners in the repair or replacement of failed septic systems. These projects help to eliminate contamination from failing septic systems which are a leading source of groundwater pollution causing contaminated drinking water, tainted shellfish beds, weed choked lakes and ponds, and polluted beaches. With the CSMP, the Trust issues low-interest rate loans to communities who, in turn, issue loans directly to homeowners for up to 20 years. Loans to homeowners are secured through a betterment on their properties. This program allows municipalities to provide access to capital for home septic repair or replacement at a subsidized interest rate. The program is funded as a non-point source program within the CWSRF program as non-point source (NPS) projects.

Community Septic Management Program Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$116,445,441	398	$2,989,822	6

Series 23 Community Septic Management Program Impact

- **Repair and replacement** of failing septic systems can be a vital component for reducing pollution. This especially important to communities with little wastewater infrastructure. For example, Cape Cod contains roughly 145,000 developed parcels. 74% of these homes and businesses are not connected to a wastewater treatment system and utilize septic systems. Septic Nitrogen loading accounts for roughly 80% of the water quality degradation of Cape Cod.

Community Septic Projects		
Borrower	**Project Description**	**Amount**
Avon	Community Septic Management Program	$400,000
Cohasset	Community Septic Management Program	$150,000
Easton	Community Septic Management Program	$1,000,000
Nantucket	Community Septic Management Program	$1,040,600
Plymouth	Community Septic Management Program	$200,000
Scituate	Community Septic Management Program	$199,222

Infiltration/Inflow (I/I) and Sewer System Rehabilitation Projects

These projects correct sewer system infiltration and inflow problems. Infiltration includes water, usually groundwater, penetrating a sanitary or combined sewer system from the ground through defective pipes or utility access holes. Inflow includes controlling the penetration of water, usually stormwater, into a system from sump pumps, drains, storm sewers, and other improper entries. Sewer system rehabilitation projects maintain, reinforce, or reconstruct deteriorating or undersized sewer systems. The corrective actions are necessary to maintain the functional integrity of the system.

Infiltration/Inflow (I/I) and Sewer System Rehabilitation Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$851,736,636	341	$86,490,955	14

Series 23 Infiltration/Inflow (I/I) and Sewer System Rehabilitation Project Impact

- **Hull, Greater Lawrence Sanitary District (GLSD) and New Bedford** upgraded their Capacity, Management, Operations and Maintenance (CMOM) systems for the identification and mitigation of I/I issues. These upgrades lead to less water that needs to be treated and will lead to less combined sewer overflow. Implementation of these upgrades helped bring many utilities in line with NPDES permit requirements.
- **Fall River, Hull, GLSD, Massachusetts Water Resources Authority (MWRA), Nantucket, New Bedford, Revere, Saugus and West Springfield** upgraded pumping stations, replaced failing waste collections mains, or replaced failing mechanical and/or electrical systems that will lead to more efficient waste water systems that have treated less water while operating with more energy efficient components.
- **Lawrence, New Bedford, Revere, Saugus and West Springfield** implemented illicit discharge detection and elimination activities that removed illicit drain connections from sump pumps, gutters and the like that increase the volume of water during wet weather events. These improvements help provide more cost-effective wastewater treatment.

Borrower	Project Description	Amount
Fall River	**President Avenue Sewer Pump Station Replacement** This project replaced a 1,400 gallons per minute sewer pump station that serves a population equivalent of 4,500. Constructed in the 1960's, the pump station was beyond its useful life. Existing piping, pumps, electrical equipment, instrumentation, and standby power system were severely corroded due to age, and is unable to consistently handle wet weather flows, resulting in sanitary sewer overflows (SSO's). A new submersible pump station was added for additional capacity, a standby power generator, motor controls and Supervisory Control and Data Acquisition (SCADA) system. Force main isolation valves, bypass connection and flow meter will give the City flexibility in emergency operations and SSO control.	**$3,930,559**

Borrower	Project Description	Amount
Hull	**Fiscal Sustainability Plan and Capacity, Management, Operations and Maintenance (CMOM) Upgrades** The Town of Hull, in compliance with an administrative order of consent, completed a Fiscal Sustainability Plan (FSP) in June 2017 which prioritized facility/wastewater system upgrades along with Capacity, Management, Operations and Maintenance (CMOM). This project addresses three construction contracts. that were deemed an extreme risk to the system and a priority for immediate attention due to age, historic failure histories, impacts to the wastewater operations and cost benefit analyses of repair/replacement. The construction project includes sewer interceptor pipeline renewal, Atlantic Avenue/Gunrock area sewer infrastructure renewal, and critical replacements for publicly owned treatment works contracts.	**$9,831,151**
Lawrence	**Sewer System Rehabilitation** Wastewater from the City of Lawrence is part of the Greater Lawrence Sanitary District (GLSD) system which discharges into the Merrimack River. The current National Pollutant Discharge Elimination System (NPDES) permit became effective in 2005 and required all members of GLSD to develop Infiltration/ Inflow (I/I) Control Programs to find, document and eliminate I/I sources within their respective systems. The City completed several of the required tasks and began portions of the Phase I and II Sewer System Evaluation Survey (SSES) and Capacity, Management, Operations and Maintenance (CMOM) work. The current project includes Cast-in-Place Pipe Lining (CIPP) and replacement of sewer main in areas across the City.	**$442,092**
Lawrence	**Sewer and Drainage Improvements** This project rehabilitated and replaced sewer system defects along with operational and maintenance issues identified in the 2017 Sewer System Evaluation Survey (SSES) report. The Sewer and Drainage System Improvements addressed structural pipe failures, reduced Infiltration and Inflow (I/I) sources and abated illicit cross-connections to the Municipal Separate Storm Sewer Systems (MS4) areas.	**$17,930,298**
MWRA	**Facility Asset Protection** The Cottage Farm Combined Sewer Overflow (CSO) Facility Improvements project is one of the critical wastewater system improvements projects that MWRA has identified. This project addresses critical needs for system rehabilitation, reliability, and optimization of the MWRA wastewater collection system.	**$767,671**
MWRA	**Remote Headworks Upgrade** MWRA has three remote headworks - Chelsea Creek, Columbus Park, and Ward Street - which were built and placed into operation in the 1960's. All wastewater flows from the MWRA Northern Service Area are collected at the remote headworks before reaching the Deer Island Treatment Plant. Preliminary treatment and flow control are performed at the remote headworks facilities. This project addresses aging infrastructure and improves operational reliability by replacing all mechanical, electrical, HVAC, plumbing, and appurtenant equipment at all three facilities.	**$22,030,256**
Nantucket	**Emergency Sewer Force Main Assessment Project** This project for an emergency assessment of Sewer Force Mains (FM), because of catastrophic failure of a force main in January 2018. Excavation of access pits, cleaning, and television of pipeline; repair of defects, installation of air relief valves, and blow off valves, utility access holes, and restoration of disturbed areas.	**$3,801,862**
New Bedford	**Pumping Station Improvements** This project was for the upgrade of three pumping stations in the City of New Bedford that were identified as high priority for overhaul. These recommendations were based on a developing Integrated Plan. Upgrades were necessary to ensure adequate system capacity and effective wastewater treatment.	**$7,084,728**

Borrower	Project Description	Amount
New Bedford	**Wastewater Collection System Improvements** The Wastewater Collection System Improvements project includes an interceptor and collector sewer rehabilitation program, a lateral sewer rehabilitation program, an illicit discharge removal program, and an over-under access manhole program. The progression of these programs will further the City's efforts to lessen or eliminate Infiltration/Inflow (I/I) issues, reduce CSOs, reinforce the critical components of the city's sewer system, address Capacity, Management, Operations and Maintenance (CMOM) and regulatory requirements, and eliminate illicit discharges. These programs address needs identified in the City's Integrated Plan.	$1,387,889
Revere	**Phase VIII - I/I, IDDE, P.S., & Drainage** The Phase VIII Construction Project will include the removal of Infiltration/inflow (I/I) from the City's sewer system. I/I contributes excess volume to the sanitary sewer, which may lead to overflows and capacity issues. Construction included the redirection of public and private inflow sources discovered during field investigations, Illicit Discharge Detection and Elimination (IDDE) source removal, and drainage improvements. Construction also included pump station improvements (both stormwater and wastewater), CIPP (Cured in Place Pipe) lining, sewer spot repairs, replacements, new sewer lines, cleaning, and additional wastewater metering.	$373,953
Revere	**Illicit Connection & Sump Pump Removal Program** The continuation of the implementation through construction contracts of the Illicit Connection and Sump Pump Removal Program is essential for the City of Revere to meet their goals and comply with the Consent Decree. There are a significant number of illicit sump pumps, roof drains, roof leaders, driveway drains, yard drains, connections from private homes and businesses that must be removed from the sewer in order to remove inflow and increase the wastewater capacity of the City's sewer system. These contracts become the mechanism to remove the illicit inflow.	$1,564,017
Revere	**Phase IX Construction- I/I, IDDE, P.S. & Drainage** This project included the removal of inflow/infiltration (I/I) from the City's sewer system, and the redirection of public and private inflow sources discovered during the field investigations, Illicit Discharge Detection and Elimination (IDDE) source removal, and drainage improvements. Construction included pump station improvements (both stormwater and wastewater), Cast-in-Place Pipe Lining (CIPP) lining, sewer spot repairs, replacements, new sewer lines, cleaning and additional wastewater metering.	$4,415,387
Saugus	**Comprehensive Sewer System Rehab. Subsystem 1C** This project includes sewer system rehabilitation in Subsystem 1C in Saugus. Construction will include the rehabilitation of pipelines, utility access holes, and the removal of private inflow sources as necessary to eliminate Infiltration/Inflow (I/I) from the system. Approximately 15,400 feet has been identified as needing Cast-in-Place Pipe Lining (CIPP) in Subsystem 1C to eliminate I/I. This project will also include the installation of a lining system to improve the quality of the service to the mainline connection. There are approximately 280 of this type of connection in Subsystem 1C. Approximately 72 utility access holes have also been identified as needing rehabilitation. Each manhole will be lined using the latest standards.	$1,310,267
West Springfield	**Pump Station Improv and Infiltration/Inflow (I/I) Reduction Project** This project implements capital improvement plan recommendations including replacement of outdated pumps, controls, emergency power generators, emergency lighting, ventilation and air quality monitoring systems, dry well flood alarms, heating systems, and building foundation repairs. The I/I project implements Sewer System Evaluation Survey (SSES) recommendations including 11 sewer disconnections, 128 manhole rehabilitations, wall rehabilitation and corbel repair, 250 ft of cured-in-place liners, 600 ft of CCTV inspection, 14 spot liner repairs, and 83 sewer lateral inspections. Improved efficiencies provide better and more cost-effective treatment.	$11,620,825

Collector and Interceptor Sewers Projects

According to the EPA, millions of gallons of human and industrial waste are sent through complex underground collections systems. These systems operate all day, every day. Most municipal sewer systems are at least 60 years old. Collection systems consist of pipelines, conduits, pumping stations, force mains, and other components to collect wastewater and convey it to treatment facilities before being discharged into the environment. Design, operation, and maintenance are critical for system efficiency and public health. System expansions can be used to mitigate issues with combined sewer overflows and septic systems. **New collector sewers** are projects associated with new pipes used to collect and carry wastewater from a sanitary or industrial wastewater source to an interceptor sewer that will convey the wastewater to a treatment facility. **New interceptor sewers** are projects for constructing new interceptor sewers and pumping stations that convey wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. This category includes costs for relief sewers, which are designed to handle the excess capacity of an existing system.

Collector and Interceptor Sewer Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$1,072,088,503	381	$40,334,371	4

Series 23 Collector and Interceptor Sewers Project Impact

- **Billerica, Norton, Plymouth and Tyngsborough** improved, repaired, or expanded their wastewater collection systems to reduce the amount of untreated wastewater being discharged into the environment.
- **Billerica, Norton and Tyngsborough** expanded their systems to remove or mitigate failing septic systems. Removing these septic systems will protect and enhance the Concord River Watershed and Shawsheen River Basin in the case of Billerica, Flint Pond and Merrimack Watersheds in the case of Tyngsborough. Norton's project protects its local ground water which is vital for public health and town-wide water quality.

Borrower	Project Description	Amount
Billerica	**Sewer Contract 36** The Town of Billerica's Sewer Contract 36 addressed the third priority Needs Area from the its Comprehensive Wastewater Management Plan. The project consisted of sewer replacement, extension of new sewer, removal of failing and/or improperly operating septic systems and connection to sewer, and the construction of two new pump stations. The Project aids in reducing degradation to the water resources in the Concord River Watershed and the Shawsheen River Basin, as well as protect the public health from the chronic septic failures documented in the area. The project included approximately 5.3 miles of new sewer, 2.8 miles of sewer replacement and construction of two new pump stations.	**$13,117,593**
Norton	**West Main Street Sewer Extension Project** This project involved providing new sanitary sewers to reduce pollution caused from the failed and malfunctioning private onsite sewage disposal systems, and more specifically the already failed systems at the Woodland Meadows Elderly Housing development. The new system provides the ability to connect the high school and the Yelle School to the sewer and bring the sewer closer to the middle school for future connection and decommissioning of their WWTF, which is currently experiencing problems meeting Groundwater Discharge Permit requirements. This project connects the properties to the MFN Regional Wastewater Treatment Facility (WWTF). Failures of these onsite systems directly affects the quality of groundwater and surface water in the project area.	**$4,693,231**
Plymouth	**Emergency Sewer Force Main Repairs & Rehabilitation** This project was for the emergency sewer force main repair and replacement in the Town of Plymouth, that was needed due to several breaks and resulting findings of excessive deterioration of the existing 30-inch ductile iron force main. The project consisted of three contracts; 1A Emergency Response and bypass systems, 1B Existing Force main-Slip line and replacement and 2 Redundant 24-inch sewer force main.	**$13,241,047**
Tyngsborough	**Sewer Extension Phase 1** The Town of Tyngsborough experienced water quality problems associated with failing private on-site wastewater disposal systems. The Phase I Sewer Extension project was in the Flint Pond Watershed Basin, which is well documented as an impaired basin. All sewer was within the current wastewater discharge permit limits for flow rate. Removing failing and/or improperly operating septic systems protects and enhances the Merrimack Watershed and preserves its designated uses.	**$9,282,500**

Combined Sewer Overflows Correction Projects

Combined sewer overflows (CSOs) are events where a combined sewer system fails to collect rainwater, domestic sewage and industrial wastewater in the same pipe as intended. When these systems exceed their capacity, untreated water can discharge directly into a water body. CSO correction projects are associated with measures used to achieve water quality objectives by preventing or controlling periodic discharges that occur when the capacity of a sewer system is exceeded during a wet weather event.

Combined Sewer Overflow (CSO) Correction Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$1,591,960,023	213	$66,956,032	3

Series 23 Combined Sewer Overflows Correction Project Impact

- **Fall River, Springfield Water & Sewer Commission and Taunton** completed projects that work to reduce the amount of untreated sewage discharged into rivers and nearby water bodies during wet weather events. These projects help protect water quality and public health.
- **Springfield Water & Sewer Commission's** CSO project will reduce the amount of untreated water being discharged into the Connecticut river by 40% annually. This project will help reduce the amount of pollutants that affect environmentally threatened and endangered animals, while also improving water quality that will eventually flow into the Long Island Sound.
- **Taunton's** project removed a pump station that was well beyond its useful life and situated in a 100-year floodplain. This project will improve the overall efficiency of this section while reducing the number of CSO events with the updated pump station.

Borrower	Project Description	Amount
Fall River	**Combined Sewer Overflows (CSO) Abatement Program-Middle Street** The City of Fall River is under federal court order (FCO) to control combined sewer overflows (CSOs) to areas receiving water. The terms of the FCO require the City's CSOs achieve a 3-month level of control by the end of 2025. While the CSOs to Mount Hope Bay outfalls have been mitigated by the CSO tunnel, additional CSO control is required to meet the FCO requirements. The FCO requires sewer separation with green infrastructure as the method of CSO control. Sanitary Sewer Overflows (SSOs) and street flooding will also be addressed, especially in the vicinity of St. Anne's Hospital. 2012 storms resulted in flooding/ closure of the St. Anne's Hospital emergency room.	**$2,321,027**
Springfield Water & Sewer Commission	**York St. Pump Station & Connecticut River Crossing** Consistent with the Springfield Water and Sewer Commission's Integrated Wastewater Plan, the York Street Pump Station and Connecticut River Crossing Project will increase the wet weather flow to the Springfield Regional Wastewater Treatment Facility (SRWTF), substantially reducing the volume and frequency of combined sewer overflow events from multiple Combined Sewer Overflow (CSO) regulators across the Connecticut River CSO system. The Project includes a new 62 MGD wastewater pumping station and screening facility, three new pipes crossing under the Connecticut River to the SRWTF, and modification to the SRWTF's Influent Structure.	**$54,360,205**
Taunton	**Main Lift Pump Station Improvements** The Taunton WWTF receives all its flow from the Main Lift Pump Station, and improvements to the station are required to provide reliable operation. This project replaced the existing station and included new screening facilities, new pumps and force main, and electrical equipment and controls. The primary goals of the project are to provide more reliable service, increase pumping capacity, and reduce combined sewer overflows into the Taunton River. Previously, when flows exceed the capacity of the Main Lift station, the system surcharges and overflows went into the river. Pumps frequently clogged with debris, which should now be reduced by a screening system.	**$10,274,800**

Stormwater Infrastructure

These projects involve techniques for managing stormwater to prevent or reduce non-point source pollutants from entering surface waters or ground waters. Techniques include designing and installing stormwater management systems for conveying, collecting, storing, discharging, recharging, or treating stormwater. These systems aim to reduce the overall impact of excess water on an existing system during wet weather events.

Stormwater Projects			
Historical SRF		Series 23	
Funding	Number of Projects	Funding	Number of Projects
$111,834,721	51	$1,126,248	1

Series 23 Stormwater Project Impact

- **Fall River's** NPDES Municipal Separate Storm Sewer System (MS4) Permit requires the constant improvement of its stormwater infrastructure. The City has spent well over $190 million in CSO abatement since 1989 and is on course to spend millions more. The Hyacinth Street project will help maintain the environmental quality of North Watuppa Pond which also bolsters public safety since it is a drinking water source.

Borrower	Project Description	Amount
Fall River	**Hyacinth Street Drainage Improvements** This project was for conveyance improvements and capacity increase to the existing drainage infrastructure. The objective was to mitigate flooding on Hyacinth Street, reduce inflow to the President Avenue Sewer System, improve the water quality of stormwater discharge using Best Management Practices, and protect the North Watuppa Ponds (Fall River's water supply).	$1,126,248

Planning Projects

Projects in this category are for developing plans to address water quality and water quality-related public health problems. Planning projects can consist of multiple types of investigations. Field investigations are used to view the state of current water infrastructure assets to identify and prioritize design, maintenance and replacement activities. Sensor and field analysis can be used as part of a larger analysis that consists of plans to adopt best management practices and capital improvements. These projects assist municipalities with determining environmental issues that may be affecting local water sources or endangering public health.

For example, comprehensive wastewater management plans provide strategies for addressing wastewater treatment and disposal issues in a municipality or utility district. Integrated municipal stormwater and wastewater resource management planning assists municipalities with meeting requirements that arise from distinct wastewater and stormwater programs. Fiscal sustainability and asset management planning assists communities with maintaining replacement schedules and forecasting capital needs for the future.

Planning Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$351,407,422	342	$10,768,176	13

Series 23 Clean Water Planning Project Impacts

- **Fall River, Gloucester, Haverhill, Hull, New Bedford, Revere and Tyngsborough** completed analysis projects related to mitigating CSOs and sanitary sewer overflows, with Illicit Discharge Detection and Elimination (IDDE) programs, sewer inspections via remote camera (CCTV). These survey methods assist utilities with creating more efficient systems that discharge less untreated water. Upgrading facilitates reduces the amount of energy needed to treat and pump water.
- **Gloucester, Hull and New Bedford** completed planning activities that assist systems with resilience and prioritize facility and asset management. These types of activities help communities become more data driven when considering maintenance and capital improvements. Properly implemented asset management and master plans assist communities with proactive as opposed to reactive processes.
- **Westport's** planning activities are aimed at reducing nitrogen and non-point source pollution in the Westport River and ensuring that residents with irregular septic systems are not a public health risk. The planning activities evaluated and recommended future technology adoption and will build into a larger planning study for the community's future water needs.

Borrower	Project Description	Amount
Fall River	**Stafford Square Collection System Evaluation** This project was for the evaluation of the Stafford Square area in the City of Fall River known to have inadequate storm drains and combined sewers. These factors are known to cause SSOs, impair water quality, and risk the public health and safety. This project will consist of an integrated stormwater and wastewater collection system evaluation for the Stafford Square watershed. The proposed planning study will advance the current resolution concepts identified in the City's Wastewater and Stormwater Integrated Plan to provide a listing of phased capital improvements to help mitigate chronic flooding and SSOs, while maximizing use of existing infrastructure systems.	**$400,000**
Gloucester	**Utility Master Plan** The City of Gloucester is generating a Utility Master Plan for comprehensive wastewater and stormwater systems asset management. The City uses the assessment and master plans to verify existing asset conditions, establish priority upgrades, and confirm compliance with wastewater and stormwater NPDES requirements. These assessments protect public and environmental health by reducing Sanitary Sewer Overflows (SSOs) at the wastewater treatment plant and pump stations and minimize treatment bypasses. The City will use the master plans to prioritize, plan and execute, necessary capital projects and future upgrades.	**$1,200,000**
Haverhill	**Combined Sewer Overflow (CSO) Control Plan for the Locke Street CSO Area** The CSO Control Plan for the Locke Street Combined Sewer Overflow (CSO) Area is part of Haverhill's 2017 Integrated Final Long-Term Control Plan (FLTCP) and 2016 Consent Decree. The project will complete comprehensive system characterization, alternatives development, analyses and report preparation to identify the best approach for control of the largest three CSOs that will be left in the combined sewer system. Ultimately, the recommendation from this plan will be designed and constructed in future project(s) and will reduce CSO discharges to the Little River and Merrimack River.	**$1,534,800**
Hull	**Facility Plan and Resiliency Plan Update** The Town of Hull's Wastewater Treatment Facility (WWTF) was built in the late 1970's with a partial upgrade in 2002. Due to age and a location that subjects the plant to coastal flooding, a Facility Plan and Resiliency Update was needed. This update is being completed with a CMOM and a Fiscal Sustainability Plan, both of which recommend planning updates for capital repairs and improvements to the collection system, pump stations and treatment plant processes, as well as energy and conservation measures.	**$478,890**
Hull	**Wastewater Treatment Facility (WWTF) Reliability Centered Maintenance (RCM) Assessment** The Town of Hull is completing an RCM assessment that provides for improved reliability, resiliency, sustainability, and overall improved asset management. It provides a comprehensive, structured, and analytical development of cost-effective solutions.	**$332,966**
Hull	**Sewer System Evaluation Survey (SSES)** This project conducted an SSES that included flow isolation, CCTV, manhole inspections, smoke and building inspections in the project area that consists of approximately 165,000 linear feet of sanitary sewer ranging in size from 8" to 36" and approximately 1,000 utility access holes. Hull experiences high levels of Infiltration/Inflow (I/I), with estimates totaling in the range of up to 30% of wastewater flow seen at the treatment facility. The study also evaluated underground piping at the facility and inspected the physical and hydraulic conditions of the 24" outfall that extends approximately 2,700 feet out into Massachusetts Bay.	**$1,436,820**

Borrower	Project Description	Amount
New Bedford	**Asset Management Plan Grant Loan** This project was for the improvement of the City of New Bedford's Asset Management Plan (AMP). The City identified specific activities needed to strengthen their AMP including the completion of the GIS network, developing a 5 to 10-year capital improvement program based on inspection data and criticality of the asset, updating its sewer/water rate models, implementing a public outreach campaign, continuing LUCITY updates, and IT infrastructure upgrades. These tasks are vital to the City's asset management vision and desire to be a national leader in proactive asset management approaches and technologies.	$260,000
New Bedford	**MS4 Permit Compliance and Reporting** The purpose of this project is to provide the groundwork for meeting the requirements of the upcoming 2017 Massachusetts Municipal Separate Storm Sewer Systems (MS4) Permit. An initial planning stage will identify gaps in existing information and lay out a feasible schedule and budget for meeting permit milestones. The majority of planning documents required by the permit, including but not limited to, Illicit Discharge Detection and Elimination (IDDE) procedures, educational materials, SOPs, ordinances, research documents, operations and maintenance procedures, will be developed and used to implement permit objectives. Field mapping of the storm water system using GPS units will be performed and used as the basis for preparation of the planning documents.	$474,700
New Bedford	**Wastewater Treatment Plan (WWTP) Facilities Planning** The WWTP Facilities Plan provides a road map for what improvements need to be made in each of the different process areas as well as those required to meet more stringent treatment limits expected within the National Pollutant Discharge Elimination System (NPDES) permit.	$2,500,000
Revere	**Illicit Connection and Sump Pump Investigation** The Illicit Connection and Sump Pump Investigation Program continuation is important for the City to enhance its progress in removing inflow from the sanitary sewer system. This program will continue the inspections of private homes and businesses to identify sources of inflow from sump pumps, roof leaders, roof drains, driveway drains, yard drains and other sources inflow.	$500,000
Revere	**Phase X Field Investigations- I/I and IDDE** The Phase X Field Investigations and Illicit Discharge Detections and Elimination (IDDE) is an important planning project for the City of Revere. These investigations are vital for the assessment of the City's wastewater and stormwater systems. These field investigation programs will include Illicit Discharge Detection and Elimination (IDDE), CCTV of drains and sewers throughout the City, dye testing, smoke testing and private building inspections. The findings of these investigations will be incorporated in the City's future construction projects to address the detected deficiencies.	$1,000,000
Tyngsborough	**Phase 2 Infiltration and Inflow Study** This project built on the metering study completed as part of Phase 1 that was finalized in 2018. The study contained the next steps of flow isolation, CCTV, manhole inspection, smoke testing and building inspections. It allowed the Town to move seamlessly into the final planning steps. All data received as a result was compiled in a Data Analysis Report, which finalized the Infiltration/Inflow (I/I) study and contained recommendations for implementation.	$500,000

Borrower	Project Description	Amount
Westport	**Integrated Water Resource Management Plan (IWRMP)** This project was for the preparation of an Integrated Water Resource Management Plan (IWRMP) to guide the Town of Westport's selection and implementation of actions to improve the Westport River's water quality with the goal of achieving the reduction of the nitrogen Total Maximum Daily Load (TMDL). The plan assessed the water, wastewater, and stormwater infrastructure demand for future development and addressed the health risk to residents with small lots that did not meet Title 5 setbacks. The Plan quantified the extent of current problems and future needs in the targeted areas. It identified and evaluated alternative technologies and management practices, prioritized environmentally appropriate and cost-effective remedies, and proposed implementation, financing, and scheduling plans.	**$150,000**

Project Deep Dive • Springfield Water and Sewer Commission

York Street Pump Station Project
Series 23B Loan Amount: $54,360,205 (Total Project Cost: $121,386,494)

Project Summary

The Connecticut River is New England's longest river at 411 miles, and its largest watershed at over 11,000 square-miles in four (4) states with 38 major tributaries. It stretches from northern New Hampshire down to Connecticut where it discharges into the Long Island Sound. The river was historically a vital resource for the region but has been dramatically impacted by development and industry.

The Springfield Water and Sewer Commission (SWSC) is located on the Connecticut River in southwestern Massachusetts. SWSC provides wastewater treatment to 260,000 customers in eight (8) communities in the region and is permitted to discharge into the Connecticut River. Due to the outdated sewer design, SWSC suffers from combined sewer overflows (CSO) events which occur when a system does not have the capacity to handle the surge of water from the stormwater that enters the system and to alleviate the increase flow of water, it discharges untreated sewage and stormwater into the river. In 2015 and 2016, SWSC measured 431 CSO events resulting in a discharge of approximately 355 million gallons of untreated water into the river.

Water pollution from CSOs have resulted in high levels of turbidity and total suspended solids (cloudy, polluted water), introduced disease-causing pathogens (e.g. E.coli) and nutrients (contributes to algal blooms), and caused low levels of dissolved oxygen (which causes fish kills and damages aquatic life). Pollution can be harmful to public health by making the water unsuitable for recreation such as boating, swimming, and fishing, and leave water murky with undesirable odors. CSOs pose a danger to the habitats of many threatened and endangered species such as shad, striped bass, short-nosed sturgeon (federally endangered species), bald eagles (threatened species) and several species of freshwater mollusks (lampwater mussels & tidewater mussels) classified by state and federal agencies as endangered and threatened.

In 2019, SWSC commenced construction of the York Street Pump Station and the Connecticut River Crossing Project to increase the wet weather flow capacity to the Springfield Regional Wastewater Treatment Facility (SRWTF). The new 62 million gallons a day (MGD) wastewater pumping station will be linked to the SRWTF through three (3) new 1,200-foot river crossing pipes. The additional pipes will supplement two (2) aging pipes currently under the river. SRWTF's Influent Structures will be modified to accommodate the new pipes and capacity to handle additional peak wastewater flowrates incurred by the updated pump station. Construction should be completed by 2023.

Environmental Project Results

The SRWTF often receives double the average flow during wet weather events. That additional water volume is diverted to the Connecticut River. Upon project completion, this project will substantially reduce the volume and frequency of CSO events from multiple regulators across the Connecticut River CSO system. SWSC anticipates the annual CSO volume to be reduced from 293 million gallons (MG) to 170 MG, and an estimated 42% reduction bacteria, nutrients and toxic loads released to the Connecticut River. This reduction will improve surface water quality and will positively affect not just the service area communities, but downstream communities and habitats in Massachusetts and Connecticut.

Financial Impact

In 2014, SWSC finalized a comprehensive Integrated Wastewater Plan (IWP) that captured SWSC's progress on implementing CSO remediation and providing a more holistic analysis of future needs balanced against the economic reality. The purpose was to provide a sustainable and effective CSO control program. The IWP noted that the City of Springfield, which accounts for approximately 70% of wastewater flows, is severely economically distressed with high unemployment, decreasing population, and limited economic growth.

Disadvantaged Community Status and Subsidies from the Trust

Utilizing data from 2018, when the initial project was approved by the Trust, Springfield's APCI was $13,676, or just 33% of the Commonwealth's APCI. This falls well within the Tier 3 Disadvantaged Community range. The Trust, having already provided below-market rate loans, no-cost construction financing, has also provided $5,639,795 (6.6% of the total project cost) in loan forgiveness.

Section 3 | Drinking Water State Revolving Fund Projects

Drinking Water Treatment Projects

Treatment projects include the construction, expansion and rehabilitation of drinking water infrastructure that reduces contamination through various treatment processes. Such processes aim to condition water or remove contaminants. Treatment processes include filtration of surface water, pH adjustment, softening, disinfection, waste handling and other treatment needs (i.e., granular activated carbon which filters out chemicals, particularly organic chemicals, aeration and iron/manganese removal) along with chemical storage tanks.

Upgrades and maintenance to water treatment plants leads to improved water quality and system efficiency. Replacing equipment that has reached the end of the its useful life along with upgrading filtering and purifying equipment makes these facilities less susceptible to failures that could endanger public health. Additionally, system improvements such as corrosion control, help keep the public safe from issues related to older cast iron pipes and lead service lines. Upgraded equipment generally leads to more efficient facilities that consume less power and improves worker safety.

Drinking Water Treatment Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$1,031,620,401	219	$50,131,223	7

Series 23 Drinking Water Treatment Project Impacts

- **Barnstable and Littleton** completed activities aimed at protecting residents from per- and polyfluoroalkyl substances (PFAS). PFAS are a family of chemicals widely used to manufacture common consumer goods and can be found in some legacy firefighting foams. PFAS has been known to enter drinking water at sites where they were manufactured, used, disposed, or spilled. PFAS seeps through the soil into groundwater or surface water. Humans are exposed to PFAS by consuming contaminated drinking water. Adverse health effects in humans exposed to high levels of PFAS may include hepatic, cardiovascular, endocrine, immune, reproductive, and developmental effects.
- **Billerica, Franklin, Pepperell and Wareham Fire District** completed upgrades of treatment facilities and infrastructure to improve the overall drinking water quality and to address filtration issues with manganese and iron. These upgrades increase the capacity of these facilities while also improving plant efficiency and filtration capabilities.
- **Wareham Fire District's Maple Springs Water Purification Plant** utilized alternative energy generation using solar power to reduce energy consumption from fossil fuel sources; and will include passive solar design elements to reduce energy consumption. Solar panels will supply roughly 100,000KW-hr annually.

Borrower	Project Description	Amount
Barnstable	**Maher Treatment Facility Upgrade** Maher Water Treatment Facility upgraded to mitigate chemical contamination of PFOS, 1,4 Dioxane and any other Contaminants of Emerging Concern (CEC) that may be found in the Hyannis Supply System.	$9,754,852
Barnstable	**Airport Well and Straightway Facility** This project was for the design, purchase, and installation of interim activated carbon filtration units at the Airport well and Straightway Facility to mitigate PFAS.	$2,642,303
Billerica	**Water Treatment Plant (WTP) Upgrades** The project included upgrades to the existing Water Treatment Plant (WTP) related to the 20-year old ozone generation equipment. The improvements were for the treatment process, electrical system, Supervisory Control and Data Acquisition (SCADA) system, structural and the HVAC system.	$9,316,240
Franklin	**Treatment Plant at Well Stations No. 3 and 6** The project included the construction of a new Water Treatment Facility (WTF) and water mains to comply with the 2014 corrective action order by MassDEP. The new WTF includes GreensandPlusTM filtration systems, centralized chemical feed equipment for each well station, new emergency back-up power, and replacement of the existing Well Station No. 6 vacuum suction system with submersible pumps in each well head. The completed project improves drinking water quality by reducing high manganese and iron concentrations, improves existing facilities and provides better overall operations of Well Stations No. 3 & 6.	$12,579,500
Littleton	**Emergency PFAS Blending Pipeline Project** The project will install a temporary water main to blend sources to maintain drinking water below 20 parts per trillion for PFAS.	$899,328
Pepperell	**Bemis Water Treatment Plant** This project included the construction of a new water treatment facility (WTF) and water mains to connect to the existing distribution system. The new WTF included a GreensandPlusTM filtration system, two backwash waste basins, and replacement of existing well pumps. The completed project improves drinking water quality by reducing high manganese and iron concentrations.	$7,939,000
Wareham Fire District	**Maple Springs Water Purification Plant** This project includes the construction of a 3.0 MGD ground water treatment plant, expandable to 4.5 MGD, which includes: iron and manganese removal for compliance with secondary treatment standards; disinfection with ultraviolet light, and/or free chlorine to address the groundwater rule or possible reclassification as groundwater under the influence of surface water; and corrosion control. The project may also include treatment for pesticides and herbicides from nearby agricultural activity that have been detected in groundwater sources. This work will remove the public health threats posed by various contaminants and ensure excellent drinking water quality. The project will also include alternative energy generation using wind or solar power to reduce energy consumption from fossil fuel sources; and will include passive solar design elements to reduce energy consumption.	$7,000,000

Drinking Water Transmission and Distribution Projects

These projects are for installing, replacing or rehabilitating transmission lines that carry drinking water from the source to the treatment plant or from the treatment plant to the consumer. Items such as pipes for raw and finished water transmission, service lines, valves, backflow prevention, water meters and pumping stations may be components of these projects.

Replacing or repairing transmission lines improves water quality, system pressure and reliability. Additionally, the replacement and relocation of lines may be needed to improve the overall efficiency of a system that was designed for a smaller and less expansive community. The older practice of grouping transmission lines can lead to water distribution issues if one begins to leak and causes physical damage to the surrounding soil and adjacent transmission lines. Replacement of lead service lines reduces the risk of lead exposure and removes a public safety risk.

Drinking Water Transmission and Distribution Projects			
Historical SRF		Series 23	
Funding	Number of Projects	Funding	Number of Projects
$820,471,721	307	$56,656,283	17

Series 23 Drinking Water Treatment Project Impacts

- **Andover, Eastham, Haverhill, Lawrence, Peabody, Revere, Southampton, Spencer and West Boylston** upgraded their water conveyance system to increase capacity, replaced deteriorated water mains, or ran additional mains to provide safe drinking water to residents. Removing leaks from the water distribution system improved system efficiency by ensuring treated water is not lost in the system.
- **Eastham** lacked a municipal water supply system and has been prompted to implement a new system after water quality sampling determined that there were water quality issues with ground water. This first phase of water system development included the construction of two well fields, a storage tank and 45 miles of water distribution piping.
- **Fall River and New Bedford** have invested in upgrading their water meters and reading technology. These investments improve the utilities' capability to track water usage and identify leaks to increase water conservation activities and reduce pumping costs. Finally, these upgraded systems allow for the cities to remove meter reading vehicles further reducing emissions, maintenance and overhead costs.
- **Revere's** project will remove approximately 600 lead service lines (LSLs) from their drinking water system. Removing LSLs helps ensure public safety and reduces the likelihood of lead contamination in water.

Borrower	Project Description	Amount
Andover	**Distribution System Improvements** A significant portion of the Town of Andover's water distribution system consists of unlined cast iron water mains that have reduced hydraulic capacity (pressure), and water quality issues due to mineral deposits. To ensure reliability and sufficient capacity within the water distribution system, a study and analysis has identified areas of the Town with deficient water mains. The Town currently conducts annual infrastructure improvements aimed at properly maintaining and upgrading the Town's aging water distribution system to help prevent catastrophic failures, improve capacity, prevent water loss, provide adequate fire protection, and improve overall water quality. Despite the Town's efforts, 154 water line leaks/breaks were reported between January 2013 and January 2019, and 542 discolored water complaints were reported between April 2015 and January 2019.	**$4,791,300**
Auburn Water District	**Prospect Street Tank Replacement** This project includes the construction of a new 1-million-gallon capacity water storage tank to replace an existing 2-million-gallon tank. The new tank is necessary to replace aging and deteriorating infrastructure, reduce excess storage capacity, and improve water quality by reducing water age and adding water mixing capabilities.	**$1,623,160**
Brockton	**Water Pump Well and Clearwell Rehabilitation** Cleanings and inspections of the finished water pump well have been conducted at the Silver Lake Water Treatment Plant. Several deficiencies have been discovered such as the ceiling losing as much as 3 inches of concrete in areas where reinforcement has been exposed among several other findings. The findings from these evaluations indicate a critical need to repair the backwash and finished water pump well ceiling and replace the CMU baffle wall in the clear well to protect the treatment facility's finished water quality and to maintain proper operating conditions for the equipment in the pump room.	**$2,982,199**
Eastham	**Water System Phase I** In Eastham, drinking water was supplied by small community public water systems and individual private wells. There was no municipal water supply system and sampling had indicated some impaired water quality, the consequence of which is a plan to put the town on a public water system that meets the standards of the Safe Drinking Water Act. This first phase of water system development included the construction of two well fields, a storage tank, and 45 miles of water distribution piping.	**$112,586**
Fall River	**Automatic Meter Reading and Meter Replacement** This project allows the City of Fall River to implement an "Advance Meter Infrastructure" (AMI). The AMI system allows the City to remove meter reading vehicles from the street, along with vehicle overhead, emissions and safety issues. Personnel costs and meter reading errors can be controlled with precise daily and hourly meter reads. Combined with the replacement of commercial and industrial meters, the project enhances the water department's revenue, streamlines office procedures, and provides the means for continued investment. The AMI system offers leak detection notification, which in turn leads to water conservation and less pumping costs. Rate payers are better served as the department becomes more efficient.	**$3,336,416**
Fall River	**Phase 18- Water System Improvements** This project was for City of Fall River's eighteenth year of its cast iron water main and lead service replacement program. The Phase 18 water main improvements included the rehabilitation or replacement of approximately 5,730 linear feet of cast iron water mains and lead services.	**$1,135,800**

Borrower	Project Description	Amount
Haverhill	**Phase 2- Transmission Main Improvements** This project involved the replacement of approximately 14,150 linear feet of water mains and associated lead service lines and installing valves for isolation. This project was necessary to provide redundancy, isolation control, and fire flow. The improvements allowed the City of Haverhill to continue to supply water and fire protection to the entire distribution system in the event of a break in either the 20-inch mains from the Gale Hill Storage Tank to the downtown area.	**$7,448,730**
Lawrence	**Distribution System Improvements** This project will replace approximately 8,800 linear feet of undersized, unlined water main and six associated lead service lines. It will also establish redundancy for a portion of South Lawrence though the installation of a 20-inch river crossing.	**$4,817,343**
MWRA	**Wachusett Aqueduct Pump Station** This project included the construction of an emergency pump station to pump water from the Wachusett Aqueduct to the Carroll Water Treatment Plant (CWTP). The pump station provides redundancy in the event of failure at the Cosgrove Tunnel or intake and for the inspection/rehabilitation of the Cosgrove Tunnel. The new pump station will be able to deliver 240 million gallons per day of raw water to the CWTP during a planned or emergency shutdown of the Cosgrove Tunnel. This flow rate represents the full water demand from the CWTP during the fall, winter, and spring low-flow seasons and mitigates potential disruption of service to Northborough, Southborough, Marlborough, and Westborough State Hospital.	**$4,103,509**
MWRA	**Commonwealth Ave Pump Station Redundancy** This project is for the construction of low service suction and pumps for the Commonwealth Avenue Pump Station (CAPS) in Newton. The project includes 24-inch diameter low service connections to the Weston Aqueduct Supply Mains 1 & 2 (WASM 1 & WASM 2) in the Carriage Lane of Commonwealth Avenue. There will be 325-linear feet of 24-inch diameter low service suction main installed from the WASM 1 & 2 connections to the existing Shaft 6 Line suction main. It will have the capability to pump using low service suction into the Newton Southern Pressure District with one new pump and one replacement pump in the East Building. The new low service suction and pumps provide redundancy to the CAPS if there is an interruption in the high service water supplied to the pump station from Shaft 6 of the City Tunnel.	**$3,018,669**
New Bedford	**Large Meter & Advanced Metering Infrastructure (AMI) Upgrade Program** This project is for the assessment and implementation of Large Meter and (AMI) upgrades. The program included two distinct elements: (1) The City conducted testing, repair, and/or replacement of some of its largest consumer meters. These meters were older and are under registering, leading to increased unaccounted- for water and decreased revenue. (2) The City upgraded its meter reading equipment for the entire water system to apply the latest technology and eliminate the current high frequency of estimated meter reads (and therefore reduce unaccounted for water and lost revenues) due to failing meter transmission units.	**$5,109,695**
Peabody	**Peabody Water Transmission Main and Pump Station** The project addresses the lack of redundant water supply to the West Peabody High Service System, presently served by the Winona Water Treatment Plant. It will provide water supply to about a third of the City of Peabody if the treatment plant is out of service, either due to failure or during proposed future renovations. It includes the installation of 24,400 feet (4.6 miles) of water main on various streets from Lynn Street near the Coolidge Avenue Water Treatment Plant to Route 1 in West Peabody, and the construction of a drinking water pump station near the High School. All lead services (approximately 50) encountered along the proposed pipeline path will be removed and replaced to the meter or building.	**$9,639,756**

Borrower	Project Description	Amount
Revere	**Lead Service Replacement** This project involved the replacement of approximately 600 lead services throughout the City of Revere. The City of Revere has identified 250 active lead services to date throughout the ongoing automatic meter replacement program. Based on the number of properties in the City that have been inspected, and extrapolating that value based on identified lead services found to date, an estimation of citywide lead services needing replacement has been determined to be approximately 600 services.	**$2,974,273**
Revere	**Oak Island Water Main Improvements Planning Stage** This project includes the preliminary planning and investigations required for Water Main Improvements in the densely populated Oak Island neighborhood. This neighborhood was fed by a single aging 6-inch unlined cast iron water pipe that crosses beneath the MBTA train tracks. Because of this sensitive location, the City needed to obtain survey, preliminary borings, easements and other preliminary information prior to design of this water main replacement. This project was vital for understanding the existing conditions, evaluating the most cost-effective route and approach for proper design.	**$706,453**
Southampton	**Southampton Water System Improvement Project** This project provided the Town of Southampton a backup water source as identified by Sanitary Survey Report. The Town had only one active water source, the Glendale Well #02 G. This project provides the required backup water source by constructing a Booster Pump Station in the Town, near the Southampton-Easthampton town line, to convey water from the Easthampton Public Water System (PWS) to the Southampton PWS water system. It included rehabilitation of Southampton's Glendale Well Field to regain its approved pumping capacity. Piping and controls connect the Booster Pump Station in the best manner to the Southampton distribution system.	**$1,590,719**
Spencer	**Main Street Looping Water Main** The project consisted of the installation of 7,275 linear feet of 12" diameter main along Moose Hill Tank to Greenville Street, Greenville Street to Main Street, Main Street, and Cherry Street. This project eliminated the dead end on Greenville Street, replaced a main with a higher risk of failure based on its asset management scoring, eliminated a hydraulic deficiency along Greenville Street and at the intersection of Main Street and North Street, and allowed the Town to take the 14" diameter main, which is a critical component in need of replacement, off-line for rehabilitation, repairs or replacement while continuing to provide fire protection to the service area.	**$1,779,911**
West Boylston Water District	**North Main St. & Laurel St. Water Main Replacement** This project involved replacement of aging infrastructure to protect public health. The water main on North Main St, Laurel St, Waushacum St and Reed St was made of deteriorating asbestos cement (AC) that reached the end of its useful life and suffered from repeat breaks. During the repair, it was noted that the water main had lost thickness in the area of the break. There was concern that more of the main was deteriorating and would continue to suffer from breaks until it was replaced with new ductile iron main. Additionally, this area of the District's water distribution system had numerous lead goosenecks on customer service lines. These lead goosenecks were eliminated through this water main replacement project.	**$1,485,764**

Drinking Water Source and Storage

These projects are used for developing or improving sources of water used in public water systems. Project costs include those for constructing or rehabilitating surface water intake structures, drilled wells, wellhead pumps and spring collectors. Having multiple sources of raw water is a standard precaution to make sure that water supplies are not endangered or cut off. Source protection and testing are necessary to confirm that raw water quality can be properly purified at the intended water treatment plant. Excessive amounts of toxins or pollutants in raw water can cause efficiency issues once raw water reaches a water treatment plant. Pumping, well maintenance and water extraction must be monitored to ensure that water quality at the source is not impacted by these activities.

Storage projects in this category aim to provide finished water storage for public water systems. Examples may include systems involving elevated and ground level storage for treated water and covers for existing storage. Storage tanks and the systems they employ are vital components of a water distribution system. Tanks are used to ensure water supply when there may be issues with supply lines or when maintenance is being performed. Upgraded systems that chlorinate water or monitor water quality are more efficient with advanced systems. This means that water quality is more consistent and requires less human maintenance.

Drinking Water Source and Storage Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$223,962,052	122	$33,901,526	3

Series 23 Drinking Water Source and Storage Project Impact

- **Dunstable** replaced storage tanks and well pumping systems to maximize efficiency in their existing chemical feed system. The original infrastructure was failing due to age and was no longer properly controlling the water pH level effectively. Corrosive water may result in deterioration of water infrastructure which can increase the level of metal in drinking water such as lead. Additionally, it may cause discoloration and taste among other aesthetic issues.
- **MWRA and New Bedford** completed upgrades to their water storage systems to ensure that water storage capacity is maintained to serve their respective communities. MWRA's Southern Extra High is required to offer redundant water transmission to five communities currently served by a single transmission source. These updates improve water quality and ensure public health.

Borrower	Project Description	Amount
Dunstable	**Dunstable Water Infrastructure Project** The project involved the construction of a new 75,000-gallon elevated steel storage tank and approximately 1,800 LF of associated water main replacement to improve system hydraulics. To optimize the existing chemical feed for pH control, the project also included various well station improvements at the Dunstable well field site along with minor access road improvements. The water infrastructure upgrades in this project were needed to meet the requirements of an Administrative Consent Order with Penalty (ACOP) that was issued by MassDEP in May 2018.	**$2,640,000**
MWRA	**Southern Extra High Redundancy and Storage** This project includes the Southern Extra High service area that was identified as being deficient in distribution storage and lacking redundant distribution pipelines. Correction of these deficiencies was assigned as a priority under MWRA's 2006 and 2013 Water System Master Plans due to the potential critical threat to public health that could result from a failure in this single transmission main.	**$18,168,150**
New Bedford	**High Hill Reservoir Rehabilitation** The High Hill Reservoir Rehabilitation project will perform required structural repairs to the reservoir and its roof. Recent inspections identified serious deficiencies with the reservoir's roof and support system, including failed beam connections, broken anchor bolts, and beams that have moved on their supports. The roof is in danger of failure and collapse, and inoperable inlet and outlet valves that need to be replaced. This project will replace inoperable inlet and outlet valves, clean the entire reservoir, remove accumulated sediment on the reservoir floor, install a new mixing system in the reservoir to improve circulation and water age, and perform other needed repairs and upgrades. This work will improve water quality and ensure reliability and flow capacity in the distribution system.	**$13,093,376**

Drinking Water Planning and Design Projects

These projects involve the activities needed to plan design and/or study drinking water infrastructure. Planning and design projects are essential for maintaining and improving the key infrastructure that protects public health and water quality. These activities may include using Geographic Information Services (GIS) to map infrastructure, develop asset management plans to better track capital cost and system maintenance. Additionally, these projects may be used to determine system improvement needs related to water loss, emerging contaminants and numerous other issues that may affect the effectiveness of a system's ability to provide safe drinking water to a community.

Drinking Water Planning and Design Projects			
Historical SRF		**Series 23**	
Funding	**Number of Projects**	**Funding**	**Number of Projects**
$10,520,505	17	$750,000	2

Series 23 Drinking Water Planning and Design Project Impact

- **Brockton and Revere** completed planning projects that assessed the current condition of water transmission mains. These field assessments confirmed the flow, water pressure and condition of material items such as valves and connections. These inspections were necessary to confirm the existing condition and to make recommendations for future projects.
- **Revere's** assessment included the evaluation of the system pressure. The existing system is not able to maintain the passive pressure needed by the fire department. A new design was needed to ensure public safety. The project is a vital first step in addressing public safety and health.

Borrower	Project Description	Amount
Brockton	**2017 Transmission Main Assessment** The City of Brockton assessed the infrastructure conditions within its 24-inch transmission mains. The City had major difficulty isolating a break in this area in 2015. Several valves need replacement, according to a recent valve testing field assignment conducted by the City. The study indicated these lines are likely to be in poor condition. A transmission main inspection is necessary to develop recommendations for transmission main improvements to prevent future water loss and extreme breaks.	**$500,000**
Revere	**Oak Island Water Main Improvements Planning Stage** This project includes the preliminary planning and investigations required for Water Main Improvements in the densely populated Oak Island neighborhood. Results of hydrant fire flow tests and investigations indicate the distribution system cannot maintain 20 psi residual pressure during a fire. This neighborhood is fed by a single aging 6-inch unlined cast iron water pipe that crosses beneath the MBTA train tracks. Because of this sensitive location, the City will need to obtain survey, preliminary borings, easements and other preliminary information prior to design of this water main replacement. This project will be vital for understanding the existing conditions, evaluating the most cost-effective route and approach for proper design.	**$250,000**

Appendix A - Series 23 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category	Disadvantaged Community Level	UN SDG
Andover	DW-19-13	Distribution System Improvements	$4,791,300	54.80%	DW	Drinking Water Transmission and Distribution		6, 12
Auburn Water District	DWP-19-19	Prospect Street Tank Replacement	$1,623,160	86.53%	DW	Drinking Water Transmission and Distribution	2	6, 12
Avon	CWT-15-12	Community Septic Management Program	$400,000	100%	T5	Community Septic Management Program	2	6, 12
Barnstable	DWP-18-10	Maher Treatment Facility Upgrade	$9,754,852	95.38%	DW	Drinking Water Treatment	1	6, 12
Barnstable	DWP-19-28	Airport Well and Straightway Facility	$2,642,303	97.70%	DW	Drinking Water Treatment	1	6, 12
Billerica	CW-17-15	Sewer Contract 36	$12,842,593	89.54%	CW	Collector and Interceptor Sewers	1	6, 14
Billerica	CW-17-15-A	Sewer Contract 36	$275,000	97.32%	CW	Collector and Interceptor Sewers	1	6, 14
Billerica	DWP-19-04	Water Treatment Plant (WTP) Upgrades	$9,316,240	82.71%	DW	Drinking Water Treatment	1	6, 12
Brockton	CWP-18-42	Wastewater Treatment Plant (WWTP) Upgrade	$5,412,841	81.25%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Brockton	DW-17-05	2017 Transmission Main Assessment	$500,000	100%	DW	Drinking Water Planning and Design	3	6, 9, 10, 11, 12
Brockton	DWP-18-11	Water Pump Well and Clearwell Rehabilitation	$2,982,199	82.98%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Cohasset	CWT-17-07	Community Septic Management Program	$150,000	100%	T5	Community Septic Management Program		6, 12
Dunstable	DW-19-05	Dunstable Water Infrastructure Project	$2,640,000	93.44%	DW	Drinking Water Source and Storage		6, 12
Eastham	DWP-16-02-R	Water System Phase I	$112,586	100%	DW	Drinking Water Transmission and Distribution	2	6, 12
Easton	CWT-17-06	Community Septic Management Program	$1,000,000	100%	T5	Community Septic Management Program		6, 12
Fall River	CW-18-44	Stafford Square Collection System Evaluation	$400,000	95.15%	CW	Planning	3	6, 9, 10, 11, 12, 14
Fall River	CWP-18-03	Combined Sewer Overflows (CSO) Abatement Program-Middle Street	$2,321,027	100%	CW	Combined Sewer Overflow Correction	3	6, 9, 10, 11, 12, 14
Fall River	CWP-18-35	Hyacinth Street Drainage Improvements	$1,126,248	91.23%	CW	Stormwater Infrastructure	3	6, 9, 10, 11, 12, 14
Fall River	CWP-18-36	President Avenue Sewer Pump Station Replacement	$3,930,559	88.35%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Fall River	CWP-18-38	Wastewater Treatment Facility (WWTF) Improvements	$21,018,115	83.29%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Fall River	DWP-17-12	Automatic Meter Reading and Meter Replacement	$3,336,416	87.66%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Fall River	DWP-18-15	Phase 18- Water System Improvements	$1,135,800	84.89%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Fitchburg	CWP-16-10-B	Fitchburg Wastewater Treatment Facility Secondary Systems Upgrade	$1,691,026	100%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Franklin	DW-19-02	Treatment Plant at Well Stations No. 3 and 6.	$12,579,500	92.10%	DW	Drinking Water Treatment		6, 12
Gardner	CWP-17-23	Gardner- Sludge Dewatering Replacement Project	$5,802,527	100%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Gardner	CWP-17-23-A	Gardner- Sludge Dewatering Replacement Project	$530,533	100%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Gloucester	CW-17-25	Utility Master Plan	$1,200,000	91.11%	CW	Planning	2	6, 12, 14
Greater Lawrence Sanitary District (GLSD)	CWP-15-15	Organics to Energy	$25,290,070	93.84%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
GLSD	CWP-15-16	Combined Sewer Overflow Abatement Program	$8,739,493	94.90%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Haverhill	CW-17-14	Haverhill Wastewater Treatment Facility (WWTF) Improvements	$7,408,631	99.82%	CW	Wastewater Treatment	2	6, 12
Haverhill	CW-19-12	Combined Sewer Overflow (CSO) Control Plan for the Locke Street CSO Area	$1,534,800	53.64%	CW	Planning	2	6, 12, 14
Haverhill	DWP-18-06	Phase 2- Transmission Main Improvements	$7,448,730	74.74%	DW	Drinking Water Transmission and Distribution	2	6, 12
Hull	CW-18-20	Facility Plan and Resiliency Plan Update	$478,890	100%	CW	Planning	1	6, 12, 14

Footnote

[1] Series 23: All Amount and Percentage Completed sections are accurate as of July 31, 2021.

Appendix A - Series 23 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category	Disadvantaged Community Level	UN SDG
Hull	CW-18-21	Wastewater Treatment Facility (WWTF) Reliability Centered Maintenance (RCM) Assessment	$332,966	100%	CW	Planning	1	6, 12, 14
Hull	CW-18-22	Sewer System Evaluation Survey (SSES)	$1,436,820	93.92%	CW	Planning	1	6, 12, 14
Hull	CWP-18-29	Fiscal Sustainability Plan and Capacity, Management, Operations and Maintenance (CMOM) Upgrades	$9,831,151	90.01%	CW	Infiltration/Inflow and Sewer System Rehabilitation	1	6, 14
Lawrence	CW-14-16-A	Sewer System Rehabilitation	$442,092	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Lawrence	CWP-18-09-A	Sewer and Drainage Improvements	$4,053,890	83.06%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11 12, 14
Lawrence	CWP-18-09	Sewer and Drainage Improvements	$9,398,438	79.51%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11 12, 14
Lawrence	CWP-19-06-A	Sewer and Drainage Improvements	$468,570	93.79%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11 12, 14
Lawrence	CWP-19-06	Sewer and Drainage Improvements	$4,009,400	96.43%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Lawrence	DWP-19-03	Distribution System Improvements	$4,817,343	70.21%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Littleton	DW-20-07	Emergency PFAS Blending Pipeline Project	$899,328	74.40%	DW	Drinking Water Treatment		6, 12
Marion	CW-18-37	Wastewater Treatment Plant & Collection System Improvements	$7,002,294	96.63%	CW	Wastewater Treatment		6, 12
Massachusetts Water Resources Authority (MWRA)	CW-19-50	Wastewater Treatment Plant and Sewer Improvements	$2,350,379	100%	CW	Wastewater Treatment		6, 12
MWRA	CW-19-49	Facility Asset Protection	$767,671	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation		6, 14
MWRA	CW-19-51	Remote Headworks Upgrade	$22,030,256	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation		6, 14
MWRA	DW-20-31	Southern Extra High Redundancy and Storage	$7,271,659	100%	DW	Drinking Water Source and Storage		6, 12
MWRA	DW-19-25	Southern Extra High Redundancy and Storage	$10,896,491	100%	DW	Drinking Water Source and Storage		6, 12
MWRA	DW-19-26	Wachusett Aqueduct Pump Station	$4,103,509	100%	DW	Drinking Water Transmission and Distribution		6, 12
MWRA	DW-20-32	Commonwealth Ave Pump Station Redundancy	$3,018,669	100%	DW	Drinking Water Transmission and Distribution		6, 12
Nantucket	CW-18-05	Emergency Sewer Force Main Assessment Project	$3,801,862	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation		6, 14
Nantucket	CWT-19-01	Community Septic Management Program	$1,040,600	100%	T5	Community Septic Management Program		6, 12
New Bedford	CWA-19-17	Asset Management Plan Grant Loan	$260,000	100%	CW	Planning	3	6, 9, 10, 11, 12, 14
New Bedford	DWP-17-06	Large Meter & Advanced Metering Infrastructure (AMI) Upgrade Program	$5,109,695	81.87%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
New Bedford	DWP-17-07	High Hill Reservoir Rehabilitation	$13,093,376	70.83%	DW	Drinking Water Source and Storage	3	6, 9, 10, 11, 12
New Bedford	CW-17-09	MS4 Permit Compliance and Reporting	$474,700	100%	CW	Planning	3	6, 9, 10, 11, 12, 14
New Bedford	CW-18-31	Wastewater Treatment Plan (WWTP) Facilities Planning	$2,500,000	87.38%	CW	Planning	3	6, 9, 10, 11, 12, 14
New Bedford	CWP-17-16	Pumping Station Improvements	$6,158,058	83.65%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
New Bedford	CWP-17-16-A	Pumping Station Improvements	$926,670	87.24%	CA	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
New Bedford	CWP-17-17	Wastewater Collection System Improvements	$1,387,889	53.42%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Norton	CWP-18-43	West Main Street Sewer Extension Project	$4,693,231	87.14%	CW	Collector and Interceptor Sewers	1	6, 14

Footnote

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Appendix A - Series 23 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category	Disadvantaged Community Level	UN SDG
Peabody	DWP-20-03	Peabody Water Transmission Main and Pump Station	$5,299,756	79.86%	DW	Drinking Water Transmission and Distribution	2	6, 12
Peabody	DWP-19-11	Peabody Water Transmission Main and Pump Station	$4,340,000	84.61%	DW	Drinking Water Transmission and Distribution	2	6, 12
Pepperell	CWP-18-08	Pepperell Wastewater Treatment Facility (WWTF) Upgrade	$4,511,146	100%	CW	Wastewater Treatment	1	6, 12
Pepperell	DWP-19-10	Bemis Water Treatment Plant	$7,939,000	90.14%	DW	Drinking Water Treatment	1	6, 12
Pittsfield	CWP-18-12-A	Wastewater Treatment Plant (WWTP) Nutrient Removal	$7,012,322	92.94%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Pittsfield	CWP-18-12	Wastewater Treatment Plant (WWTP) Nutrient Removal	$50,724,760	88.35%	CW	Wastewater Treatment	3	6, 9, 10, 11, 12
Plymouth	CWP-16-07-B	Emergency Sewer Force Main Repairs & Rehabilitation	$13,241,047	100%	CW	Collector and Interceptor Sewers	1	6, 14
Plymouth	CWT-18-46	Community Septic Management Program	$200,000	100%	T5	Community Septic Management Program	1	6, 12
Revere	CW-18-19	Illicit Connection and Sump Pump Investigation	$500,000	87.59%	CW	Planning	3	6, 9, 10, 11, 12, 14
Revere	CW-18-26	Phase X Field Investigations- I/I and IDDE	$1,000,000	96.00%	CW	Planning	3	6, 9, 10, 11, 12, 14
Revere	CWP-17-27-A	Phase VIII - I/I, IDDE, P.S., & Drainage	$373,953	90.51%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Revere	CWP-18-27	Illicit Connection & Sump Pump Removal Program	$1,564,017	84.04%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Revere	CWP-18-28	Phase IX Construction- I/I, IDDE, P.S. & Drainage	$4,415,387	91.26%	CW	Infiltration/Inflow and Sewer System Rehabilitation	3	6, 9, 10, 11, 14
Revere	DW-18-08	Oak Island Water Main Improvements Planning Stage	$250,000	93.76%	DW	Drinking Water Planning and Design	3	6, 9, 10, 11, 12
Revere	DWP-17-14	Lead Service Replacement	$2,974,273	98.89%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Revere	DWP-18-09	Oak Island Water Main Improvements Planning Stage	$706,453	60.15%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Saugus	CWP-19-30	Comprehensive Sewer System Rehab. Subsystem 1C	$1,310,267	78.74%	CW	Infiltration/Inflow and Sewer System Rehabilitation	2	6, 14
Scituate	CWT-18-13	Community Septic Management Program	$199,222	100%	T5	Community Septic Management Program		6, 12
Southampton	DWP-18-12	Southampton Water System Improvement Project	$1,590,719	100%	DW	Drinking Water Transmission and Distribution	1	6, 12
Spencer	DWP-18-13	Main Street Looping Water Main	$1,779,911	100%	DW	Drinking Water Transmission and Distribution	3	6, 9, 10, 11, 12
Springfield Water & Sewer Commission (SWSC)	CWP-18-18-A	York St. Pump Station & Connecticut River Crossing	$5,252,623	100%	CW	Combined Sewer Overflow Correction	3	6, 9, 10, 11 12, 14
SWSC	CWP-18-18	York St. Pump Station & Connecticut River Crossing	$49,107,582	75.89%	CW	Combined Sewer Overflow Correction	3	6, 9, 10, 11 12, 14
Taunton	CW-17-19	Main Lift Pump Station Improvements	$10,274,800	59.77%	CW	Combined Sewer Overflow Correction	3	6, 9, 10, 11, 12, 14
Tyngsborough	CW-15-10	Sewer Extension Phase 1	$9,282,500	100%	CW	Collector and Interceptor Sewers	1	6, 14
Tyngsborough	CW-19-03	Phase 2 Infiltration and Inflow Study	$500,000	88.38%	CW	Planning	1	6, 12, 14
Wareham Fire District	DWP-17-09-A	Maple Springs Water Purification Plant	$7,000,000	99.06%	DW	Drinking Water Treatment	3	6, 9, 10, 11, 12
West Boylston Water District	DWP-19-27	North Main St. & Laurel St. Water Main Replacement	$1,485,764	77.67%	DW	Drinking Water Transmission and Distribution	2	6, 12
West Springfield	CWP-17-30-A	Pump Station Improv and Infiltration/Inflow (I/I) Reduction Project	$974,973	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation	2	6, 14
West Springfield	CWP-17-30	Pump Station Improv and Infiltration/Inflow (I/I) Reduction Project	$10,645,852	98.67%	CW	Infiltration/Inflow and Sewer System Rehabilitation	2	6, 14
Westport	CW-18-30	Integrated Water Resource Management Plan (IWRMP)	$150,000	100%	CW	Planning	1	6, 12, 14

Footnote

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Appendix B - Series 22 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category
Adams Fire District	DWP-18-04	Chemical Feed and SCADA Upgrades	$766,794	97.20%	DW	Drinking Water Treatment
Brockton	CW-16-27	Sewer Flow Monitoring Program	$1,100,000	81.54%	CW	Planning
Brockton	CW-16-28	Stormwater Management Plan	$400,000	100%	CW	Planning
Brockton	DWP-17-10	Transmission Main and Valve Replacement Project	$1,402,890	90.22%	DW	Drinking Water Transmission and Distribution
Chicopee	CWP-16-25	Phase 5B Sewer Separation Project	$832,718	60.34%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Dartmouth	CWP-16-32	Installation of New UV Disinfection System	$1,879,624	98.30%	CW	Wastewater Treatment
Dedham-Westwood Water District	DW-16-08	Bridge Street Water Treatment Plant Upgrades	$8,841,400	100%	DW	Drinking Water Treatment
Eastham	DW-17-01	Phase 2A Town-Wide Water System	$7,685,012	100%	DW	Drinking Water Transmission and Distribution
Fall River	CW-17-21	CSO Facilities Plan	$1,000,000	99.08%	CW	Planning
Fall River	CWP-18-07-A	Cress Brook Drainage Improvements	$699,886	100%	CW	Stormwater Infrastructure
Fall River	DWP-17-08	Water Main Rehabilitation - Phase 17	$2,930,713	100%	DW	Drinking Water Transmission and Distribution
Gloucester	DWP-18-03	Babson WTP Raw Water Systems Improvements	$1,830,012	97.68%	DW	Drinking Water Transmission and Distribution
Goshen	CWP-18-11	Goshen Landfill Cap Repair	$615,336	97.77%	CW	NPS Sanitary Landfills
Haverhill	DWP-16-05-A	Haverhill Water Treatment Plant Upgrades	$31,094,762	93.19%	DW	Drinking Water Treatment
Lawrence	CW-16-14	Sewer System Evaluation Survey	$2,700,000	100%	CW	Planning
Lawrence	DW-13-05-A	Water Main Replacement	$12,130,925	97.95%	DW	Drinking Water Transmission and Distribution
Leominster	DWP-16-13	Rehabilitation of Pump Stations	$1,450,565	100%	DW	Drinking Water Transmission and Distribution
Lowell	CWP-16-13	West St. Flood Protection, Storage and Stations	$12,168,345	92.29%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Lowell	CWP-16-15	CIP Phase - WWTF and Infrastructure Upgrades	$12,666,941	100%	CW	Combined Sewer Overflow Correction
MWRA	CW-18-39	Facility Asset Protection	$1,070,733	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-18-40	Remote Headworks Upgrade	$28,727,859	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-18-41	Wastewater Treatment Plant and Sewer Improvements	$2,971,701	100%	CW	Wastewater Treatment
MWRA	DW-16-06-A	SEH Redundancy and Storage	$14,355,913	100%	DW	Drinking Water Source and Storage
MWRA	DW-18-16	Wachusett Aqueduct PS	$5,363,933	100%	DW	Drinking Water Transmission and Distribution
Nantucket	CW-16-35	Sea Street Pump Station Upgrade	$5,873,812	99.97%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Nantucket	CW-17-01	Shimmo & PLUS Parcels Sewer Extension	$1,587,750	99.20%	CW	Collector and Interceptor Sewers
New Bedford	CW-17-10	Supplemental WW and SW Plan	$4,646,600	96.38%	CW	Planning
New Bedford	DWP-16-14	Quittacas WTP Rehabilitation	$8,912,740	100%	DW	Drinking Water Treatment
New Bedford	DWP-17-03	Lead Service Line Replacement Program - Phase I	$5,698,174	100%	DW	Drinking Water Transmission and Distribution
Norton	DW-14-10	New WTP	$10,300,000	100%	DW	Drinking Water Treatment
Revere	CW-17-28	Illicit Connection & Sump Pump Removal Investigations	$600,000	93.15%	CW	Planning
Revere	CW-17-29	Phase IX Field Investigations-I/I and IDDE	$1,200,000	100%	CW	Planning
Revere	CWP-17-26	Illicit Connection & Sump Pump Removal Program	$783,027	80.85%	CW	Infiltration/Inflow and Sewer System Rehabilitation

Footnote

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Appendix B - Series 22 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category
Revere	DW-13-09-A	Water Meters AMR System	$779,057	65.93%	DW	Drinking Water Transmission and Distribution
Saugus	CW-16-09-A	Sewer System and Pump Station Rehab/Improvements	$829,583	99.25%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Taunton	CW-17-08	Comprehensive Water Resources Planning	$760,000	98.73%	CW	Planning
Tyngsborough	CW-18-04	Tyngsborough I-I Program	$250,000	100%	CW	Planning
Upper Blackstone Water Pollution Abatement District (UBWPAD)	CWP-16-39-A	Nutrient Removal Improvements	$15,000,000	99.96%	CW	Wastewater Treatment
UBWPAD	CWP-16-39-B	Nutrient Removal Improvements	$2,100,000	88.89%	CW	Wastewater Treatment
Wareham Fire District	DWP-17-09	Maple Springs Water Purification Plant	$6,346,096	100%	DW	Drinking Water Treatment
Wayland	DW-18-01	Wayland 2018 Water Main Improvements	$700,000	100%	DW	Drinking Water Transmission and Distribution
Webster	DWP-17-04	Memorial Beach Wells Water Treatment Plant	$9,688,617	99.63%	DW	Drinking Water Treatment
West Springfield	DWP-17-13	Drinking Water System Improvements Project	$6,699,639	99.96%	DW	Drinking Water Source and Storage
Whatley	DW-16-11	Manganese Removal	$440,000	95.57%	DW	Drinking Water Treatment

Footnote

[1] Series 22: All Amount and Percentage Completed sections are accurate as of July 31, 2021.

Appendix C - Series 21 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category
Adams Fire District	DW-16-10	Well 4 Pump Station Rehabilitation	$527,230[2]	100%	DW	Drinking Water Transmission and Distribution
Brockton	CWP-16-29	Sewer Rehabilitation Project	$2,746,309[2]	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Chatham	DW-14-06	New Water Treatment Facility	$8,421,768[2]	100%	DW	Drinking Water Treatment
Fall River	CW-13-02-A	Combined Sewer Overflow Abatement Program Abatement Program	$487,150	100%	CW	Combined Sewer Overflow Correction
Fall River	CWP-16-03	Globe Street Sewer Improvements Project	$3,713,753[2]	100%	CW	Combined Sewer Overflow Correction
Fall River	DWP-13-06-A	Airport Road High Service Area Improvements	$306,968[2]	100%	DW	Drinking Water Source and Storage
Fall River	DWP-14-08-A	Water Main Improvements and WTP Residual Handling	$139,747	100%	DW	Drinking Water Transmission and Distribution
Fall River	DWP-16-09	Water Main Improvements - Phase 16	$3,230,880[2]	100%	DW	Drinking Water Transmission and Distribution
Fitchburg	CWP-16-05	Beech and Hazel Streets Sewer Separation	$1,934,770[2]	100%	CW	Combined Sewer Overflow Correction
Fitchburg	CWP-16-10	Fitchburg WWTF Secondary Systems Upgrade	$9,017,418	100%	CW	Wastewater Treatment
Hadley	DWP-16-03	Water Infrastructure Improvement	$172,998	100%	DW	Drinking Water Transmission and Distribution
Haverhill	DWP-16-07	Transmission Main Improvements	$2,514,366[2]	100%	DW	Drinking Water Transmission and Distribution
Haverhill	DWP-16-05	Haverhill Water Treatment Plant Upgrades	$8,645,659	100%	DW	Drinking Water Treatment
Medway	CW-11-20	IWRMP	$499,922[2]	100%	CW	Planning
MFN Regional Wastewater District	CW-15-25-A	WPCF Upgrades and Landfill Closure	$17,911,611	100%	CW	Wastewater Treatment
Montague	CWP-14-28	Pump Station Replacements	$1,583,047	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	DW-16-06	SEH Redundancy and Storage	$4,045,484	100%	DW	Drinking Water Source and Storage
MWRA	DW-16-23	Low Service Storage	$319,493	100%	DW	Drinking Water Source and Storage
MWRA	DW-17-15	Wachusett Aqueduct PS	$28,249,352	100%	DW	Drinking Water Transmission and Distribution
MWRA	CW-16-42	Caruso Pump Station	$2,194,852	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-17-35	Remote Headworks Upgrade	$4,786,700	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-16-43	Wastewater Treatment Plant and Sewer Improvements	$3,394,837	100%	CW	Wastewater Treatment
MWRA	CW-17-34	Wastewater Treatment Plant and Sewer Improvements	$3,249,355	100%	CW	Wastewater Treatment
MWRA	CW-17-36	Clinton WWTP Phosphorous Removal	$3,759,927	100%	CW	Wastewater Treatment
Nantucket	CW-16-36	Shimmo & PLUS Parcels Sewer Extension	$13,307,603[2]	100%	CW	Collector and Interceptor Sewers
Nantucket	CW-15-26	Surfside WWTF Improvements	$8,409,503[2]	100%	CW	Wastewater Treatment
New Bedford	CW-16-37	Supplemental WW and SW Plan	$1,000,000	100%	CW	Planning
Northampton	CWP-10-14-R	Pumping Station Improvements	$73,066[2]	100%	CW	Planning
Norwood	CWP-15-08-A	Underdrain Area Sewer Rehab	$363,121[2]	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Quincy	CWP-15-06	PS Renovation	$3,531,447[2]	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation

Footnote

[1] Series 21 projects have been fully drawn and will no longer appear in Green Bond reporting. All Amount and Percentage Completed sections are accurate as of July 31, 2021.
[2] Amount was reduced following the completion of the project. Excess funds were reallocated to additional green projects.

Appendix C - Series 21 Projects[1]

Borrower	Loan No.	Project Name	Amount	Percentage Drawn	Program	Category
Revere	DW-13-10	GIS Implementation of AMR Program	$240,000[2]	100%	DW	Drinking Water Planning and Design
Revere	CW-16-19	Phase VIII Field Investigations - I/I and IDDE	$1,500,000	100%	CW	Planning
Revere	CW-16-23	Illicit Connections & Sump Pump Detection	$850,000	100%	CW	Planning
Saugus	CWP-16-09	Sewer System and Pump Station Rehab/Improvements	$3,197,219	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Shrewsbury	DW-16-15	Home Farm Water Treatment Facility Upgrade	$11,585,569[2]	100%	DW	Drinking Water Treatment
Taunton	CWP-16-38	Sewer/Drain Separation and Inflow Removal	$3,927,054	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
UBWPAD	CWP-16-39	Nutrient Removal Improvements	$8,842,079	100%	CW	Wastewater Treatment
Uxbridge	CW-16-26-A	Wastewater Treatment Facility - BNR and Infrastructure Upgrade	$17,253,299	100%	CW	Wastewater Treatment

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SEPTEMBER 2021

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