

City of Taunton, MA
Wastewater Treatment Facility Upgrade
Phase 2
CWSRF 6760
August 2021

CWSRF CONSTRUCTION STAGE APPLICATION
PART 4 PROJECT NARRATIVE



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Prepared for: MassDEP CWSRF

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PART IV – PROJECT NARRATIVE

Objectives

The project consists of a complete upgrade of the Taunton Wastewater Treatment Facility (WWTF). Improvements to the WWTF are required to meet the requirements of the new NPDES discharge permit. In addition, the facility is being expanded hydraulically to accept higher flows from the new Main Lift Pumping Station, which will reduce the size and frequency of combined sewer overflows (CSOs). This application encompasses Phase 2 of the upgrades, for inclusion on the 2021 IUP. Phase 1 and the Solids Handling upgrades at the WWTF have been previously submitted under separate projects.

The primary objective of this Phase is to upgrade the existing WWTF to provide an advanced level of treatment for Total Nitrogen removal. This will reduce the WWTF's discharge of Nitrogen to the Taunton River.

Implementation of this project will bring the WWTF into compliance with its NPDES Discharge Permit MA0100897. In addition, this project is in partial compliance with the requirements of the Administrative Consent Order (No. ACOP-SE-05-R006-1N-SEP) issued by MassDEP to the City of Taunton on April 15, 2005. The consent order focuses on wastewater collection system maintenance and repair work geared toward reducing the frequency and volume of wet weather discharges through the CSO. In addition, the work done under this project will help the City stay in compliance with the USEPA Order for Compliance (Docket 08-042).

Project Description

Taunton's centralized wastewater treatment system is served by a single Wastewater Treatment Facility, located on West Water Street. The facility was originally built in 1950, with significant upgrades constructed in 1978 and 2000. In 2015, the WWTF was issued a new NPDES discharge permit. Upgrades are being undertaken for three reasons: improved level of treatment (specifically total nitrogen removal), improved hydraulic capacity, and general upgrades.

The existing WWTF is not capable of achieving the level of treatment necessary to meet the new permit limits. In particular, the new permit includes a discharge limit for Total Nitrogen (TN) which did not exist in previous permits. In addition, the Main Lift Pumping Station, which delivers all flow to the WWTF, is currently being upgraded and will soon be capable of delivering flows to the WWTF beyond what it is currently designed for. The additional capacity at the Main Lift station was designed with the intent of helping to abate the CSO. Lastly, portions of the WWTF are beyond their design life and require replacement due to age and wear. Building systems need upgrading for energy efficiency and improved operations.

The WWTF is the single most critical part of the City's wastewater system. It treats all of Taunton's wastewater, and is in need of major upgrades. These upgrades will improve water quality in the Taunton River, and subsequently in Mt Hope Bay and Narragansett Bay. Upgrading the WWTF will help to reduce CSOs into the Taunton River, and the frequency and scope of costly emergency maintenance and repairs.

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This phase of the project will include the following improvements:

Phase 2

- Upgrade of existing biological treatment system to facilitate total nitrogen (TN) removal, including:
 - Retrofit of existing biological treatment tanks
 - Construction of new biological treatment tanks
 - Replacement of aeration blowers
 - Upgraded instrumentation and controls
- Retrofit of existing final clarification, including:
 - Replacement of clarifier mechanisms
 - Replacement of return activated sludge (RAS) and waste activated sludge (WAS) pumping systems

This project is proposed and outlined in the City's Comprehensive Wastewater Management Plan, which was approved in 2020. The certificate for the CWMP is included as part of this application.

In summary, this entire project:

- Is intended to remove nutrients in order to meet the facility's NPDES permit
- Is in accordance with the City's approved CWMP

Cost Estimating – The estimated costs for this construction project were based on projects of similar size utilizing similar technologies. The estimated construction cost for this project is included as Attachment B to this application. The total cost of Phase 2, including contract administration and contingency, is estimated at \$40,000,000

PART IV – PROJECT RANKING

A. PUBLIC HEALTH IMPACTS

1. WHAT IS THE CAUSE OF THE ENVIRONMENTAL/PUBLIC HEALTH PROBLEM OR NUISANCE WHAT THE PROJECT WILL ADDRESS?

c) Combined Sewer Overflows (1-10/year)

The City's CSO outfall is immediately upstream from the Main Lift Pump Station, on West Water Street. The upgrade of the WWTF will allow the Main Lift Pump Station to convey more flow to the WWTF, reducing the size and frequency of overflow events.

Reduction of CSO discharges is a primary goal of the USEPA Order for Compliance (Attachment D). Records of recent CSOs are included as Attachment F.

i) POTW Malfunction

The current WWTF is not capable of meeting the limits included in its most recent NPDES discharge permit. This upgrade is necessary in order for the WWTF to meet its permit limits. A copy of the WWTF permit is included as Attachment E

2. WHAT IS THE NATURE OF THE RESOURCE AFFECTED?

a) Public Drinking Water Supply

A drinking water treatment plant is located in Dighton, which supplies drinking water to the community of Brockton. The source of water for this plant is the Taunton River. Since the City of Taunton's CSO and WWTF discharge are upstream of this plant, any discharge of wastewater or contaminated stormwater to the Taunton River could have adverse effects on the drinking water supply. This project will reduce and eliminate sources of contamination to the Taunton River.

A map showing the location of the drinking water plant and a copy of its draft permit are included as Attachment G.

e) Swimming Beaches

The Taunton river discharges to Mt. Hope Bay, and subsequently Narragansett Bay. The Rhode Island Department of Health routinely closes beaches on Narragansett Bay due to contamination resulting from Combined Sewer Overflows (CSOs). A reduction in CSOs from communities such as Taunton will ensure that swimming beaches stay open for more days of the year. A chart of Rhode Island beach closures for 2019 (through Mid-July) is included as Attachment M.

f) Boating Areas

The Taunton River is a popular boating area, especially for canoes and kayaks, due to its long stretch of undammed water and varied wildlife. A brochure heralding boating on the Taunton River is included as Attachment N.

h) Population Affected (>10,000)

Taunton's sewer system and WWTF service over 35,000 residents of Taunton, as well as other surrounding towns. A discussion of the demographics of the sewer system is included in the CWMP (Attachment C)

B. ENVIRONMENTAL CRITERIA

1. WHAT IS THE NATURE OF THE ENVIRONMENTAL PROBLEM ENCOUNTERED?

a) NPDES Limits Exceeded

In 2015, the WWTF was issued a new NPDES discharge permit, which included a total nitrogen limit during the summer months (Attachment E). The WWTF as currently constructed and configured is not capable of meeting the total nitrogen limit, resulting in consistent exceedances. A summary sheet showing these exceedances is included at the end of Attachment E.

c) Nutrients

The Taunton WWTF discharges to the Taunton River at Segment MA 62-02 (Rte. 24 bridge to Berkley Bridge). The Taunton River discharges to Mt Hope Bay, which is listed as impaired for total nitrogen. The total nitrogen impairment in Mt Hope Bay was a primary factor in the inclusion of a total nitrogen limit for the Taunton WWTF in its permit. The segments of the Taunton River and Mt Hope bay included on the 303(d) list of impaired waters is included in Attachment I.

c) Bacteria

The Taunton WWTF discharges to the Taunton River at Segment MA 62-02 (Rte. 24 bridge to Berkley Bridge). This segment of the river, as well as downstream segments (62-03 & 62-04) are listed as impaired for pathogens. The WWTF upgrade will enhance the treatment capacity of the facility and will reduce the size and frequency of CSO events, which will reduce the risk of exposure to harmful bacteria in the river. The segments of the Taunton River included on the 303(d) list of impaired waters is included in Attachment I.

f) Dissolved Oxygen

The Taunton WWTF discharges to the Taunton River at Segment MA 62-02 (Rte. 24 bridge to Berkley Bridge). The two segments of the Taunton River downstream of the WWTF (62-03 & 62-04) are listed as impaired for low dissolved oxygen. In addition, the Taunton River discharges to Mt Hope Bay, which is listed as impaired for dissolved oxygen. The dissolved oxygen impairment in Mt Hope Bay was a primary factor in the inclusion of a total nitrogen limit for the Taunton WWTF in its permit. The segments of the Taunton River and Mt Hope bay included on the 303(d) list of impaired waters is included in Attachment I. Dissolved oxygen levels in Mt. Hope Bay are shown in Attachment O.

2. WHAT ENVIRONMENTAL RESOURCE IS AFFECTED?

c) – Outstanding Resource Water (ORW)

This project is intended to address issues which have negative impacts on the water quality of the Taunton River. The Taunton River discharges to Mount Hope Bay, which is contiguous with Narragansett Bay. Narragansett Bay has been classified as an Outstanding Resource Water.

g) Commercial Fishery/Shellfish Area

The Taunton WWTF discharges to a portion of the Taunton River which is part of Growing Area MHB2 as designated by the Massachusetts Division of Marine Fisheries. Northern portions of the river are classified as “prohibited”, while southern sections are listed as “restricted”. The portion of Mt. Hope Bay where the Taunton River discharges (near Fall River) is likewise listed as “prohibited” for shellfishing. The upgrade of the Taunton WWTF, along with other projects in neighboring communities, will serve to upgrade conditions for shellfishing activities in the future. Maps of shellfishing areas are included in Attachment L.

h) Endangered Species Habitat

The National Heritage and Endangered Species Program (NHESP) has designated a Priority Habitat of Rare Species along the Taunton River immediately downstream of the project. The Southeastern Regional Planning & Economic Development District (SRPEDD) reports that more than 154 species of birds, and 29 species of native fish live within the Taunton River watershed. The river also contains 7 species of mussels, 3 of which are on the state’s list of endangered and at-risk species. The list of species is included as Attachment J.

k) Recreational Fishery/Shellfish Area

The Taunton WWTF discharges to a portion of the Taunton River which is part of Growing Area MHB2 as designated by the Massachusetts Division of Marine Fisheries. Northern portions of the river are classified as “prohibited”, while southern sections are listed as “restricted”. The portion of Mt. Hope Bay where the Taunton River discharges (near Fall River) is likewise listed as “prohibited” for shellfishing. The upgrade of the Taunton WWTF, along with other projects in neighboring communities, will serve to upgrade conditions for shellfishing activities in the future. Maps of shellfishing areas are included in Attachment L.

l) Federally Designated River

The Taunton River is on the federal list of Wild and Scenic Rivers. Legislation was passed in March 2009 to include the river. The legislation is included as Attachment H.

C. PROJECT EFFECTIVENESS

1. INDICATE HOW AND TO WHAT EXTENT WILL THE PROJECT ELIMINATE OR MITIGATE THE PROBLEM.

a) Reduces Violations of Water Quality Standards

The Taunton River downstream of the WWTF is classified as an “SB” water under 314 CMR 4.00. This designation includes a minimum dissolved oxygen content of 5.0 mg/L. Recent MassDEP studies reviewing the water quality standards have shown that the Taunton River and Mt Hope Bay are frequently below the current standard during the summer months (See Attachment O). It is hoped that improvements at the Taunton WWTF and other treatment facilities in the area will improve water quality in the Taunton River and Mt. Hope Bay and reduce the violations of standards.

b) Restores Designated Uses

The Taunton WWTF discharges to a portion of the Taunton River which is part of shellfish Growing Area MHB2 as designated by the Massachusetts Division of Marine Fisheries. Northern portions of the river are classified as “prohibited”, while southern sections are listed as “restricted”. The portion of Mt. Hope Bay where the Taunton River discharges (near Fall River) is likewise listed as “prohibited” for shellfishing. The upgrade of the Taunton WWTF, along with other projects in neighboring communities, will serve to upgrade conditions for shellfishing activities in the future. Already, some areas of the river have been upgraded – in 2009, the entire Taunton River south of the WWTF was listed as “prohibited”. With continued improvements in treatment and reductions of CSOs, it is hoped that the entire river can be upgraded in the future for shellfishing activities.

c) Reduces Potential Adverse Impacts to Sensitive Resources

Many threatened and endangered species live in and around the Taunton River. Improvements to the Taunton WWTF will have a positive impact on dissolved oxygen concentrations and overall water health in the Taunton River and downstream bays.

f) Protects Public Health Resources from Contamination

The Taunton River Desalination Plant, located in Dighton, uses the Taunton River as its source water. Upgrading the Taunton WWTF will reduce the amount of contaminants present in the source water for this plant, both by improving the level of treatment at the facility and reducing the occurrence of CSOs into the river.

h) To what extent will the project eliminate or mitigate the problem

Upgrading the Taunton WWTF will have a positive impact on the health of the Taunton River and Mt. Hope Bay. While it is not the only, or largest, contributor of contaminants to the river, it is a visible one. Reducing the amount of total nitrogen contributed to the river should have an impact on downstream water quality. In addition, reduction of the size and frequency of CSO events will reduce or eliminate the discharge of untreated wastewater to the Taunton River at that location.

D. PROGRAM AND IMPLEMENTATION CRITERIA

1. CONSISTENCY WITH EOEEA/MASSDEP WATERSHED MANAGEMENT PLANS OR PRIORITIES

a) Implements a Recommendation within CWMP/EIR

The improvements recommended under this project have been outlined in the City’s Draft EIR and Final CWMP, submitted in July 2009. The Plan makes recommendations for upgrading the WWTF in compliance with the new NPDES discharge permit, and outlines a series of steps required to abate the City’s permitted CSO. A copy of the approval letter for the CWMP is included as Attachment C.

b) Compliance and Enforcement

MADEP issued an Administrative Consent Order (ACOP-SE-05-R006-1N-SEP) to the City of Taunton on April 15, 2005. USEPA issued an Order for Compliance (Docket 08-042 in September 2008. This project will help achieve compliance with the Consent Order and the Order for Compliance. The Orders are included as Attachment D.

c) Multi-Community, Regional or Basin Solution

This project will help to alleviate two regional problems. First, the Taunton WWTF services several communities, including Taunton, Raynham, and Norton. As such, the WWTF is a critical asset, its performance affects residents of all tributary communities. Second, reduction of CSO events into the Taunton River will help to improve and preserve water quality for a drinking water supply for Brockton.

e) Pricing System under MGL c. 40, § 39J

The pricing system for sewer service in the City of Taunton, in accordance with MGL c.40, s.39J, is included as Attachment K.

f) Energy Efficiency – Project Recommended by an Audit

In December 2017, an energy audit was conducted on the WWTF process equipment and buildings. The recommendations of that report are being incorporated into the design of the WWTF upgrades and building renovations. A copy of the audit is included as Attachment P.

During the design of this project, it is intended that several energy efficiency measures will be incorporated. Among the measures to be implemented or considered are:

- Premium efficiency motors
- Variable Frequency drives for pumps
- Passive and energy efficient lighting for buildings
- Energy efficient generator for backup power
- New Instrumentation and Control system for efficient operation

g) Renewable Energy – Project Recommended by an Audit

As part of the energy audit conducted on the WWTF, opportunities for renewable energy were explored. The audit identified multiple locations where solar panels could viably be located. The recommendations of that report are being incorporated into the design of the WWTF upgrades and building renovations. A copy of the audit is included as Attachment P.

E. THRESHOLD CRITERIA

1. Does the capacity to be provided by the project duplicate existing treatment or disposal capacity already available at an economic cost within the relevant region?
 - a. No
2. Are there any potential negative impacts to public health or the environment from this project?
 - a. No

F. BEST MANAGEMENT PRACTICES

a) Asset Management Plan

The City employs an asset management plan for the WWTF and pump stations, administered by the contract operator (Veolia). As an example, the WWTF asset list is included as Attachment Q

b) Full Cost Pricing

Sewer Rates in Taunton are based on a study of all direct and indirect costs to operate the WWTF and collection system. This takes into account Operation and Maintenance costs, debt service,

and indirect costs from other City departments. An example of the calculation of the sewer rates from a recent study is included as Attachment R.

c) Enterprise Fund

The Taunton Sewer Enterprise fund was established in 2011. The sewer system, including WWTF and collections, have operated as an enterprise fund since then. Documentation of the vote establishing the enterprise fund is included as Attachment S.

e) Inter Municipal Agreement

The City of Taunton is the Host community for multiple inter-municipal agreements. They currently have IMAs with the towns of Raynham, Norton, and Dighton. Under the terms of these agreements, the contributing communities will be responsible for a portion of the cost of the new WWTF construction. Excerpts from the IMAs are included as Attachment T.

G. QUALIFYING EPA GREEN PROJECTS

1. List the Project item codes from the checklist that qualify as green
 - EE4 Premium Motor for Blower or Pump
 - EE5 Variable Frequency Drive for Blower or Pump
 - EE7 Upgrade of Wastewater Treatment Processes
 - EE18 Aeration System upgrade
 - EE19 Install Turboblower
 - EE20 Install Dissolved Oxygen Monitoring and Automated Control
2. List the total value of the green items
 - a. The total value of all green items is approximately \$7,550,000, or 41.3% of the total project construction cost.