ROCKLAND, MASSACHUSETTS

Comprehensive Wastewater Management Plan

OCTOBER 2023

Combined 3-Phase Report

WRIGHT-PIERCE
Engineering a Better Environment

Comprehensive Wastewater Management Plan
Combined 3-Phase Report
Rockland, Massachusetts

October 2023

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*page numbers reflect position in combined PDF

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AUGUST 2022

Phase 1 – Existing Conditions, Problem Identification & Needs Assessment

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Section 1 Introduction

1.1 Background Information

The Town of Rockland is a suburban community located in Plymouth County, approximately 20 miles southeast of Boston and 50 miles northeast of Providence, Rhode Island. The Town is comprised of 10.1 square miles of land area with 1,404 acres of wetlands and 116 acres of water bodies. Rockland is bordered by Weymouth to the northwest, Hingham and Norwell to the northeast, Hanover to the east, Abington and Whitman to the west, and Hanson to the south. Refer to Figure 1-1 for an aerial view of Rockland and its surrounding communities.

State Route 3, Route 123, and Route 139 serve Rockland with access to and from the surrounding communities. The central part of the Town includes the downtown areas as well as residential communities and open spaces throughout. The northeastern corner of the Town includes a major commercial and industrial center. According to the Metropolitan Area Planning Council (MAPC), the Town is classified as a maturing New England town, meaning it has a growing mixed-use town center that is surrounded by compact neighborhoods.

In preparation for impending wastewater treatment plant upgrades that will be needed to comply with a more stringent phosphorous permit limit, the Town is developing a Comprehensive Wastewater Management Plan (CWMP). The CWMP evaluates the Town's current and future wastewater needs. The CWMP is also one of five requirements that will help position the Town for potential zero percent interest loan financing through the State Revolving Fund (SRF) program issued by the Massachusetts Department of Environmental Protection (MassDEP).

1.2 Purpose and Scope of Services

In January 2022, the Town of Rockland (the Town) retained Wright-Pierce to develop a CWMP, which will be used as a wastewater planning tool to guide the Town for the next 20-year planning period. This CWMP is funded by the Town of Rockland. A copy of the scope of services is included in Appendix A. The Town continues its efforts to evaluate, update, and improve its wastewater collection system (including pumping stations) and treatment plant to remain in compliance with its regulatory requirements.

This CWMP for the Town of Rockland has been prepared in compliance with the *MassDEP Guide to Comprehensive Wastewater Management Planning*, published in January 1996.

Preparation of the CWMP will include information and recommendations (as appropriate) from previous studies, including the Town's master and open space planning, watershed studies, drinking water systems, wastewater collection system, pumping stations, and wastewater treatment plant (WWTP). This document satisfies the Phase 1 requirements of the three-phase CWMP process. The intent of the phased approach is to perform the increasingly complex tasks for Phases 2 and 3 based on the information developed from the previous phase(s).

The three CWMP phases are:

- **Phase 1: Assessment of existing conditions, problem identification and needs assessment for the Town. The needs assessment will determine areas with a "need for further study" in Phase 2.**
- Phase 2: Alternatives Identification and Screening. Identify and short-list appropriate means of wastewater management alternatives to address any "needs areas" identified in Phase 1. The analysis will include a review of technical, environmental, institutional, and economic factors; and

- Phase 3: Detailed evaluation of alternatives short-listed in Phase 2 and development of recommended wastewater management plan.

This Phase 1 assessment summarizes the Town's existing municipal wastewater collection and treatment systems and evaluates the near and long-term wastewater management "needs" of non-sewered areas.

1.3 Review of Prior Wastewater Planning Efforts

The Town of Rockland has been involved in the wastewater planning process in various forms over several years. The Town recently has completed a Sewer System Evaluation Survey (SSES) and a Comprehensive Wastewater Treatment Plant Assessment and Evaluation. The Town is currently performing a sewer rate study. In addition, the Town is upgrading two of its pump stations, Butternut Lane and Spruce Street, from pneumatic ejector pump stations to submersible pump stations.

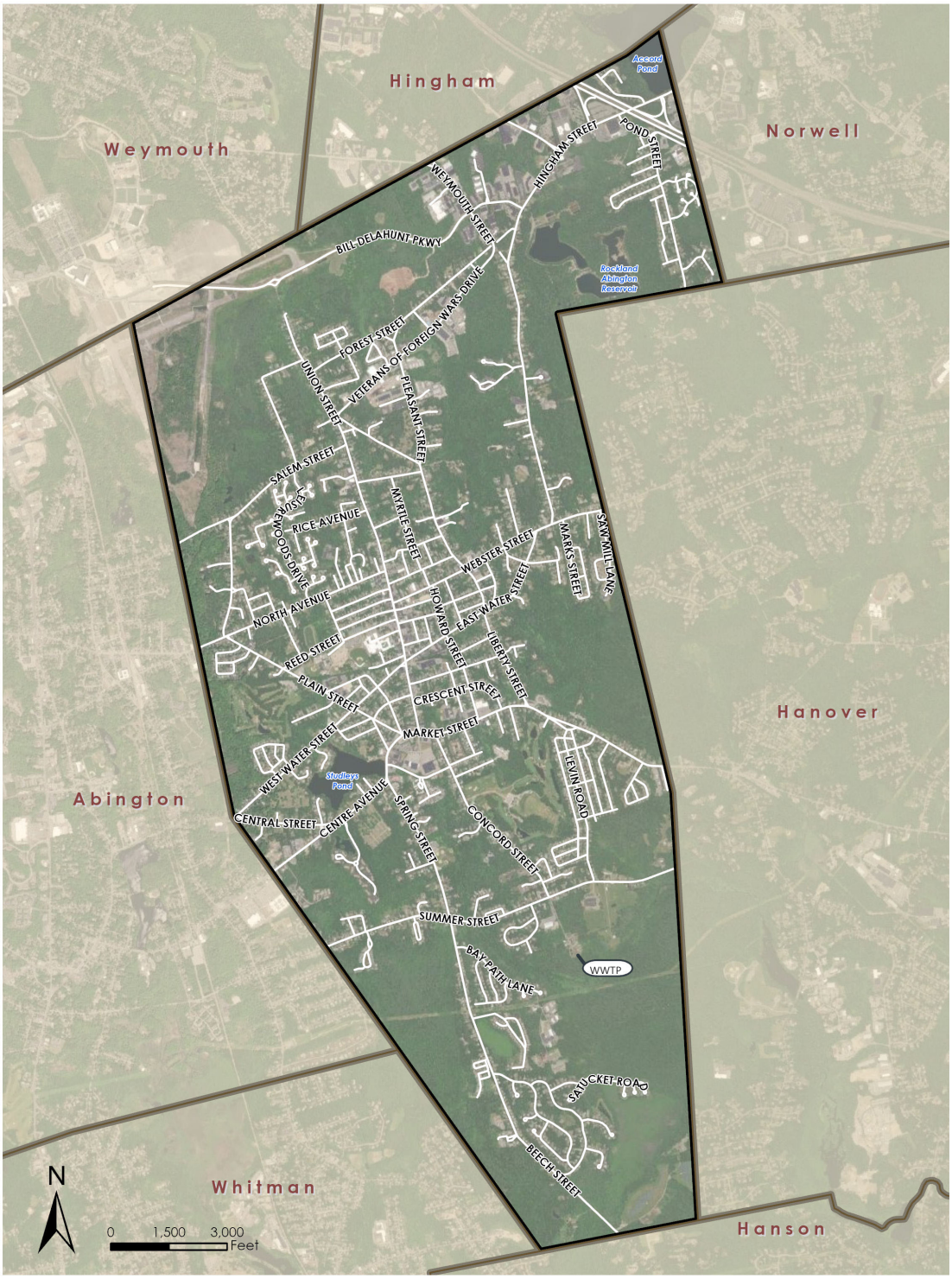
The WWTP evaluation completed in April 2021 assessed the existing processes and developed alternatives to meeting potential future nitrogen permit limits and a stricter phosphorus permit limit. After the evaluation report was issued, the Town received the final National Pollutant Discharge Elimination System (NPDES) permit, #MA0101923, in November 2021. The new NPDES permit includes a more stringent phosphorous limit with a reduction from 0.2 mg/l in the older permit to 0.1 mg/l in the new permit from April 1 to October 31. The total phosphorous limit remained at 1.0 mg/l for November 1 to March 31. A nitrogen limit was not added at this time, but weekly and monthly monitoring requirements were added for nitrate and nitrite, total Kjeldahl nitrogen, and total nitrogen. It is anticipated the Town may receive a numerical total nitrogen limit in a future permit renewal.

1.4 Stakeholders

The Town understands the importance of the involvement of the citizens and interested stakeholders in Rockland as part of the CWMP process. The stakeholders include the citizens of Rockland; Rockland Board of Selectman; Board of Sewer Commissioners; Highway Department; Abington and Rockland Joint Board of Water Commissioners; Board of Health; Conservation Commission; Planning Board; Massachusetts Department of Environmental Protection; Department of Fish, Wildlife and Environmental Law Enforcement (DFWELE) Natural Heritage Program; Water Resources Commission (WRC); Executive Office of Energy and Environmental Affairs (EOEEA); and officials from neighboring communities. Town of Rockland staff have provided input regarding the development of the Phase 1 CWMP.

The report for each phase of the CWMP will be available for review and comment by all interested stakeholders. There will be two public meetings near the completion of Phases 1 and 2 and a public hearing at the completion of Phase 3. The meetings will take place during the Rockland Board of Sewer Commissioners meeting and will give the opportunity for the public and interested stakeholders to provide input on the CWMP.

Figure 1-1 Aerial View of Rockland



2

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Section 2 Existing Conditions

The purpose of this section of the CWMP is to describe the built, human, and natural environment within the Town of Rockland. Information for this section has been obtained through readily available reports, plans, initiatives, and studies that were reviewed to compile existing and future conditions that impact, or may affect, the CWMP for the Town of Rockland. The sources utilized include, but are not limited to:

- Town of Rockland Departments and Boards
- Town of Rockland Open Space and Recreation Plan 2018 – Written by the Town of Rockland Open Space and Recreation Plan Update Committee and the Metropolitan Area Planning Council (MAPC)
- Rockland Master Plan 2030 – December 2020, Written by the Town of Rockland and MAPC
- United States Geologic Survey (USGS)
- United States Census Bureau
- Executive Office of Energy and Environmental Affairs (EOEEA)
- Massachusetts Department of Conservation and Recreation
- Massachusetts Division of Fisheries and Wildlife, National Heritage and Endangered Species Program (NHESP)
- The Federal Emergency Management Agency (FEMA)
- Boston Harbor South Watersheds 2004-2009 Action Plan -Written by Neponset River Watershed Association
- How's My Waterway? Online Database – EPA; https://mywaterway.epa.gov/community/Rockland,%20MA,%20USA/overview
- Final Pathogen TMDL for the South Coastal Watershed – August 2014, Written by MassDEP
- Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle, Written by MassDEP

2.1 Conditions in Planning Area

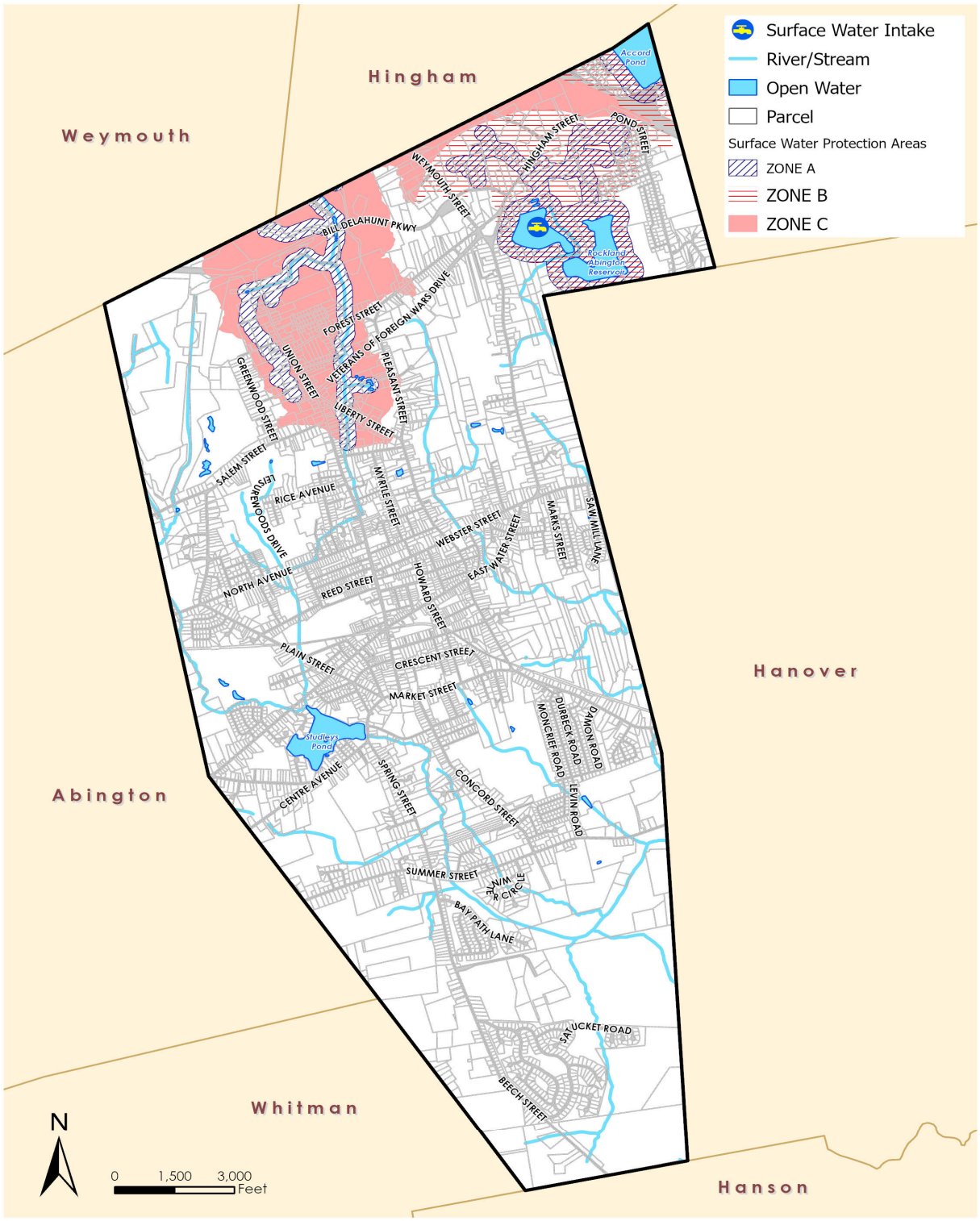
The planning area considers the entirety of the Town of Rockland and focuses on areas that currently use individual onsite septic systems, to determine their condition and whether they are sustainable long-term. If they are not found sustainable long-term, an offsite solution will be investigated in Phase 2, such as a connection to the Rockland WWTP. The focus areas include those areas that have been or may be impacted by failed or poorly performing onsite wastewater disposal systems. The planning area takes into account many criteria, such as the Town's surface waters and wetlands, and is discussed in Section 5. Refer to Figure 1-1 for an Aerial Map of Rockland.

2.2 Basin-Wide Initiatives and Other plans for the Town's Watershed Basins

At local, state, and federal levels of government, initiatives have been established to promote a balance between economics and the environment. This section of the CWMP focuses on the environmental initiatives and plans that have been developed to minimize environmental impacts on the sub-watershed basins within the Town of Rockland.

Within the Town's boundaries, the major water bodies consist of Rockland Abington Reservoir, Old Swamp River, Accord Pond, French Stream, Ben Mann Brook, Cushing Brook, and Studleys Pond. In surrounding communities, there are several water bodies that receive flow from Rockland, such as Factory Pond in Hanson and the Indian Head River. The Town consists of 116 acres of surface water. Refer to Figure 2-1 for water resource areas within the Town.

Figure 2-1 Water Resources



2.2.1 Description of the Town's Watersheds

Watersheds define the flow of surface water and groundwater. Rockland lies primarily within the boundaries of the United States Geological Survey (USGS) designated South Coastal Watershed. However, a small amount of the northern part of the town is located in the Boston Harbor Watershed.

In Massachusetts, the South Coastal Watershed spans 240 square miles. The South Coastal Watershed (SCW) is influenced by its many coastal rivers which drain directly into the Atlantic Ocean. Rockland lies within a sub-watershed of the SCW called the North and South Rivers Watershed which includes 12 towns on the South Shore.

A small northern portion of Rockland lies within the Back River Watershed which is within the Weymouth and Weir Watershed and is a sub-watershed of the Boston Harbor Watershed. The Back River Watershed is located in Plymouth and Norfolk counties south of Boston.

The term "watershed" can be further reduced to the local level, consisting of each river, brook, or stream in the Town and its associated drainage basin. Figure 2-2 illustrates the locations of the hydrology and local watersheds in Rockland.

2.2.1.1 Indian River Watershed in Rockland

Rockland has four rivers (Drinkwater River, French Stream, Ben Mann Brook, and Cushing Brook), one pond (Studleys Pond), and one reservoir (Abington and Rockland Reservoir) that connect to the Indian Head River Watershed. The Indian Head River is one of the sub-watersheds of the North and South Rivers watershed. It is approximately 30 square miles. The Indian Head River headwaters is the outlet of Factory Pond in Hanover, and its confluence is with the Herring Brook in Hanover where it forms the headwaters of the North River. The French Stream headwaters is on the southeast side of the South Weymouth Air Station then flows through Studleys Pond ending with its mouth at the Drinkwater River. Cushing Brook also flows into the Drinkwater River. The Drinkwater River then flows into Factory Pond.

All of these water bodies are impaired due to various reasons except Ben Mann Brook, as seen in Table 2-1. In the Town of Rockland, French Stream and Studleys Pond are listed as category 5 waters meaning they are impaired due to a pollutant and therefore, require a total maximum daily limit (TMDL). Several streams in the surrounding towns in this watershed are also impaired, as shown in the table.

2.2.1.2 Back River Watershed in Rockland

Rockland has one river (Old Swamp River) and one pond (Accord Pond) in the Back River Watershed. The Back River Watershed is a small watershed of approximately 18.7 square miles with Rockland accounting for 6% of the watershed area. Old Swamp River's headwaters are in Rockland located west of Pleasant Street and north of Liberty Street and flows into Whitman's Pond in Weymouth, MA. Accord Pond is a total of 103 acres and is in the northeast of Rockland, the Town of Hingham, and the Town of Norwell. Old Swamp River is an impaired water body and has a TMDL. Accord Pond was reassessed in 2020 and there is currently no impairment decision.

Figure 2-2 Hydrography

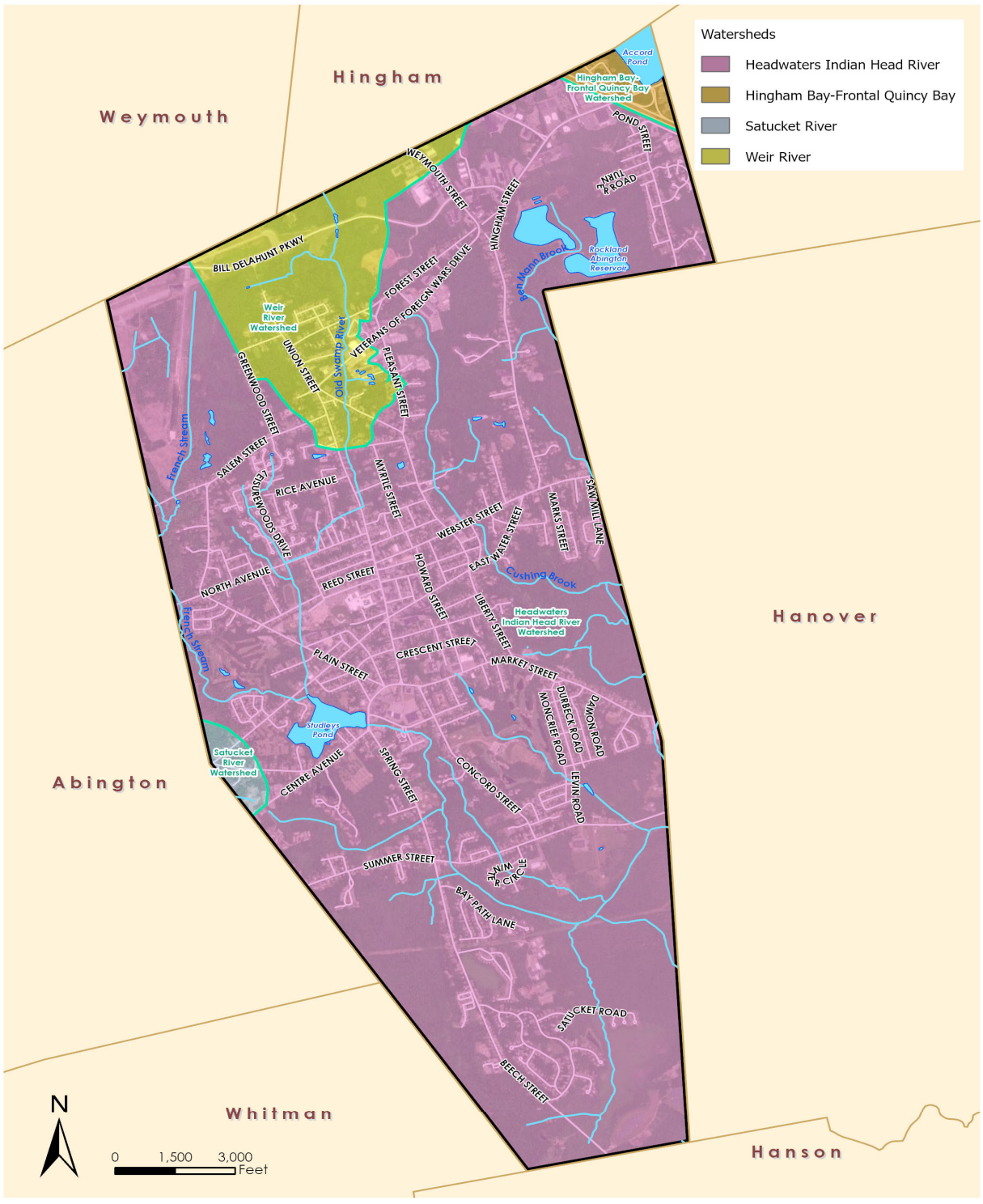


Table 2-1 List of Impaired Waters in Rockland, MA Watersheds

Water Body	Category	Impairment	Source	TMDL
Drinkwater River	5	Fish consumption due to mercury from Fireworks Site, nutrients, fecal coliform	Rockland WWTP, stormwater and agricultural runoff	Yes
French Stream	5	Nutrients, Organic enrichment, Pathogens, Dissolved Oxygen	Rockland WWTP, Cow pasture	Yes
Indian Head River	5	Fish Passage Barrier, mercury in fish tissue, E.Coli	Contaminated Sediments, Dam/Impoundment, and Unknown	No
Old Swamp River	4a	Fecal Coliform, E.Coli, Fish Passage Barrier	Dam/Impoundment, Unknown, and Potential SSO	Yes
Cushing Brook*	5	E.Coli	Unknown and Potential Municipal Storm Sewer System Discharge	No
Longwater Brook*	5	E.Coli	Unknown and Potential Municipal Storm Sewer System Discharge	No
Factory Pond*	5	Mercury in fish tissue, fish passage barrier	Fireworks Factory, dam or impoundment, illegal dumps	No
Studleys Pond*	5	Fecal coliform	Unknown	No

*Added to the list of impaired waters in 2020 as a category 5 impaired water.

2.2.2 Initiatives/Plans Relating to the Town of Rockland's Watershed Basin and Potential Impacts to the CWMP

The following bylaws, regulations, and studies will be taken into consideration for preserving and protecting the watersheds within the Town of Rockland. A summary of the local, state, and federal initiatives in relation to the watersheds in Rockland are described in the following sections.

2.2.2.1 Local Level – Town of Rockland

The Town of Rockland has two plans related to protecting watersheds, the Open Space Plan of 2018 and the Rockland Master Plan. The purpose of the Open Space Plan is for the Town to establish open space and recreation priorities to ensure that natural and historic resources are protected as the community grows over time. One of the goals of both the Open Space Plan and the Master Plan is identifying the watersheds in Rockland and creating by-laws for resource protection. The Town has also partnered with the North and South River Watershed Association and has become part of its Smart Program. As part of this program, the Town has posted educational materials on the Town's website.

2.2.2.2 Regional Level

2.2.2.2.1 South Coastal Watershed Action Plan

In September 2006, the Watershed Action Alliance of Southeastern Massachusetts prepared a South Coastal Watershed Action Plan for the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA). The document provided the following goals for the South Coastal Watershed Action Plan, specifically for the Indian Head River Watershed, such as:

1. Improve water quality to address point and non-point sources of pollution
2. Protect and restore natural habitats
3. Maintain and restore the natural hydrology of our watersheds
4. Enhance local capacity to protect and enjoy watersheds

For each goal, priority actions were created for how to achieve the goal and listed the lead parties involved and the funding sources. For each impaired water, the following actions were recommended to address the first goal:

- French Stream – address the WWTP discharge and advocate for daylighting (removing man-made obstructions to the stream) and stream restoration.
- Drinkwater River – identify contributions from upstream sources like the Rockland WWTP and other stormwater sources, evaluate stormwater outfalls, and establish erosion control measures.
- Factory Pond – investigate illicit discharges, eliminate direct or treat stormwater outfalls' discharge to the pond, and cleanup shoreline.

In August of 2014, MassDEP prepared a Final Pathogen TMDL for the South Coastal Watershed with the purpose of creating TMDLs to improve the condition of the impaired waters and ultimately return them to their designated uses. Most recently, MassDEP also included the assessment of the South Shore Coastal Drainage Area in the 2018/2020 Massachusetts Integrated List of Waters.

2.2.2.2.2 Boston Harbor Watersheds Action Plan

In November 2004, the Neponset River Watershed Association issued to the Massachusetts EOEEA a comprehensive 5-year (2004-2009) action plan to enrich the quality and sustainability of the Boston Harbor Watershed. There is a common action plan for all Boston Harbor Watersheds and then specific plans for each sub-watershed.

The Back River Watershed Priority Action Items are focused on the top four problems of the Back River Watershed: bacterial pollution, excessive nutrients, inadequate stream flows, and lack of recent data on the watershed. The Action Plan recommends for municipal governments to increase water and sewer user fees to provide consistent funding, to expand their view on water and sewer infrastructure towards watershed management, and to encourage water conservation. The Action Plan also recommends municipalities to gain assistance from citizen groups and collaborate on water quality monitoring and testing, public education, and pilot projects.

In October of 2018, MassDEP prepared a Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds. The report assessed the Old Swamp River and its impairment with fecal coliform. The impaired water bodies in this watershed were also reevaluated in the Boston Harbor: Weymouth and Weir River Watershed and Coastal Drainage Area in the 2018/2020 Massachusetts Integrated List of Waters.

2.2.2.3 State Level

At the State level, MassDEP has studied several water bodies in the Town of Rockland as seen in Table 2-1 above. Not all of Rockland's waterbodies meet state and federal water quality standards. Most recently, the 2018/2020 Massachusetts Integrated List of Waters assessed both the South Shore Coastal and the Boston Harbor Watersheds. The integrated list of waters reevaluated all the water bodies in these watersheds and updated the statuses.

For the South Coastal watershed, the Drinkwater River impairments were changed to curly-leaf pondweed, fanwort, nutrient/eutrophication biological indicators, and trash; French Stream's whole effluent toxicity was removed as an impairment; and Indian Head River's dissolved oxygen and total phosphorous impairments were removed as the original basis for listing was incorrect. For the Boston Harbor Watershed, the Old Swamp River was delisted as a 4a category water as the impairment was covered under the pathogen TMDLs of the Bost Harbor Watersheds.

2.2.2.4 Federal Level

The 1972 enactment of the Federal Water Pollution Control Act Amendments, currently referred to as the Clean Water Act (CWA), is the founding act for surface water quality protection in the United States. Regulatory statutes are in place to reduce direct pollutant discharges into waterways, finance wastewater treatment facilities and manage polluted runoff. In the 1980s, favorable funding created improvements to wastewater treatment facilities, and EPA-State partnerships were formed.

The evolution of CWA programs over the last decade has shifted from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Equal emphasis is placed on protecting healthy waters and restoring impaired water bodies under the watershed approach. A full array of issues is addressed not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of EPA's approach.

2.2.3 Regional Water Quality

The United States Environmental Protection Agency stormwater management program was initiated in 1990 under the Clean Water Act (CWA). Under the first phase of this program, the National Pollutant Discharge Elimination System (NPDES) permit identifies stormwater runoff in systems serving a population of 100,000 or more as well as construction activities disturbing five acres or more as well as particular industrial activities. Phase II permits cover stormwater discharges from systems under 100,000 in population in urban zones and smaller construction sites.

The Town of Rockland has a small MS4 permit under Phase II of the NPDES stormwater permit. The small MS4 permit requires the Town to develop, implement, and enforce a Stormwater Management Program (SWMP). The Town last updated its SWMP in September of 2020 and aligned its regulations with the Massachusetts Stormwater Handbook.

The MassDEP Office of Research and Standards issues guidelines for the Commonwealth's drinking water. The US EPA recognizes the need for towns reliant on wells and groundwater to supply potable drinking water to meet the demand of local residents.

The Town of Rockland's water is supplied and treated through the Abington and Rockland Joint Water Works. The Water Works supply comes from both groundwater and surface water sources. The groundwater source comes from four gravel-packed wells located in Abington. The surface water sources include the John F. Hannigan Memorial Reservoir, also known as the Rockland Abington Reservoir, located in the northeast corner of Rockland, and the Great Sandy Bottom Pond located in the Town of Pembroke. There are three water treatment plants – two for the surface waters and one for the groundwater sources. The water is then treated and distributed to the two towns.

The Town has approximately 100 private wells used for general use or irrigation purposes.

2.3 The Built and Human Environment

2.3.1 Town Government

The Town of Rockland is governed by a five-member Board of Selectman and a Town Administrator. The Board of Selectmen act as the chief elected and executive body of the Town. The Board of Selectman set the policies and procedures governing all Town boards. The Town Administrator is appointed by the Board of Selectmen and is responsible for the day-to-day Town management. The Town of Rockland has one annual town meeting in May.

The Planning Board is responsible for the establishment of planning and community development policies and consists of five elected members. The Planning Board is also responsible for creating and implementing the Rockland Master Plan, which lays out the way the town wishes to grow over a twenty-year period. The Planning Board reviews and approves all subdivisions in the town, thus ensuring the appropriate design of roadways, stormwater drainage systems, utilities, neighborhood parks, and other open space areas.

The Rockland Board of Health enforces Massachusetts General Laws, State Environmental and Sanitary Codes, and Town of Rockland Ordinances and Regulations. The Health Department has the primary responsibility of protecting and improving the public health and well-being of the Rockland community. The enforcement and inspection activities ensure a safe and healthy environment in which to live and work. The Health Department has jurisdiction over all onsite wastewater disposal systems in the Town. The Department maintains the records for these systems and is responsible for enforcing state and local regulations.

The Sewer Department is responsible for implementing and enforcing the Town of Rockland's Sewer Use Ordinance. The Sewer Ordinance sets requirements for the use of public and private sewers, private wastewater disposal, connection into the sewer collection system, and the use of the wastewater treatment plant. The Sewer Department is managed by the Board of Sewer Commissioners which consists of three elected members. The WWTP is contract operated by Veolia and the Sewer Department is managed by a full-time Superintendent (currently an interim Superintendent).

The Highway Department is responsible for the control and repair of public ways. The Highway Superintendent manages the Highway Department.

2.3.2 Population/Demographics Characteristics

Under the United States 2020 Census Bureau, the demographics in Rockland has been broken down into categories including population, age and sex, race and Hispanic origin, population characteristic, housing, family living arrangements, computer and internet use, education, health, economy, transportation, and income and poverty. Rockland recorded a population in April 2020 of 17,803 with a density of approximately 1,760 persons per square mile. As of 2015-2019, there are 6,959 households with 2.55 people per household. Rockland's historical and projected future growth population is shown in Table 2-2 and is depicted in Figure 2-3.

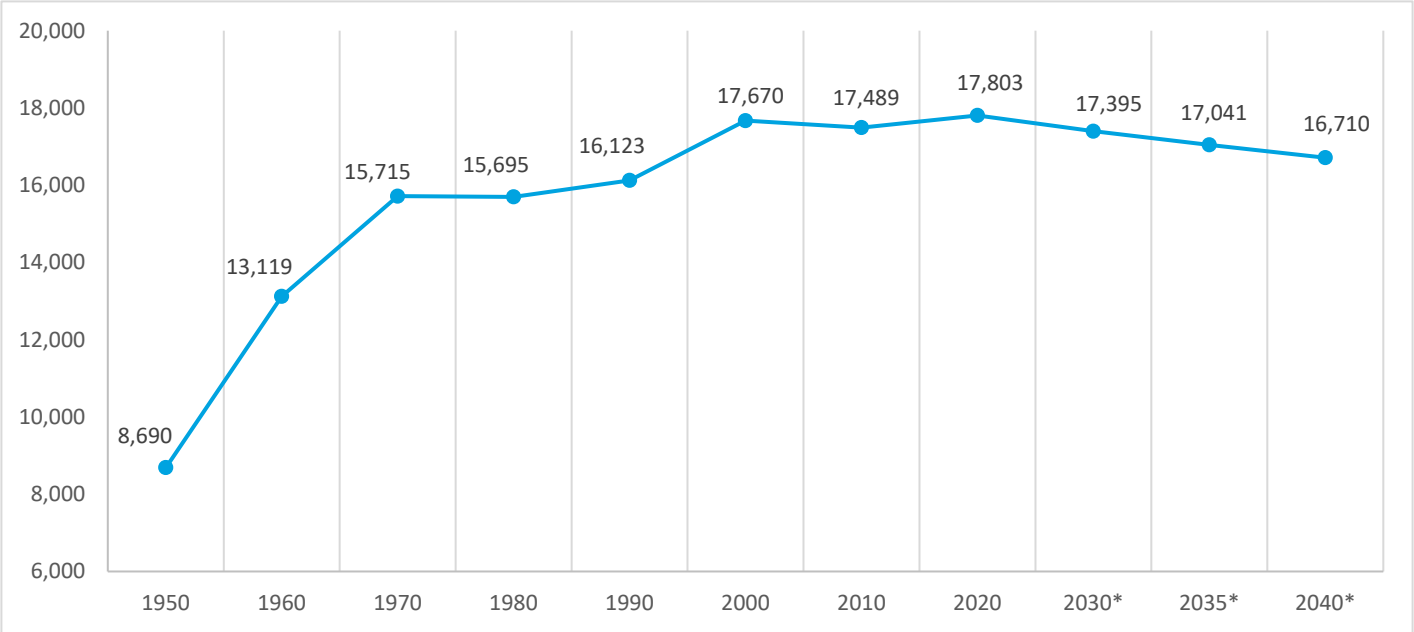
The demographic breakdown of the Town is as follows: 52.5% Female and 47.5% Male; 94.0% White, 3.0% Black or African American, 0.6% Asian, 1.0% Two or More Races, and 3.1% Hispanic or Latino.

Table 2-2 Established and Projected Population Changes (1950 – 2040)

Year	Population	Increase in Population from Previous Decade
1950	8,690	+10.8%
1960	13,119	+46.4%
1970	15,715	+19.8%
1980	15,695	-0.1%
1990	16,123	+2.7%
2000	17,670	+9.6%
2010	17,489	-1.0%
2020	17,803	+1.8%
2030*	17,395	-2.3%
2035*	17,041	-2.0%
2040*	16,710	-1.9%

*Future population estimates provided by UMASS Donahue Institute

Figure 2-3 Established and Projected Population Changes (1950 – 2040)



The MAPC population projection for Rockland predicted that the population would continue to decrease in 2020 to 17,483, where instead there was an increase of 314 people. The MAPC projection also predicted a decline in 2030 to a population of 17,367, which is similar to the decline in population of the UMass Donahue Institute projection of 17,395.

2.3.3 Age Distribution

Persons under 5 years in age comprise less than 6% of the population and persons under the age of 18 comprise less than 22.1% of the population. Persons between ages 18 and 65 account for 56.5% of the population while persons 65 years and over account for 15.8%. The median age is 37.3 years.

2.3.4 Economy

Within the civilian labor force, the total percent of age 16 years and older was 71.1%. In 2020, the median household income (MHI) was $80,783, with 8.3% of the total base population recorded as persons in poverty.

The largest sources of employment in Rockland are construction, accommodation/food services, health care and social assistance, wholesale trade, educational services, insurance, and retail. The labor force statistics and employment rates are included in Table 2-3.

Table 2-3 Labor Force, Employment, and Unemployment

Year	Labor Force	Employed	Unemployed	Unemployment Rate
2021	10,038	9,434	604	6.0%
2020	9,968	8,963	1,005	10.1%
2019	10,180	9,856	324	3.2%
2018	10,049	9,679	370	3.7%
2017	9,894	9,482	412	4.2%
2016	9,734	9,310	424	4.4%
2015	9,654	9,161	493	5.1%
2014	9,645	9,054	591	6.1%
2013	9,521	8,864	657	6.9%
2012	9,525	8,862	663	7.0%
2011	9,511	8,801	710	7.5%

Source: Massachusetts Executive Office of Labor and Workforce Development

2.3.5 Transportation

The Rockland Master Plan 2030 discusses strategies for the Town to expand its transportation options. There are 56.5 miles of roadways and direct highway access to Route 3 to connect to Boston to the north and other South Shore communities to the south. The majority of Rockland residents drive to work, at 91%, with 5% taking public transit, and 3% working from home prior to the COVID-19 pandemic.

For public transit, Rockland is closest to the commuter rail via the MBTA Abington Station but could also access the MBTA South Weymouth and Whitman commuter rail stations. There is a regional bus service, the Brockton Area Transit (BAT) agency, which operates a limited Rockland Flex bus service that runs through downtown Rockland to the west in Abington and Brockton. This bus service passes the MBTA Abington Station, but it is not a stop along the route. There is also a Park and Ride facility for carpooling needs at Route 3 and 228.

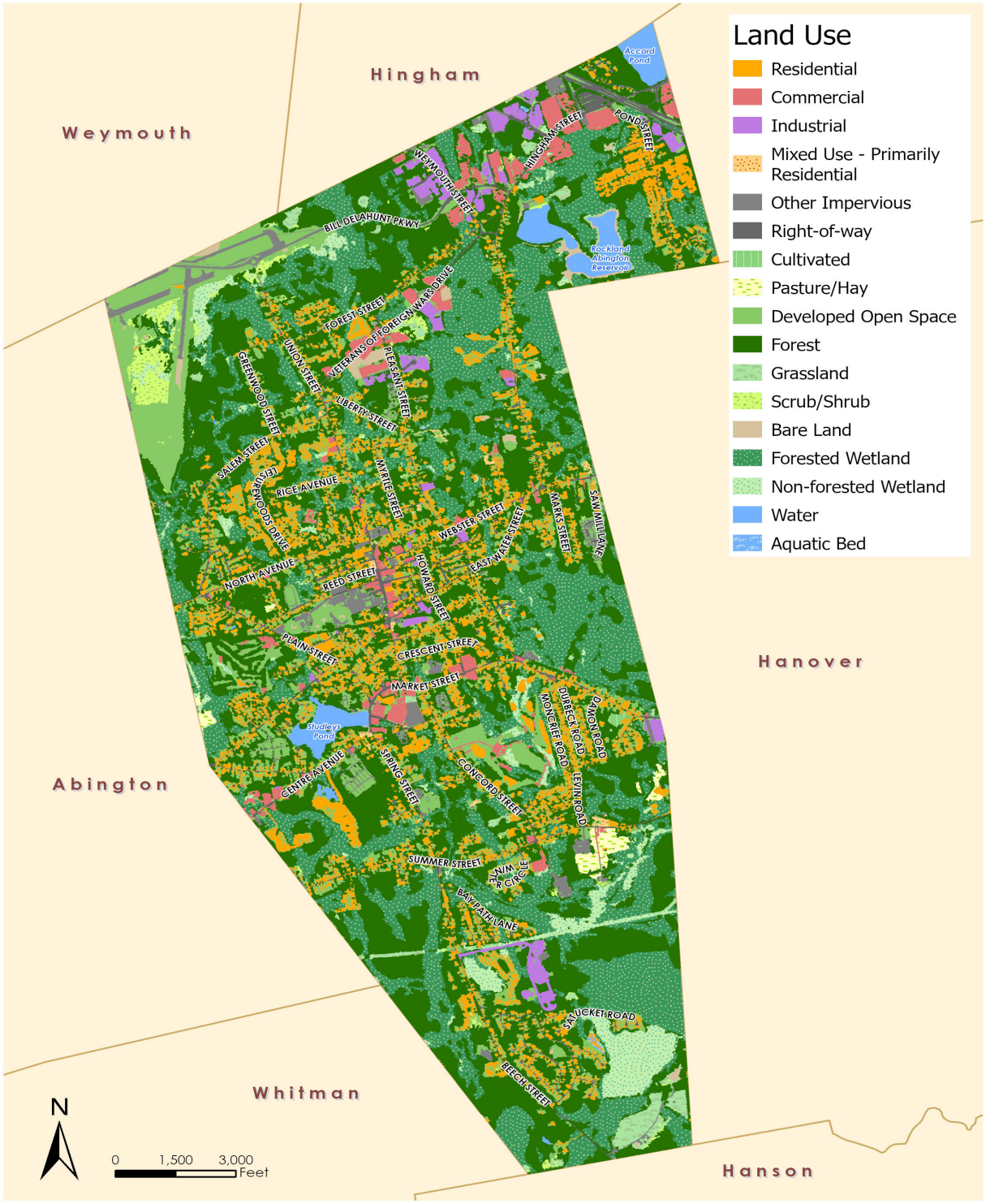
2.3.6 Land Use

The major land uses within the Town of Rockland are included in Table 2-4 and shown in Figure 2-4. Forest, forested wetland, and developed open space have the greatest percent of total area within the Town.

Table 2-4 Land Use Classifications

Category	Total Acres	Percent of Total Area
Aquatic Bed	2.8	0.04%
Bare Land	32.4	0.50%
Commercial	161.1	2.5%
Cultivated	3.0	0.05%
Developed Open Space	1,079.9	16.7%
Forest	2,147.4	33.1%
Forested Wetland	1,554.1	24.0%
Grassland	74.2	1.1%
Industrial	89.3	1.4%
Mixed Use - Primarily Residential	8.8	0.1%
Non-forested Wetland	192.8	3.0%
Other Impervious	131.8	2.0%
Pasture/Hay	30.3	0.5%
Residential	463.4	7.1%
Right-of-Way	325.6	5.0%
Scrub/Shrub	64.4	1.0%
Water	122.5	1.9%
Total	6,483.7	100%

Figure 2-4 Land Use



2.4 Open Space

The Town of Rockland first implemented an Open Space Plan in 2005 and it was most recently updated in 2018. Rockland has dedicated 1,863 acres of land to open space, recreation and land and water conservation, with 23% dedicated specifically to open space. A critical component in contributing to Rockland's quality of life is through its inventory of open spaces. Key types of areas and functions include, but are not limited to:

- Watershed lands which collect and store potable water for local residents
- Wetlands to provide habitat for wildlife
- Fields and playgrounds to provide recreational activities
- Beaches and public landings for residents
- Forests to provide trails for hiking and biking
- Cemeteries to provide a resting place for ancestors and loved ones

Traditionally, land used for open space or recreation has a high degree of protection under Article 97 of the Massachusetts Constitution. See Table 2-4 for designated classifications for the division of land use by type.

2.4.1 Chapter 61 Land

Under Massachusetts General Laws Chapter 61, 61A, and 61B are laws governing the taxation of lands which are privately held. These chapters specifically target the Commonwealth's forests, farmland, and recreational open spaces. Property owners who fall under this category are given considerable local tax benefits that have long-term commitments towards their particular disciplines such as: forestry, farming, agriculture, and preservation of land for outdoor activities. This classification of land is typically allowed to recover tax benefits at the municipal level. If the designated land were to be declassified from the listed chapters, the land will be available to be purchased.

The corresponding owner must notify via certified mail the council assessors, planning board, and conservation commission the intention to proceed with the sale or conversion of the designated land. If the owner continues to convert the land for other uses, then the town reserves the right to purchase it at the fair market value through an unbiased appraisal. The intended space may also be assigned by the town to a nonprofit or conservation organization. The seller is not allowed to proceed with transfer or conversion of land for at least a specified 120 days after the successful mailing of the required notification or whichever is earliest; the owner is to have been notified in writing the option will not be exercised.

There are three properties that fall under Massachusetts General Laws Chapter 61, 61A, and 61B, including the Brenda McCarthy Property, the Gerald Del Prete Farm, and the Harmon Golf Course. In 2021, the Town of Rockland purchased the Brenda McCarthy Property, previously known as the McCarthy Farm, which consists of 36 acres. The purchase prevented the construction of townhouses on the property and was to preserve open space in the Town. The Harmon Golf Course was purchased by a land conservation organization called the Trust for Public Land in 2007 and the Town purchased a conservation restriction in 2008 to protect the golf course from development.

2.4.2 Town Planning Efforts/ Proposed Developments

2.4.2.1 Chapter 40B/40R Planning

Chapter 40B reserves Section 2 to promote the welfare and prosperity of its citizens. Setting regulations consistent with the local needs especially in keeping a proportion of low-income housing for local residents is essential. Regulations require cities or towns to maintain at least 10% of housing units to be accessible to low to moderate income housing. Chapter 40R Section 2 deems affordable housing to be houses affordable to individuals or families whose annual income is less than 80% of the area wide median income by the United States Department of Housing and Urban Development. These laws encourage the production rate of affordable housing to stay consistent throughout the State. Local Zoning Boards of Appeals (ZBAs) are allowed to begin development of housing if 20 percent of units have long-term affordability restrictions.

In 2016, Rockland developed a Rockland Housing Production Plan to comply with the Massachusetts Department of Housing and Community Development's regulation 760 CMR 56.03(4) and to create goals and strategies to become in compliance with M.G.L. Chapter 40B. Rockland also has the second lowest median household income on the south shore. Two out of five households in Rockland are cost burden, meaning they spend more than 30 % of their income on housing, with one in five spending more than 50% on housing. In general, the population in Rockland is aging, which will change the housing market as the senior population grows and young householders enter the market. In 2016, the Town had 6.4% of the housing units as affordable housing.

2.4.2.2 New and Proposed Developments in Rockland

The Town of Rockland currently has six development projects in planning stages.

A proposed development of a non-profit educational facility/school at 80 Bill Delahunt Parkway was proposed in August of 2021. The project proposed an onsite individual sewage system due to the moratorium of connections to the Town sewer system.

There is a proposal for the development of four detached single-family condominiums at 320 Concord Street, which is an existing Chapter 40B site in Rockland. There is currently sewer on this existing parcel, but individual sewer service with ejector pumps will need to be installed for each home in this development. This development is currently on the sewer waiting list.

The Lydia Square Apartments was a proposed apartment complex for local seniors, senior employees of Rockland, and senior Veterans at 80 Norman Street. The Lydia Square Apartments are connected to Town sewer.

Shinglemill LLC located at 75-79 Pond Street is looking to develop 236 rental units located in two buildings in an undeveloped lot. The project plans to include 25 percent of the units as long-term affordability restrictions. The site proposes to be connected to the existing sewer system and is currently on the sewer connection waiting list. The project is currently on hold due to Zone A protection restrictions by MassDEP.

There was a proposal to build 40 single-family dwellings on the remaining undeveloped land of 365 Concord Street. On January 30th, 2020, the Rockland Sewer Commission voted to approve development of a reduced 20 units. This was approved prior to the sewer moratorium.

The proposal for a Brewing Company at 406 VFW will require an onsite treatment plant for sewer. In addition, it is proposed for a Patriot Athletic Club to also be added to 406 VFW.

In addition to Shingle Mill, 320 Concord Street, and 365 Concord Street there are three other properties, 0 Pleasant Street Lot 4, 168 Concord Street and 120 Bill Delahunt Boulevard, that are potential developments.

2.4.3 Zoning

In 1958, the Town of Rockland developed comprehensive zoning regulations called the Zoning Bylaw. Its purpose aligns with MGL Chapter 4 and serves as a base plan to promote health, safety, convenience, quality of life, and welfare of local residents. The Zoning Bylaw's most recent amendment occurred in September 2021 with the addition of a floodplain overlay district. The Town is divided into a total of 12 districts as seen in Figure 2-5.

2.4.3.1 Business Districts

The Town has two business districts: Business I District (B-1) and Business II District (B-2). B-1 and B-2 allow retail businesses, personal and business service establishments, eating establishments, houses of worship, public parks, public institutional uses, private clubs, funeral homes, and two-family residences. B-1 also allows multi-family residences, whereas B-2 allows theatres, bowling alleys, and nurseries. There are no minimum lot sizes in both B-1 and B-2.

2.4.3.2 Residential Districts

Rockland's residential zones are split into five districts: Residential Districts (R-1, R-2, R-3, and R-4) and Residential Senior Housing District (RSH-1). R-1, R-2, R-3, and R-4 allow single-family residences, agricultural, houses of worship, schools, cemeteries, parks, and non-commercial kennels; as well as a minimum lot size of 32,670 square feet. R-2 and R-3 also include two-family residences. R-4 also includes multi-family residences. RSH-1 allows single family senior living, houses of worship, schools, parks, other use customarily accessory to the permitted principal uses and non-commercial kennels. RSH-1 senior living requires a minimum of 5 acres for the total area.

2.4.3.3 Industrial Districts

The Town has five industrial districts: Limited Industrial Zoning District (I-1), Industrial Park Zoning District (I-2), Industrial/Business Zoning District (I-3), Industrial/Business Zoning District (I-4), and Industrial Park-Hotel District (H-1). I-1 allows professional, administrative, and office buildings; banks; public utility facilities; warehouses, and wholesale and retail distribution centers; art galleries; photography studios; art framing shops; and antique shops. I-2, I-3, I-4, and H-1 allow professional, administrative, and office buildings; banks; warehouses and wholesale and retail distribution centers; bottling plants; and food processing. I-3 also includes major retail businesses. The district I-4 also allows for daycare centers; cemeteries (human and pet); educational institutions; conventional centers and hotels; funeral parlors and public utility facilities. In addition to I-2, H-1 permits hotels, motels and extended stay lodging.

2.4.3.4 Special Regulations, Overlay Districts, and Personal Service Areas

The Town of Rockland has six overlay districts to encourage development and to direct land uses where normal zoning mechanisms are difficult to apply. The overlay districts include the following:

- The Wireless Communications Service District's purpose is to protect the public from hazards associated with wireless communications and minimize the visual impacts. It includes all the land located in I-2, I-3, and I-4.
- The Watershed Protection District protects watersheds by prohibiting uses within the district
- The Ground Mounted Solar PV Overlay District's purpose is to promote the creation of large-scale ground mounted solar photovoltaic installations by providing standards for the placement, design, construction, monitoring, modification, and removal. This overlay district includes all the land located in the R-1 zone with a

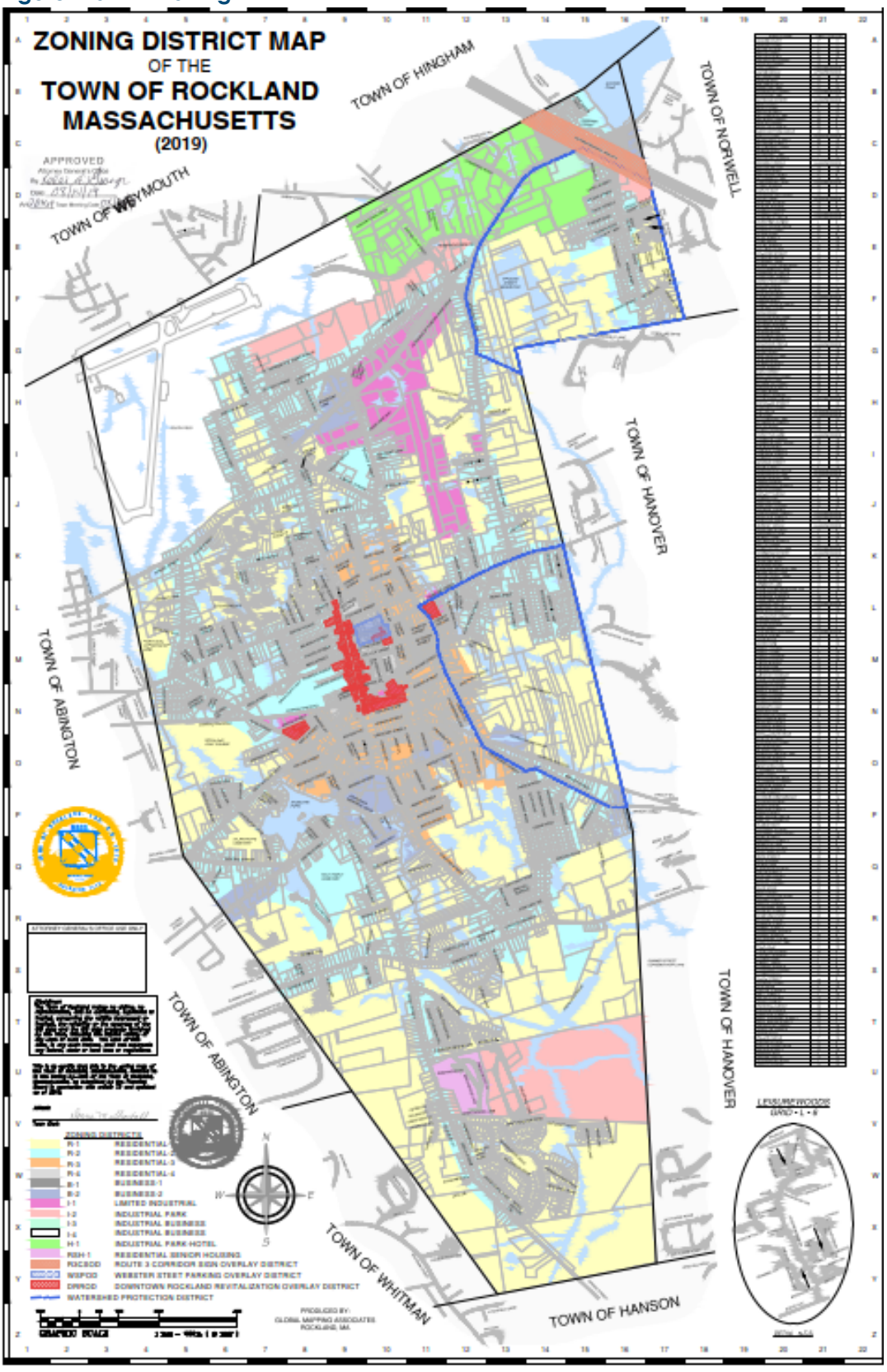
minimum of five contiguous acres of uplands, I-2, I-3, and I-4 zone with a minimum of three contiguous acres of uplands.

- The Downtown Rockland Revitalization Overlay District (DRROD) encourages smart growth in the Town by providing special regulations to expand the commercial and housing opportunities in Rockland's downtown area, refer to Figure 2-5.
- The Route 3 Corridor Sign Overlay District provides for the development and construction of electronic billboards. The development of billboards purpose is to allow for visibility of businesses and in turn benefit new and existing businesses. It is located along Route 3 in Rockland in the northeastern corner, refer to Figure 2-5.
- The Webster Street Parking Overlay District (WSPOD) provides safe and adequate parking for employees on Webster Street between Union Street and Liberty Square.

2.4.3.5 MBTA Community

The Town of Rockland is a MBTA Community and is designated as a MBTA adjacent community due to the surrounding towns having a commuter rail. The designation of a MBTA adjacent community type requires Rockland to have a minimum of ten percent of its total housing consist of multi-family units. A MBTA community also requires the Town to have a zoning by-law where multi-family housing is permitted by-right. The Town allows multi-family developments by-right in the R-4 district. It is also allowed by-right in the B-1 district, but only on the upper stories; and it is allowed by special permit in the B-2 district.

Figure 2-5 Zoning



2.4.4 Historic Areas

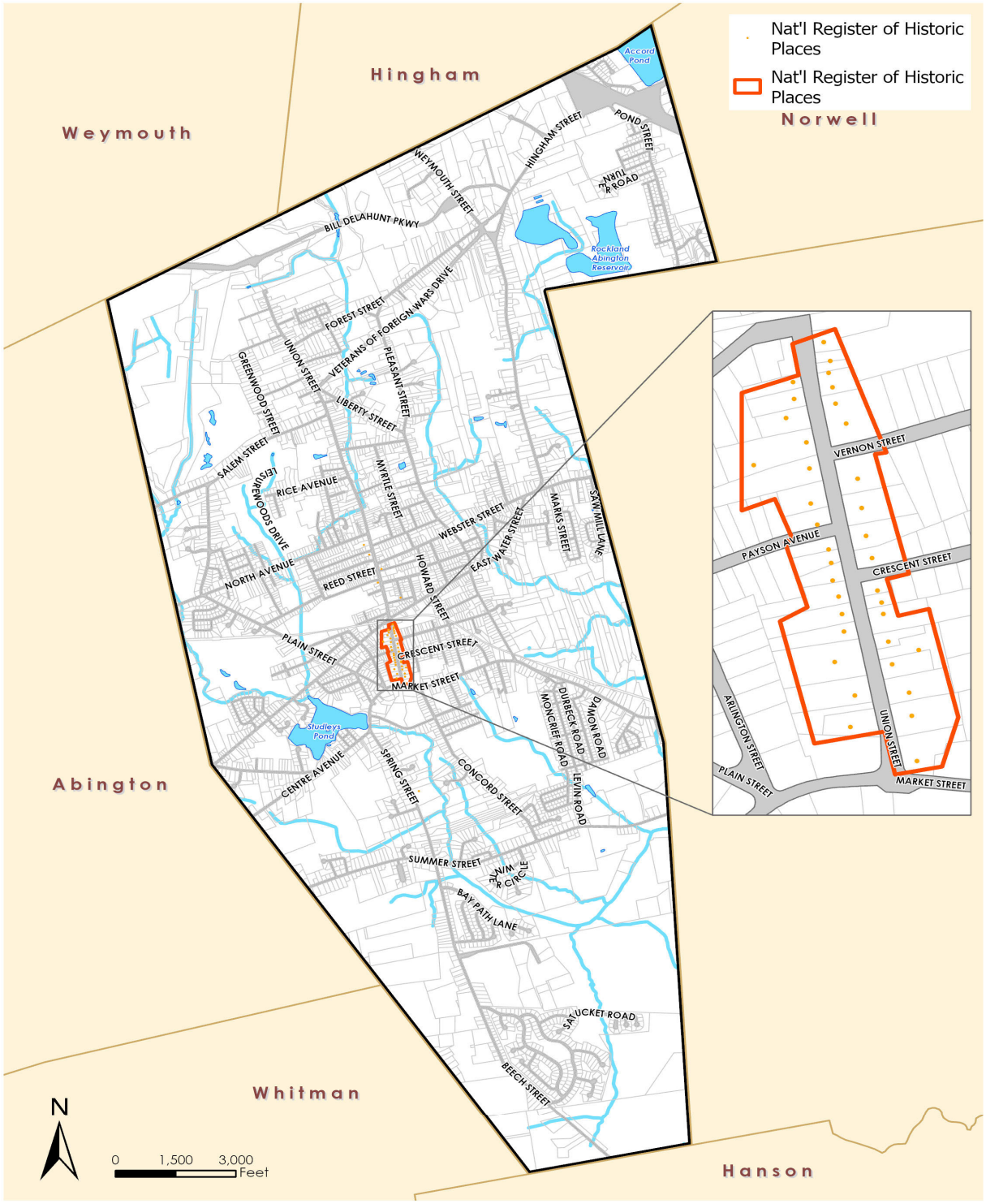
In the Town, there is one historic district, four structures in the National Register of Historic Places, and historic cemeteries and churches throughout. The South Union Historic District was established in 1989 and consists of 36 structures within a three-block area between Market Street and East Water Street. The Community Preservation Committee and the Historical Commission are responsible for the preservation and protection of the historic resources in the Town. The 2030 Rockland Master Plan recommended the establishment of a Cultural District or Local Historic District for preservation of its historic resources. The historic resources are considered conservation land and therefore is protected from development by the Town. Table 2-5 lists the historic resources located within the Town of Rockland. Refer to Figure 2-6 for the locations of the historic inventory within the Town.

Table 2-5 Historic Resources in Rockland

Historic Resource	Address	Designation	Number of Properties
Grand Army of the Republic Hall	34 School Street	NRIND1	3
Lower Union Street Historic District	Water Street to Market Street	NRDIS2	57
Phoenix Building	315-321 Union Street	NRIND	1
Rockland Almshouse	198 Spring Street	NRIND	1
McKinley School	394 Union Street	NRIND	1
Rockland Memorial Library	366 Union Street	NRIND	1
Rockland Trust Company	288 Union Street	NRIND	1
Emerson Shoe Factory	51 Maple Street	--	1

1. NRDIS stands for National Register District including properties of local, state, or national significance designated by the Department of the Interior though the State Historic Preservation Officers.
2. NRIND stands for National Register individual property.

Figure 2-6 Historic Inventory



2.5 Natural Environment

2.5.1 Soils

Rockland is comprised of three major types of soil. The north and southwest portions of the Town primarily consist of glacial till. The wetlands areas and base of Beech Hill consists of floodplain alluvium soils. The remainder of the Town consists of sandy/gravel type soil. The glacial till is relatively impervious, causing limited suitability for septic systems. The alluvium soils absorb the groundwater that drains into the aquifers which serve the municipal water supplies of the surrounding towns. Refer to Figure 2-6 below.

2.5.2 Topography

Rockland has gently rolling terrain and has the edge of two rivers traversing through portions of the Town. This has caused Rockland to have wetland areas, rivers, and ponds throughout the Town. The highest point in town is Beech Hill with an elevation of approximately 180 feet. The local elevation of Rockland is 100 feet above mean sea level.

Rockland is also characterized by its geology, as it is known for its rocky terrain. In particular, the Rock Train is a defining feature of the land. The Rock Train is a large boulder field with boulders up to two and a half feet high and extending an area of 400 to 500 feet. Refer to Figure 2-7 below.

2.5.3 Environmentally Sensitive Areas

2.5.3.1 Areas of Critical Environmental Concern

The Executive Office of Energy and Environmental Affairs (EOEEA) established the Areas of Critical Environmental Concern (ACEC) program in 1975. The purpose has been to address the areas in need of special attention because of their resources both natural and cultural. Since then, the program has recognized thirty ACECs totaling up to 268,000 acres within seventy-six (76) communities throughout Massachusetts. There are currently no ACECs located within the Town of Rockland.

2.5.3.2 Wetlands

Rockland's Conservation Commission places protection for wetlands under the local Wetlands Protection Bylaw. This is a comprehensive approach to address the public interest, providing procedures intended for users of both public and private water supplies, groundwater, recreation, local flora, fauna, and their habitats. Wetlands are a significant component of Rockland's terrain. Particularly, the northern portion of Rockland has four wetland areas: Union Point, Old Swamp River, Cushing Brook, and Ben Mann Brook.

2.5.3.3 Species Habitat

Massachusetts protects its biodiversity through the Massachusetts Division of Fisheries and Wildlife and the Natural Heritage and Endangered Species Program (NHESP). Its goal is to protect and preserve the existence of its native species through this comprehensive program. Through years of scientific research, species and habitat management and restoration, reviews of environmental impacts, and conservation planning the division works to manage the vernal pool certification program.

In 2012, the NHESP and the Nature Conservancy's Massachusetts Program developed BioMap2 to protect the state's biodiversity from the changing climate. BioMap2 identified 1,355 acres of core habitat with 10 acres of protected land as well as 146 acres of critical natural landscape within the Town of Rockland. Core habitat is defined as key areas which are critical for the persistence of rare species and other species of concern, whereas critical natural landscapes are large natural landscape blocks that provide habitats for native species.

The core habitat land is located in the northwestern portion of Rockland and the southeastern portion of Rockland. The northwestern portion is on the land of the former South Weymouth Naval Station, commonly known as Union Point. Union Point includes the following species of conservation concern: mocha emerald, eastern box turtle, spotted turtle, grasshopper sparrow and the upland sandpiper. The other core habitat land is part of the Forge Pond/Summer Street Conservation Land in Hanover, MA. This area consists of undisturbed wetlands, intact river corridors, Priority Natural Communities, and 17 species of conservation concern. This core habitat also includes the 146 acres of critical natural landscape.

The NHESP assumes the responsibilities of all living species inclusive of plants and animals. A biological inventory of endangered species has been under constant update under the Massachusetts Endangered Species Act (MESA). The NHESP, through its website, lists all species that are endangered, threatened, or of special concern. As of January 10, 2020, there are 173 species of animals and 259 species of plants under the Massachusetts Endangered Species Act; a total of 432 species. In the Town of Rockland, there are six endangered, threatened, and special concern species, as described in Table 2-6.

Table 2-6 Endangered (E), Threatened (T), and Special Concern (SC) Species in Rockland, MA

Common Name	Taxonomic Group	MESA Status	Most Recent Observation
Seabeach Needlegrass	Vascular Plant	E	1920
Upland Sandpiper	Bird	E	2005
Grasshopper Sparrow	Bird	T	2005
Bridle Shiner	Fish	SC	1952
Mocha Emerald	Dragonfly/Damsel Fly	SC	2003
Eastern Box Turtle	Reptile	SC	2015

2.5.3.4 Wildlife Management Areas

Mass Wildlife manages over 200,000 acres of land for hunting, fishing, and trapping throughout the Commonwealth. Wildlife Management Areas (WMAs) regulate the use of these designated areas to allow these resources to be responsibly enjoyed and to ensure sensitive areas are left undisturbed. Currently, no Wildlife Management areas exist in Rockland. Refer to Figure 2-8 below.

Figure 2-7 Soil Type

Figure 2-8 Topography

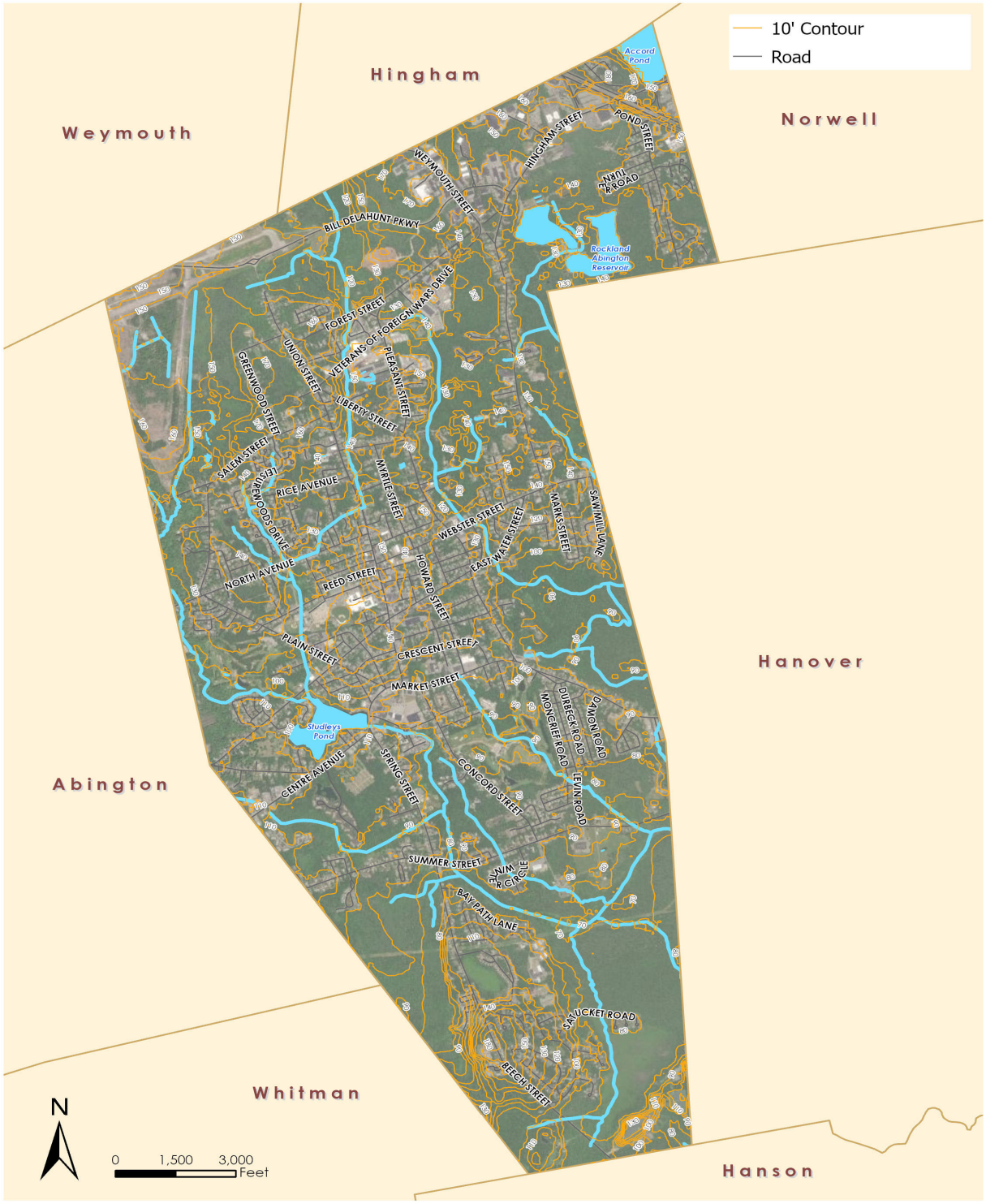
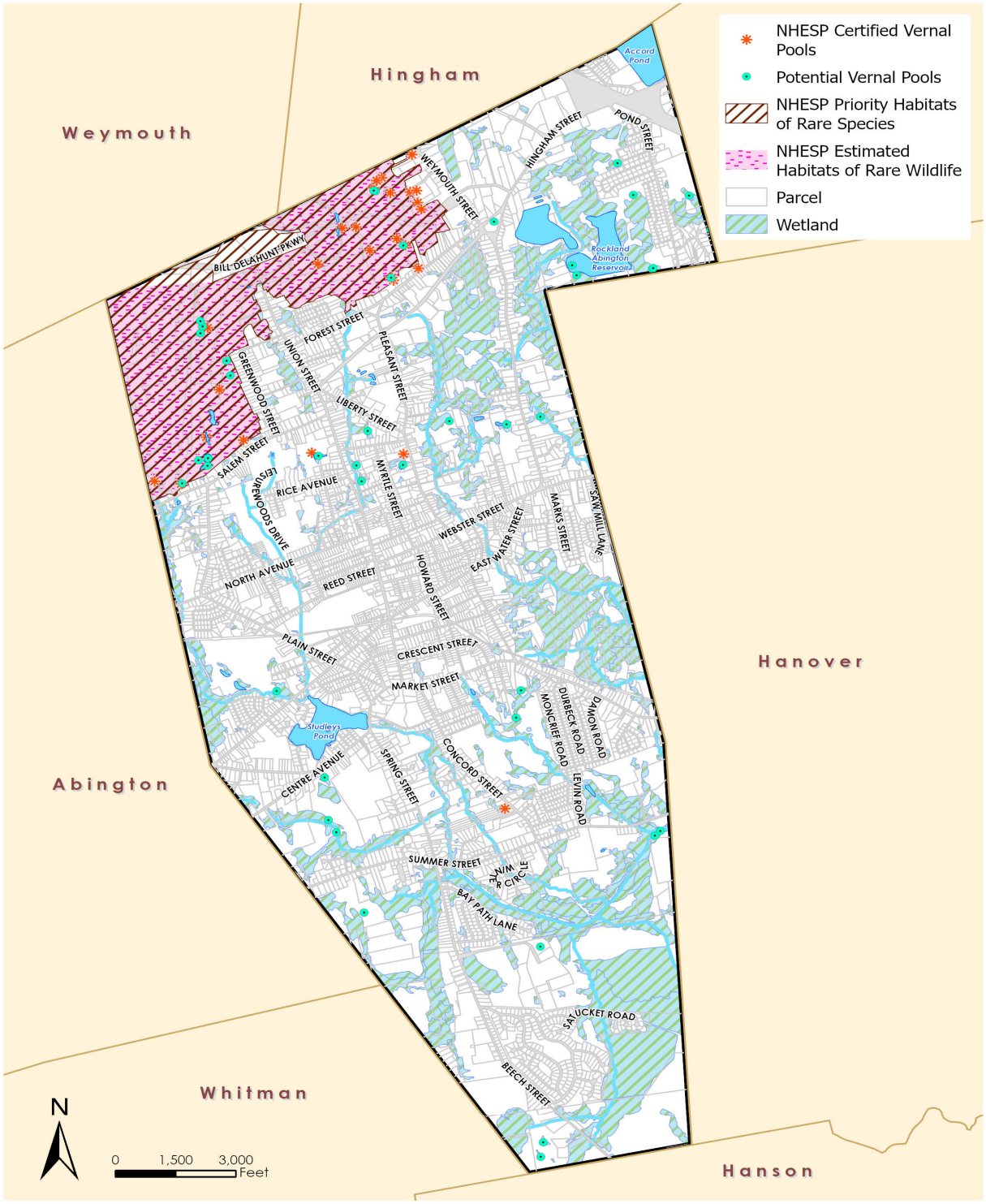


Figure 2-9 Environmentally Sensitive Areas

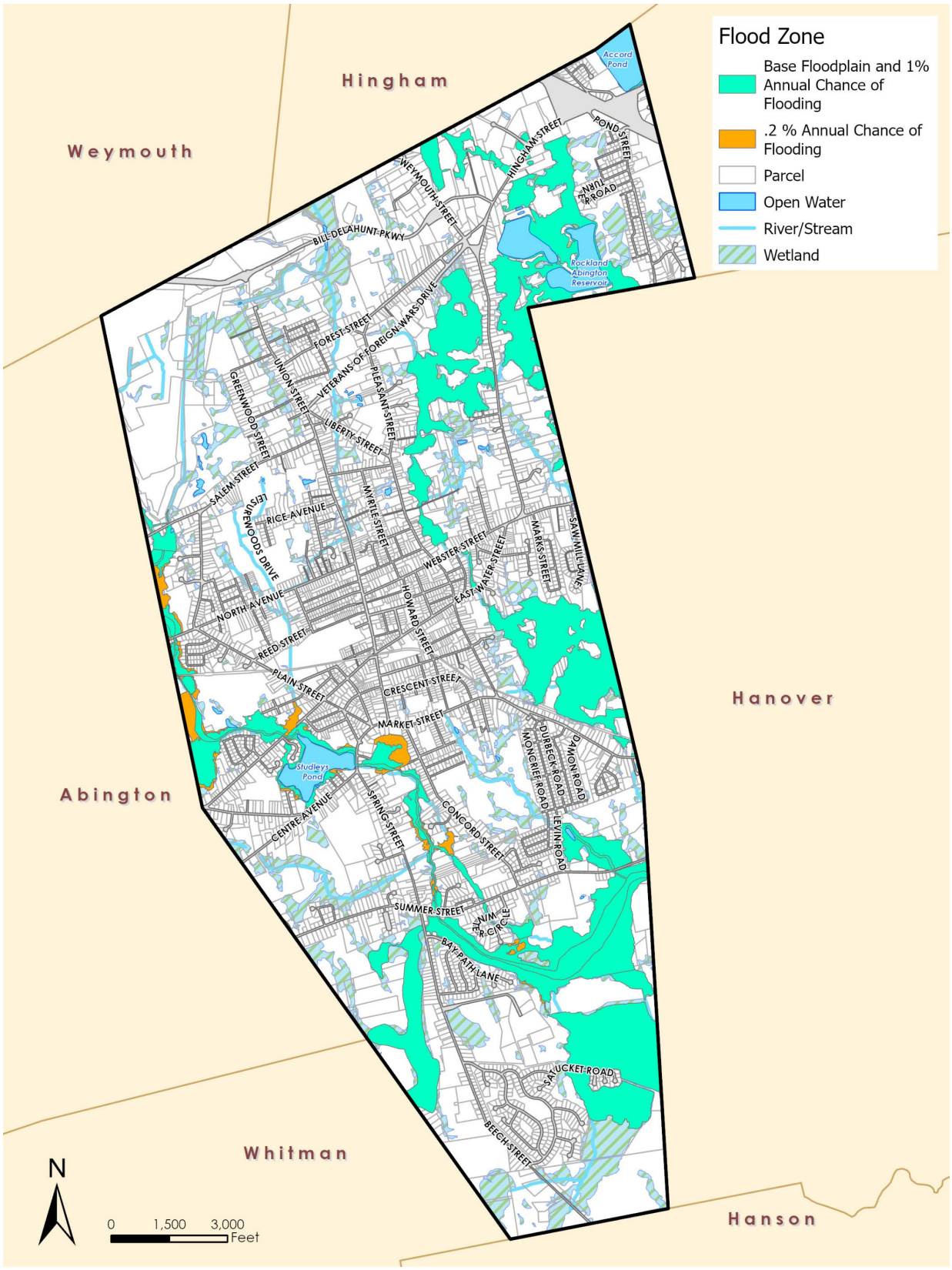


2.5.4 Flood Plains

The Federal Emergency Management Agency (FEMA) is an agency under the U.S. Department of Homeland Security which is responsible for mitigation of loss of life and property. Typically hazards such as floods and extreme climate conditions are leading factors that cause destruction and loss. In accordance with the Federal Insurance Administration, the National Flood Insurance Program run through FEMA has handled over 19,000 instances from communities. As a result of this program and the number of cases, Flood Insurance Rate Maps (FIRMs) confirm the flood plain in particular locations necessary to make insurance claim determinations.

In July 2021, FEMA revised the FIRMs for the Town of Rockland. FEMA maps confirm that multiple sections of Rockland lie in areas classified as a flood risk. Figure 2-10 shows the floodplain map for Rockland. The most significant flood areas in Rockland lie along the French Stream, Cushing Brook, and near the Rockland Abington Reservoir. Careful analysis of the Town's drainage should also be considered to determine the risk of flooding more accurately.

Figure 2-10 Flood Zones



3

WRIGHT-PIERCE
Engineering a Better Environment

Section 3 Existing Wastewater Management Systems

3.1 Introduction

The purpose of this section of the CWMP is to describe the existing wastewater collection, pumping and treatment systems in the Town of Rockland. The Town of Rockland manages a wastewater system that serves around 18,000 customers. The wastewater treatment plant and pumping stations are contract-operated by Veolia. The Town is responsible for managing the collection system.

Wastewater is received, treated, and discharged at the Town of Rockland Wastewater Treatment Plant (WWTP) located on Summer Street. The WWTP also receives flow from small areas of the Town of Abington, managed through an Intermunicipal Agreement (IMA) as seen in Appendix C. The WWTP currently has a permitted (permit number MA0101923, Appendix B) average monthly flow limit of 2.5 MGD and a peak hourly flow of 6.0 MGD.

Wright-Pierce completed a WWTP evaluation in 2021 and AECOM completed a Sewer System Evaluation Survey (SSES) in 2021. This document uses much of the information summarized in those two reports with minor updates based on 2021 and 2022 data. Detailed information can be found in the respective reports, which will be included as Appendices within the combined final CWMP.

3.2 Wastewater Collection System

The Town of Rockland's wastewater collection system includes approximately 57 miles of gravity sewer, 4 miles of force main/low pressure sewer, 13 pump stations, and 1,600 sanitary sewer manholes, see Figure 3-1. The collection system serves customers in the Towns of Rockland and Abington. Since July 2021, the Town has implemented a sewer moratorium preventing new connections to the sewer system due to capacity issues.

The Town continues evaluating the wastewater collection system for infiltration and inflow (I/I). AECOM has worked with the Town on multiple Sewer System Evaluation Surveys (SSES) to investigate sources of infiltration and inflow (I/I) in the sewer system in 2008, 2013, and 2021. The results of the 2021 SSES Report and other I/I improvements the Town has completed and implemented are summarized below.

3.2.1 Infiltration/Inflow

Since 1999, the Town of Rockland has made many efforts to investigate and remove sources of I/I. In 1999, the Town developed a High Flows Management Plan (HFMP), last updated in 2016, to identify actions that need to be taken at the WWTP and associated pump stations in the event of high flows. The HFMP outlines procedures to process high flows at the WWTP by diverting high flows into excess process tanks and when the storage capacities of the tanks are exceeded it eventually is diverted to the outfall.

The Town of Rockland's I/I Annual Report for 2020 estimated the amount of I/I in the sewer system at approximately 1.3 MGD. The average flow at the WWTP in 2020 was 2.4 MGD, so about 54 percent of the flow is likely infiltration/inflow. Previous I/I reports had similar findings of the I/I amount in the sewer system.

More recently, in 2021, AECOM developed an SSES Report. The SSES Report provided recommendations to remove/reduce sources of I/I from the sewer system. The SSES work involved flow isolations and camera inspections of 8-inch diameter and larger sewer piping in the Town's sewer system. The evaluation found that there

were 140 infiltration sources from main pipelines, manholes, and lateral connections that were cost-effective to remove. These sources are estimated to contribute approximately 219,300 gallons per day of I/I. The cost for rehabilitation of the identified manholes and main pipeline sections was estimated in September 2021 at $134,500.

The AECOM SSES Report found that there is more infiltration entering the sewer system from lateral service connections rather than from the main pipelines. AECOM recommended pipe lining 69 lateral service connections that are contributing to infiltration to the system. These service connections contribute an estimated 153,100 gpd of infiltration to the sewer system and would cost approximately $674,900 to rehabilitate.

AECOM also recommended further investigation of five pipe segments located near Memorial Park School to receive CCTV inspection during a high groundwater period to determine the pipe condition and any sources of infiltration.

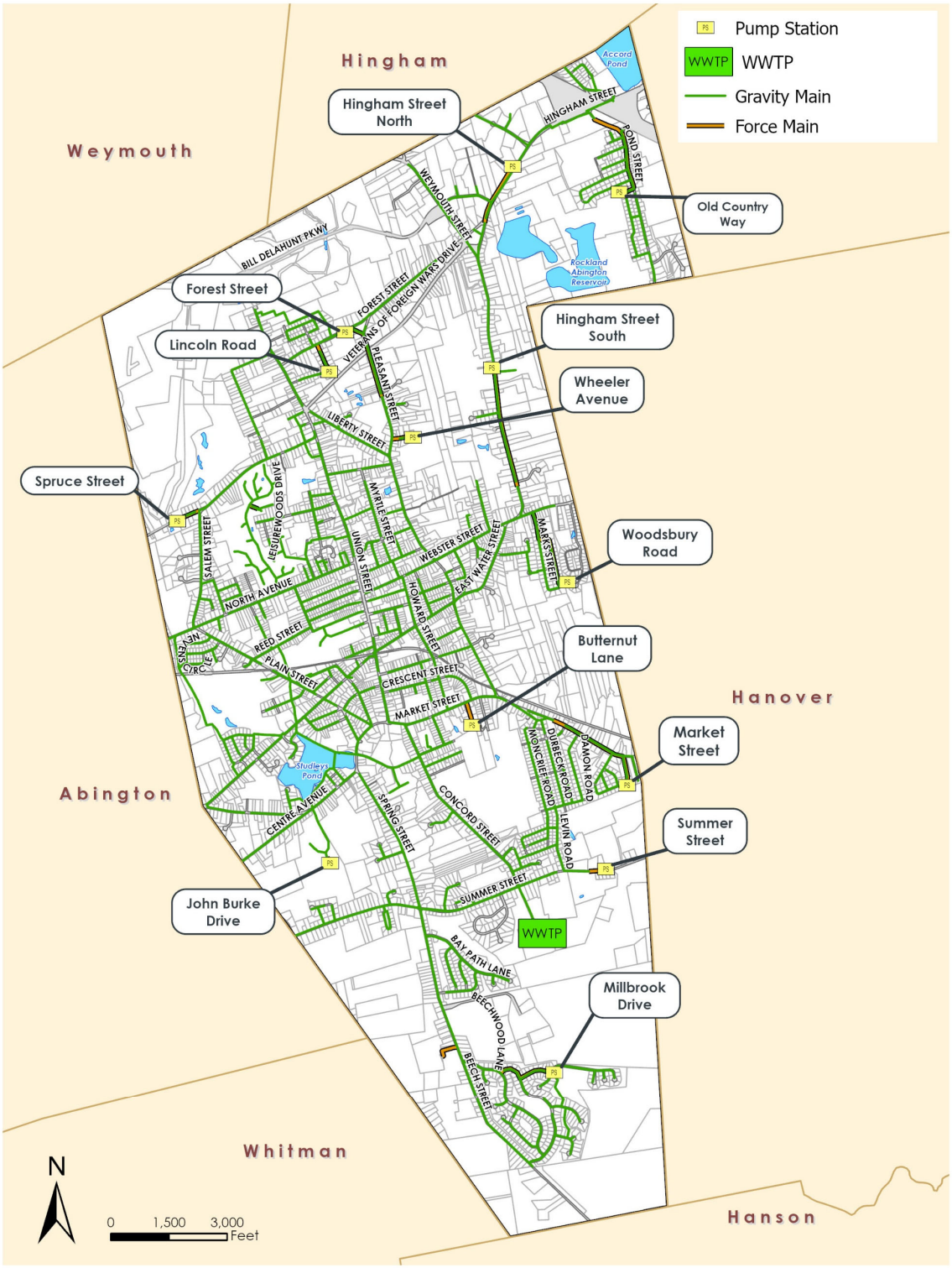
The Town has also taken other measures to reduce I/I from the system. During the construction of the new elementary school, the main piping of an abandoned sewer system previously connected to a combined sewer overflow (CSO) was plugged. Another source of infiltration was removed on West Water Street by repairing the breaks in the sewer line that were discovered from camera inspections. Additionally repair of various mainline breaks in the collection system was conducted that assisted in removing infiltration.

The Town also installed a temporary flow meter at the influent of the WWTP and analyzed the overnight flows from January 2021 to December 2021 to approximate the amount of overall I/I in the sewer system. The analysis of overnight flows found that there is an estimated annual average of 1.72 MGD of I/I in the sewer system (as compared to the 1.3 mgd of I/I estimated in 2020).

In 2022, the Town plans to continue rehabilitation and repair of mainline sewers, lateral connections, and sewer manholes. The Town is conducting a sewer rate study for fiscal year 2023. The base rate was raised by $0.99 to cover the fiscal year of 2022.

In order to prove I/I removal quantities after work has been completed, it is generally required to have pre-construction and post-construction flow monitoring completed so the actual amount of I/I removed can be proven.

Figure 3-1 Wastewater Collection System



3.3 Wastewater Pumping Stations

The Town owns and Veolia operates 13 wastewater pumping stations within the Town's collection system. Table 3-1 summarizes available information from each pumping station, including name, type, pump manufacturer, number of pumps, capacity, pump motor horsepower, and generator type, if applicable.

The existing conditions for each of the 13 pump stations are described below. This includes the type of pump station, rated capacity, pump station equipment, and the current condition of each pump station and its assets.

3.3.1 Forest Street Pump Station

The Forest Street Pump Station is a submersible type station with a brick façade building that was built in 1999. It is located across from 184 Forest Street and behind the Boxberry Lane condominiums. The Pump Station has a rated capacity of 350 gallons per minute (gpm) with 29 horsepower (hp) motors and an indoor natural gas generator to supply backup power. The wet well interior, hatch, and concrete are in average condition and the piping is in fair condition due to corrosion. The valve vault piping is in good condition and the hatch is in average to fair condition. The valve vault concrete is experiencing plant growth at the base of the concrete. The check valves in the valve vault are in average to fair condition due to some corrosion.

For the exterior of the building, the roof is old but in average condition; the brick façade is in good condition; and the trim is in fair condition. The ceilings, door, and concrete pad are in good condition. The interior walls are in average condition and need to be painted. The hardware of the door needs to be replaced. The instruments are in fair to poor condition (ultrasonic conduit sleeve is broken). The pump station has Milltronics controllers that are controlled via SCADA plc. The controllers are old but in good condition.

3.3.2 Lincoln Road Pump Station

The Lincoln Road Pump Station is a submersible type station with an outdoor control cabinet and was built in 1999. It is located across from 109 Lincoln Road. The pump station has a rated capacity of 100 gpm with 7.5 hp motors and a portable generator (kept at the WWTP) for backup power. The concrete, hatch, interior, and piping of the wet well are in good condition. The valve vault concrete, hatch, and piping are also in good condition. The control panel is old but in good condition and the concrete pad is in good condition. The electrical equipment is old but in average condition. The instruments consist of Milltronics controllers that are old but in average condition. The fence is in fair condition.

3.3.3 Wheeler Avenue Pump Station

The Wheeler Avenue Pump Station is a submersible type station with an outdoor control panel and was built in 1999. It is located across from 46 Wheeler Avenue. The pump station has a rated capacity of 30 gpm with 2 hp motors and a portable generator for backup power. The fiberglass hatch of the wet well is in good condition. The internal structure is in fair to average condition and there is grease build-up in the wet well. The control panel and concrete pad are in good condition. The controls are also in good condition but are old. The fence is in good condition.

3.3.4 Summer Street Pump Station

The Summer Street Pump Station is a submersible type station with an outdoor control cabinet and was built in 1999. It is located across from 839 Summer Street. The pump station has a rated capacity of 40 gpm with 2 hp motors and a portable generator for backup power. The fiberglass hatch and interior of the wet well are in good

condition. The wet well piping is in fair condition due to corrosion and grease buildup. The control panel is in good condition. The fence is in good condition.

3.3.5 John Burke Drive Pump Station

The John Burke Drive Pump Station is a submersible type station with an outdoor control cabinet and was built in 1999. It is located in front of 47 John Burke Drive in the middle of a cul-de-sac. The pump station has a rated capacity of 40 gpm with 2 hp motors and a portable generator for backup power. The fiberglass hatch and interior of the wet well are in average condition. The wet well piping is in average to fair condition due to corrosion. The control cabinet is in good condition.

3.3.6 Hingham Street North Pump Station

The Hingham Street North Pump Station is a submersible type station with a brick façade building and had major upgrades in 2002. It is located across from the Best Western. It receives flow from the Old Country Road Pump Station and pumps to the Hingham Street South Pump Station. The pump station has a rated capacity of 1,000 gpm with 20 hp motors and an indoor diesel generator for backup power. There are suction lift pumps provided on a skid for backup to the station.

The wet well hatch and concrete are in good condition with the interior concrete being in average condition. The wet well has a lot of ragging build up. The wet well piping is in poor condition. The valve vault interior, hatch, and concrete are in good condition. The valve vault piping is in average condition. The exterior brick façade is in good condition, but the trim is in fair condition. The building lighting and louver are in poor condition, otherwise the interior of the building is in good condition. The instruments are in good condition.

3.3.7 Hingham Street South Pump Station

The Hingham Street South Pump Station is a submersible type station with a building and had major upgrades in 2002. It is located across from 497 Hingham Street. It receives flow from the Hingham Street North Pump Station. The pump station has a rated capacity of 1,800 gpm with 100 hp motors and an indoor natural gas generator for backup power. The wet well concrete, hatch, and interior are in good condition and the piping is in fair condition. The valve vault hatch and interior are in good condition and the concrete is in average condition. The valve vault piping is in fair condition as the valve looks like it may be leaking. There are suction lift pumps provided on a skid for backup to the station.

For the exterior building, the brick façade is in good condition, but the roof and trim are in poor to fair condition. For the interior of the building, the ceiling is in good condition, the walls are in fair condition, and the concrete slab is in average condition. The controls are in fair condition as they are old. The instruments include an ultra-sonic sensor that is old and in fair condition. The fence is in average condition with some vine growth. There is odor control at this station but is only used during the summer.

3.3.8 Market Street Pump Station

The Market Street Pump Station is a submersible type station with a brick façade building and was built in 1994. It is located behind the Rockland Highway Department. The pump station has a rated capacity of 250 gpm with 7.5 hp motors and an indoor propane generator for backup power. The wet well concrete, hatch, and interior are in good condition. The wet well piping and cable are in average condition due to corrosion. The valve vault hatch, concrete, interior, and piping are in good condition. The brick façade of the building is in good condition and the roof and trim are in average condition. The interior of the building is in average condition.

3.3.9 Woodsbury Road Pump Station

The Woodsbury Road Pump Station is a submersible type station with a building and was built in 1994. It is located behind 25 Corn Mill Way. The pump station has a rated capacity of 300 gpm with 15 hp motors and an indoor propane generator for backup power. The wet well hatch and concrete are in good condition. The interior of the wet well is in average condition and the piping is old and corroded. The valve vault piping and interior are in good condition and the hatch and concrete are in average condition. The wood trim and building foundation are in good condition. The roof is in fair condition and the brick façade is in average condition with some vines growing along the side. The building interior is in good condition.

3.3.10 Millbrook Pump Station

The Millbrook Pump Station is a submersible type station with a building and was built in 2000. It is located across from 11 Millbrook Road. The pump station has a rated capacity of 180 gpm with 15 hp motors and an indoor natural gas generator for backup power. The concrete, interior, and hatch are in good condition. The discharge piping of the wet well is in average condition to due to corrosion. The valve vault hatch, interior, and concrete are in good condition. There is water at the bottom of the valve vault causing some corrosion. The water is likely coming through the precast concrete sections of the valve vault at the joints. The wood trim and concrete foundation are in average condition. The interior of the building is in good condition. The instrumentation consists of old Milltronics controllers that are in average condition.

3.3.11 Old Country Way Pump Station

The Old Country Way Pump Station is a submersible type station with a building and was built in 1980. It is located next to 33 Old Country Way. The pump station has a rated capacity of 350 gpm with 7.5 hp motors and an outdoor natural gas generator for backup power. The hatch, interior, and piping are in good condition. The concrete is in average condition. There is a new mixer installed in the wet well and it is working well. The valve vault hatch and concrete are in good condition. The vinyl siding of the building is in average condition. The roof is in poor condition. The interior of the building is old and in average condition. The ceiling and slab are in good condition and the walls are in average condition.

3.3.12 Spruce Street Pump Station

The Spruce Street Pump Station is planned to be upgraded into a submersible type pump station in 2023. It is located next to 76 Spruce Street and is next to the Rockland Town Forest. It was built in 1980 as a pneumatic ejector station with outdoor controls. The previous pneumatic ejector station had issues with handling flow during wet weather and the electrical controls are aged. The access for employees is not ideal as it requires two operators instead of only one for other stations. Additionally, the inefficiency of the compressors does not allow for two pots to be run simultaneously.

3.3.13 Butternut Lane Pump Station

The Butternut Lane Pump Station was upgraded into a submersible type pump station in 2022. It is located in the driveway of 55 Butternut Lane. It was built in 1980 as a pneumatic ejector station with outdoor controls. The original duplex pneumatic station had two 50-gallon pots that filled with influent raw wastewater. Before the station was upgraded, it had issues with handling flow during wet weather and electrical issues. The mechanical solenoid valves were also prone to failure during high flows requiring much attention and inspection from operators. The original pump station was rated at 100 GPM at 27 feet TDH; it was assumed that the 100 GPM refers to the capability of each 50-gallon pot to fire once within a minute. However, that condition was never possible due to the air capacity demand from the compressors.

The upgrade included the installation of two Tsurumi 5 HP pumps, above-grade control cabinet, and 4-inch discharge pipe, gate, and check valves. The existing system was retrofitted with a duplex submersible pump station with the metal vault being used as the new wet well. The electrical equipment was moved out of the vault and a duplex control panel along with an automatic transfer switch for backup power was mounted above ground.

Table 3-1 Wastewater Pumping Stations

Pump Station Name	Type	Building (Yor N)	Number of Pumps	Capacity (ea.)	Pump Horsepower	Generator Type
Forest Street	Submersible	Yes	2	400 gpm	29	Indoor - Natural Gas
Lincoln Road	Submersible	No	2	100 gpm	7.5	Portable
Wheeler Avenue	Submersible	No	2	30 gpm	3	Portable
Summer Street	Submersible	No	2	40 gpm	2	Portable
John Burke Drive	Submersible	No	2	40 gpm	2	Portable
Hingham Street – North	Submersible	Yes	2	1,000 gpm	20	Indoor - Diesel
Hingham Street – South	Submersible	Yes	2	1,800 gpm	100	Indoor - Natural Gas
Market Street	Submersible	Yes	2	250 gpm	7.5	Indoor - Propane
Woodsbury Road	Submersible	Yes	2	300 gpm	15	Indoor - Propane
Millbrook	Submersible	Yes	2	180 gpm	15	Indoor - Natural Gas
Old Country Way	Submersible	Yes	2	350 gpm	7.5	Outdoor - Natural Gas
Spruce Street	Submersible[1]	No	2	100 gpm	5	Portable
Butternut Lane	Submersible	No	2	100 gpm	5	Portable

Notes:

1. Spruce Street is planned to be upgraded in 2023 to a submersible pump station.

3.4 Wastewater Treatment Plant

The WWTP was evaluated in 2020-2021 by Wright-Pierce. A report titled "Comprehensive Wastewater Treatment Plant Assessment and Evaluation" was completed and serves as source material for the CWMP. A shortened summary and an update since mid-2021 is provided in this report. The evaluation covers the existing conditions of the WWTP, an introduction on the new NPDES permit requirements, and recommended capital improvements for the facility. For detailed information, the reader should refer to the evaluation report, which will be included as an Appendix in the final CWMP. In addition, an Administrative Order was received in July 2022, included in the Appendices, and discussed at the end of this section.

The facility was constructed in the mid-1960s and upgraded in 1977 with other minor upgrades in 2000 and 2013. Since the recent evaluation, the facility has had maintenance improvements but no major upgrades.

Wastewater flows through an influent gravity sewer into the influent manhole (IMH) where an internal weir wall directs flows less than 6.0 MGD through the influent channels to a wet well in the influent pump station building where the flow is pumped to the aerated grit chamber. Influent flows greater than 6.0 MGD overflow the internal weir wall in the IMH and flows through a gravity sewer line to the bypass influent manhole (BIMH). In this manhole, excess influent and recycle flows from the facility sludge processing systems combine and flow by gravity directly to the wet well of the Influent Pump Station, bypassing screening and the influent Parshall flume.

Grit is removed in an aerated grit chamber. The aeration system uses coarse bubble diffusers in the middle of the chamber and blowers in the main building. From the grit chamber, wastewater flows to the primary splitter box where it is diverted to one of the two large primary settling tanks for primary treatment which includes the removal of settleable solids, floating materials, and scum. Ferric chloride is added in the gravity main from the aerated grit chamber to the primary clarifier splitter box and from the nitrification tanks to the nitrification settling tanks. Ferric chloride addition is critical for the removal of phosphorus.

After initial settling in the primary settling tanks, wastewater flows to the influent channel at the nitrification tanks where it mixes with the return activated sludge from the nitrification settling tanks. The nitrification tanks consist of two tanks in parallel with four zones in series in each tank. The first zone is operated as an anoxic zone followed by three aerobic zones in series. The sludge-wastewater mixture (mixed liquor) enters the anoxic zone of each nitrification tank where bacteria use the carbonaceous organic matter to remove nitrogen, then flows into the three aerobic zones in series where oxygen transferred through the agitation from the surface aerators is used by bacteria for the oxidation of carbonaceous organic matter and nitrogen.

Treated mixed liquor from the nitrification tanks flows through the effluent channel into its corresponding nitrification settling tanks. In the nitrification settling tanks, incoming mixed liquor is separated into clarified effluent and settled sludge. The settled sludge at the bottom of the tanks is pumped back to the nitrification tanks to maintain a desired mixed liquor suspended solids (MLSS) concentration. The recycle stream is "return activated sludge (RAS)" and the fraction of the stream that is wasted is "waste-activated sludge (WAS)".

The nitrification waste-activated sludge and scum pumps transport settled sludge and scum, respectively from the nitrification settling tanks to the primary clarifier influent splitter box. In the primary clarifiers, the WAS is co-settled with the primary solids prior to transfer to the anaerobic digestors.

Wastewater then flows to one of two chlorine tanks. The chlorine contact tanks are two parallel tanks used to disinfected wastewater. After treatment in the chlorine contact tanks, final wastewater effluent flows by gravity to a wet well in the Effluent Pumping Station and is discharged into through cascade reaeration steps to the French Stream.

Co-settled sludge from the primary clarifiers is pumped to the anaerobic digestion facility for solids reduction prior to dewatering. The facility has four anaerobic digesters, two small digesters and two large units. Digested sludge stored in the small primary digester is pumped to the Belt Filter Presses (BFPs) in the Main Building where the sludge is dewatered to "cake". The sludge is sent to one of two flocculation tanks, where polymer is added to the sludge to promote flocculation prior to the BFPs. The presses dewater by applying pressure to the sludge between two belts to squeeze out the water. Water is recycled back to the influent wet well, while the resulting dewatered cake is collected and transferred via a belt conveyance system. Dewatered sludge is transferred from the BFPs via a belt conveyor system to a roll-off container in the Sludge Removal Room. Once the containers are full, the dewatered sludge is hauled to the Synagro facility in Woonsocket, RI for final disposal.

3.4.1 Prior Evaluation Summary

The recent WWTP evaluation developed a Capital Improvement Plan (CIP). The majority of the equipment at the facility was installed in the 1977 upgrade and is beyond its useful life. It is recommended that a comprehensive upgrade to facilities occurs every 25 years to address worn out equipment. Therefore, a comprehensive upgrade of the WWTP is necessary to address the equipment beyond its useful life. In recent years, Veolia has replaced some high priority pieces of equipment for the facility to remain functional. Due to the age of the system and requirements in the final NPDES permit, this will be a significant and costly upgrade. Final recommendations will be included in Phase 3 of the CWMP.

The following summarizes the recommended improvements associated with a comprehensive WWTP upgrade:

- Screening and Grit Facility
  - Provide a new facility located upstream of the influent pump station
  - One new mechanical screen and associated wash press
  - One new vortex style grit removal system and associated grit washer
  - One new grit and screenings receiving roll off
- Influent Pump Station Modifications
  - Replace existing pumps and piping
  - Address structural issues in lower wet well
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Primary Clarifier Modifications
  - Replace clarifier sludge removal mechanisms
  - Address tank structural issues
- Secondary System Modifications
  - Modify the secondary treatment process to an A2O process to achieve additional treatment capacity and biological nitrogen and phosphorus removal
  - Repurpose the existing secondary settling tanks to activated sludge tanks
  - Provide a new flow distribution structure
  - Provide new mixing system for anaerobic and anoxic zones
  - Provide new mechanical mixer/aerators for the oxic zones

  - Provide new blowers and associated blower building
  - Provide new internal recycle system
  - Provide new instrumentation and control system
  - Address secondary settling tank and nitrification tank structural issues
  - Provide new return and waste activated sludge pumps, piping and valves
  - Provide new mechanical/HVAC system for lower gallery
- Secondary Clarifier Modifications
  - Modify the effluent weirs to raise the tank water surface by three feet
  - Provide new sludge removal mechanisms
  - Address tank structural issues
- Tertiary Building
  - Provide a new tertiary treatment process for phosphorus removal
  - Tertiary treatment process will include two ballasted flocculation units complete with associated pumps, mixers, hydrocylcones, chemical feed and polymer system
  - Provide a new ferric chloride storage and feed system
- Chemical Building
  - Provide a new chemical building
  - New magnesium hydroxide storage and feed system for supplemental alkalinity.
  - New sodium hypochlorite storage and feed system
  - New sodium bisulfite storage and feed system
- Chlorine Contact Tanks and Effluent Pump Station
  - Address tank structural issues
  - Sludge Storage tanks
  - Repurpose the ex. aeration tank to two new sludge storage tanks
  - Provide aeration and mixing devices
  - Provide a tank cover and associated odor control unit
  - Address tank structural issues
- Administration Building
  - Provide new primary sludge piping and valves
  - Provide new dewatering and sludge transfer pumps
  - Provide new blower for sludge tank mixing
  - Demolish existing lime system
  - Demolish existing lower-level chemical systems
  - Provide two new screw presses for sludge dewatering
  - Provide new polymer system
  - Provide new sludge transfer conveyor, truck loading system and odor control unit
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Garage and Electrical Building
  - Provide a new electrical building with additional garage space
  - Provide a new generator
  - Provide a new main switch gear
- General
  - Provide a new electrical distribution system
  - Provide new site piping as required
  - Replace all existing motor control centers throughout the facility

- Provide a new fiberoptic network and plant SCADA system
- Address existing site lighting

3.4.2 Final NPDES Permit

The facility operates under NPDES permit number MA0101923. The current permit was finalized in November 2021. The new NPDES permit includes more stringent total phosphorous removal requirements. The new permit limits that were added/changed are summarized in Table 3-2. See the full NPDES permit in Appendix B for additional requirements.

Table 3-2 NPDES Permit Limits

Parameter	Limitation	Sample Frequency
BOD_5 Removal TSS Removal	≥85%	1/month
Escherichia coli	Average Monthly = 126 cfu/100 mL Maximum Daily = 409 cfu/100 mL	3/week, grab
Total Phosphorous (TP)	Average Monthly: Apr 1 - Oct 31 = 0.1 mg/L Nov 1 - Mar 31 = 1.0 mg/L Maximum Daily = Report	 2/week, 24-hour composite 1/week, 24-hour composite
Dissolved Oxygen	≥ 7.4 mg/L	1/day, grab
Total Copper	Average Monthly = 12 µg/L Maximum Daily = 19 µg/L	1/month, 24-hour composite
Total Aluminum	Average Monthly = 87.2 µg/L Maximum Daily = Report	1/month, 24-hour composite
PFAS Compounds	Maximum Daily = Report	1/quarter, composite

Other new items added include ambient and influent characteristics reporting.

The new NPDES permit includes a total phosphorous compliance schedule which includes the following:

- TP Status Report to evaluate the potential treatment process changes due January 28, 2023
- TP Progress Report of completed process changes due January 28, 2024
- TP Optimization of the plant and compliance with the TP limit due January 28, 2025

The facility's ability to meet this new limit is discussed further below.

3.4.3 Flows and Loads Update

In order to assess the effectiveness of the existing wastewater treatment systems and to evaluate alternatives to meet current and future discharge limitations, an analysis of the historical influent flows and loads was conducted in 2020 as part of the WWTP evaluation. Flows and loadings, specifically biological oxygen demand (BOD_5), total suspended solids (TSS), ammonia, and total phosphorous (TP), were statistically analyzed for the period of January 2016 to June 2020. Flow data was based on the WWTP reported monthly average flows. BOD and TSS data were based on monthly and daily maximum sampling and analysis values reported by the WWTP. The previous flows and loads analysis can be found in Appendix E. An updated flows and loads analysis is included in this section with data from June 2020 to January 2022. This data set is heavily impacted by the pandemic and the results of which will not have any bearing on recommendations made during the WWTP evaluation. This is for informational purposes only.

The WWTP serves the Town of Rockland and a small portion of the Town of Abington. An estimate of the sewered versus non-sewered population is summarized in Table 3-3 below based on 2020 census information and the 2021 Fact Sheet No. MA0101923 issued by the Environmental Protection Agency (EPA).

Table 3-3 Sewered Population Estimates

Parameter	Rockland	Abington
Total Population[1]	17,803	17,062
Persons per Household[1]	2.62	2.70
Population served by WWTP	17,000	1,000
Percent of Residents served by WWTP[2]	95%	5%

Source:

1. 2020 Census

The data in Table 3-4 and Table 3-5 presents the updated flow and loads at the facility from June 2020 to January 2022.

Table 3-4 Influent Flows and Loads for BOD_5, TSS, PO_4, and NH_3 (Jun 2020 – Jan 2022)

Parameter	Flow	Raw Influent							
		BOD_5		TSS		PO_4		NH_3	
	MGD	mg/l	lb./day	mg/l	lb./day	mg/l	lb./day	mg/l	lb./day
Annual Average	2.6	150	3,050	120	3,810	3.9	90	23	500
Maximum Month[1]									
Load-based	2.8	170	3,910	160	3,680	4.0	90	22	490
Flow-based	3.5	100	2,720	130	3,630	2.0	60	18	560
Maximum Day[2]									
100th Percentile	5.2	360	6,850	430	10,390	6.0	190	37	930
98th Percentile	4.7	290	5,300	370	6,640	6.0	180	37	920

Notes:

1. The maximum month conditions are based on the 30-day rolling average.
2. The maximum day values are calculated independently for all parameters.

The following paragraphs compare the prior report data (January 2016 to May 2020) to the updated data (June 2020 to January 2021).

The annual average flow increased by 0.1 MGD. The 100th percentile maximum day flow decreased by 0.8 MGD and the 98th percentile maximum day remained the same. There is a change in the typical trend from June 2020 to November 2020 where the average flow is steady and below 2.0 MGD and then there is a return to the typical oscillating pattern in December 2020 with flow ranging from 2.0 MGD to 5.0 MGD.

The BOD_5 concentrations and loadings decreased overall. The annual average concentration and loading decreased by 60 mg/l and 140 lbs./day. The maximum monthly flow-based concentration and load decreased by 50 mg/l and 2,740 lbs./day. The maximum monthly load-based concentration and load decreased by 20 mg/l and 1,990 lbs./day. The 100th percentile maximum day decreased by 6,360 lbs./day.

The TSS annual average concentration decreased by 50% and the loading decreased by about 1,200 lbs./day. The maximum monthly flow-based concentration and load decreased by 125 mg/l and 5,460 lbs./day. The maximum monthly load-based concentration and loading decreased by 50% and 5,380 lbs./day.

The phosphate annual average concentration increased by 0.3 mg/l and 16 lbs./day for loading. The phosphate flow-based maximum monthly concentration decreased by 0.1 mg/l and 50 lbs./day for loading.

The ammonia annual average concentration remained the same and the loading slightly increased by 30 lbs./day. The flow-based maximum monthly concentration remained the same, but the loading decreased by 70 lbs./day.

The flow, loadings, and concentration changes over the past year are likely due to the COVID-19 pandemic. The change in flow is most likely due to industrial and commercial flows dropping and the residential flow increasing as more people worked from home. Other changes in concentration and loading of the TSS and BOD_5 are also likely due to decreases in industrial and commercial flows, such as restaurants. As a result, the WWTP evaluation report recommendations remain unchanged.

However, it is interesting to see the change in the data from June 2020 to January 2022 and how the pandemic impacted the flows and loads. Additionally, it is important to note that the pandemic has changed the typical workweek with companies allowing employees to complete work from home or have hybrid schedules, which may continue to affect the flows and loads into the future.

Table 3-5 Effluent Flows and Loads for BOD_5, TSS, TP, and TN (Jun 2020 – Jan 2022)

Parameter	Flow	Plant Effluent							
		BOD_5		TSS		TP[1]		TN[1]	
	MGD	mg/l	lb./day	mg/l	lb./day	mg/l	lb./day	mg/l	lb./day
Annual Average	2.6	2.8	60	3.1	70	0.3	6.0	13	270
Maximum Month[1]									
Load-based	2.8	3.3	77	2.6	61	0.70	17	13	300
Flow-based	3.5	2.7	78	2.4	70	0.35	10	11	280
Maximum Day[2]									
100th Percentile	5.2	7.7	290	10	250	0.9	32	22	330
98th Percentile	4.7	5.9	140	6.7	180	0.8	20	20	330

Notes:

1. The maximum month conditions are based on the 30-day rolling average.
2. The maximum day values are calculated independently for all parameters.

The WWTP is operating at 98% flow capacity and is meeting its permit limits for BOD_5 and TSS. The annual average flow is 0.1 MGD higher than the WWTP's annual average flow limit of 2.5 MGD. The effluent annual average BOD_5 and TSS concentration and loading is lower than the effluent limit from May 1 through September 30 and the effluent limit from October 1 through April 30. The average TP concentration from April 1st to October 31st was 0.15 mg/l which meets the interim permit limit of 0.2 mg/l for those months. The annual average TP concentration from November 1 to March 31 was 0.55 mg/l, which is below the permit limit of 1.0 mg/l for those months.

The following figures summarize the influent and effluent data for the flow, TSS, BOD_5, PO_4, NH_3, TP and TN from June 2020 to January 2022.

Figure 3-2 Daily Influent Flow vs Daily Rainfall Data – Jun 2020 to Jan 2022

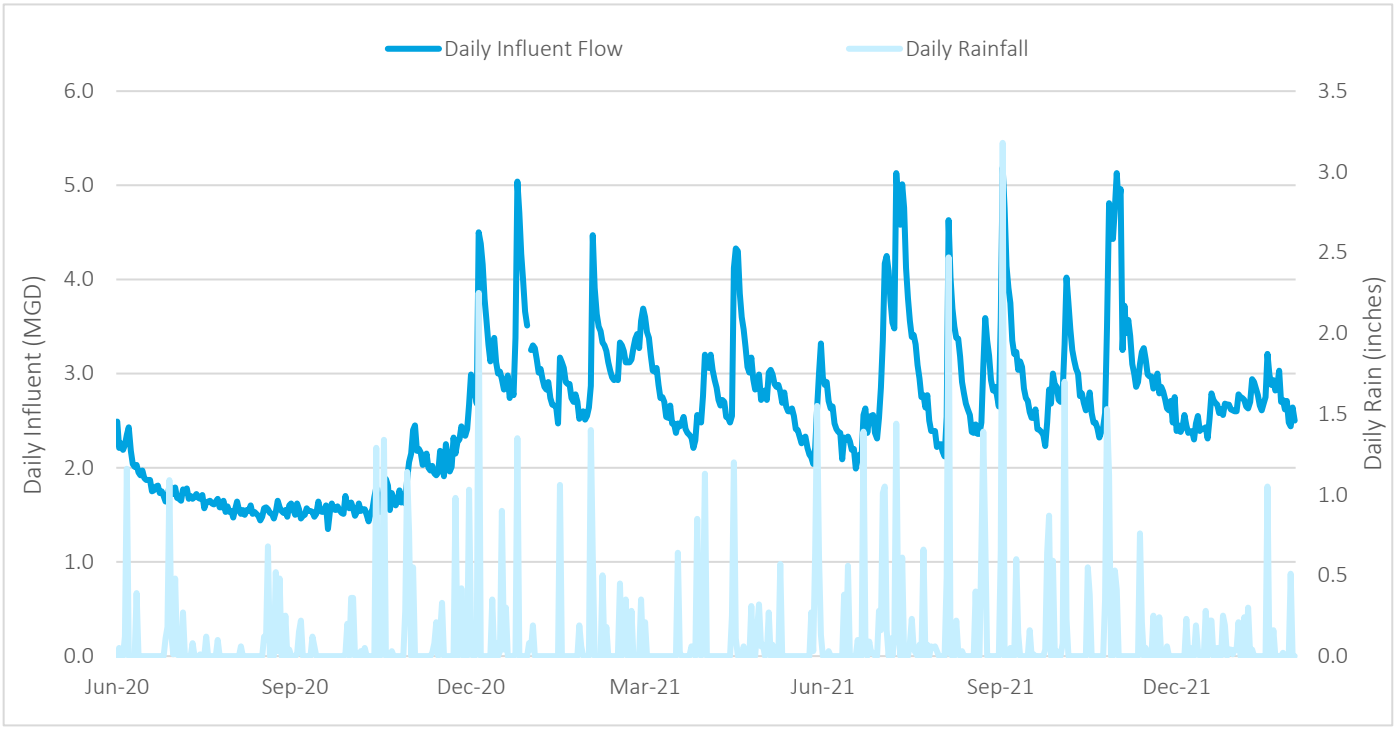
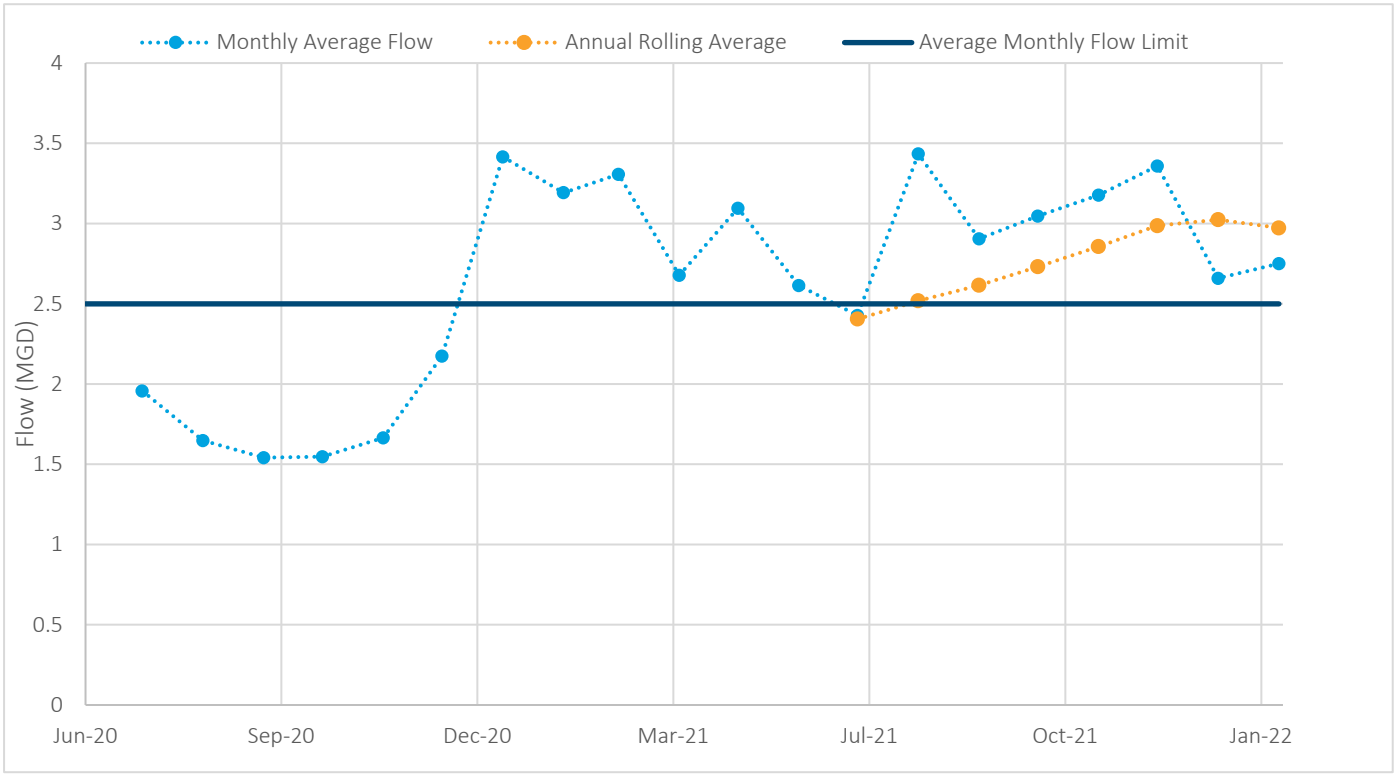


Figure 3-3 Monthly Average Flow – Jun 2020 to Jan 2022



Figures 3-2 and 3-3 present the WWTP flow data. The flow data is heavily impacted by rainfall events (inflow into the system) as seen in Figure 3-2. Figure 3-3 presents the monthly average flow calculated by taking the average of each month, respectively. The annual rolling average presents the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows for the previous eleven months. The NPDES Permit requires the facility to report the monthly average flow and the annual rolling average. The NPDES Permit monthly average flow limit is 2.5 MGD. As seen in Figure 3-3, the permit was exceeded from December 2020 to May 2021 and then from August 2021 to January 2022. The Town continues to work on I/I reduction capacity to manage flows at the WWTP. In addition, the sewer connection moratorium remains in place. A large portion of the July 2022 Administrative Order relates to high flows and is discussed at the end of this section.

Figure 3-4 BOD and TSS Influent Concentration – Jun 2020 to Jan 2022

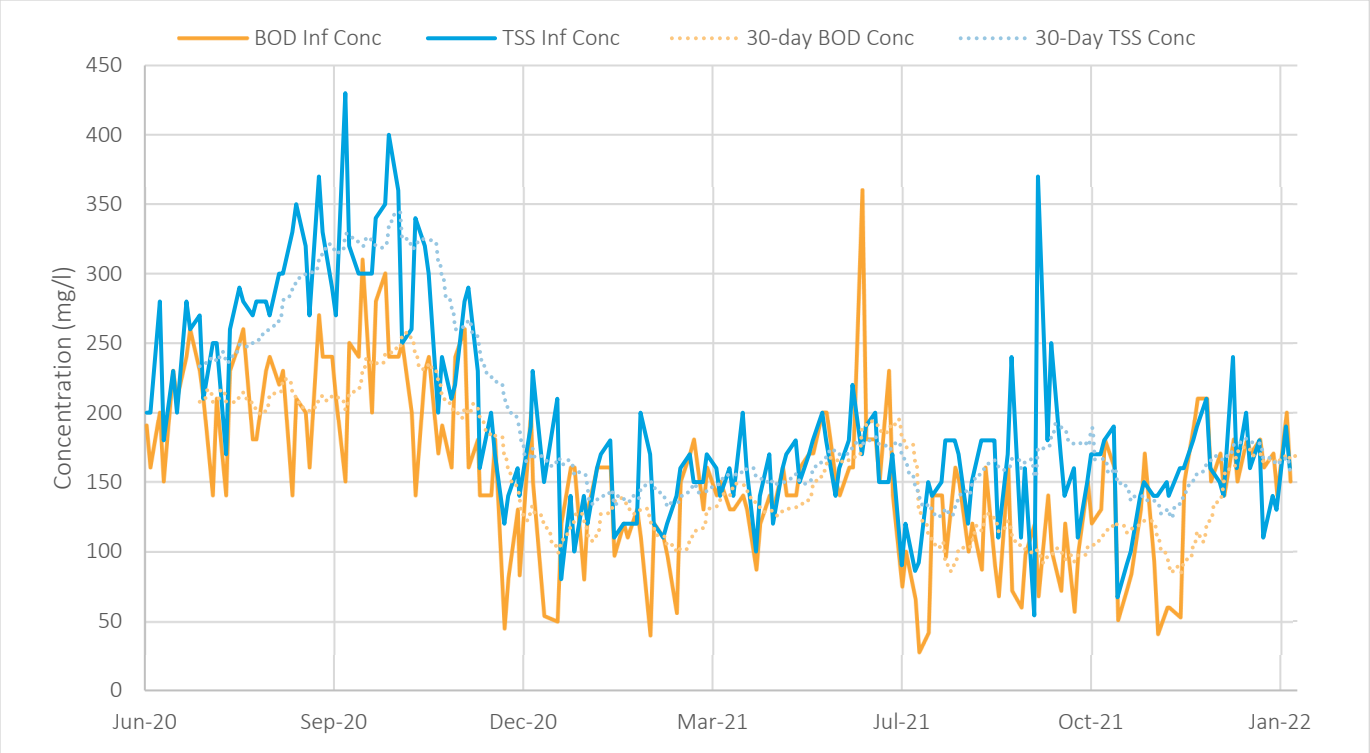


Figure 3-5 BOD and TSS Influent Loading – Jun 2020 to Jan 2022

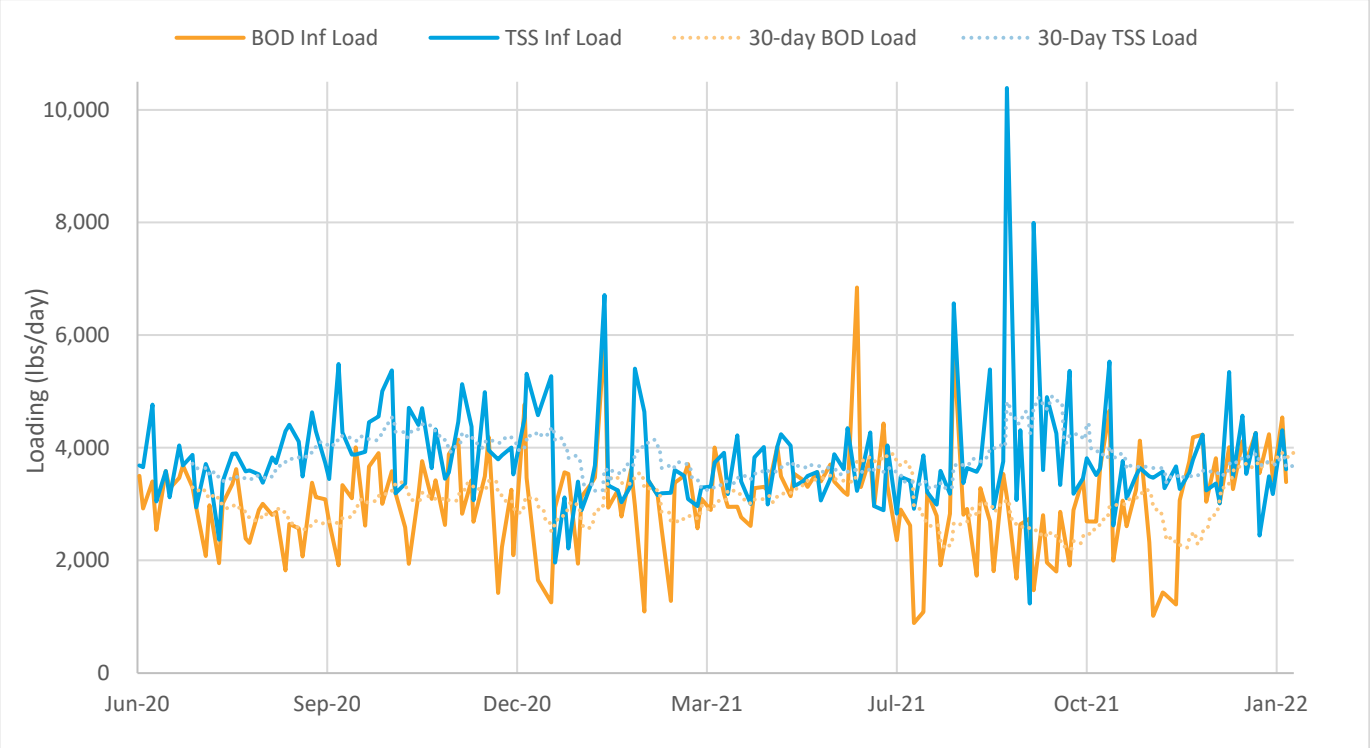


Figure 3-6 BOD and TSS Effluent Concentration – Jun 2020 to Jan 2022

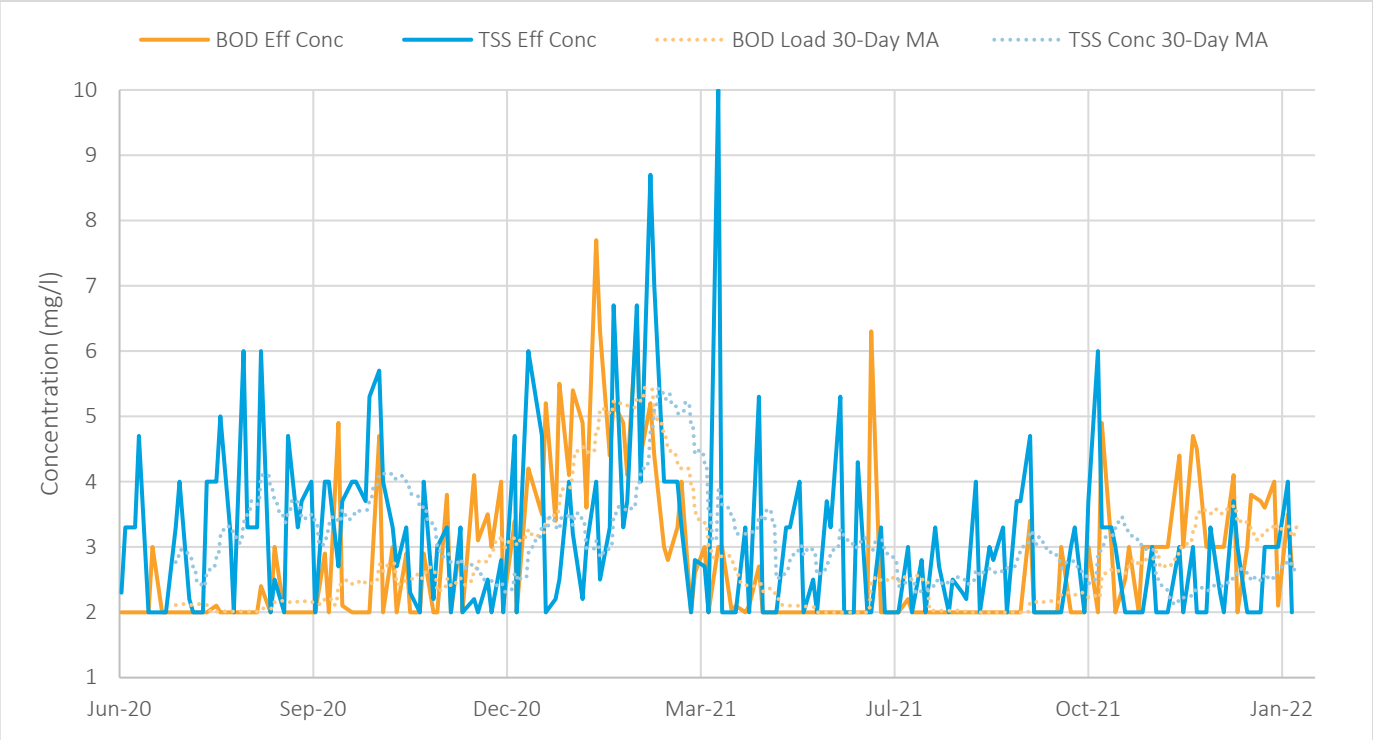
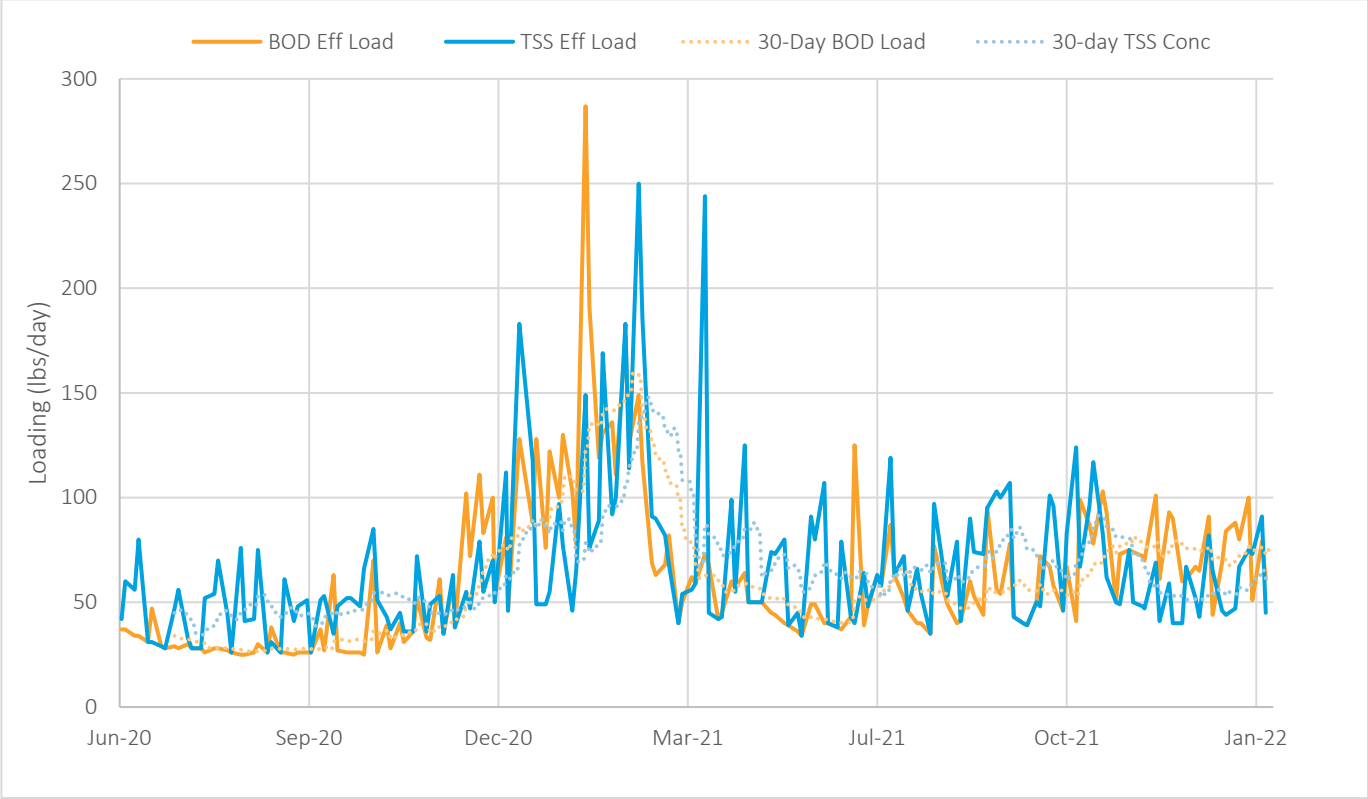


Figure 3-7 BOD and TSS Effluent Loading – Jun 2020 to Jan 2022



The influent BOD_5 and TSS loadings follow similar trends for both data sets, with significant loading occurring after large precipitation events. The influent BOD_5 and TSS from the previous data set showed significant TSS loadings during the winters of 2018 and 2019. The data from June 2020 to January 2022 follow similar trends to the previous loadings, with significant loading in February 2021 for both BOD_5 and TSS, in June 2021 for BOD_5, and in September 2021 for TSS. The significant loading of BOD_5 in June 2021 is related to a large rainfall event of 1.4 inches that occurred on June 22, 2021. Similarly, the significant loading of TSS in September 2021 is related to a large rainfall event of 3.2 inches on September 2, 2021. The loading followed a similar trend from the previous data with the TSS loading being higher than the BOD_5 loading.

Figure 3-8 Phosphate and Ammonia Influent Concentration – Jun 2020 to Jan 2022

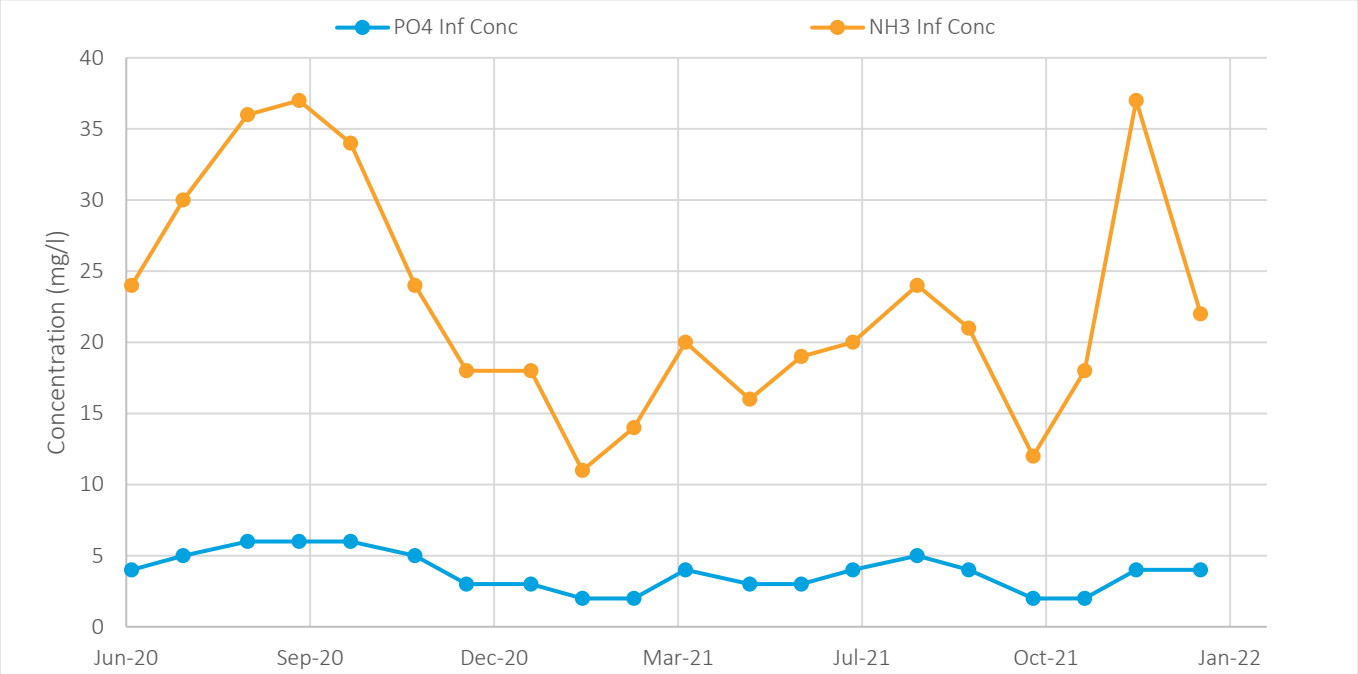


Figure 3-9 Phosphate and Ammonia Influent Loading – Jun 2020 to Jan 2022

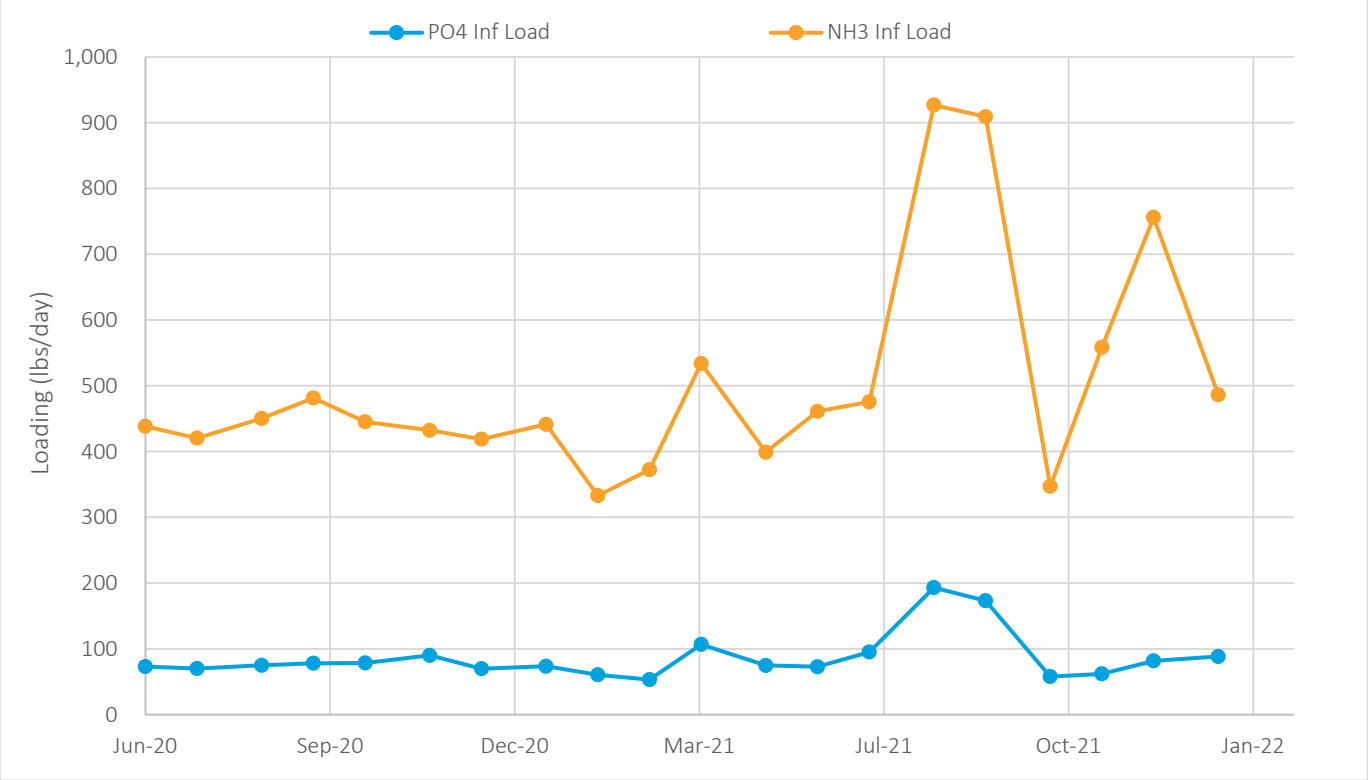


Figure 3-10 Total Phosphorus and Total Nitrogen Effluent Concentration – Jun 2020 to Jan 2022

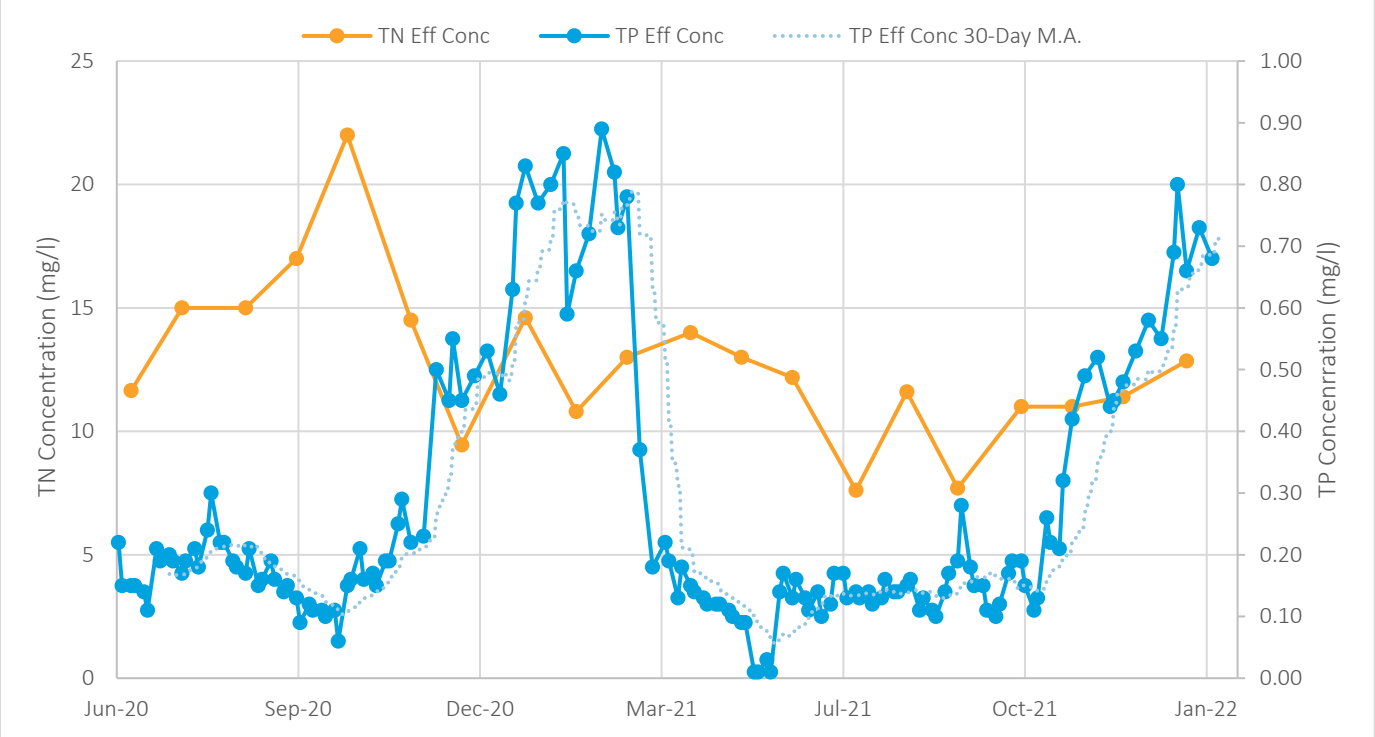
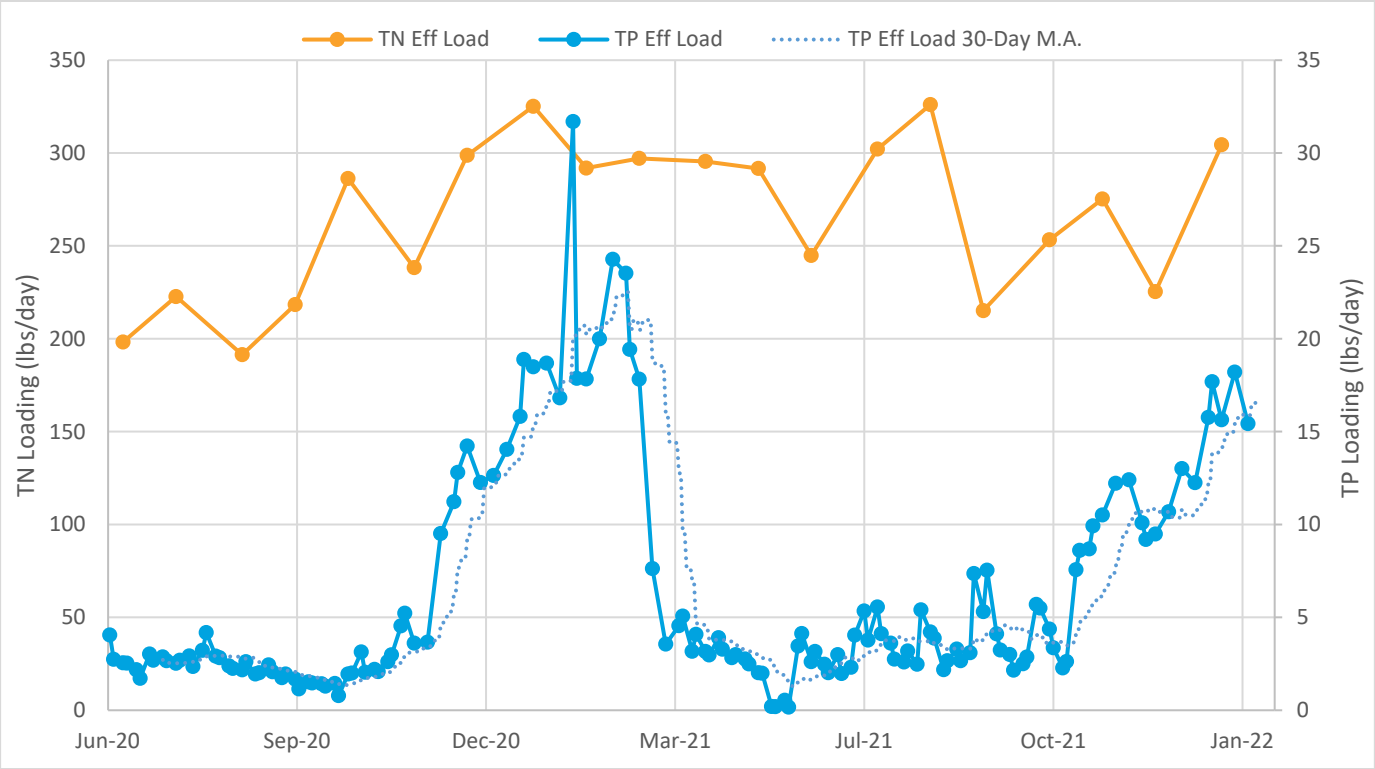


Figure 3-11 Total Phosphorous and Total Nitrogen Effluent Loading – Jun 2020 to Jan 2022



The new NPDES permit implemented a stricter total phosphorous effluent limit (0.1 mg/l) from April 1 to October 31. The new limit is not effective until January 18, 2025. See section 3.4.2 for the TP compliance schedule. The previous permit limit was 0.2 mg/l from April 1st to October 31st. The new TP limit is due to nutrient limits for the French Stream and its designation as a category 5 impaired water. The effluent TP ranged between 0.1 to 0.3 mg/l from June 2020 to November 2020. There was an increase to 0.5 to 0.8 mg/l during December 2020 to February 2021. There is a subsequent decrease in TP effluent concentration of 0.1 to 0.2 mg/l from April 2021 to October 2021. The facility is close to compliance with the new permit with only chemical addition, but it is clear that a tertiary treatment upgrade will be required to reliably meet the new permit limit.

3.5 Onsite Subsurface Wastewater Disposal Systems

The total acreage for the Town of Rockland is approximately 6,460 acres and the majority of the Town Rockland is sewered. The Rockland Board of Health is responsible for enforcing Massachusetts General Laws, State Environmental and Sanitary Codes, Town Ordinances and Regulations. Further, the Board of Health has the primary responsibility of protecting and improving the public health and well-being of the Rockland Community. The Board of Health maintains all records of onsite septic system construction, repair, and inspections.

Title 5 regulations are used as the standards for design, construction, and operations of onsite systems. As stated in MassDEP's 310 CMR 15, the purpose of Title 5 provisions "are intended to provide safe, efficient, and economical means of collecting, transporting and disposing of septage". Title 5 also maintains an affiliation with the environmental protection regulations which determine the siting constraints within which wastewater handling systems may be installed.

Parameters that must be considered for inclusion in evaluation criteria include soil classification, structure, texture, depth, drainage and permeability, ground and surface water location and seasonal high groundwater elevation, geology, topography, and climate. Each of these factors plays a role in the proper treatment of effluent from a septic system, and if not considered appropriately, can contribute to improper or incomplete treatment. Additionally, the hydraulic conductivity and the hydraulic gradient at the disposal site should be appropriately assessed to determine whether the site is capable of transmitting the volume of water that will be discharged from the system.

According to 310 CMR 15.03 (7), Title 5 regulations currently require that in siting septic tanks, leaching structures, and the other appurtenances associated with a septic tank/soil absorption system, certain minimum horizontal separation distances must be maintained:

> "Setback distances refer to the horizontal or lateral distance between the various components of the septic tank/soil absorption system and areas, or items of concern. Generally, the specified separation distances are intended to provide adequate transport time for the passage of the effluent through the soil where the concentrations of contaminants are expected to be reduced by filtration, straining, physical-chemical processes, biological activity and dilution and dispersion.
>
> Setbacks from surface water bodies are generally considered necessary to reduce the risk of contamination by pathogenic micro-organisms and the harmful eutrophication effects instilled by the introduction of high concentrations of nitrates and phosphates. The only conventional means of protecting surface water bodies is through designs which promote proper treatment in the unsaturated zone and the maintenance of low septic system densities which allow for adequate dilution.
>
> The majority of states use a distance of 100 feet for private wells and between 100 to 200 feet for public wells.
>
> A Zone II is a wellhead protection area that has been determined by hydrogeologic modeling and approved by the Department of Environmental Protection's (DEP) Drinking Water Program (DWP). Zone II was developed for predicting future nitrate loading under steady state conditions in zones of contribution to water supplies. The Drinking Water Regulations require Wellhead Protection Bylaws to prohibit the use of individual sewage disposal systems which discharge more than 440 gallons per acre."

If a septic system is not properly maintained, failures that impact the homeowner and environment may occur. Failed septic systems can lead to sewage back-up in the property building, groundwater contamination and/or private well contamination and wastewater surfacing onto the property. In terms of the public's wellbeing, a failed septic system can lead to water supply contamination and impacts on surrounding water bodies, which may include, algae blooms, dead fish and closing of public swim areas (beaches, lakes etc.).

Education and public relations are an important aspect of septic system management; when the public is aware of the environmental consequences, they can help prevent groundwater contamination and understand the proper siting, design, installation, and maintenance of septic systems.

Signs that a septic system may be failing include:

- Sewage surfacing over the drain field (especially during wet weather events)
- Sewage back-up
- Algae growth over the drain field
- Slow draining toilets or drains, and
- Sewage odors in and around the household

3.6 Existing Intermunicipal Agreements

The Town of Rockland has had an Intermunicipal Agreement (IMA) with the Town of Abington since 1983. The Town of Abington is allowed to discharge an average daily flow of 110,000 gallons per day (GPD) with a peak hour flow of 550,000 GPD to Rockland's collection system and WWTP. The Town of Abington's connection to Rockland's wastewater collection system is at the intersection of Morgan Avenue and Central Street. The IMA can be found in Appendix C. An updated IMA is currently being drafted by the Rockland Sewer Commission.

3.7 Sewer Use Regulations

As with many communities, Rockland has a variety of local bylaws, regulations, and policies designed to control wastewater disposal to the groundwater and to the Town's wastewater system, see Appendix D. The following departments and/or regulatory mechanisms specific to wastewater disposal were identified, and are discussed further below:

- Board of Health Regulations and Procedures
- Sewer Connection and Extension Policy
- Sewer Use Regulation

3.7.1 Board of Health Regulations and Procedures

The Board of Health in Rockland is responsible for regulating all onsite disposal systems in the Town. They utilize the DEP, State Environmental Code (Title 5, 310 CMR 15.00), along with related sections of the regulations exclusively to regulate disposal systems. The state regulations outline general provisions and enforcement; siting of systems; design, construction, repair, and replacement; inspection and maintenance; procedures for local upgrade approvals and variances; and transportation and disposal of septage.

The WWTP discontinued the treatment of septage at the facility in the early 1980s. Currently, septage is trucked and treated at facilities outside of Rockland.

3.7.2 Sewer Extension and Connection Policy

The sewer extension policy allows for additional connections to the sewer system within the sewer service area, providing that the property has access to an existing sewer line and meets the other requirements stated in the policy. The Board of Sewer Commissioners reviews the plans and specifications of the public sewer extension.

In 2011, to remain in compliance with the EPA, the Town adopted stringent permitting requirements for sewer connections and discharges. The Town was restricted from receiving additional wastewater outside of its municipal borders and developers are required to buy sewer capacity on a per unit basis. Sewer connections and additions are charged $100 per single-family unit, $750 for commercial, business, or industrial developments, and $7,500 per residential unit, payable to the Town. The sewer use and connection policies are included in Appendix D.

Due to the current flows in the Rockland wastewater system, the Town put into place a Sewer Moratorium in July 2021 until further notice, restricting any new sewer connections to the WWTP. There is currently a waiting list for connections to the sewer after the sewer moratorium is lifted. When a new sewer connection is made, the Town requires an 11:1 ratio of I/I to be removed by the entity making the municipal sewer connection (11 gallons of I/I must be removed for every new gallon of wastewater flow to be added to the system).

3.7.3 Sewer Use Regulations

Properties connected to the Town of Rockland's wastewater collection system are governed by the Town's sewer regulations in the Town's charter. The objectives of this sewer ordinance are to:

- Prevent the introduction of pollutants into the WWTP that will interfere with its operation
- Prevent the introduction of pollutants into the WWTP, which will pass through the system inadequately treated, into receiving waters, or otherwise be incompatible with the WWTP
- Protect both WWTP personnel who may be affected by wastewater and sludge in the course of their employment and general public
- Promote reuse and recycling of industrial wastewater and sludge from the WWTP
- Provide for fees for the equitable distribution of the cost of operation, maintenance, and improvement of the WWTP
- Enable the Town to comply with its NPDES permit conditions, sludge use and disposal requirements and any other Federal or state laws to which WWTP is subject

The Rockland Sewer Commission is responsible for administrating the provisions outlined in the Sewer Regulations.

3.8 EPA Order of Compliance

On July 14, 2022, the Town of Rockland received an Order of Compliance (Order) from the EPA. The Order is included in Appendix B, after the final NPDES permit. An Order of Compliance is utilized by the EPA to enforce corrective action to violations that have occurred for a NPDES permit. The Order is organized by findings, which state the problem that has occurred, the order, which outlines the corrective actions required and a schedule of compliance required to correct the violations that have occurred. The July 2022 Order is summarized below.

3.8.1 Findings

The Order findings are summarized in bullet format below:

- The WWTP's NPDES permit limits flow discharge on a monthly average of 2.5 MGD.
- From June 2017 to June 2022, the flow limit was violated (exceeded) in 32 of the 60 months.
- Information was requested by EPA to determine what the Town has done since 2006 to identify and remove I/I from the collection system.
- Approximately half of the base flow to the WWTP is I/I

3.8.2 Order

The order portion of the Order of Compliance is summarized in bullet format below. A summary table, Table 3-6, is included below for the compliance schedule.

- By August 1, 2022, the Town shall submit a plan to EPA and MassDEP that outlines I/I removal work to be implemented that is described in the Summary section of the 2021 SSES report or an alternative plan that will remove the same amount of flow identified in that section
- By September 1, 2022, the Town shall develop and submit to EPA and MassDEP an updated CWMP Scope of Services which includes an evaluation of alternatives to ensure its compliance with the monthly flow limit of the WWTP's NPDES permit. The updated scope shall include the following:
  - Additional studies to identify sources of I/I not described in the 2021 SSES report
  - Opportunities to utilize inline storage within the Collection System to reduce peak flows at the WWTP
  - Opportunities to utilize offline storage (flow equalization tanks) to reduce peak flows to the WWTP
  - Opportunities for inground injection of treated wastewater
  - Additional connection restrictions outside of the existing moratorium
  - Other means to address flow violations
- By September 30, 2025, submit to EPA and MassDEP a report which includes an evaluation of additional alternatives to ensure flow compliance that will include the following:
  - Investigation of diversion of all or partial flows from the Collection System to another municipal collection system
  - Investigation of moving WWTP discharge location to another water body
  - Report shall include a description of the alternatives investigated, costs associated, and time frame for implementation of the options. A final recommendation will be made for which should be implemented by the Town. The CWMP shall be updated with the final recommendation in the Report.
- By April 30, 2023, submit to EPA and MassDEP the final CWMP
- By September 30, 2023, submit to EPA and MassDEP a plan and schedule describing what measures from the CWMP the Town plans on implementing. Upon submission, the Town shall begin implementation of the plan.
- By July 1, 2023, submit the undergoing rate study to EPA and MassDEP, which shall include spending scenarios based on I/I removal projects and the WWTP upgrade.

- The final NPDES permit compliance schedule for Total Phosphorus removal is extended an additional 11 months (to January 2024).
- Beginning in November 2022, a 6-month compliance report is required to be submitted to EPA and MassDEP by November 30 and May 31 each year that shall detail actions taken by the Town during the 6-month period and a plan for the next 6-month period for addressing compliance with the order and flow violations. The report shall include:
  - A summary of all monthly flow violations, including any bypass quantities
  - Date and quantity of bypasses
  - Description of actions taken during 6-month period to comply with AO
  - A map of the Collection System showing project locations to address I/I removal
  - A table that outlines I/I quantity removed and cost of project(s)
  - Description of actions taken by the Town to comply with the Sewer Moratorium
  - Table showing proposed developments with projected flows, I/I to be removed, and revenue to be received
  - A table showing money available for I/I removal projects based on revenue from new developments
  - Description of actions taken toward the Alternatives Report
  - 6-month projection of work to be completed in future

Table 3-6 Order of Compliance, Compliance Schedule

Item	Date
Submit plan to implement I/I removal work outlined in 2021 SSES Report	August 1, 2022
Update and submit CWMP Scope	September 1, 2022
Submit Final CWMP	April 30, 2023
Complete Rate Study	July 1, 2023
Submit plan to implement CWMP recommendations regarding I/I removal	September 30, 2023
Obtain Compliance with Total Phosphorus Removal NPDES limit	January 2024
Alternative Discharge Report Complete	September 30, 2025
Semi-Annual Compliance Report	November 30, 2022, and every 6 months thereafter

The Town is in the process of addressing the first two items on this list and the CWMP is on track to complete within the required time.

4

WRIGHT-PIERCE
Engineering a Better Environment

Section 4 Existing Water Supply, Treatment, and Distribution Systems

The information provided in this section describes the Town of Rockland's water supply system, along with the physical infrastructure components of the water system. Water system information has been obtained through previous reports and studies along with data provided by the town.

4.1 Introduction

Since 1885, the Town of Rockland and the Town of Abington have been in a partnership for their water supply and treatment, called the Abington and Rockland Joint Water Works (ARJWW). The towns get their water supply from two surface water bodies and one groundwater source and are permitted to produce a total of 2.67 million gallons per day (mgd) of water, combined.

The surface bodies are the John F. Hannigan Memorial Reservoir, better known as the Abington/Rockland Reservoir, located in the northeast corner of Rockland, and the Great Sandy Bottom Pond located in the Town of Pembroke. The Abington/Rockland Reservoir is a man-made water body. The groundwater source consists of four gravel-packed wells located on Myers Avenue in Abington. The Myers Avenue Well Field is only able to withdraw a total of 0.49 mgd of water.

4.2 Public Water Supply System

4.2.1 Public Water Distribution System

The distribution system includes approximately 126 miles of water main ranging in size from 4-inches to 16-inches in diameter and 184 public and private hydrants, as seen in Figure 4-1. There is a 33,000-foot water main from Great Sandy Bottom Pond in Pembroke, MA to Summer Street on the Abington and Rockland town line.

The Lincoln Street Booster Station pumps water from the Myers Avenue Wells and Great Sandy Bottom Pond. It also adds sodium hypochlorite to the water to aid in disinfection. There used to be a pump station at Beech Hill, but it is no longer in service. The Beech Hill Pump Station used to pump water from the Great Sandy Bottom Pond.

There are six storage facilities for the Abington Rockland Joint Water Works. Two of the storage facilities are located at the Great Sandy Bottom water treatment plant (WTP) and the Hingham Street WTP. The Great Sandy Bottom Storage Facility is a concrete underground storage tank with a capacity of 0.75 million gallons (MG). The Hingham Steet Storage Facility is a concrete underground storage tank with a capacity of 2 MG. There are two storage tanks located in Abington on Chestnut Street and Lincoln Street with capacities of 0.4 MG and 1.25 MG, respectively. In Rockland, the White Rice Avenue Storage Tank is a 0.5 MG elevated storage tank made of steel. The Blue Rice Avenue Tank is also located in Rockland and is a 0.5 MG elevated storage tank made of steel.

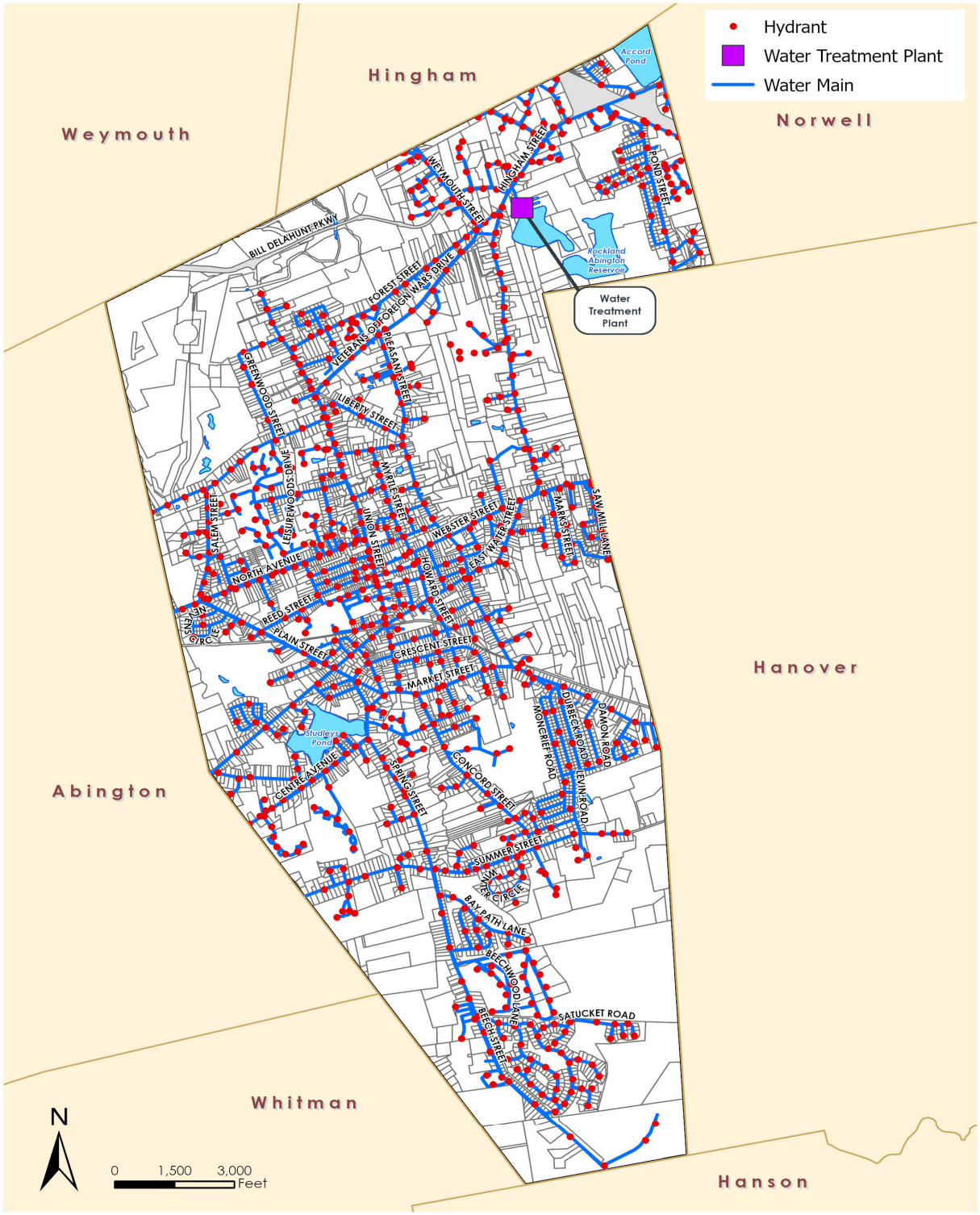
4.2.2 Public Water Treatment Facilities

The Abington and Rockland Joint Water Works treats water from the surface water bodies at two surface water treatment plants and the groundwater source at another water treatment plant.

The two surface water treatment plants include the Great Sandy Bottom WTP and the Hingham Street WTP. The Great Sandy Bottom WTP is located on Phillips Road in Pembroke, MA, and treats water from Great Sandy Bottom Pond. The Hingham Street WTP is located on Hingham Street in Rockland, MA, and treats water from the Abington/Rockland Reservoir. The surface water is treated through the treatment processes of coagulation, flocculation, sedimentation, rapid sand filtration, and disinfection. Potassium permanganate is also added for taste and odor control and there is a pH adjustment for corrosion control.

The groundwater is treated at the Myers Avenue Water Treatment Plant with chemicals (potassium permanganate, aluminum sulfate, and sodium hydroxide), goes through pressurized filtration, then a granular activated carbon (GAC) filter to remove PFAS compounds, and lastly, disinfection.

Figure 4-1 Water System



4.3 Water Demand

Under the authority of the DEP-Bureau of Resource Protection, Public Water System Operators are required to submit an Annual Statistical Report on the operation of their water supply system. These annual reports allow the DEP to determine if the authorized withdrawals regulated under the Town's Water Management Act (WMA) permit are being exceeded. These reports include the volume of water being withdrawn from each source, the population served, and the number and type of service connections in the distribution system. This information is a critical component in the determination of existing conditions and historical trends. It is also a useful tool for developing future conditions.

A review of the ARJWW's Annual Statistical Reports was conducted for the years 2019 to 2021 to determine how the historical operation of Rockland's groundwater and surface water sources compared to the registered and permitted average day and total annual volumes. From 2019 through 2021, the Town's allowable average day and total annual values under the WMA were 2.21 MGD from the South Coastal Basin (Hingham Street WTP and Great Sandy Bottom WTP) and 0.46 MGD from the Taunton River Basin (Myers Ave WTP).

In 2020, the Town exceeded the 2.21 MGD withdrawal limit from the South Coastal Basin due to the Myers Avenue WTP shut down for seven and a half months due to retrofit upgrades for PFAS removal. The Covid-19 pandemic was also a factor as more people were at home, resulting in higher water demand. Similarly, in 2021, the Town also exceed the 2.21 MGD limit for the South Coastal Basin by 0.63 MGD; however, the Taunton River Basin was below the permitted volume of 0.46 MGD by 0.41 MGD. Therefore, Rockland had exceeded its permit, but due to special conditions outlined in the Findings of Fact for the Water Management Act (WMA) Permit, the Town is able to withdraw more than the 2.21 MGD from the South Coastal Basin.

The ARJWW has mitigation credit allowing an additional permitted withdrawal amount. The mitigation requirement is calculated by determining the amount that will be returned to local groundwater. The ARJWW reports that 3% of its water is delivered to areas with on-site septic systems and will be discharged into the groundwater. From 2015 to 2020, the ARJWW was allowed to withdraw 2.73 MGD from the South Coastal Basin. The ARJWW is then allowed to withdraw 2.77 MGD until additional mitigation activities are implemented. After implementation, the Town can withdraw 2.81 MGD from 2020 to 2025 and 2.90 MGD from 2025 to 2039.

Mitigation credits are gained from completed infiltration/inflow (I/I) remediation projects, stormwater remediation projects, I/I Program Planning, and drought management plans. If the Town updates the drought management plan, they can increase the approved firm yield of the Great Sandy Bottom Pond. Currently, Rockland and Abington have a total water ban on outside water usage. The mitigation credits are determined through the amount of I/I removal and then credits are also given for plans and studies in amounts of 10,000 gpd of removal.

The historical water usage for the Town is shown in Table 4-1. Historical water demand was evaluated and used as a baseline for demand projections throughout the Town. The average and maximum daily water use is presented in Table 4-1, as documented in the MassDEP Annual Statistical Reports (ASRs) from 2019 to 2021.

Table 4-1 Historical Demand Trends

Year	Average Day (MGD)	Maximum Day (MGD)	Total Production (MGY)
2019	1.69	3.31	618
2020	1.89	3.63	695
2021	2.03	3.63	741

4.4 Water Consumption

As of 2021, the Towns of Abington and Rockland had an estimated 11,565 individual customer (metered) accounts. The total number of customer accounts decreased from 2019 to 2020 and then increased from 2020 to 2021 as demonstrated in Table 4-2.

Table 4-2 Water Customer Accounts

Year	Total Number of Customer Accounts	Differential in Customer Accounts (+)
2019	11,518	0
2020	11,513	-5
2021	11,565	+52

4.5 Future Water Supply Sites

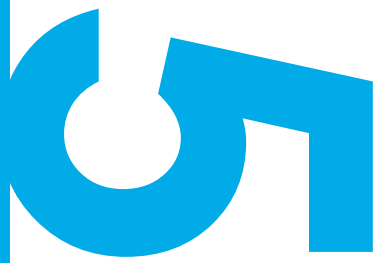
Rockland and Abington have struggled with water capacity issues due to limited water supply. In Rockland, this has been a limiting factor for potential residential and economic development and growth. This has also resulted in strict water bans for outdoor usage. In May 2018, MassHousing awarded the Abington-Rockland Joint Water Works a grant for the engineering design of an additional well at Myers Avenue to increase the capacity by 160,000 gallons per day. In November 2021, the MassWorks Infrastructure Program awarded the Abington-Rockland Joint Water Works a $2.24 million grant for improvements to the Myers Avenue Water Treatment Plant. This will provide an additional 160,000 gallons of water that can be used for residential and commercial developments. After the improvements are made to the Myers Avenue Water Treatment Plant, the Town can consider future water supply sites.

4.6 Water Conservation Efforts

As part of ongoing water conservation efforts, the Town of Rockland provides water conservation tips through the Public Works website to educate the community.

For tips and information on this topic, the following is a partial list of organizations and agencies that promote educational awareness in the conservation of clean drinking water:

- MWRA - Massachusetts Water Resource Authority (www.mwra.state.ma.us/water/)
- AWWA - American Water Works Association (www.waterwiser.org/)
- EPA's EnergyStar Program (www.energystar.gov)
- DEP Model Water Use Restriction Bylaw Ordinance (www.state.ma.us/dep/brp)



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Section 5 Needs Assessment

5.1 Introduction and Approach

As previously presented in this report, approximately ninety-five percent of Rockland residents rely upon the Town's sewer system to collect, transport, treat and dispose of its wastewater at the WWTP. The remaining residents, which reside outside of the municipal sewer areas or have not connected, rely upon onsite wastewater disposal systems. If operated and maintained under the right conditions, onsite systems can provide a cost-effective solution for reliable wastewater treatment and disposal. Those favorable conditions include ideal soils for percolation, adequate depth to groundwater, sufficient depth to bedrock, and spatial parcel sizes.

Under this phase of the CWMP, a Town-wide needs assessment was conducted for the non-sewered areas to evaluate whether conventional, onsite septic systems can provide adequate treatment for sanitation and environmental protection now and through the 20-year planning period. The non-sewered areas were divided into seven Study Areas based on location and various physical and environmental criteria. Each study area was assessed using parcels of land within the study area for soil/drainage conditions, onsite private water systems, depth to groundwater, depth to bedrock, and parcel size. A more detailed discussion of the methodology used to assess the Study Areas is presented in the following sections.

5.2 Determination of Study Area Boundaries

As shown in Figure 5-1, a total of 7 Study Areas were created and analyzed as part of this CWMP. The Study Areas are all located in non-sewered areas located outside of the Town's existing sanitary sewer collection system. The boundaries for each of the Study Areas are based on a number of criteria and environmental conditions. Protected open space parcels and other non-developable parcels were removed from the development of Study Areas. Study Areas were also developed based on surrounding physical characteristics such as location of streets, parcel sizes, topography, surface water, watersheds, or other observations. A summary of the Study Areas' number of parcels and area is shown below in Table 5-1.

5.2.1 Future Developments

There are several large developments noted in discussions with Town staff that were removed from consideration as study areas. These developments have detailed plans in place at this time as described below.

Lovell Academy, denoted in purple on Figure 5-1, is a proposed development at 80 Bill Delahunt Parkway. The development consists of a proposed hockey prep school and a hockey rink that is currently under construction. The Lovell Academy Project proposes an onsite individual sewage system due to the sewer moratorium in place at this time.

Union Point Development, outlined in blue on Figure 5-1, is a former South Weymouth Naval Air Base that is now run by the Southfield Redevelopment Authority. The Southfield Redevelopment Authority designated Brookfield Properties as the master developer in January 2020. Union Point is a 1,400-acre Smart Growth development with a master plan including 4,000 residential units, 10 million square feet of commercial space, 1,000 acres of open space, and 50 miles of hiking and biking trails across Rockland, Weymouth, and Abington. Much of the residential development will be in Weymouth. Rockland has planned to create Open Space in much of the land on the Rockland side, as shown in Figure 5-1.

In the Union Point Narrative by Brookfield Properties, it discussed wastewater solutions from an onsite wastewater treatment facility, municipal sewer in Weymouth, municipal sewer in Abington and Rockland, or a combination. In

August 2021, the Southfield Redevelopment Authority discussed funding an evaluation of water and sewer demands within each community. The wastewater solution depends on the available capacity in each community and the individual community needs. It is unlikely at this time that Rockland would be a disposal solution due to the capacity issues at the WWTP.

Shinglemill LLC. is a development proposed for 0 Pond Street, shown in purple on Figure 5-1. This property is a proposed development of 236 units with 355 bedrooms. The proposed wastewater flow is 39,050 gallons per day and has approval through the Sewer Commission once the moratorium is lifted.

5.2.2 Study Area Descriptions

The following sections provide a detailed description of each individual study area.

5.2.2.1 Study Area 1 – Weymouth Street

As shown in Figure 5-1, Study Area 1 is located in the north central part of Rockland. It is located near the Town of Hingham to the north, Union Point to the west and Study Area 2 to the east. This study area encompasses approximately 20.5 acres and is comprised of five parcels. The area has very poorly drained soils and high groundwater around the wetlands, and then has a mixture of somewhat poorly drained to well drained soils in the areas away from wetlands. Parcel sizes were typically greater than one acre. The study area is within Zone A and Zone B surface water protection areas in the north.

5.2.2.2 Study Area 2 – Pond Street

Study Area 2 is located in the northeastern part of Rockland. It is bordered by the Abington/Rockland Joint Water Works Supply Land to the South and the Town of Norwell to the east. This study area encompasses approximately 15.3 acres and is comprised of five parcels. The area has mostly very poorly drained soils and poorly drained soils. The depth to groundwater is typically less than 6 feet for the entire area due to the wetlands in the study area. Parcel sizes were typically greater than one acre. The entire area consists of Zone A and Zone B surface water protection zones.

5.2.2.3 Study Area 3 – VFW

Study Area 3 is located in the north central part of Rockland. It is located near Lovell Academy to the north, and Union Point to the northwest. This study area encompasses approximately 50 acres and is comprised of 19 parcels. The area has some poorly drained soils and some well drained soils. The depth to groundwater is mostly greater than 6 feet except for the area along the Old Swamp River. Parcel sizes were greater than one acre with some parcels ranging from a half to one acre. The study area has Zone C surface water protection and Zone A surface water protection along the Old Swamp River.

5.2.2.4 Study Area 4 – Liberty Street

Study Area 4 is located in the central part of Rockland. It is south of Study Area 3 and north of Study Area 5. This study area encompasses approximately 84.5 acres and is comprised of 27 parcels. The area has well drained to moderately well drained soils for most of the study area with some sections of very poorly drained soils near wetlands. The parts of the area near the wetlands have high groundwater; however, most of the study area has groundwater greater than 16 feet. Parcel sizes were typically greater than one acre.

5.2.2.5 Study Area 5 – East Water Street

Study Area 5 is located in the central west part of Rockland. It is bordered by the Phillips Street Conservation Area to the east and Abington/Rockland Joint Water Works Supply Land to the south. This study area encompasses approximately 20.4 acres and is comprised of eight parcels. The area has some moderately well-draining soils and very poorly drained soils. The majority of the area has high groundwater due to the wetlands. Parcel sizes are mostly greater than one acre with a few parcels ranging from half to one acre in size.

5.2.2.6 Study Area 6 – Summer Street

Study Area 6 is located in the central east part of Rockland. It is bordered by the WWTP to the west and French's Crossing Conservation Area and Summer Street Conservation Area to the south. This study area encompasses approximately 96.6 acres and is comprised of nine parcels. The majority of the study area has poorly drained to very poorly drained soils. The depth to groundwater is high near the wetlands and greater than 16 feet in other parts of the area. Parcel sizes are all greater than one acre.

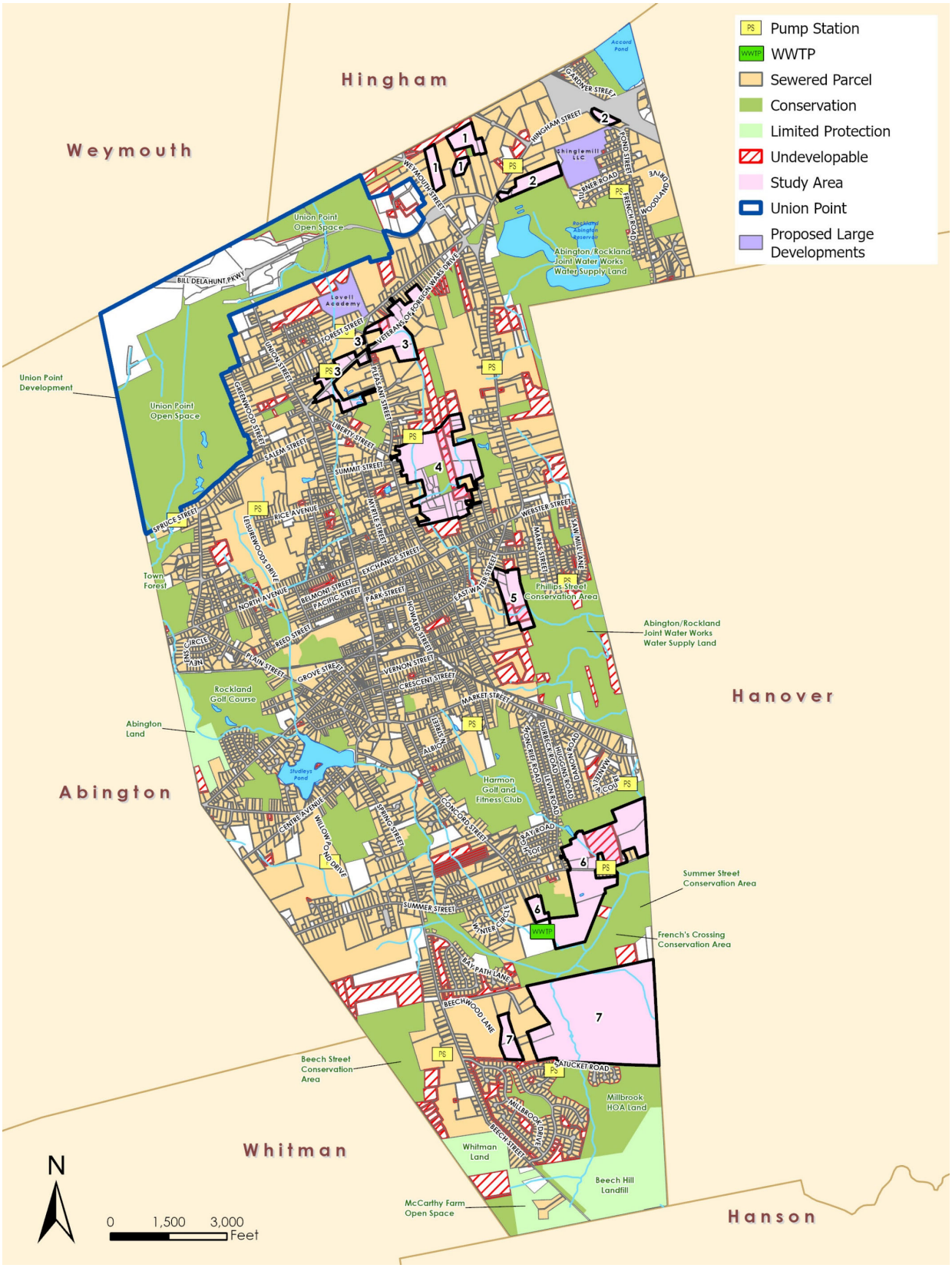
5.2.2.7 Study Area 7 – Industrial Way

Study Area 7 is located in the southeastern part of Rockland. It is bordered by the Town of Hanover to the east, French's Crossing Conservation Area to the north, and Millbrook HOA Land to the south. This study area encompasses approximately 180.3 acres and is comprised of four parcels. The area has some moderately well drained soils and some very poorly drained soils. Approximately half of the area has high groundwater, and the other half has groundwater depth greater than 16 feet. Parcel sizes are all greater than one acre.

Table 5-1 Study Areas Summary

Study Area	Number of Parcels	Area (acres)
1 – Weymouth Street	5	20.5
2 – Pond Street	4	15.3
3 – VFW	19	50
4 – Liberty Street	27	84.5
5 – East Water Street	8	20.4
6 – Summer Street	9	96.6
7 – Industrial Way	4	180.3

Figure 5-1 Study Areas



5.3 Needs Rating Methodology

The needs assessment rating methodology focused on avoiding sanitary problems, protecting the Town's drinking water supplies, reducing nutrients to surface waters, and maintaining community character. Each study area received a score based on the analysis criteria. Then, all Study Areas were ranked based on the scores. The highest scoring Study Areas (>25) became "needs areas", which will be further evaluated as part of Phase 2 - Alternatives Identification and Screening for further detailed evaluation as part of Phase 3 of the CWMP.

Depending on several evaluative criteria, a "needs area" may or may not be well suited to utilize a conventional, onsite septic system to provide adequate means of treatment and environmental protection throughout the 20-year planning period. During CWMP Phases 2 and 3, specific recommendations for each "needs area" will consider the appropriateness of utilizing septage management plans, nutrient (i.e., nitrogen and phosphorus) management plans, innovative/alternative (I/A) treatment systems, communal systems, decentralized collection and treatment facilities, regional collection system extension, and connection to the Town's existing sewer collection system and WWTP.

5.3.1 Study Area Assessment

The assessment of each study area was based on a study-area-wide approach. This assessment was derived from the data received from various stakeholders, including the Town of Rockland's Departments of Sewer, Health, Planning, and Assessors' Office, Massachusetts Geographical Information System (MassGIS), Abington-Rockland Joint Water Works, and the Natural Resources Conservation Services (NRCS). The evaluative criteria were established as either primary criteria or secondary criteria, as summarized in Table 5-2.

Each of the listed primary criteria was ranked from 0 to 10. A score of "0" represents that a criterion had no negative impact, while a score of "10" means that the criterion had the most negative impact. To differentiate the importance of primary criteria from secondary criteria, the scoring for the secondary criteria ranged only from 0 to 5 points. The maximum number of points that a study area could receive was 75 points. After all the Study Areas were analyzed and each study area received its total score, the Study Areas were placed into prioritized needs categories as discussed later in this section.

The following sections provide a detailed discussion for each of the primary and secondary evaluative criteria and their scoring systems.

Table 5-2 Evaluative Criteria

Primary Criteria (Ranking 0 to 10)	Secondary Criteria (Ranking 0 to 5)
Soil Type / Drainage Class	Drinking Water Protection Districts
Depth to High Groundwater Elevation	Surface Water Protection
Depth to Bedrock	Flood Plains
Parcel Sizes	Priority/ Estimated Habitat Areas
Private Well Setbacks	Historic Districts

5.3.2 Primary Criteria

There were five primary criteria conditions that were considered as part of the evaluation to determine if an area's onsite septic systems would remain a viable option for wastewater disposal over the 20-year planning period. A brief discussion of each one of those evaluative criteria is presented in the following sections.

5.3.2.1 Soil Type / Drainage Class

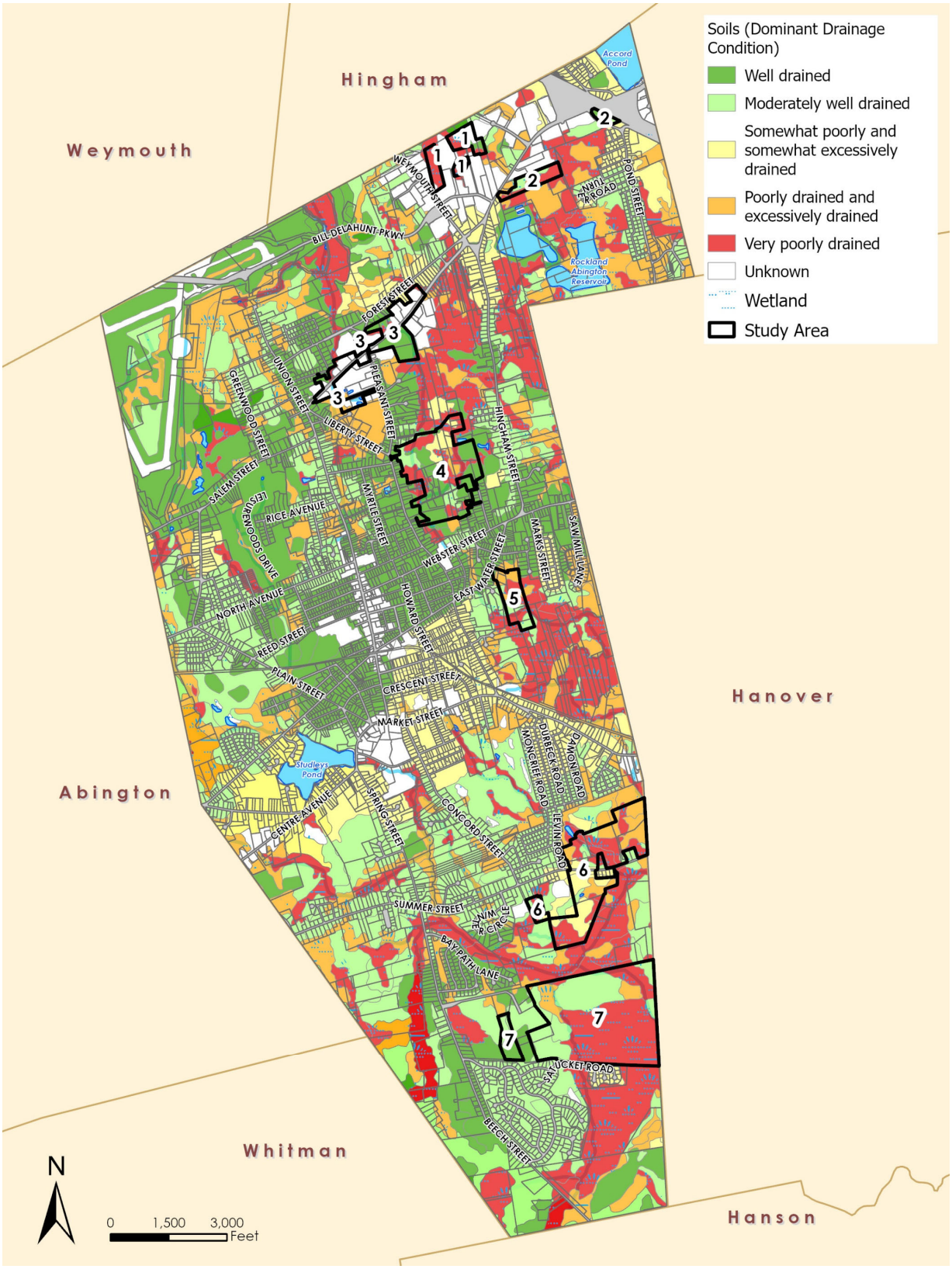
Each of the Study Areas were evaluated based on soil drainage qualities. Soil classifications were determined using NRCS data. Each soil type in the Town of Rockland was classified using NRCS drainage categories.

It is noted that the NRCS data considers soils classified as excessively drained as a severe soil type. These gravelly soils are often noted to have 'fast percs' of less than 2 minutes per inch (mpi). Massachusetts's Title 5 regulations for onsite wastewater disposal systems does allow septic systems to be constructed under these conditions, but it must have a 5-foot separation to groundwater. Only a 4-foot separation to groundwater is required for perc rates above 2 mpi. The soil drainage class ranking system is included in Table 5-3. Figure 5-2 shows the Soil Type / Drainage class.

Table 5-3 Soil Drainage Class Ranking System

Soils/Drainage Class	Score
Very Poorly Drained	10
Excessively Drained or Poorly Drained	7
Somewhat Excessively Drained	4
Moderately Well Drained	2
Well Drained	0

Figure 5-2 Soil Drainage



5.3.2.2 Depth to High Groundwater Elevation

An estimate of the annual maximum high groundwater elevation was determined from the best available information obtained from NCRS. The State's Title 5 regulations mandate particular requirements for onsite wastewater disposal systems in regard to groundwater elevation. Specifically, these regulations require a minimum vertical separation distance from the bottom of the onsite wastewater disposal system to the top of the seasonal high groundwater elevation of 4 feet in soils where the percolation rate is greater than 2 mpi and 5 feet in soils where the percolation rate is less than or equal to 2 mpi. The ranking system for the depth to water table is included in Table 5-4 below. Figure 5-3 shows the High Groundwater elevation map.

Table 5-4 Depth to High Water Table Ranking System

Depth to High Groundwater Elevation	Score
Less than 5 feet	10
Greater than 5 feet	0

5.3.2.3 Depth to Bedrock

Another primary criterion used as part of the evaluation ranking system is the depth to bedrock as shown in Table 5-5 below. NCRS typical soil type descriptions relative to bedrock depth were used for each of the Study Areas as appropriate to approximate the depth to bedrock. No soil exploration (borings) was performed as part of this evaluation. Engineering design standards/practices recommend a depth to bedrock greater than 6.5 feet, or it could negatively impact the septic system operation. The 6.5-foot depth to bedrock is derived from standards that recommend 6 inches of topsoil (cover), four feet for the subsurface disposal system and two feet of aggregate below the system. While it is possible to install septic systems in areas with shallow bedrock, these septic systems are generally costlier to design and construct. Figure 5-4 shows the Depth to Bedrock map.

Table 5-5 Depth to Bedrock Ranking System

Depth to Bedrock	Score
Less than 6.5 feet	10
Greater than 6.5 feet	0

Figure 5-3 Water Table Depth

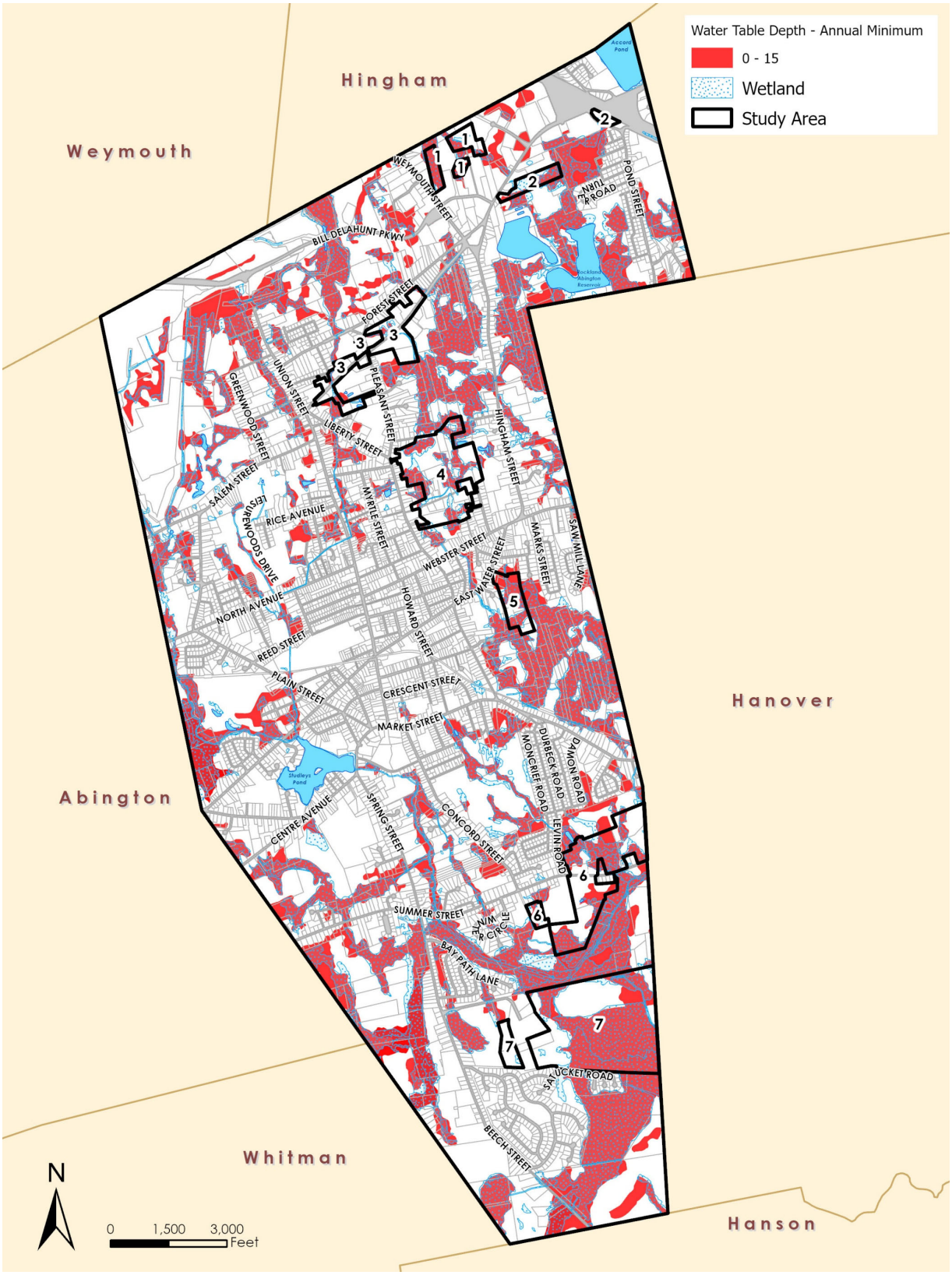
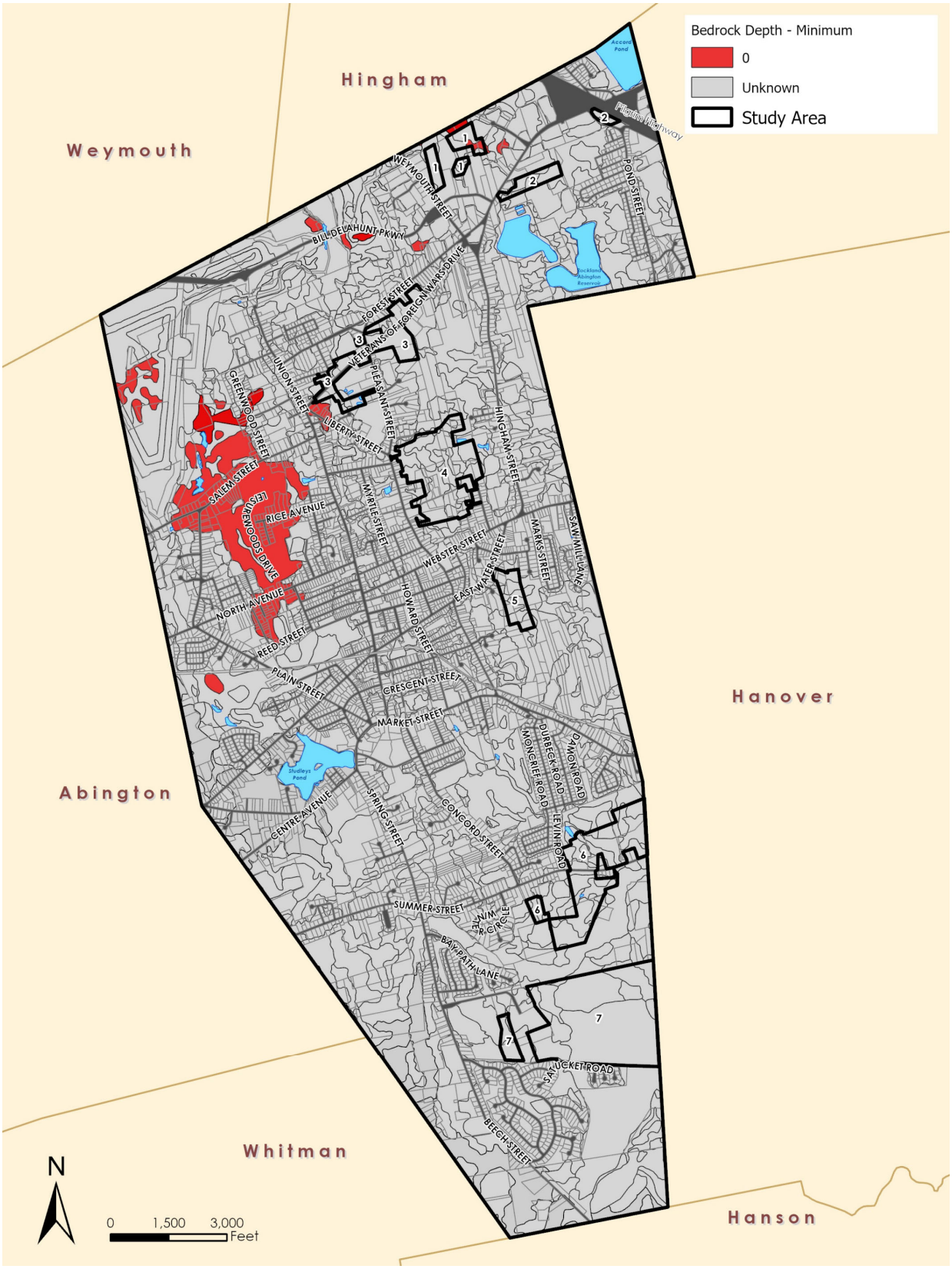


Figure 5-4 Bedrock Depth



5.3.2.4 Parcel Sizes

Parcel size (area) was a primary criterion that was included as part of the evaluation. Small parcel sizes, less than ½ acre, score higher in the ranking system, as shown in Table 5-6, for its anticipated inability to comply with all of the Title 5 requirements. Further complicating smaller parcel sizes is whether or not a failed onsite septic system could be repaired to meet current Title 5 standards. Therefore, it is a reasonable assumption that under less-than-ideal soil and groundwater conditions, the smaller parcel sizes could require a variance to Title 5 to repair the onsite septic system. Figure 5-5 shows the parcel size map.

Table 5-6 Parcel Size Ranking System

Parcel Size	Score
Less than 0.5 acre	10
0.5 to 1.0 acre	5
Greater than 1 acre	0

5.3.2.5 Private Wells

The final primary criterion for the analysis is the location of private wells. To properly evaluate parcels with private wells, it is also necessary to evaluate parcel size at the same time. If a particular parcel has a private well and it is less than a ½ acre, it scored the highest possible points for this evaluation (as shown in Table 5-7). With smaller parcels, it becomes more difficult to repair failed septic systems and still comply with Tile 5 requirements. More specifically, the protection radius (100 feet) around a private well eliminates potential areas where a new septic system could be installed. Figure 5-6 shows the private well setback figure.

Table 5-7 Private Well Ranking System

Private Wells	Score
Private Well on a Parcel Less than 0.5 acre	10
Private Well on a Parcel between 0.5 to 1 acre	5
Private Well on a Parcel Greater than 1 acre	0
No Private Well	0

Figure 5-5 Lot Sizes

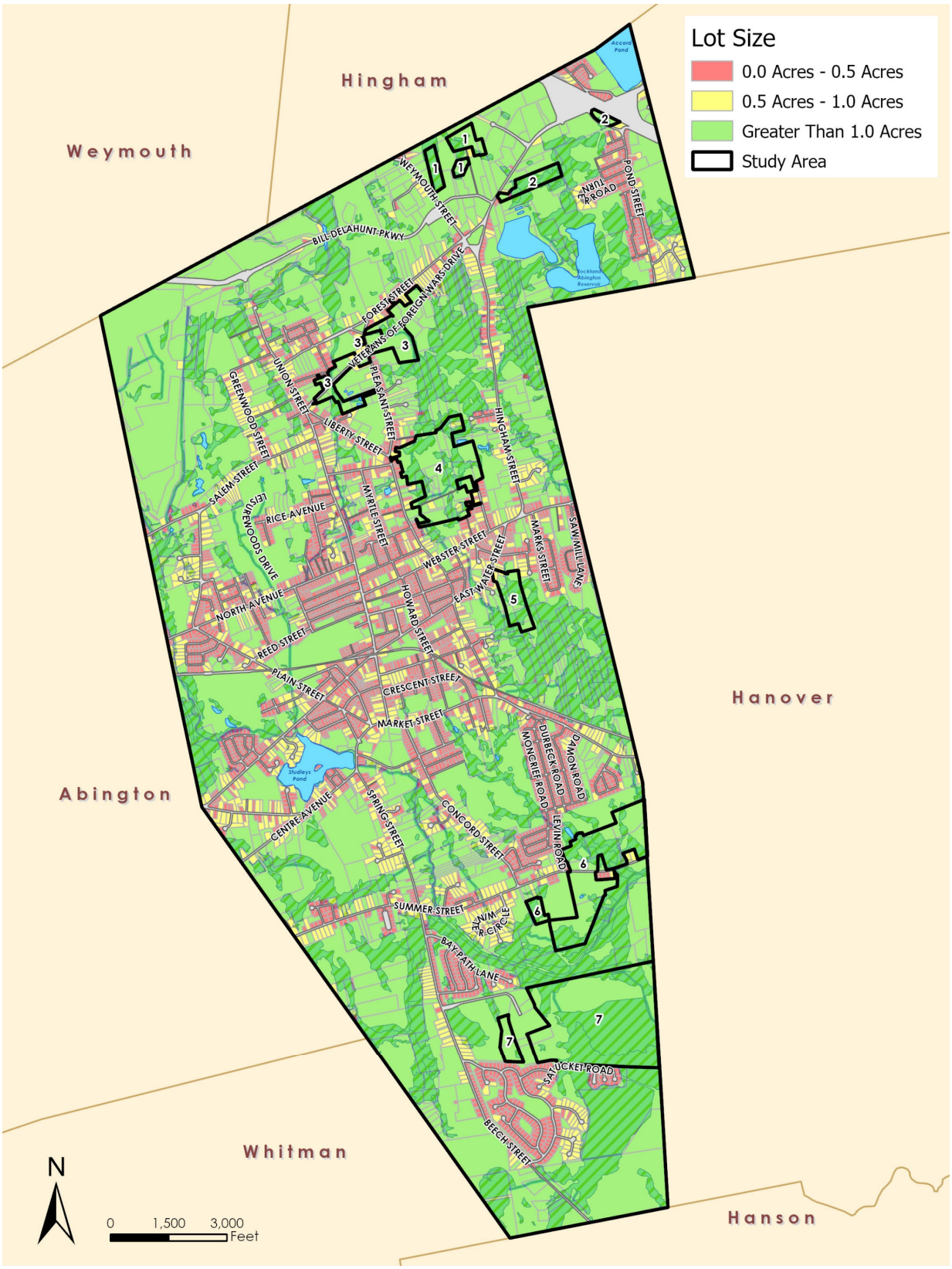
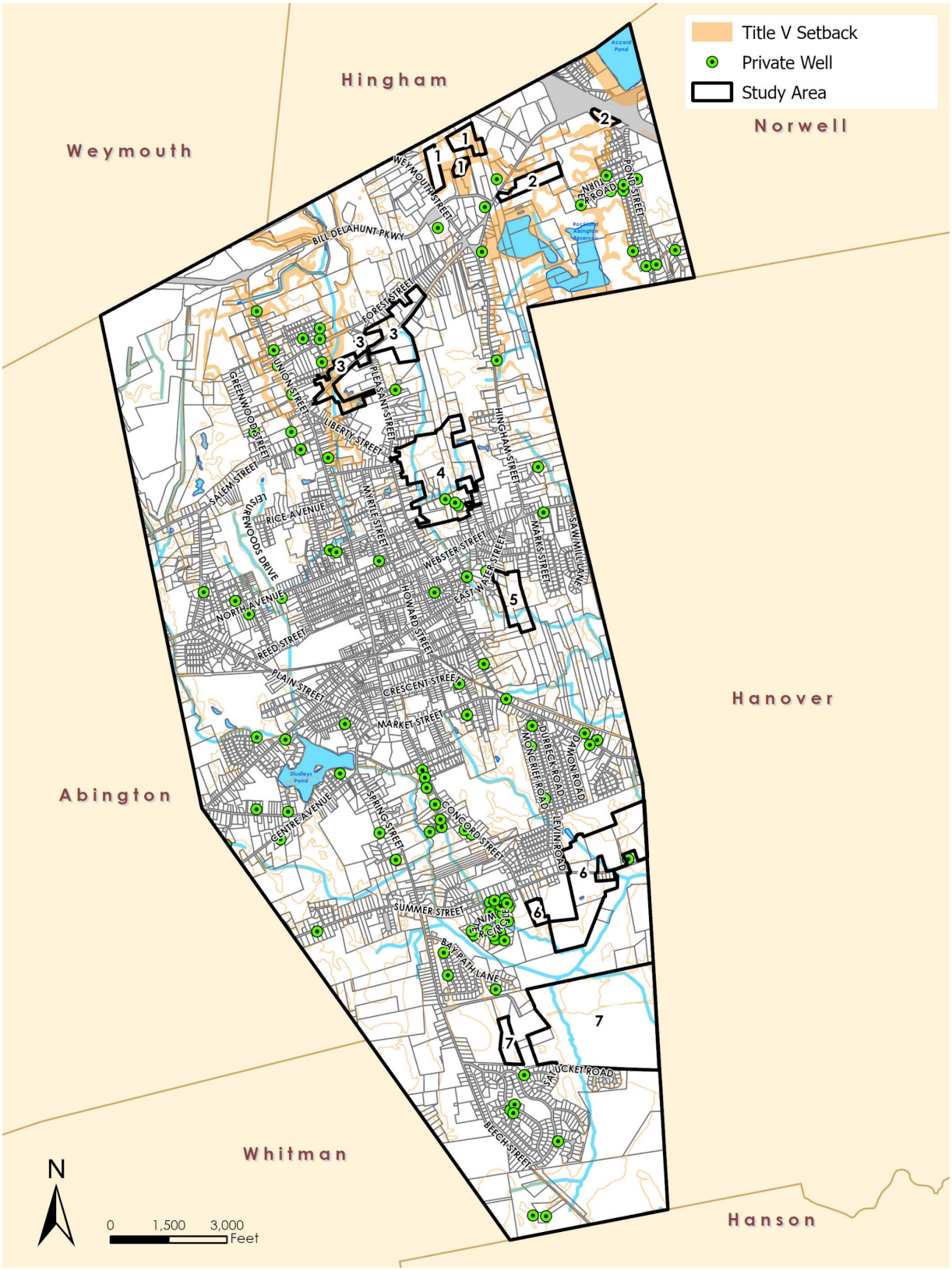


Figure 5-6 Private Well Setbacks



5.3.3 Secondary Criteria

The following five secondary evaluative criteria were analyzed as part of the evaluation to determine if the area's onsite septic systems could remain a viable option for wastewater disposal over the 20-year planning period.

5.3.3.1 Drinking Water Protections

Each study area was examined to determine whether it was located within, or partly within, or outside of the Town's Watershed Protection, Drinking Water Protection, or other State-Protected water Districts. If an area was located within a protection district, it was assigned the appropriate score based on the ranking system presented below in Table 5-8. The protection district includes surface water protection areas (Zones A and B) and groundwater protection areas (Zone I, Zone II, and Interim Wellhead Protection Area (IWPA) zones). Figure 5-7 shows the Water Protection figure.

Table 5-8 Water Protection District Ranking System

Watershed Protection District	Score
Within Watershed Protection District	5
Not Within Watershed Protection District	0

5.3.3.2 Surface Water Protection - Areas with Regulated Setbacks

Surface water impacts were assessed utilizing Massachusetts Title 5 regulated setback requirements. The MassGIS layer in Figure 5-8 shows the buffer areas as polygon features that represent the minimum setback requirements for the installation of septic systems near natural resources and water features. The state requires that the buffer area be 50 feet around all hydrologic features and wetlands, except within the drainage basin for a public surface water supply, where the buffer zones are 100 feet around wetland features, 200 feet around streams and ponds, and 400 feet around public surface water supplies. If the parcel of land was completely located with the Title 5 regulated setback, then it would have had a high score of 5 points for this secondary criterion. The complete ranking systems for state regulated setbacks for water bodies are summarized in Table 5-9 below.

Table 5-9 Areas Within Regulated Setbacks Ranking System

Areas Within Regulated Setbacks	Score
Within Title 5 Regulated Setback	5
Not Within Regulated Setback	0

Figure 5-7 Water Resources

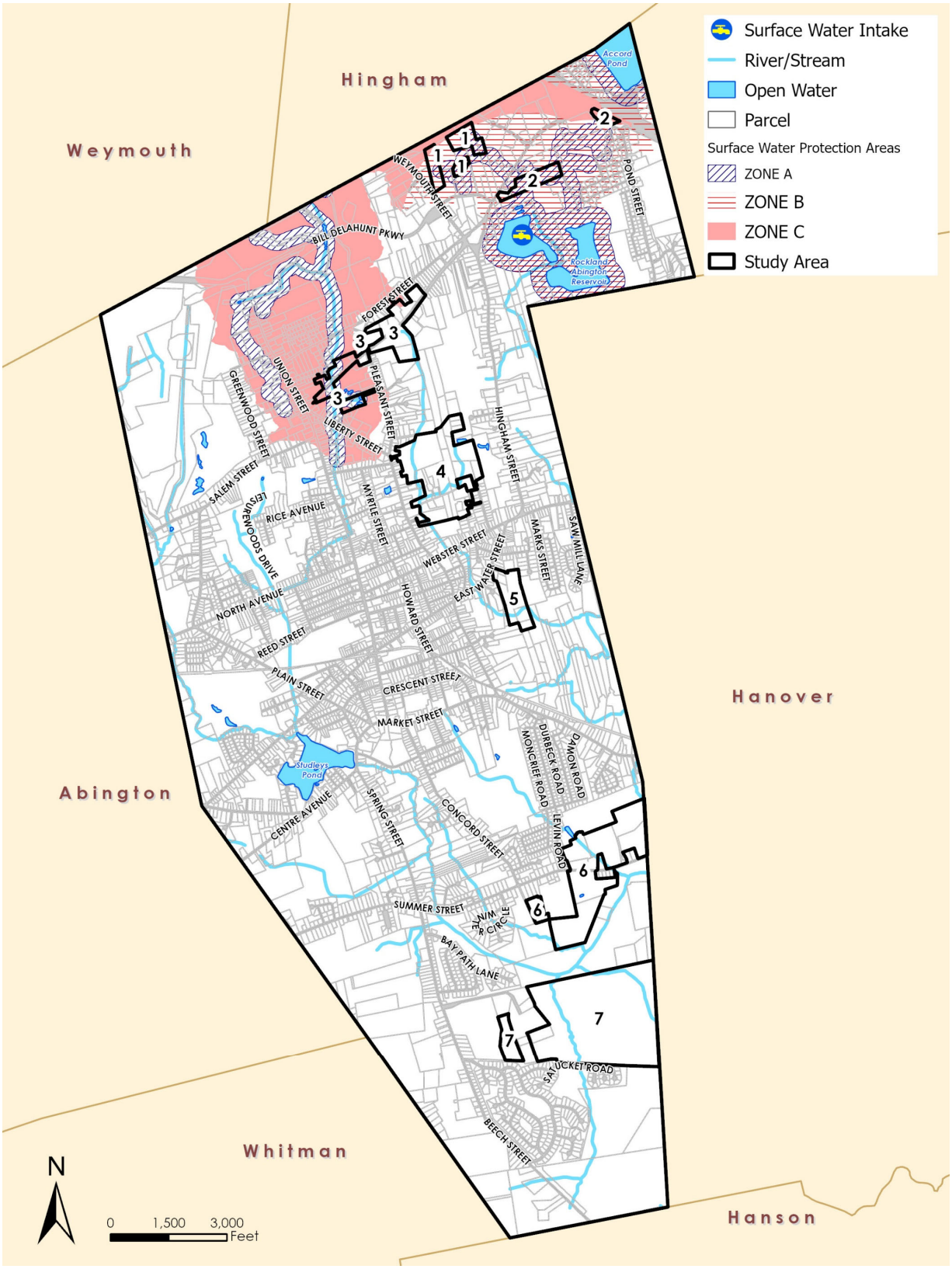
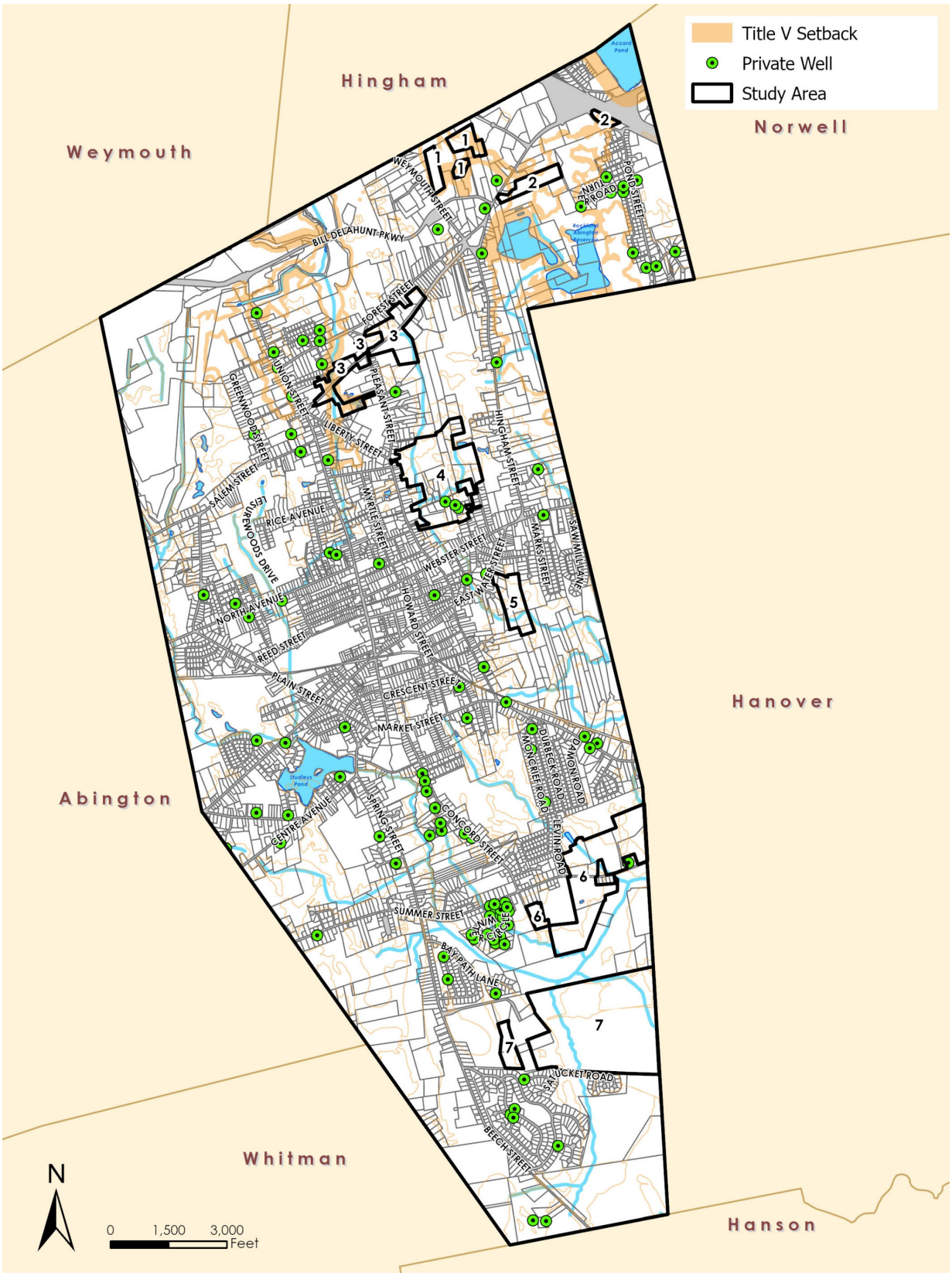


Figure 5-8 Title 5 Setbacks



5.3.3.3 Floodplains

The location of floodplains was the next secondary criterion that was analyzed. Areas within the 100- or 500-year Federal Emergency Management Agency (FEMA) floodplains were identified utilizing MassGIS data. If an area was located within a 100-year floodplain, it was assessed a score of five as identified in the ranking system shown below in Table 5-10. An area located within the 500-year floodplain was assessed with a score of two. Figure 5-9 shows the floodplains map.

Table 5-10 Floodplain Ranking System

Floodplains	Score
Within 100-year Floodplain	5
Within 500-year Floodplain	2
Not within floodplain	0

5.3.3.4 Priority/Estimated Habitat Areas & Areas of Critical Environmental Concern (ACEC)

Failing onsite wastewater disposal systems could potentially damage Priority/Estimated Habitat Areas and/or ACECs, which could cause some species to become endangered or extinct. As discussed in Section 2, there are two areas of core habitat in Rockland located in the northwest and southeast portions of Rockland. Neither of these are part of a study area. The ranking system for protecting priority/estimated habitat areas is included in Table 5-11. The habitat area map is shown in Figure 5-10.

Table 5-11 Priority/Estimated Habitat Areas

Priority/Estimated Habitat Areas	Score
Within Habitat Areas	5
Within Estimated Habitat Areas	3
Not within Habitat Areas	0

Figure 5-9 Floodplains

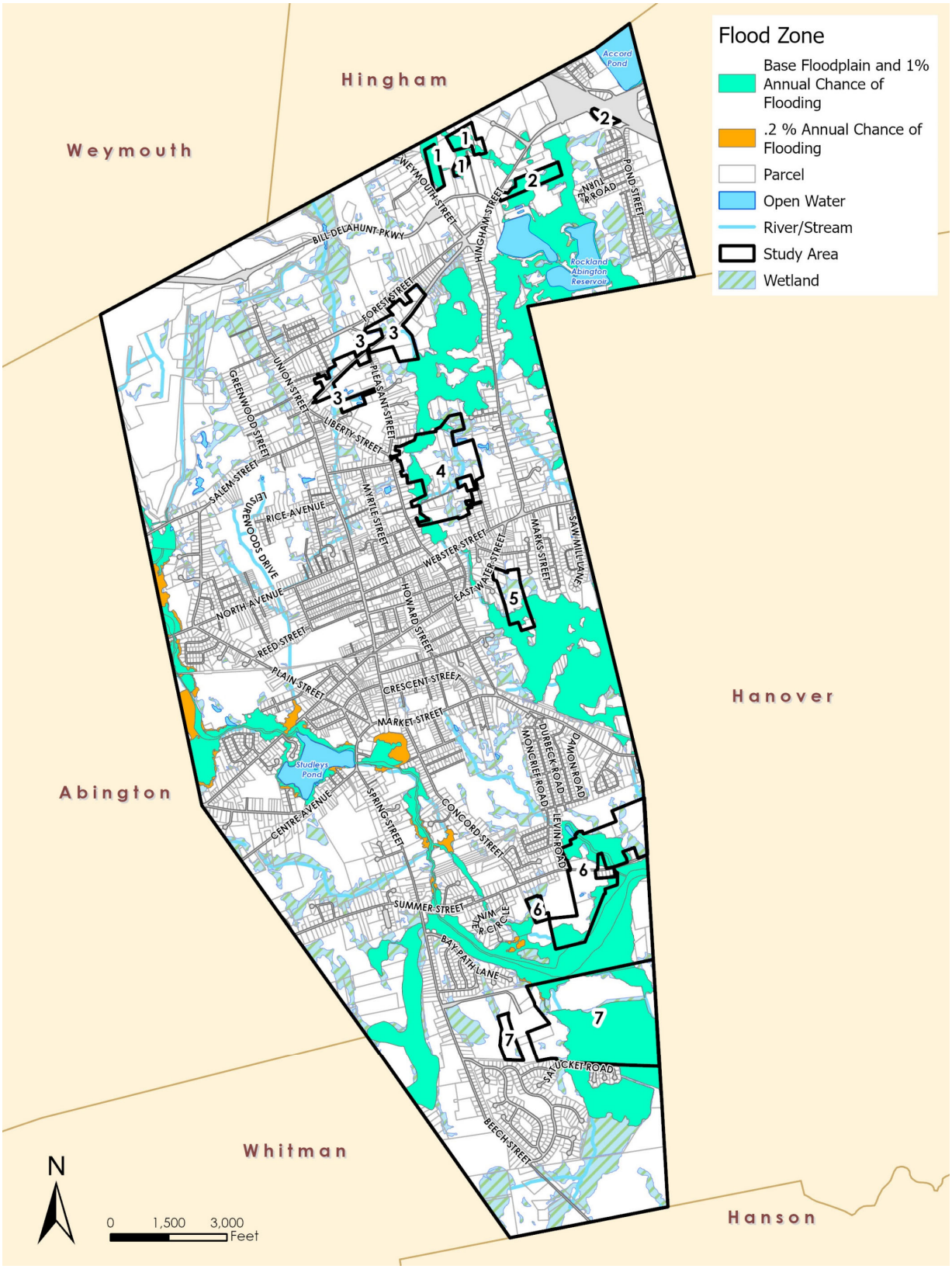
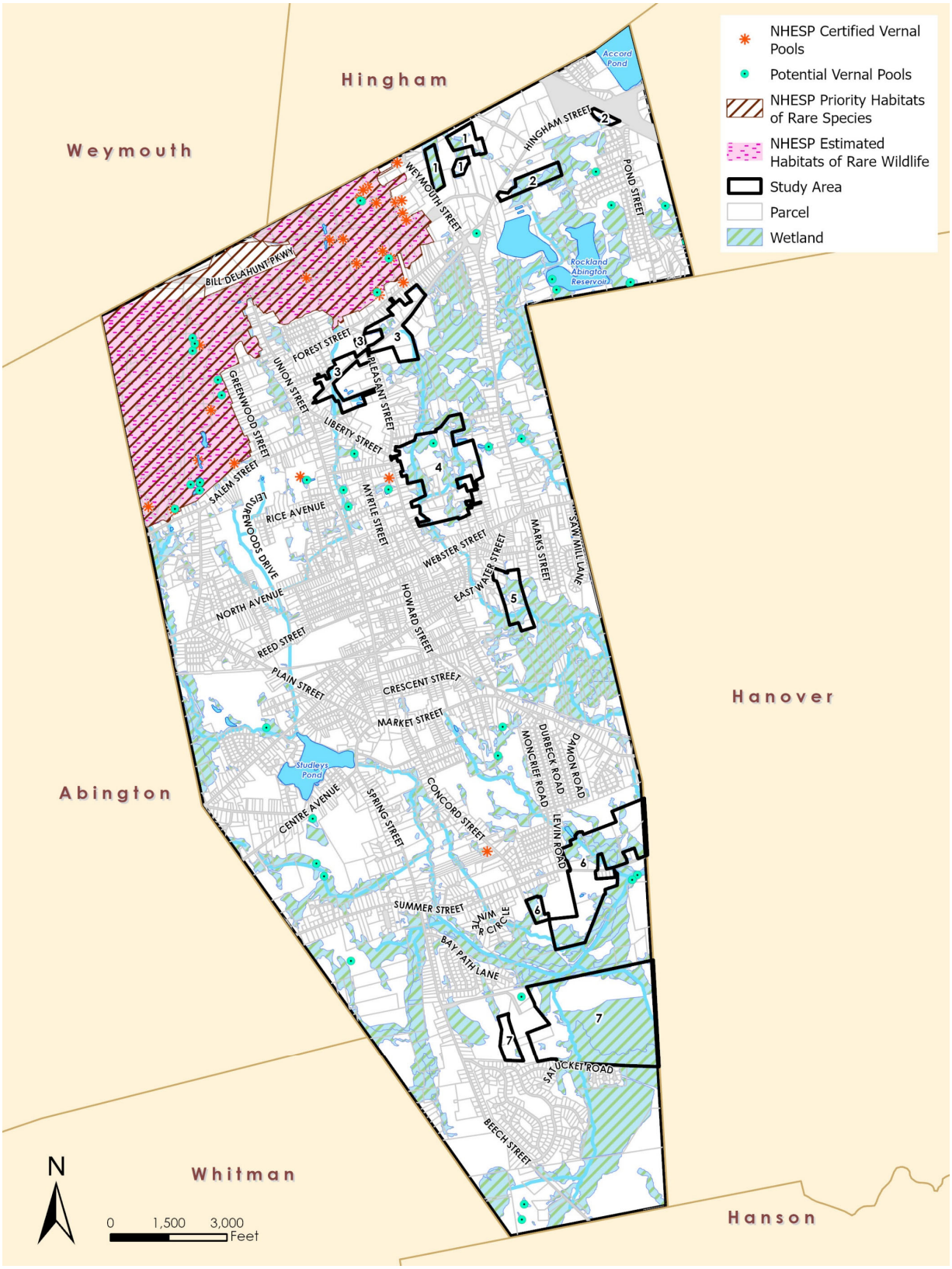


Figure 5-10 Habitats



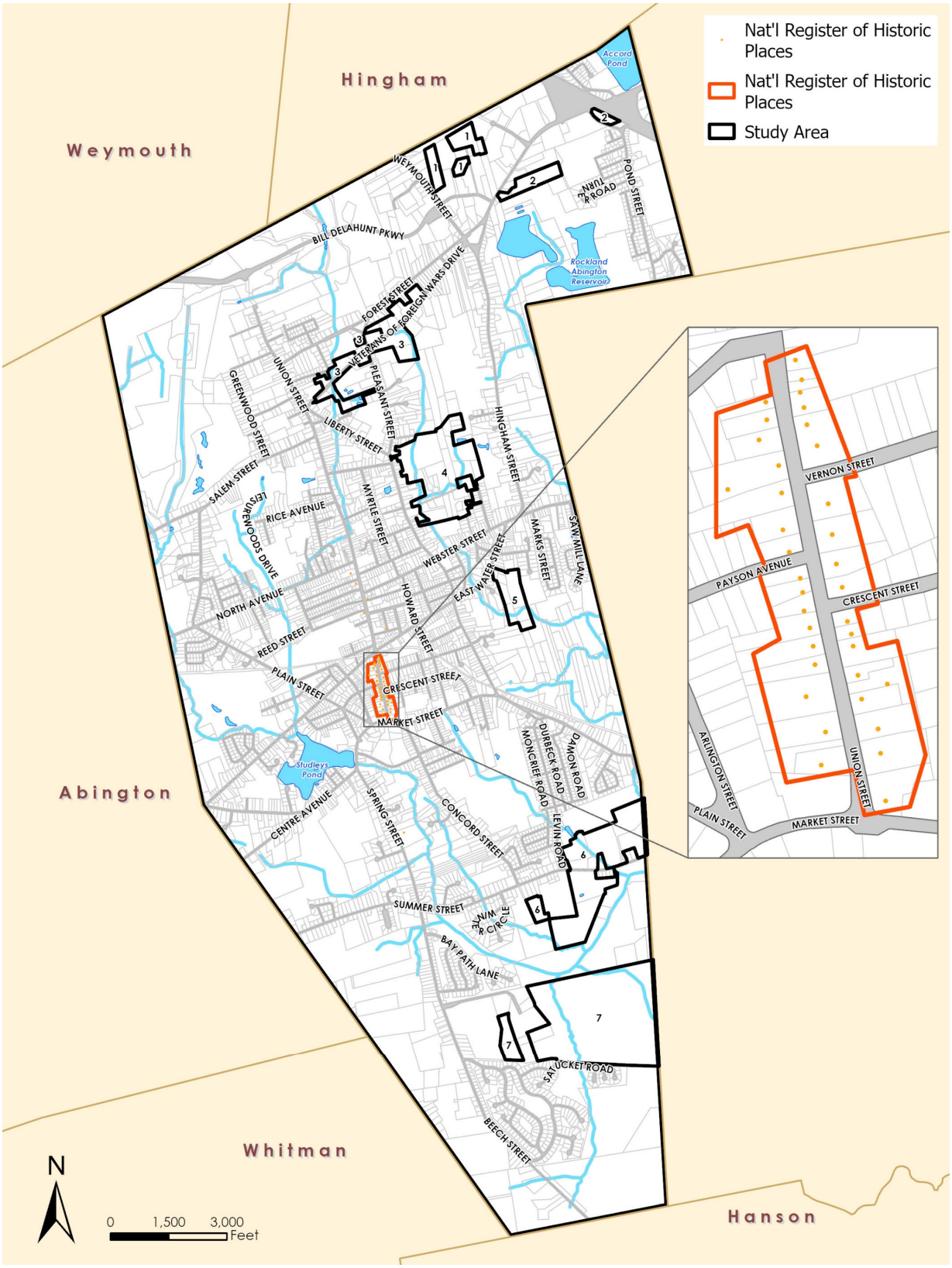
5.3.3.5 Historic Districts

The Historic District areas within the Town of Rockland where onsite wastewater disposal systems are inconvenient and/or aesthetically displeasing to property owners or neighbors were also evaluated. If a study area is located within or partially within a historic district, it was assigned a score of five as shown in the ranking system in Table 5-12. There is one historic district in Rockland, located in the downtown area within the existing municipal sewer service area. Refer to Figure 5-11 for the historic area map for the Town of Rockland.

Table 5-12 Historic Districts

Historic District	Score
Within Historic District	5
Not within Historic District	0

Figure 5-11 Historic Districts



5.4 Study Area Needs Assessments

5.4.1 Needs Assessment

The following sections describe the results of the needs assessments of the Study Areas.

5.4.1.1 Needs Assessment Results

Each of the seven Study Areas were ranked based on its total score and placed into one of four "needs" categories as shown in Table 5-13 below. A complete summary of the evaluation including primary and secondary criteria ranking scores for each of the seven Study Areas is shown in Table 5-14.

Four out of the seven Study Areas had a combined total score in the range of 16 to 19 points and were subsequently placed into the Low Needs Area category. The Low Needs Areas had conditions that are favorable to septic system replacement or new construction.

Two out of the seven Study Areas had a combined total score of 20 points and were subsequently placed into the Average Needs Area category as shown in Table 5-14. These areas were impacted by poor soils and high groundwater, typically due to wetlands in the area.

One out of the seven Study Areas had a combined total score greater than 25 points and was subsequently placed into the High needs area category. This High Needs Study Area scored higher in the ranking system primarily due to certain physical characteristics, including poorly drained soils, high groundwater table, and drinking water protection zones. The High Needs Area, along with the other Study Areas are shown in Figure 5-12.

Table 5-13 Needs Categories

Needs Category	Total Points
Very Low	0 to 14 total points
Low	15 to 19 total points
Average	20 to 24 total points
High	25 or more total points

5.4.1.2 Study Area 1 – Weymouth Street

Based on our evaluation, Study Area 1 received a total score of 27 points and was categorized as a High Needs category area. Conventional septic systems may not appear to be a viable long-term wastewater disposal solution for this Study Area. This area will progress to the next phase as a needs area and alternative wastewater disposal methods will be evaluated.

5.4.1.3 Study Area 2 – Pond Street

Study Area 2 received a total score of 22 points and was categorized as an average needs category area. Conventional septic systems appear to be a viable long-term wastewater disposal solution for this study area. It is recommended that this area continue to be maintained in accordance with the Town's Health Department regulations. Based on the zoning in the area (commercial/hotel) and proximity to the Town sewer, any future

development is likely to require sewer extension or a groundwater discharge permit based on exceeding 10,000 gpd of wastewater flow.

5.4.1.4 Study Area 3 – VFW

Study Area 3 received a total score of 16 points and was categorized as a low needs category area. Conventional septic systems appear to be a viable long-term wastewater disposal solution for this study area. It is recommended that this area continue to be maintained in accordance with the Town's Health Department regulations.

5.4.1.5 Study Area 4 – Liberty Street

Study Area 4 received a total score of 17 points and was categorized as a low needs category area. Conventional septic systems appear to be a viable long-term wastewater disposal solution for this study area. It is recommended that this area continue to be maintained in accordance with the Town's Health Department regulations.

5.4.1.6 Study Area 5 – East Water Street

Study Area 5 received a total score of 20 points and was categorized as an average needs category area. Conventional septic systems appear to be a viable long-term wastewater disposal solution for this study area. It is recommended that this area continue to be maintained in accordance with the Town's Health Department regulations.

5.4.1.7 Study Area 6 – Summer Street

Study Area 6 received a total score of 19 points and was categorized as a low needs category area. Conventional septic systems appear to be a viable long-term wastewater disposal solution for this study area. It is recommended that this area continue to be maintained in accordance with the Town's Health Department regulations.

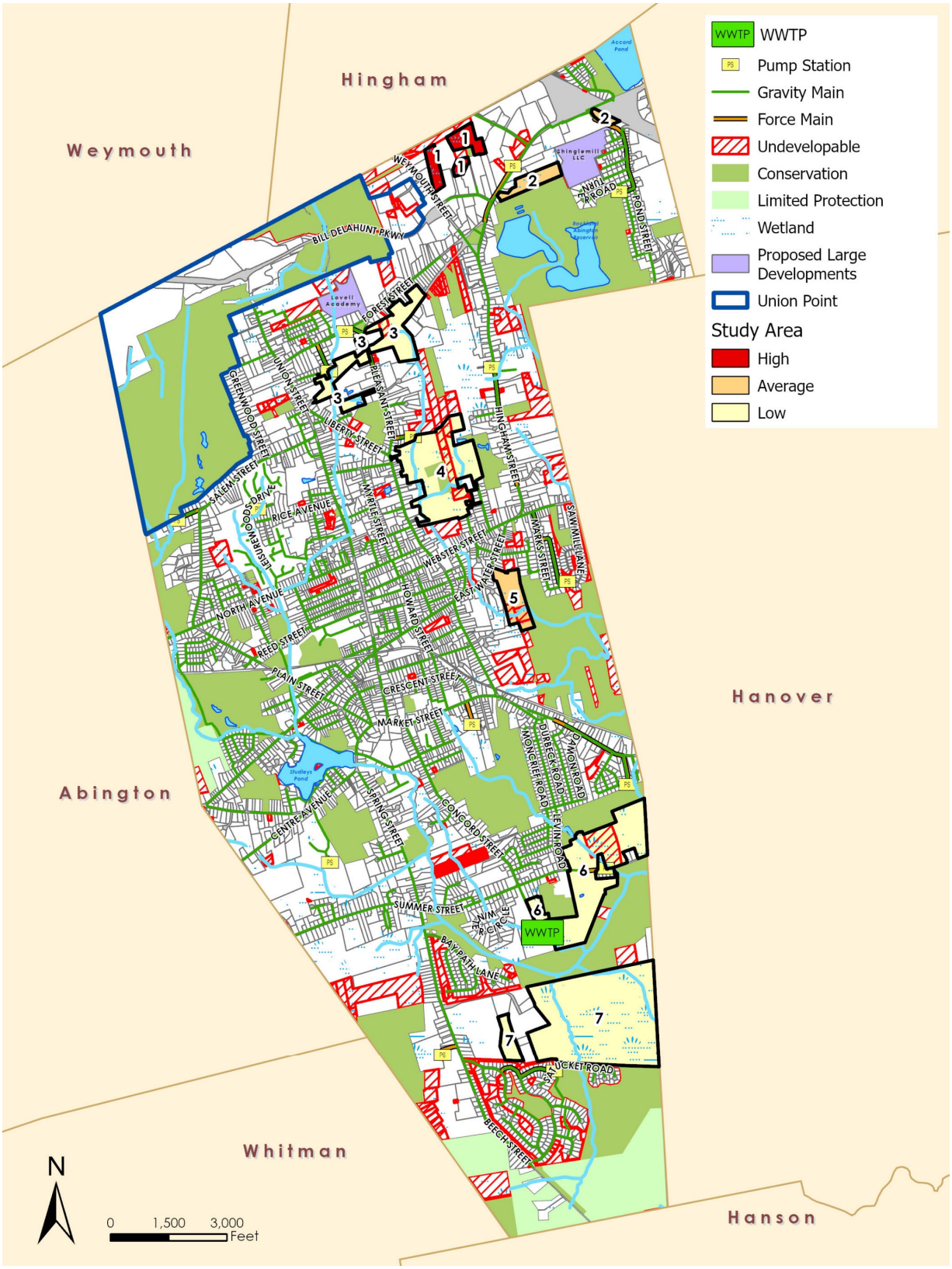
5.4.1.8 Study Area 7 – Industrial Way

Study Area 7 received a total score of 19 points and was categorized as a low needs category area. Conventional septic systems appear to be a viable long-term wastewater disposal solution for this study area. It is recommended that this area continue to be maintained in accordance with the Town's Health Department regulations.

Table 5-14 Study Area Scoring

Study Area		Primary Criteria (Ranking 0 to 10)						Secondary Criteria (Ranking 0 to 5)						Total Score	Study Area Ranking
No.	Name	Soils Drainage Class	Depth to Water Table	Depth to Bedrock	Parcel Sizes	Private Wells	*Primary Total*	Drinking Water Protection District	Areas Within Regulated Setbacks	Flood Plains	Priority/Established Habitat Areas	Historic District	*Secondary Subtotal*		
1	Weymouth Street	6	8	3	1	0	*18*	3	2	4	0	0	*9*	**27**	**High**
2	Pond Street	5	4	0	1	0	*10*	5	3	4	0	0	*12*	**22**	**Average**
3	VFW	4	3	0	3	0	*10*	3	3	0	0	0	*6*	**16**	**Low**
4	Liberty Street	5	5	0	1	2	*13*	0	2	2	0	0	*4*	**17**	**Low**
5	East Water Street	8	7	0	1	0	*16*	0	2	2	0	0	*4*	**20**	**Average**
6	Summer Street	8	6	0	0	0	*14*	0	2	3	0	0	*5*	**19**	**Low**
7	Industrial Way	7	6	0	0	0	*13*	0	2	4	0	0	*6*	**19**	**Low**

Figure 5-12 Needs Areas Summary



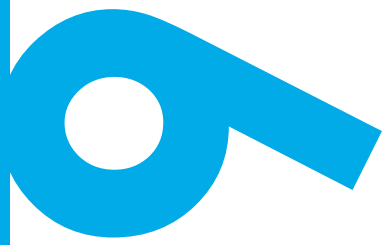
5.4.1.9 Needs Assessment Summary

The evaluation of the needs assessment concluded with six of the seven Study Areas being categorized as having Average or Low needs. All of these Study Areas will be discontinued from further evaluation as it has been determined that these parcels appear to be acceptable for the continued use of onsite septic systems. The Town and the Board of Health should institute a public education program regarding the importance of proper maintenance of onsite septic systems in order to prolong the life of these systems. Consideration of a Septage Management Plan will be evaluated for these areas as part of Phase 3 of the CWMP.

The analysis concluded that the Town has one high needs area, Study Area 1, which scored higher in the evaluation. Conventional septic systems may not be sufficient for adequately addressing wastewater treatment in these Study Areas, both near and longer term.

5.5 Alternatives Identification and Screening

The CWMP Phase 2 - Alternatives Identification and Screening will present alternatives for wastewater management in the identified needs area of Rockland (Study Area 1). Specific alternatives by needs area will take into account the appropriateness of utilizing septage management plans, nutrient management plans, alternative collection systems, I/A systems, communal systems, and local and/or regional wastewater collection system extension. Phase 2 will evaluate the environmental impacts and design criteria associated with each alternative and recommend a short list of alternatives for detailed evaluation in Phase 3 of the CWMP.



WRIGHT-PIERCE
Engineering a Better Environment

Section 6 Public Participation

6.1 Introduction

Public outreach strategies and activities included meetings with municipal officials and representatives of regulatory agencies and other appropriate stakeholders.

Relevant Town Boards and Departments were interviewed to identify:

- The current wastewater management status within the Town.
- The short and long-term goals regarding the Town's wastewater management systems.
- The issues, concerns, and inputs specific to the CWMP.

The public outreach efforts are also utilized to gauge the level of knowledge and interest in the wastewater issues within the Town.

This process gives interested parties in the Town of Rockland a chance to understand the issues, the CWMP process, and the opportunity to "have a voice" in the decision-making process. Communication between Town officials, interested stakeholders, and state agencies is important and will continue through the CWMP process and beyond.

Implementation of an effective public participation process results in a plan that can be "approved" by Town officials and the citizens of the community.

6.2 Summary of Public Participation

Wright-Pierce has worked closely with the Town's Board of Sewer Commissioners, Highway Department, Board of Health, Planning Department, Assessor's Department, and relevant state agencies to develop the Phase 1 CWMP. The intent of the CWMP is to ultimately build consensus for the recommended wastewater management plan.

The Town will establish a depository for project information to be viewed by the public. This depository is to be located at Town Hall. This depository site is for displaying information generated during the CWMP process and may include:

- Draft and final versions of CWMP reports.
- Project progress reports.
- Any advertisements and press releases published.
- Newspaper articles.
- Any relevant project meeting schedules.

Two public meetings and one public hearing will be held for gathering and reporting information for the residents of Rockland. The two public meetings will be held at the end of Phase One and Phase Two at Rockland Board of Sewer Commissioners meetings. The public hearing will be held at an Open Meeting of the Rockland Board of Sewer Commissioners after Phase 3 is completed. The purpose of the public meetings/hearing is to present the overall approach, goals, and progress to date. After the public hearing, Wright-Pierce will summarize the comments, the questions, and the answers presented in the final appendix of the CWMP.

WRIGHT-PIERCE
Engineering a Better Environment

APPENDIX

Appendix A
CWMP Agreement

AGREEMENT BETWEEN
TOWN OF ROCKLAND, MASSACHUSETTS
AND
WRIGHT-PIERCE
FOR
COMPREHENSIVE WASTEWATER MANAGEMENT PLAN (CWMP)

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Amendment No. 1 _____ dated _____

Amendment No. 2 _____ dated _____

Amendment No. 3 _____ dated _____

Amendment No. 4 _____ dated _____

AGREEMENT BETWEEN
TOWN OF ROCKLAND, MASSACHUSETTS
AND
WRIGHT-PIERCE
FOR
COMPREHENSIVE WASTEWATER MANAGEMENT PLAN (CWMP)

THIS IS AN AGREEMENT made as of January 11, 2022, ~~2021~~ between TOWN OF ROCKLAND, MASSACHUSETTS ("CLIENT") and Wright-Pierce ("ENGINEER"). CLIENT intends to perform a Comprehensive Wastewater Management Plan (CWMP) (the "Project").

CLIENT and ENGINEER in consideration of their mutual covenants herein agree in respect to the performance or furnishing of professional engineering services by ENGINEER with respect to the Project and the payment for those services by CLIENT as set forth in Section 2 below. Execution of this Agreement by ENGINEER and CLIENT constitutes CLIENT's written authorization to ENGINEER to proceed on the date first above written with the Services described in Section 1 below. This Agreement will become effective on the date first above written.

SECTION 1 - SCOPE OF SERVICES

I. Study and Report Phase.

The detailed scope of services for this phase is included in Exhibit B.

II. Preliminary Design Phase.

A. Not included in this Agreement.

III. Final Design Phase.

A. Not included in this Agreement.

IV. Value Engineering.

A. Not included in this Agreement.

V. Bidding Phase.

A. Not included in this Agreement.

VI. Construction Phase.

A. Not included in this Agreement.

VII. Operational Phase.

A. Not included in this Agreement.

VIII. Additional Services.

During ENGINEER's work on the project, it may become apparent to either CLIENT or ENGINEER that Additional Services not included in the basic Scope of Services are desired. ENGINEER will undertake to provide such Additional Services only upon CLIENT's written authorization.

SECTION 2 - COMPENSATION

I. Payments to ENGINEER

ENGINEER's fee for the services outlined in the **SCOPE OF SERVICES** section of this Agreement is as follows:

For Scope Item I, Study and Report Phase, an amount based on ENGINEER's Direct Labor Costs times a factor of 3.08, plus Reimbursable Expenses times a factor of 1.0 and charges for Consultants' services times a factor of 1.10. Total compensation for these Scope Item is Not-to-Exceed $180,000. The fee per phase is listed below:

Phase I	$66,500
Phase II	$43,600
Phase III	$69,900
Total	$180,000

The maximum total compensation for the Project shall not exceed the total compensation for the scope items above without written authorization from the CLIENT. If it becomes apparent to ENGINEER at any time that changes in Scope or other issues impact total compensation, ENGINEER will so notify CLIENT in writing. CLIENT and ENGINEER will then promptly meet to review the status of the Project and any potential adjustments to Scope and/or compensation. Any resulting adjustments to compensation need to be approved by written authorization.

For authorized Additional Services, ENGINEER will bill CLIENT a fee based on ENGINEER's Standard Billing Rates, plus Reimbursable Expenses times a factor of 1.0 and charges for Consultants' services times a factor of 1.10.

This Agreement (consisting of pages 1 to 4 plus Exhibits A and B) constitutes the entire agreement between CLIENT and ENGINEER and supersedes all prior written or oral understandings. This Agreement may only be amended, supplemented, modified, or canceled by a duly executed written instrument.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement to be effective as of the date first above written.

CLIENT:

Town of Rockland

By: Board of Sewer Commissioners

Date:

ENGINEER:

Wright-Pierce

By: Paul F. Birkel, PE

Title: Executive Vice President

Date: 7/29/2021

The undersigned being the Town Accountant of the Town of Rockland hereby certifies that an appropriation in the amount of $180,000.00 is available for this Contract.

Elizabeth Zaleski, Town Accountant 1/11/2022

26014408 · 680290 NTE $ 180,000 -

Approved as to Form:

Christopher J. Kenny, Town Counsel

Address for giving notices:

Mr. Keith Nastasia, Superintendent
Rockland Sewer Commission
587 R Summer Street, P. O. Box 330
Rockland, Massachusetts 02370

Mr. Kevin Olson, PE, Project Manager
WRIGHT-PIERCE
600 Federal Street, Suite 2151
Andover, Massachusetts 01810

EXHIBIT A
SCHEDULE OF TERMS AND CONDITIONS
(CLIENT IS OWNER)
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EXHIBIT A - SCHEDULE OF TERMS AND CONDITIONS
(CLIENT IS OWNER)

1.0 Standard of Care

The standard of care for all professional engineering and related services performed or furnished by ENGINEER under this Agreement will be the care and skill ordinarily used by members of ENGINEER's profession practicing under similar conditions at the same time and in the same locality. ENGINEER makes no warranties, express or implied, under this Agreement or otherwise, in connection with ENGINEER's services.

2.0 Client's Responsibilities

Except as otherwise provided in this Agreement, CLIENT shall do the following in a timely manner as requested by ENGINEER and shall bear all costs incident thereto:

2.1. Designate in writing a person to act as CLIENT's representative with respect to the services to be performed or furnished by ENGINEER under this Agreement. Such person will have complete authority to transmit instructions, receive information, interpret and define CLIENT's policies and decision with respect to ENGINEER's services for the Project.

2.2. Provide all criteria and full information as to CLIENT's requirements for the Project, including design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations, and furnish copies of all design and construction standards which CLIENT will require to be included in the Drawings and Specifications.

2.3. Assist ENGINEER by placing at ENGINEER's disposal all available information pertinent to the Project including previous reports and any other data relative to design or construction of the Project as requested by ENGINEER.

2.4. Arrange for access to and make all provisions for ENGINEER to enter upon public and private property as required for ENGINEER to perform services under this Agreement.

2.5. Provide approvals and permits from all governmental authorities having jurisdiction to approve the portions of the Project designed or specified by ENGINEER and such approvals and consents from others as may be necessary for completion of such portions of the Project.

2.6. Give prompt written notice to ENGINEER whenever CLIENT observes or otherwise becomes aware of any development that affects the scope or time of performance or furnishing of ENGINEER's services, or any defect or nonconformance in ENGINEER's services or in the work of any Contractor.

3.0 Reuse of Documents, Records

3.1. Documents are Instruments of ENGINEER's Service

All documents including Drawings and Specifications provided or furnished by ENGINEER (or ENGINEER's Consultants) pursuant to this Agreement are instruments of service in respect of the Project, and ENGINEER and ENGINEER's Consultants, as appropriate, shall retain an ownership and property interest therein (including the right of reuse by and at the discretion of ENGINEER and ENGINEER's Consultants, as appropriate) whether or not the Project is completed.

CLIENT may make and retain copies of documents for information and reference in connection with the use and occupancy of the Project by CLIENT. Such documents are not intended or represented to be suitable for reuse by CLIENT or others on extensions of the Project or on any other project.

Any such reuse, or modification, without written verification or adaptation by ENGINEER and ENGINEER's Consultants, as appropriate, for the specific purpose intended will be at CLIENT's sole risk and without liability or legal exposure to ENGINEER, or to ENGINEER's Consultants, and CLIENT shall indemnify and hold harmless ENGINEER and ENGINEER's Consultants from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle ENGINEER to further compensation at rates to be agreed upon by CLIENT and ENGINEER.

3.2. Records Retention/Access to Records.

ENGINEER will retain pertinent records relating to the services performed under this Agreement for a period of three (3) years following completion of the services, during which period the records will be made available to CLIENT at ENGINEER's office during normal business hours with reasonable advance notice. Copies will be prepared by ENGINEER for CLIENT for reasonable cost of reproduction and associated labor.

3.3. Electronic Transmittals

CLIENT and ENGINEER may transmit, and shall accept, project-related correspondence, documents, data, drawings, specifications in electronic media or digital format either directly or through access to a secure file transfer protocol. The method of electronic transmittal will be by a mutually agreeable protocol.

CLIENT and ENGINEER make no representations as to the long-term compatibility, usability, or readability of the item resulting from the recipient's use of software applications, operating systems or computer hardware differing from those used by the transmitter.

CLIENT acknowledges that electronic data is changeable. CLIENT acknowledges that any revisions made to electronic data and any consequences of its direct or indirect use by the CLIENT or its agents are beyond the control of the ENGINEER. The ENGINEER cannot be held responsible for software errors, for deterioration of data due to aging, damage to the computer disk, or for failure of the data to respond as intended if used with software and/or operating systems other than those on which it was developed. The original document maintained by the ENGINEER shall be the controlling document.

4.0 Third Party Information

CLIENT acknowledges and agrees that ENGINEER may solicit and reasonably rely on third party information essential and relative to the performance of ENGINEER's duties created and addressed by this Agreement whenever such information is under the control of a third party; and, ENGINEER will not be responsible or liable for the direct or indirect consequences of its reliance on such third party information. Examples of the type of third party information addressed above include, but are not limited to, any information within the control of any of the following: a public, quasi-public or private utility; a governmental body, agency or government (federal, state or local); water and/or sewer facility, district or entity; or, an agent or employee of CLIENT.

5.0 Estimates of Cost

Since ENGINEER has no control over the cost of labor, materials or equipment or over Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, its estimate of probable project costs provided for herein are to be made on the basis of its experience and qualifications and represent its professional judgment as a design professional familiar with the construction industry, but ENGINEER cannot and does not guarantee that proposals, bids or the project costs will not vary from its estimate of probable costs. If, prior to the Bidding or Negotiating Phase, CLIENT wishes greater assurance as to the project costs, CLIENT shall employ an independent cost estimator. Engineering services to modify the Contract Documents to bring the project costs within any limitation established by CLIENT will be considered Additional Services and paid for as such by CLIENT.

The construction cost of the entire Project (herein referred to as "Construction Cost") means the total cost to construct the project including furnishing and installing all equipment and materials, but it will not include ENGINEER's compensation and expenses, the cost of land, right-of-way, or compensation for or damages to properties unless this Agreement so specifies, nor will it include CLIENT's legal, accounting, insurance counseling or auditing services, or interest and financing charges incurred in connection with the Project.

6.0 Allocation of Risks

6.1. ENGINEER shall Indemnify CLIENT from Claims caused by ENGINEER's Negligence

To the fullest extent permitted by law, ENGINEER shall indemnify and hold harmless CLIENT, CLIENT's officers, directors, partners, and employees from and against any and all costs, losses and damages (including but not limited to reasonable attorneys' fees and all court or other dispute resolution costs) arising from claims by third parties, to the extent caused by the negligent acts, errors or omissions of ENGINEER or ENGINEER's officers, directors, partners, employees, agents and ENGINEER's Consultants in the performance and furnishing of ENGINEER's services under this Agreement.

6.2. CLIENT shall Indemnify ENGINEER from Claims caused by CLIENT's Negligence

To the fullest extent permitted by law, CLIENT shall indemnify and hold harmless ENGINEER, ENGINEER's officers, directors, partners, and employees and ENGINEER's Consultants from and against any and all costs, losses and damages (including but not limited to reasonable attorney' fees and court or other dispute resolution costs) arising from claims by third parties, to the extent caused by the negligent acts, errors or omissions of CLIENT or CLIENT's officers, directors, partners, employees, agents and CLIENT's consultants with respect to this Agreement or the Project.

6.3. CLIENT shall Indemnify ENGINEER from Claims caused by Hazardous Waste

In addition to the indemnity provided under Paragraph 6.2 of this Schedule, and to the fullest extent permitted by law, CLIENT shall indemnify and hold harmless ENGINEER and its officers, directors, partners, and employees and ENGINEER's Consultants from and against all claims, costs, losses, and damages (including but not limited to reasonable attorneys' fees and court or other dispute resolution costs) caused by, arising out of or relating to the presence, discharge, release or escape of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material at, on, under or from the Project site.

6.4. ENGINEER's Liability Limited to Amount of Insurance Proceeds Paid

Notwithstanding any other provision of this Agreement, and to the fullest extent permitted by law, the total liability, in the aggregate, of ENGINEER and ENGINEER's officers, directors, partners, employees, agents and ENGINEER's Consultants, and any of them, to CLIENT and anyone claiming by, through or under CLIENT, for any and all claims, losses, costs or damages whatsoever arising out of, resulting from or in any way related to the Project or the Agreement from any cause or causes, including but not limited to the negligence, professional errors or omissions, strict liability or breach of contract or warranty express or implied of ENGINEER or ENGINEER's officers, directors, partners, employees, agents or ENGINEER's Consultants or any of them (hereafter "CLIENT's Claims"), shall not exceed the total insurance proceeds paid up to the limits required in Section 7.1 on behalf of or to ENGINEER by ENGINEER's insurers in settlement or satisfaction of CLIENT's Claims under the terms and conditions of ENGINEER's insurance policies applicable thereto (excluding fees, costs and expenses of investigation, claims adjustment, defense and appeal). If no such insurance coverage is recovered with respect to CLIENT's Claims, then the total liability, in the aggregate, of ENGINEER and ENGINEER's officers, directors, partners, and employees and ENGINEER's Consultants and any of them to CLIENT and anyone claiming by, through or under CLIENT, for any and all such uninsured CLIENT's Claims shall not exceed the ENGINEER's fee or $100,000, whichever is less.

6.5. Exclusion of Special, Incidental, Indirect and Consequential Damages

To the fullest extent permitted by law, and notwithstanding any other provision in the Agreement, ENGINEER and ENGINEER's officers, directors, partners, employees, agents and ENGINEER's Consultants shall not be liable to CLIENT or anyone claiming by, through or under CLIENT for any special, incidental, indirect or consequential damages whatsoever, arising out of, resulting from or in any way related to the Project or the Agreement from any cause or causes, including but not limited to any such damages caused by the negligence, professional errors or omissions, strict liability, breach of contract or warranty express or implied of ENGINEER or ENGINEER's officers, directors, partners, employees, agents or ENGINEER's Consultants, or any of them.

6.6. Limitation of ENGINEER's Liability on Comparative Negligence Basis

To the fullest extent permitted by law, ENGINEER's total liability to CLIENT and anyone claiming by, through or under CLIENT for any claim, cost, loss or damages caused in part by the negligence of ENGINEER and in part by the negligence of CLIENT or any other negligent entity or individual, shall not exceed the percentage share that ENGINEER's negligence bears to the total negligence of CLIENT, ENGINEER and all other negligent entities and individuals determined on the basis of comparative negligence principles. CLIENT further agrees to hold harmless ENGINEER against any such claim, cost, loss or damages but only to the extent of the percentage share that CLIENT's negligence bears to the total negligence of CLIENT, ENGINEER and all other negligent entities and individuals determined on the basis of comparative negligence principles.

6.7. Florida Individual Liability Statute

FOR PROJECTS PERFORMED IN THE STATE OF FLORIDA, PERUSANT TO FLORIDA STATUTE 558.0035, EMPLOYEES OF THE ENGINEER MAY NOT BE HELD INDIVIDUALLY LIABLE FOR DAMAGES RESULTING FROM NEGLIGENCE UNDER THIS AGREEMENT.

7.0 Insurance

7.1. ENGINEER's Insurance

ENGINEER shall procure and maintain insurance for protection from claims under workers' compensation acts, claims for damages because of bodily injury including personal injury, sickness or disease or death of any and all employees or of any person other than such employees, from claims or damages because of injury to or destruction of property, and from professional liability claims due to ENGINEER's negligent acts, errors or omissions. Upon request, ENGINEER shall list CLIENT as an additional insured on ENGINEER's general liability insurance policy, and shall provide CLIENT with a copy of the Certificate of Insurance.

As long as it remains commercially available, ENGINEER shall procure and maintain the following insurance coverage:

A. Worker's Compensation: Statutory Limits.
B. Employer's Liability: $500,000 per Accident and $500,000 per Disease per Employee.
C. Commercial General Liability, including Bodily Injury and Property Damage: $1,000,000 occurrence and $2,000,000 aggregate.
D. Commercial Automobile Liability, including owned, hired and non-owned vehicles: Combined Single Limit of $1,000,000 per accident.
E. Excess Umbrella Liability: $5,000,000 per occurrence and $5,000,000 aggregate over the Employer's, Commercial General and Commercial Auto Liability.
F. Professional Liability Insurance: $1,000,000 per claim and $3,000,000 annual aggregate.

7.2. CLIENT's Insurance and Contractor's Insurance

CLIENT shall list ENGINEER and ENGINEER's Consultants as additional insureds on any general liability or property insurance policies carried by CLIENT that are applicable to the Project. CLIENT shall require Contractor to purchase and maintain general liability and other insurance as specified in the Contract Documents and to list ENGINEER and ENGINEER's Consultants as additional insureds with respect to such liability, property and other insurance purchased and maintained by Contractor. All policies of property insurance shall contain provisions to the effect that ENGINEER and ENGINEER's Consultants' interests are covered and that in the event of payment of any loss or damage the insurers will have no rights of recovery against the insured or any additional insureds thereunder.

7.3. Additional Insurance

At any time, CLIENT may request that ENGINEER, at CLIENT's sole expense, provide additional insurance coverage. If so requested by CLIENT, and if commercially available, ENGINEER shall obtain and shall require ENGINEER's Consultants to obtain such additional insurance coverage, different limits or revised deductibles, for such periods of time as requested by CLIENT, at CLIENT's sole expense.

8.0 Subsurface Conditions

8.1 Interpretations and Recommendations Based Solely on Information Available.

CLIENT recognizes that subsurface conditions may vary from those encountered at the location where borings, surveys, or explorations are made by the ENGINEER or ENGINEER's geotechnical Consultant, and that the data, interpretations and recommendations of the ENGINEER or geotechnical Consultant are based solely on the information available to it. The ENGINEER or geotechnical Consultant will be responsible for those data, interpretations, and recommendations, but neither shall be responsible for the interpretation by others of the information developed.

8.2 Utilities

In the prosecution of its work, the ENGINEER, and its Consultants will take reasonable precautions to avoid damage or injury to subterranean structures or utilities. CLIENT agrees to release, indemnify, and hold the ENGINEER, and its Consultants harmless for any damage to subterranean structures or utilities and for any impact this damage may cause where the subterranean structures or utilities are not called to the ENGINEER, and its Consultants' attention or are not correctly shown on the plans furnished.

9.0 Independent Contractors

It is understood and agreed that all contractors and Consultants engaged by the ENGINEER are independent contractors of the ENGINEER and not employees or agents of the ENGINEER; and ENGINEER shall have no right, duty or obligation to direct or control the means, methods or techniques of any such contractors and consultants.

10.0 Compensation

10.1. Direct Labor Costs

Direct Labor Costs means the hourly wages paid to ENGINEER's personnel. For salaried personnel, the imputed direct hourly rate shall be the weekly salary divided by 40.

10.2. Standard Billing Rates

ENGINEER's Standard Billing Rates mean Direct Labor Costs times ENGINEER's Standard Multiplier that is based on ENGINEER's standard and customary overhead rate and profit. Standard Multiplier will be adjusted as may be appropriate to reflect changes in its various elements. All such adjustments will be in accordance with generally accepted accounting practices.

10.3. Reimbursable Expenses

Reimbursable Expenses are those non-labor expenses associated with ENGINEER's conduct of the Project. Some examples of Reimbursable Expenses are meals, transportation, printing and photocopying costs, and field equipment rental. The amount ENGINEER will bill for Reimbursable Expenses will be in accordance with ENGINEER's standard schedule of Reimbursable Expenses Billing Rates or, if the expense item is not listed on the schedule, the cost actually incurred or the imputed cost ENGINEER allocates to the expense item.

10.4. Invoices/Late Payment

Invoices will be prepared in accordance with ENGINEER's standard invoicing practices and will be submitted to CLIENT at least monthly. Invoices are due and payable upon receipt. If CLIENT fails to pay any invoice within thirty days of the invoice date, the amounts due ENGINEER will increase at the rate of 1.0% per month from the thirtieth day following the invoice date; and, in addition, ENGINEER may, after giving seven days' written notice to CLIENT, suspend services under this Agreement until ENGINEER has been paid in full all amounts due. Payments will be credited first to interest and then to principal. In the event of a disputed or contested billing, only that portion so contested may be withheld from payment.

10.5. Professional Services Taxes

If at any time ENGINEER's compensation under this Agreement becomes subject to a professional services tax, sales tax, Value Added Tax, gross receipts tax or similar levy imposed by any local, state, federal or other government or quasi-government agency or authority, CLIENT agrees to pay such tax or levy on ENGINEER's behalf or reimburse ENGINEER for its paying such tax or levy.

11.0 Controlling Law

This Agreement is to be governed by the laws of the Commonwealth of Massachusetts. Any dispute resulting in legal action and not resolved by arbitration, mediation or such other method as may be mutually agreed to by the parties, shall be adjudicated solely and exclusively within the aforementioned jurisdiction.

12.0 Financial Advisor

ENGINEER is not a financial professional firm and makes no recommendations as to the best way for CLIENT to fund the Project. ENGINEER recommends that CLIENT seek the advice of an Independent Registered Municipal Advisor or other financial professional regarding the type and structure of financing appropriate for the Project. Engineer's services do not include (1) serving as a "municipal advisor" for purposes of the registration requirements of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) or the municipal advisor registration rules issued by the Securities and Exchange Commission, or (2) advising Owner, or any municipal entity or other person or entity, regarding municipal financial products or the issuance of municipal securities, including advice with respect to the structure, timing, terms, or other similar matters concerning such products or issuances.

13.0 Dispute Resolution

The parties hereto agree that prior to filing litigation they will consider alternative dispute resolution techniques to resolve all claims, counterclaims, disputes and other matters in question between the parties arising out of or relating to this Agreement.

14.0 Notices

Any notice required under this Agreement will be in writing, addressed to the appropriate party at the address which appears on the signature page to this Agreement (as modified in writing from time to time by such party) and given personally, by registered or certified mail, return receipt requested, or by a nationally recognized overnight courier service. All notices shall be effective upon the date of receipt.

15.0 Precedence

These provisions shall take precedence over any inconsistent or contradictory provisions contained in any proposal, contract, purchase order, requisition, notice to proceed, or like document.

16.0 Severability

Any provision or part of the Agreement held to be void or unenforceable under any law or regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon CLIENT and ENGINEER, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

17.0 Successors and Assigns

CLIENT and ENGINEER each binds itself and its partners, successors, executors, administrators and assigns to the other party of this Agreement and to the partners, successors, executors, administrators and assigns of such other party, in respect to all covenants of this Agreement. Neither CLIENT nor ENGINEER shall assign, sublet or transfer its interest in this Agreement without the written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public body that may be a party hereto, nor shall it be construed as giving any rights or benefits hereunder to anyone other than CLIENT and ENGINEER.

18.0 Survival

All express representations, indemnifications or limitations of liability made in or given in this Agreement will survive the completion of all services of ENGINEER under this Agreement or the termination of this Agreement for any reason.

19.0 Termination

The obligation to provide further services under this Agreement may be terminated:

19.1 For cause

For cause by either party upon thirty days' written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party. Notwithstanding the foregoing, this Agreement will not terminate as a result of such substantial failure if the party receiving such notice begins, within seven days of receipt of such notice, to correct its failure to perform and proceeds diligently to cure such failure within no more than thirty days of receipt thereof; provided, however, that if and to the extent such substantial failure cannot be reasonably cured within such thirty-day period, and if such party has diligently attempted to cure the same and thereafter continues diligently to cure the same, then the cure period provided from herein shall extend up to, but in no case more than, sixty days after the date of receipt of the notice.

19.2 By ENGINEER

By ENGINEER upon seven days' written notice if ENGINEER believes that ENGINEER is being requested by CLIENT to furnish or perform services contrary to ENGINEER's responsibilities as a licensed design professional; or upon seven days' written notice if the ENGINEER's services for design or during the construction of the Project are delayed or suspended for more than ninety days for reasons beyond ENGINEER's control.

In the case of termination under this paragraph, ENGINEER shall have no liability to CLIENT on account of such termination.

19.3 For convenience

For convenience by CLIENT effective upon the receipt of notice by ENGINEER.

19.4 ENGINEER's Compensation

In the event of any termination, CLIENT will pay ENGINEER for all services rendered to the date of termination and all reimbursable expenses.

20.0 Equal Employment Opportunity

ENGINEER is an Equal Employment Opportunity employer and is committed to recruiting, hiring, training and promoting for all job classifications without regard to race, religion, color, national origin, sex or age, physical or mental handicap, marital status or status as a disabled veteran, veteran of the Vietnam era, ex-offender or former patient of a state institution except where based on a bona fide occupational qualification.

EXHIBIT B
TOWN OF ROCKLAND, MASSACHUSETTS
COMPREHENSIVE WASTEWATER MANAGEMENT PLAN (CWMP)
SCOPE OF SERVICES (SOS)/PLAN OF STUDY (POS)

PROJECT MANAGEMENT, REGULATORY COORDINATION, MEETINGS

1. Prepare and submit a detailed Scope of Services (SOS)/Plan of Study (POS) to MassDEP for review and approval at the project outset. Goal is to have the Scope of Services that is included in the Agreement be the same document that is approved by MassDEP (submit SOS/POS to DEP for review and approval prior to completing the engineering services Agreement).

2. The Town of Rockland, MA plans to complete a Comprehensive Wastewater Management Plan (CWMP) to be used in the development of wastewater collection and WWTP upgrades and improvements. The CWMP process is divided into three Phases. Phase I includes an assessment of existing conditions, projection of future wastewater disposal requirements, and a needs assessment for the entire Town study area. In Phase II, alternative means of handling the wastewater are developed to address the needs identified in Phase I. Phase III involves a detailed evaluation of the alternatives identified, and a recommendation of a specific wastewater management plan. The culmination of the CWMP process is in Phase III, where a draft and a final CWMP report are prepared, submitted, and reviewed for approval by the Town and MassDEP.

3. The CWMP study area covers the entire Town of Rockland. Since the WWTP serves portions of the Town of Abington, this community will be contacted to obtain any additional flow required over the planning period. The Planning Period will extend 20 years beyond the date when all the planned facilities are scheduled to become operational.

4. Prepare and submit monthly invoices.

5. **Regulatory Coordination:** It is anticipated that regulatory coordination will be limited to MassDEP. Wright-Pierce will contact MassDEP at project outset to review SOS/POS with MassDEP. It is currently anticipated that a MEPA Environmental Notification Form (ENF) will <u>not</u> be required for the CWMP. Hence, preparation of an ENF is <u>not</u> included in the Scope of Services. A MEPA Environmental Impact Report (EIR) is also <u>not</u> included in this Scope of Services. If a MEPA ENF and/or EIR are ultimately required, this will be an addition to the Scope of Services and fee and will affect the project completion schedule.

6. **Project Meetings**: Prepare for and attend a total of seven meetings as outlined below:

    a. Project Kickoff Meeting

    b. Review draft CWMP Phase I with Town and Stakeholders

    c. Review CWMP Phase I with Town and MassDEP

    d. Review draft CWMP Phase II with Town and Stakeholders

e. Review CWMP Phase II with Town and MassDEP

f. Review draft CWMP Phase III Report with Town and MassDEP

g. Public Hearing to be held at completion of the CWMP Phase III – unified Draft CWMP.

7. **Schedule Management and Coordination:** The schedule for obtaining an approved CWMP is expected to take 10-12 months. This project schedule assumes that no MEPA ENF or EIR are required.

PUBLIC PARTICIPATION

1. Development of and coordination with a Project Advisory Committee (PAC) or Citizen's Advisory Committee (CAC) is not planned and not included in the scope of services. *Due to the comprehensive nature of the CWMP, Rockland will involve a variety of stakeholders, as appropriate. Stakeholders may include members from: Rockland Sewer Commission; Water Commission; Highway Department; Rockland Board of Selectmen, Board of Health, Finance Committee, Conservation Commission; Planning Board; Community Development Office; Capital Planning Committee; Southfield-Redevelopment-Authority Citizens of Rockland; Department of Fish and Wildlife (DFW) Natural Heritage Program, Water Resources Commission (WRC), and the EOEEA MEPA Unit. All stakeholders, including governmental agencies, will have a chance to provide input into the development of the CWMP.*

2. The Town, at its own discretion, can make certain project progress meetings open to the public. The Town will post on Town web site planning and process documents and project progress meeting dates and times

3. As this CWMP will take on a streamlined approach and be completed on a fast-track schedule, a formal public participation program will not be implemented. Rather, one Public Hearing will be held as part of the project. The Public Hearing will be held near the completion of the Project. The intent is to have a draft of the recommended CWMP available for review in advance of the public hearing.

PHASE I – EXISTING CONDITIONS, FUTURE REQUIREMENTS AND PROBLEM IDENTIFICATION AND NEEDS ASSESSMENT

1. Assemble and review all relevant prior studies of Rockland wastewater collection and treatment facilities and master planning and incorporate relevant and current information as part of the CWMP. Wastewater Treatment Plant (WWTP) record drawings were obtained as part of the Comprehensive Wastewater Treatment Plant Assessment and Evaluation that is currently being completed by Wright-Pierce. The report development from the Facility Assessment and Evaluation will be used to assist with the CWMP. If there are other reports available, it is assumed that Town staff will assemble and provide the necessary prior studies and relevant information to Engineer.

The intent in this section is to reuse all relevant and accurate information from the above noted studies and update the available relevant information via critical evaluation of the data used and the interpretation of such, and collect, evaluate and properly interpret all relevant new data available specific to existing wastewater management systems.

2. Identify the General Environmental Conditions in and around the Town of Rockland (Town staff to assist in this task). This will include:

   a. Description of Basin-Wide Initiatives and Other Facilities Plans for Town's Watershed Basin:

      - Compile a bibliography of existing reports, plans and initiatives that impact the land use and conditions of Rockland and the watershed basin. Metropolitan Area Planning Commission (MAPC), MassDEP, EPA, and other entities may have plans for inclusion in the bibliography.
      - Identify important components of other plans that may impact Rockland's wastewater management plans.

   b. Description of the Town's built/human environment (desktop study). Based on current, relevant information to be provided by Town staff:

      - Meet with the Rockland Conservation Commission, Planning Department staff and Capital Planning Committee to describe recent and anticipated development trends, both residential and commercial, and to describe any conservation or open space efforts, including wetlands conservation bylaws.
      - Based on availability, develop a base map using data layers from MassGIS and/or Rockland's GIS.
      - Indicate locations of existing conservation land on the base map.

   c. Description of the natural environmental systems based on reviewing and summarizing information compiled in previous studies:

      - Identify locations and issues of critical environmental concern. Coordinate, as applicable with MAPC and Rockland Conservation Commission.
      - Describe the regional climate conditions using available NOAA data.
      - Describe the soils in Rockland using NRCS soil conditions reports and maps as informational sources. Coordinate with Board of Health (BOH) staff on soils, perc rates and groundwater information. The BOH staff will be interviewed to gather specific field observations and experiences regarding Rockland soils information and locations. Locate areas containing soils poorly suited to onsite disposal on the base map.
      - Describe the regional and localized hydrologic conditions using available published information from USGS or other agency sources.
      - Describe the regional and localized hydrogeologic conditions using available published information from USGS or other agencies sources.
      - Describe the regional and localized water quality conditions using available reports from the BOH summer water quality testing for specific water bodies

within the Town and other available published information from USGS, MassDEP, EPA, MAPC or other agency sources. Location any historically troubled surface water bodies on the base map.

- Describe wetlands or species habitats in Rockland using available published information by the Conservation Commission, Natural Heritage, MAPC or other agency sources. Locations on the base map.
- Describe flood plain locations in Rockland using available FEMA maps. Locations on the base map.
- Describe regional air quality and noise conditions using available MassDEP, EPA and other available sources.

d. Compile the summary information from this task into a draft of Chapter 1 of the CWMP Phase I report submittal.

3. Describe the Town of Rockland Existing Water System and Supply Sources.

   a. The Town of Rockland have a joint agreement with the Town of Abington, called the "Abington/Rockland Joint Water Works", for the production, treatment, and distribution of the town's water supply. The Town owns and operates a surface water treatment facility and water infrastructure. Engineer will summarize a description of the existing water system into Chapter 2 of the CWMP Phase I report submittal, emphasizing the following items:

      - A brief description of the Town's existing potable water supply, source/raw water treatment and High/Low pressure distribution systems based on available relevant information (Annual Statistical Report, Annual Water Quality Report, Water Management Permit, Water Withdraw Permit, past water system assessments, etc.) provided by the Town.
      - Discuss private well zoning issues, compliance with MassDEP Zone I wellhead protection areas and any recent water system assessments with Town's Water Department.
      - A summary of water use trends and future water demands.
      - A review of recent and ongoing water conservation efforts and potential for further demand reduction.
      - A description of Rockland's source water protection measures and any goals for enhancing protection in the future.

4. Describe the current Sewered Wastewater Collection and Treatment Systems and Non-Sewered Wastewater Management Systems and Determine Wastewater Management Needs. This will include:

   a. Wright-Pierce is currently completing a Comprehensive Wastewater Treatment Plant Assessment and Evaluation report that will be used to assist with the CWMP. In addition, Wright-Pierce will be conducted desk top studies to develop a description of the Town's Existing Wastewater Systems. This effort will include:

- Description of the Town's existing wastewater facilities including the collection, treatment, and effluent disposal systems.
- Review, evaluate and summarize the existing and future wastewater flows and loads. *(Existing flows and load have been reviewed, evaluated, and summarized. Writeup will be copied to Phase 1 report)*
- Review and summarize the current status of the wastewater treatment facilities. *Current status of the wastewater treatment facilities has been summarized in WWTP Evaluation. Writeup will be copied to Phase 1 report to summarize the following items:*
  - Current and future permit conditions (NPDES permit limits, compliance schedule and other conditions).
  - Physical and operational conditions of facilities.
  - Historical modifications and upgrades to the facilities.
  - Planned upgrades and modifications to treatment facilities including: headworks; influent screw pumps; septage receiving; primary clarifiers; sludge handling/thickening/dewatering/removal; disinfection; odor control; standby generator; electrical distribution; SCADA; addition of a secondary treatment system (aeration system; final clarifiers; WAS & RAS pumping systems; secondary sludge handling/thickening/dewatering/removal).
- Review and summarize the current status of the wastewater collection system, including:
  - Current and future permit conditions (NPDES conditions for infiltration/inflow work and reporting).
  - Physical conditions of collection system.
  - Recent modifications and upgrades to the collection system.
  - Review and summary of I/I investigations and SSES work completed in the last decade.
  - Planned I/I rehabilitation projects/tasks (rehabilitation tasks/projects remaining).
- Describe the Town's current pretreatment program, including the quantity of septage pumped from Rockland's septic systems (the WWTP is currently not receiving septage and has not since the 1980s). Discuss any grease trap and odor issues from businesses with WWTP personnel.
- Meet with the Board of Health staff to collect available relevant information and develop summary description of the current situation of Town's onsite surface wastewater disposal systems. Discuss any grease trap and odor issues from businesses with BOH health agent.

b. Develop description of division of non-sewered Areas into Study Areas:

- Create distinctive Study Areas for which wastewater management needs can be assessed and solutions analyzed. The size of the individual Study Areas will be small enough so that customized solutions will be developed. Should significantly different natural conditions be found within existing neighborhoods, areas may be subdivided to reflect specific characteristics. Study Areas will also include open land that has been targeted for development.

c. Summarize existing conditions of Non-Sewered Areas within Study Area and identify and evaluate problems for each within the Study Area including:

- Develop a streamline "Needs Assessment" for the project based on the results of the previous studies. This will include categorization of each Non-Sewered Area "needs" into broad groupings. Examples of these "needs" groupings could be: Public Health; Water Supply Protection; Protection of Surface Waters (from nutrient enrichment); and enabling smart growth/other desired/required development (Chapter 40B or 40R projects, for example).
- Develop a short-list of the Distinctive Non-Sewered Areas down to a strategic number so that the analysis can be focused and cost-effective (i.e., exclude conservation restricted land and other non-developable land areas). In general, Distinctive Non-Sewered Areas will not include the areas of the Town that are already sewered. Exception, those Non-Sewered Areas adjacent to a sewer line or subsurface disposal systems that if converted to pumped systems could access sewer.
- Review water quality data collected in previous studies, if applicable and update as appropriate (specifically looking for areas near bacteria impacted ponds or receiving waters); query available GIS system information (specifically looking for areas with high unit water use); and review BOH variances collected in previous studies, if applicable and update as appropriate.
- Perform brief visual ("windshield") survey to determine overall characteristics of each Distinctive Non-Sewered Areas. Survey will: identify natural characteristics surrounding the Area, such as the presence of woodlands, water bodies, floodplain or wetlands; comment on the development characteristics of the neighborhood such as density of development; note the presence or absence of trees or ledge outcroppings; describe the overall topography of the Area, including the severity and direction of street grades, and if houses are significantly higher or lower than street elevations; identify signs of failed on-site systems; and identify, characterize and list by street address any commercial properties. This survey will be "drive-by with appropriate stops" in nature, as opposed to a detailed lot-by-lot review. Compile available Board of Health records for the Distinctive Non-Sewered Areas, including: septage pumping records; sites that have failed Title 5 inspections; sites that have been issued system repair or replacement permits; and properties that have applied for financial assistance for system repairs. Update base map to locate system problems.
- Identify current lot sizes and zoning regulations within each Distinctive Non-Sewered Area. Consult assessor's maps and zoning regulations and discuss known variances from the regulations with the Board of Health and Planning Board staff. It is assumed that the Assessors information necessary for these tasks will be available electronically from the Town.
- Identify the potential for subdivision of land and further development within each Distinctive Non-Sewered Area. Review the Town's Master Plan and zoning regulations and consult with the Planning Board Staff. Identify and evaluate

planned and potential Chapter 40B and 40R housing projects in Rockland within the Distinctive Non-Sewered Areas. Update base map to indicate these potential Distinctive Non-Sewered Areas developments.

- Identify the development potential of land adjacent to each Distinctive Non-Sewered Areas. Review the Town's Master Plan and zoning regulations and consult with the Planning Board staff. Update base map to indicate potential development.
- Combine information on current zoning and planned growth to estimate current and future wastewater flows from each Distinctive Non-Sewered Areas. Develop a flow calculation spreadsheet based on the assessor's information. Spreadsheet to include information necessary to summarize current flow and projected future flow estimates. It is assumed that the Assessors information necessary for these tasks will be available electronically from the Town.
- Perform a soils evaluation to determine the characteristics of soils in each Distinctive Non-Sewered Areas. The evaluation will focus on assessing the feasibility of using on-site systems or groundwater discharge systems. This evaluation will consist of a review of previous studies along with available BOH records and soils data. No field investigations will be conducted as part of this Task.
- Compile and analyze existing groundwater quality data if available from past studies and the Town. Available BOH groundwater quality data will be obtained from staff and evaluated. No field investigations will be conducted as part of this Task.

d. Rank Distinctive Non-Sewered Areas within Study Area by need for wastewater management:

- Apply a rating formula to each Distinctive Non-Sewered Areas within the Study Area (including undeveloped lands) and present the rating criteria and Distinctive Non-Sewered Areas conditions in a decision matrix to illustrate how each Distinctive Non-Sewered Area's rating was determined.
- Rank the Distinctive Non-Sewered Areas according to their respective wastewater needs as determined by the calculated rating.

e. Based on high rankings, recommend Distinctive Non-Sewered Areas within Study Area that require off-site solutions and therefore, further investigation in the CWMP:

- Summarize the Distinctive Non-Sewered Areas into groupings that will range from the favorable scenario (capable of handling current and expanded use with on-site systems) to least favorable scenario (not adequate for onsite disposal and requiring off-site solution). The final grouping of Needs Distinctive Non-Sewered Areas will establish the baseline for specific Distinctive Non-Sewered Areas to be considered in Phase II.

- Assess the suitability of continued reliance on subsurface disposal systems for Distinctive Non-Sewered Areas Study that received low rankings and determine if those areas should be studied further in the CWMP.

f. Evaluate alternatives for legal and/or zoning regulations which control the number of tie- ins to existing and future sewers.
g. Evaluate the Town's current Sewer Regulations/Ordinance and recommend revisions (if necessary) to provide minimum design criteria for private sewer connections in anticipation of the transfer of authority for such issues from MassDEP to the local level.

5. CWMP Phase I Report:

   a. Compile the conclusions of all tasks and prepare and produce an initial Draft CWMP Phase I Report.
   b. Engineer will produce hard copies and have Town post a pdf copy to their web site of an initial Draft CWMP Phase I Report and submit to the Town for review and comment.
   c. One (1) project meeting is included in this task for review and discussion of the initial Draft CWMP Phase I Report with the Town and applicable stakeholders.
   d. Comments received from Town and during the public review process will be finalized by discussion and addressed prior to submitting a revised Draft CWMP Phase I Report to MassDEP for review.

6. Massachusetts Department of Environmental Protection Review

   a. Engineer shall submit one copy of the revised Draft CWMP Phase I Report to MassDEP for review. One (1) joint meeting is included in this task for review and discussion of revised Draft CWMP Phase I Report with MassDEP and the Town.
   b. Engineer will meet with MassDEP officials and Town to discuss revised Draft CWMP Phase I Report. Written comments will be received, finalized by discussion as necessary and addressed prior to submitting a Final CWMP Phase I Report to MassDEP for approval.
   c. Engineer will finalize Report, make and submit one copy of the Final CWMP Phase I Report to MassDEP for approval. Additional copies will be made for distribution to the Town.

PHASE II – MANAGEMENT TECHNIQUES AND ALTERNATIVES IDENTIFICATION AND SCREENING

1. Determine potential locations for off-site collection and treatment facilities. *(Note, the level of effort for this task depends on the number of off-site locations and the number of treatment facilities under consideration.* This effort will include:

   a. Review required siting criteria and update as appropriate.

   b. Compile a list of potential sites for construction of decentralized wastewater treatment facilities and groundwater discharge:

      - Using assessor's information, identify undeveloped parcels with sufficient acreage, proximity to need areas, and distance from environmentally sensitive areas to develop a list of potential sites.

- Perform a visual inspection of each site to describe topography and ground cover.
- Perform a literature search to determine the general soils and groundwater conditions of each site.
- Using the selection criteria and information in the above tasks, screen the identified sites to form a short-list of potential sites.
- Perform a desktop hydrogeologic evaluation of identified potential sites to determine the feasibility of constructing an effluent disposal system on site (s).
- Rank the potential sites according to the desktop hydrogeologic evaluation and the evaluation criteria.
- Update the base map to reflect the locations of the potential sites.

c. Prepare a technical memorandum describing the selection criteria and the list of potential off-site treatment sites. Distribute to the Town and MassDEP for review and incorporate any suggested revisions into Chapter 1 of the CWMP Phase II submittal.

2. Develop overview of wastewater management techniques and technologies. This will include:

a. Review technical, operational, and permitting considerations of potential **on-site solutions** as appropriate:

- Technical considerations:
  - Identify ideal, adequate, and prohibitive soil types.
  - Identify preferred and prohibitive groundwater separations, per applicable regulation.
  - Identify spatial constraints such as lot size, proximate to property lines and proximity to wells, etc.
  - Identify other facilities, such as septic tanks, leaching fields and/or electricity power sources that must be present for any proposed technology to be feasible.
  - Describe other conditions that are required for proposed system to work or other conditions that prohibit the system's use.

- Operational considerations:
  - Describe the maintenance required to sustain a proposed system's operation.
  - Describe conditions that may cause the system to operate ineffectively.
  - Identify the residuals produced by the process.

- Describe the overall advantages and disadvantages of potential on-site solutions with regard to:
  - Disposal of wastewater.
  - Continued limitations on growth.
  - Capital and O & M costs.
  - Pollution potential from failing or improperly maintained systems.

- Odors.
- Reliability.
- Redundancy.
- Phasing considerations.
- Environmental impacts.

- Group the technologies into similar categories, and assess the general permitting and regulatory requirements for the on-site systems.

b. Review technical, operational, and permitting considerations of potential **decentralized treatment solutions** as appropriate:

- Technical considerations:

  - Describe the wastewater loading rates and characteristics that are well suited and poorly suited for the technology.
  - Describe site conditions, including climate, soils, and groundwater elevation, that promote efficient treatment.
  - Describe the conditions that hinder operations.
  - Identify other treatment trains that must be paired with the technology to gain regulatory approval or adequate effluent quality.
  - Estimate the required land area for a decentralized treatment facility.

- Operational considerations:

  - Describe the staffing and training requirements to operate the facility.
  - Identify the materials/chemicals required to operate the system.
  - Identify the residuals produced by the process, and the requirements for residuals disposal.
  - Describe required maintenance schedules and procedures.

- Describe the advantages and disadvantages of decentralized treatment solutions with regard to:

  - The non-centralized disposal of wastewater.
  - The limitation of growth.
  - Location of treatment facilities.
  - Odor control.
  - The technologies reliability.
  - The technologies performance.
  - Any significant environmental impacts.
  - Potentially higher capital and operations costs.

- Assess the general permitting/regulatory requirements of each decentralized treatment solution, including:

  - Board of Health approval.
  - Conservation Commission approval.
  - Possible Army Corps of Engineers 404 permit.

- Possible MassDEP 401 Water Quality Certification.
- MassDEP groundwater discharge permits.
- MassDEP approval for some I/A technologies.
- Other applicable permitting and regulatory requirements.

c. Review technical, operational, and permitting considerations of potential additions (sewer extensions) to the existing **centralized/regional** wastewater collection system:

- Review previously described technical considerations associated with the different wastewater collection system alternatives available:
  - Conventional sewers (gravity sewers, pump stations and force mains).
  - Low pressure sewers.
  - Small diameter gravity sewers.
  - **STEP and vacuum systems will not be considered.**
- Describe the operational considerations associated with different collection system components, such as:
  - Odor control.
  - Lower O&M on conventional gravity sewers.
  - Higher O&M on low pressure and pump stations.
- Describe the overall advantages and disadvantages of a centralized/regional wastewater solution, including:
  - Management/control of facilities.
  - Capital and O&M costs.
  - WWTF effluent monitoring and control.
- Describe the overall general permit/regulatory requirements for the construction of wastewater collection systems, including:
  - Possible Conservation Commission approval.
  - MassDEP sewer extension permit.
  - Easements and/or property takings.

d. Review previously detailed watershed-based (wastewater and non-wastewater) management techniques and update as appropriate: Review local and regional conservation initiatives, and briefly describe conservation issues.

e. Prepare a technical memorandum summarizing the information generated for Item 2c on potential technologies. To the maximum extent possible, present the information in a format that facilitates the evaluation of potential technologies using the general screening criteria. This will become Chapter 2 of the CWMP Phase II report.

4. Screening of the Potential Techniques/Technologies.

   a. Develop a technology evaluation form based on the screening criteria (if/as necessary).

   b. Complete a technology evaluation form for each potential technology (if/as necessary).

   c. If necessary, develop a decision matrix summarizing the information on the technology evaluation forms. The matrix would consist of criteria on one axis, technologies on the other, and numerical ratings in the array.

   d. Prepare a technical memorandum summarizing the screening process and recommendation of candidate technologies for further examination in Phase III. This will become Chapter 3 of the CWMP Phase II Report.

5. CWMP Phase II Report:

   a. Compile the conclusions of all tasks and prepare and produce an initial Draft CWMP Phase II Report.
   b. Engineer will produce hard copies and have Town post a pdf copy to their web site of an initial Draft CWMP Phase II Report and submit to the Town for review and comment.
   c. One (1) project meeting is included in this task for review and discussion of the initial Draft CWMP Phase II Report with the Town and applicable stakeholders.
   d. Comments received from Town and during the public review process will be finalized by discussion and addressed prior to submitting a revised Draft CWMP Phase II Report to MassDEP for review.

6. Massachusetts Department of Environmental Protection Review

   a. Engineer shall submit one copy of the revised Draft CWMP Phase II Report to MassDEP for review. One (1) joint meeting is included in this task for review and discussion of Draft CWMP Phase II Report with MassDEP and the Town.
   b. Engineer will meet with MassDEP officials and Town to discuss revised Draft CWMP Phase II Report. Written comments will be received, finalized by discussion as necessary and addressed prior to submitting a Final CWMP Phase II Report to MassDEP for approval.
   c. Engineer will finalize Report, make and submit one copy of the Final CWMP Phase II Report to MassDEP for approval. Additional copies will be made for distribution to the Town.

PHASE III - DETAILED EVALUATION OF ALTERNATIVES, DEVELOPMENT OF RECOMMENDED WASTEWATER MANAGEMENT PLAN AND DRAFT AND FINAL COMPREHENSIVE WASTEWATER MANAGEMENT PLAN REPORT

1. Pair candidate technologies with Needs Areas to create viable alternatives:

   a. Describe conditions present in each Study Area, including a summary of conditions described in the Phase III report:

      - For each Study Area:

         - Identify on-site techniques that are not feasible because area conditions (e.g. soils, lot size, and groundwater) are prohibitive for the technology.
         - Identify on-site technologies that are not preferred because area conditions are not ideal for the technology.
         - Identify on-site technologies that are technically feasible because area conditions align with conditions that are conducive for implementation of the technology.
         - Create a short-list of viable on-site technologies for each Area.

   b. Pair needs Areas with nearby potential sites for decentralized treatment facilities and describe the collection/conveyance system from the Study Area to the site:

      - Describe the conditions present at each potential site and create a short-list of viable decentralized technologies for each site.
      - Describe the viable centralized alternatives.
      - Compile the viable alternatives into solutions for each Area and combination of Areas and potential sites, as necessary.

2. Prepare general conceptual designs of each viable alternative *(Note, the level of effort for this task depends on the number of Study Areas and the number of candidate technologies under consideration.* In the case of on-site solutions, conceptual designs will consist of selecting representative lots and representing the I/A technology (if necessary) on those lots. For decentralized solutions, a collection system schematic in the Study Area and a preliminary facility layout on the Site will be developed. For the centralized solutions, a schematic wastewater collection system layout indicating the destination of the wastewater will be presented.

   a. For each viable alternative, identify the associated general environmental impacts:
      - Water quality and quantity including the amount of groundwater recharge vs. surface water discharge.
      - Solid/hazardous waste generation (including septage or residuals disposal).
      - Odors, air and noise.
      - Visual, historical, open space and recreation impacts.
      - Wetlands, habitat, and flood plain impacts.
      - Growth and development consideration.
      - Aesthetic compatibility of the system with the surrounding environment.

b. For each viable alternative, prepare a preliminary present-worth cost analysis for construction and operation of systems in each Area or site:
   - Establish budgetary costs for components of potential wastewater management systems.
   - Estimate quantities for each viable technology in each Area or potential site.
   - Calculate a budgetary capital cost of each viable option for each Area or potential site, including ancillary costs to develop the solution.
   - Estimate the operation and maintenance cost of each viable alternative for each Area, including any unique costs.

c. Compile the conceptual designs for each Area and combinations of Areas and sites. This will include schematic layouts, evaluation matrices for environmental impacts, and a present-worth calculation to estimate the preliminary costs

3. Apply the selection methodology to each of the viable alternative conceptual designs:

   a. Develop a viable alternative evaluation form based on the selection methodology set forth. The impetus behind the form and format of the form will be similar to the one developed for the technology screening process.
   b. Complete an evaluation form for each viable alternative.
   c. Generate a decision matrix summarizing the information on the evaluation forms.

4. Develop a recommended preferred technology for each Area or combination of Areas and sites. This will become a chapter of the Phase III report. Final Wastewater Management Plan Refinement.
   a. Develop a conceptual summary of the recommended wastewater management systems which may include, on-site, decentralized, and centralized systems
      - Prepare schematic design presenting wastewater collection system routes and connection to existing system.
      - Locate proposed pumping stations.
      - Indicate present and future design flows.
      - If applicable, provide a general summary of decentralized treatment facilities to accommodate current and future flows.
      - Identify potentially impacted wetlands and estimate any required replication.
      - Outline water conservation programs.

   b. Review and evaluate existing Inter-Municipal Agreement (IMA) with Town of Abington.
   c. Identify and generally summarize the environmental impact of the preferred alternative:
      - Assess the aesthetics impacts of decentralized facilities, <u>if applicable</u>.
      - Assess the alternative impacts to groundwater quality, particularly in any Zone II's, <u>if applicable.</u>
      - Estimate the quantities of residuals produced by the treatment facilities and indicate the potential disposal methods.
      - Indicate the potential for odor generation or air pollution.

- Assess the reduced risk to human health by discontinuing use of septic systems for areas that this was determined to be the best solution.
- Identify any general impacts to wetlands or species habitat and indicate any mitigation measures (no wetlands delineation is included in the Scope of Services).
- Estimate average power consumption by the operation of the proposed facilities.
- Indicate the materials and chemicals required to operate the facilities.
- Assess how the proposed alternatives might impact projected growth patterns.
- Prepare a complete flow table for both the existing and proposed sewers for each proposed alternative.

d. Identify the regulatory considerations and permit requirements of the preferred alternatives
e. Prepare a planning level present-worth cost analysis for the recommended plan, including both capital and O & M costs.

5. Compile the separate selected components of the overall plan into a single Recommended Wastewater Management Plan:

a. Combine the selected preliminary solutions into a single recommended plan.
b. Assess the cumulative environmental impacts of the recommended plan.
c. Develop a final cost estimate for the recommended plan.
d. Assess the "cost-per-household" of the recommended plan by comparing the final cost estimate to the number of households served by the recommended plan.

6. Develop an Implementation Plan:

a. Prepare a brief project implementation plan.
b. Identify a plan for financing the project including possible sources of funding.
c. Outline a proposed project schedule, including sequencing of construction contracts, permits and project compliance.

7. Compile all of the Phase I, II and III efforts into a unified Draft CWMP Report. This report will serve as the **draft** version of the Comprehensive Wastewater Management Plan:

a. Engineer will produce hard copies and have Town post a pdf copy to their web site of a unified Draft CWMP Report and submit to the Town for review and comment.
b. Engineer shall submit one copy of the unified Draft CWMP Report to MassDEP for review. One (1) joint meeting is included in this task for review and discussion of Draft CWMP Report with MassDEP and the Town.
c. One (1) Public Meeting is included in this task for review and discussion of the unified Draft CWMP Report with the Town, applicable stakeholders, and Public Meeting/Hearing attendees (see Item 8 below).

8. Facilitate public review process:

   a. Facilitate the CWMP public review process.
   b. Prepare materials, including summary sheets, maps, and graphics for a Public Hearing.
   c. Attend one Public Meeting/Hearing with Town and MassDEP.
   d. Compile a summary of comments received from the Public hearing/review process.

9. Revise the unified Draft CWMP Report into the Final CWMP report based on feedback from the Public Meeting/Hearing and review and feedback from MassDEP and other stakeholders:

   a. Upon the completion of this phase, Engineer in conjunction with the Town and MassDEP officials will agree upon which comments received during the public review process to address, and how to best address them. The responses to these comments will be incorporated into the Final CWMP submittal. The content of the report will be revised to reflect comments from regulatory agencies and the public. An executive summary including the conclusions and recommendations will be added to the report.

   b. The input resulting from the unified Draft CWMP will be incorporated into the Final CWMP for approval by MassDEP and ratification by the Town.

   c. Engineer will produce hard copies and have Town post a pdf copy to their website of the Final CWMP Report.

   d. Engineer will make and submit one hard copy and one digital of the Final CWMP Report to MassDEP for approval.

Appendix B
Current NPDES Permit

NPDES Permit is provided in Phase 3 Appendix C

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, 33 U.S.C. §§ 1251 et seq. (the "CWA"),

Town of Rockland, Massachusetts

is authorized to discharge from the facility located at

Rockland Wastewater Treatment Plant
587R Summer Street
Rockland, MA 02370

to receiving water named

French Stream
South Coastal Watershed

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature.[1]

This permit expires at midnight, five years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on January 27, 2006.

This permit consists of **Part I** including the cover page(s), **Attachment A** (Freshwater Acute Toxicity Test Procedure and Protocol, February 2011), **Attachment B** (Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013), and **Part II (**NPDES Part II Standard Conditions, April 2018).

Signed this day of

KENNETH MORAFF Digitally signed by KENNETH MORAFF Date: 2021.11.29 14:57:19 -05'00'

Ken Moraff, Director
Water Division
Environmental Protection Agency
Region 1
Boston, MA

[1] Procedures for appealing EPA's Final Permit decision may be found at 40 CFR § 124.19.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the French Stream. The discharge shall be limited and monitored as specified below; the receiving water and the influent shall be monitored as specified below.

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Rolling Average Effluent Flow[5]	Report MGD[5]	---	---	Continuous	Recorder
Effluent Flow[5]	2.5 MGD	---	Report MGD	Continuous	Recorder
BOD_5 (May 1 – September 30)	6 mg/L 125 lb/day	6 mg/L 125 lb/day	10 mg/L 209 lb/day	2/Week	Composite
BOD_5 (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	2/Week	Composite
BOD_5 Removal	≥ 85 %	---	---	1/Month	Calculation
TSS (May 1 – September 30)	10 mg/L 209 lb/day	10 mg/L 209 lb/day	15 mg/L 313 lb/day	2/Week	Composite
TSS (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	2/Week	Composite
TSS Removal	≥ 85 %	---	---	1/Month	Calculation
pH Range[6]	6.5 - 8.3 S.U.			1/Day	Grab
Total Residual Chlorine[7,8]	11 µg/L	---	19 µg/L	1/Day	Grab
Escherichia coli [7,8]	126 cfu/100 mL	---	409 cfu/100 mL	3/Week	Grab
Total Copper	12 µg/L	---	19 µg/L	1/Month	Composite
Total Aluminum	87.2 µg/L	---	Report µg/L	1/Month	Composite
Dissolved Oxygen (May 1 – Sept 30)	≥ 7.4 mg/L			1/Day	Grab
Ammonia Nitrogen (April 1 – May 31)	2.5 mg/L	2.5 mg/L	5.7 mg/L	2/Week	Composite
Ammonia Nitrogen (June 1 – Sept 30)	1.0 mg/L	1.0 mg/L	1.5 mg/L	2/Week	Composite
Ammonia Nitrogen (Oct 1 – March 31)	3.3 mg/L	3.3 mg/L	5.7 mg/L	2/Week	Composite

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Total Kjeldahl Nitrogen[9] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	Composite
Nitrate + Nitrite[9] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	Composite
Total Nitrogen[9]	Report mg/L Report lb/day	---	Report mg/L	1/Month	Calculation
Total Phosphorus[10] (April 1 – October 31)	0.1 mg/L	---	Report mg/L	2/Week	Composite
Total Phosphorus (November 1 – March 31)	1.0 mg/L	---	Report mg/L	1/Week	Composite
Perfluorohexanesulfonic acid (PFHxS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorononanoic acid (PFNA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanesulfonic acid (PFOS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanoic acid (PFOA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluoroheptanoic acid (PFHpA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorodecanoic acid (PFDA)[11]	---	---	Report ng/L	1/Quarter	Composite
Whole Effluent Toxicity (WET) Testing[12,13]					
LC_{50}	---	---	≥ 100 %	1/Quarter	Composite
C-NOEC	---	---	≥ 99 %	1/Quarter	Composite
Hardness	---	---	Report mg/L	1/Quarter	Composite
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Composite
Total Aluminum	---	---	Report mg/L	1/Quarter	Composite
Total Cadmium	---	---	Report mg/L	1/Quarter	Composite
Total Copper	---	---	Report mg/L	1/Quarter	Composite
Total Nickel	---	---	Report mg/L	1/Quarter	Composite
Total Lead	---	---	Report mg/L	1/Quarter	Composite
Total Zinc	---	---	Report mg/L	1/Quarter	Composite
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Composite

Ambient Characteristic[14]	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Hardness	---	---	Report mg/L	1/Quarter	Grab
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Grab
Total Aluminum	---	---	Report mg/L	1/Quarter	Grab
Total Cadmium	---	---	Report mg/L	1/Quarter	Grab
Total Copper	---	---	Report mg/L	1/Quarter	Grab
Total Nickel	---	---	Report mg/L	1/Quarter	Grab
Total Lead	---	---	Report mg/L	1/Quarter	Grab
Total Zinc	---	---	Report mg/L	1/Quarter	Grab
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Grab
Dissolved Organic Carbon[15]	---	---	Report mg/L	1/Quarter	Grab
pH[16]	---	---	Report S.U.	1/Quarter	Grab
Temperature[16]	---	---	Report °C	1/Quarter	Grab

Influent Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
BOD_5	Report mg/L	---	---	2/Month	Composite
TSS	Report mg/L	---	---	2/Month	Composite
Perfluorohexanesulfonic acid (PFHxS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorononanoic acid (PFNA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanesulfonic acid (PFOS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanoic acid (PFOA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluoroheptanoic acid (PFHpA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorodecanoic acid (PFDA)[11]	---	---	Report ng/L	1/Quarter	Composite

Sludge Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Perfluorohexanesulfonic acid (PFHxS)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorononanoic acid (PFNA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorooctanesulfonic acid (PFOS)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorooctanoic acid (PFOA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluoroheptanoic acid (PFHpA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorodecanoic acid (PFDA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]

Footnotes:

1. All samples shall be collected in a manner to yield representative data. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented as an electronic attachment to the applicable discharge monitoring report. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and the State of any additional testing above that required herein, if testing is in accordance with 40 CFR Part 136.

2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" to all non-detects for that reporting period and report the average of all the results.

4. A "grab" sample is an individual sample collected in a period of less than 15 minutes.

   A "composite" sample is a composite of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportional to flow.

5. The limit is a monthly average, reported in million gallons per day (MGD). The Permittee shall also report the annual rolling average, which will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months. Also report maximum daily flow in MGD.

   The Permittee must utilize an effluent flow meter to measure effluent flow. See section I.G.3 for a compliance schedule regarding installation of the effluent flow meter.

6. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.).

7. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges that have been previously chlorinated or that contain residual chlorine. The compliance level for TRC is 20 µg/L.

   Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

   The Permittee shall substitute three TRC grab samples per day, for any day that they are unable to comply with the continuous recording requirement. Each grab sample shall be taken at least 2 hours from the previous grab sample.

8. The monthly average limit for *Escherichia coli* (*E. coli*) is expressed as a geometric mean. E. coli monitoring shall be conducted concurrently with TRC monitoring, if TRC monitoring is required.

   The *E. coli* limit shall become effective in accordance with the compliance schedule found at Part I.G.1.

9. Total Kjeldahl nitrogen and nitrate + nitrite samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen, as follows.

   Total Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) + Nitrate + Nitrite (mg/L)

   Total Nitrogen (lb/day) = [(average monthly Total Nitrogen (mg/L) * total monthly effluent flow (Millions of Gallons (MG)) / # of days in the month] * 8.34

10. The phosphorus limit shall become effective in accordance with the compliance schedule found at Part I.G.2.

11. Report in nanograms per liter (ng/L). This reporting requirement for the listed per- and polyfluoroalkyl substances (PFAS) parameters takes effect the first full calendar quarter following 6 months after EPA notifies the Permittee that an EPA multi-lab validated method for wastewater is available.

12. The Permittee shall conduct acute toxicity tests (LC50) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in Attachment A and B of this permit. LC50 and C-NOEC are defined in Part II.E. of this permit. The Permittee shall test the daphnid, *Ceriodaphnia dubia*. Toxicity test samples shall be collected during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the DMR submittal that includes the results for that toxicity test.

13. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachment A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

14. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachment A and B.** Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

1. Monitoring and reporting for dissolved organic carbon (DOC) are not requirements of the Whole Effluent Toxicity (WET) tests but are additional requirements. The Permittee may analyze the WET samples for DOC or may collect separate samples for DOC concurrently with WET sampling.

2. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

3. Report in nanograms per gram (ng/g). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter following 6 months after EPA notifies the permittee that an EPA multi-lab validated method for sludge is available.

4. Sludge sampling shall be as representative as possible based on guidance found at https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf.

Part I.A., continued.

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

4. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical, chemical, or biological nature of the bottom.

5. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

6. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

7. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

8. The Permittee must provide adequate notice to EPA-Region 1 and the State of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 CFR Part 122 Appendix A as amended) discharging process water; and

    b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

    c. For purposes of this paragraph, adequate notice shall include information on:

        (1) The quantity and quality of effluent introduced into the POTW; and

        (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

9. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit in accordance with Part II.D.1.e.(1) (24-hour reporting). See Part I.H below for reporting requirements.

2. The Permittee must provide notification to the public within 24 hours of becoming aware of any unauthorized discharge, except SSOs that do not impact a surface water or the public, on a publicly available website, and it shall remain on the website for a minimum of 12 months. Such notification shall include the location and description of the discharge; estimated volume; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue.

3. Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance (O&M) of the sewer system shall be in compliance with the Standard Conditions of Part II and the following terms and conditions. The Permittee shall complete the following activities for the collection system that it owns:

1. Maintenance Staff

The Permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Provisions to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

2. Preventive Maintenance Program

The Permittee shall maintain an ongoing preventive maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. Plans and programs to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

The Permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to

control I/I shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the Permittee shall prepare a map of the sewer collection system it owns. The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;

b. All combined sewer lines, related manholes, and catch basins;

c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);

d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;

e. All pump stations and force mains;

f. The wastewater treatment facility(ies);

g. All surface waters (labeled);

h. Other major appurtenances such as inverted siphons and air release valves;

i. A numbering system that uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j. The scale and a north arrow; and

k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System O&M Plan

The Permittee shall develop, or update, as applicable and implement the Collection System O&M Plan it has previously submitted to EPA and the State. The Plan shall be available for review by federal, state and local agencies as requested. The Plan shall include:

a. A description of the collection system management goals, staffing, information management, and legal authorities;

b. A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and

c. A preventive maintenance and monitoring program for the collection system;

d. Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;

e. Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;

f. Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;

g. A description of the Permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof downspouts;

h. An educational public outreach program for all aspects of I/I control, particularly private inflow; and

i. An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The Permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year, including a quantification of I/I identified and removed;

c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;

d. A map with areas identified for investigation/action in the coming year;

e. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit; and

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's 2.5 MGD design flow (2.0 MGD), or there have been capacity related overflows, the report shall include:

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and

(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the Permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works it owns and operates, as defined in Part II.E.1 of this permit.

E. INDUSTRIAL USERS AND PRETREATMENT PROGRAM

1. The Permittee shall submit to EPA and the State the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432, 447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended) who commences discharge to the facility after the effective date of this permit.

   This reporting requirement also applies to any other IU who is classified as a Significant Industrial User which discharges an average of 25,000 gallons per day or more of process wastewater into the facility (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the facility; or is designated as such by the Control Authority as defined in 40 CFR § 403.3(f) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 CFR § 403.8(f)(6)).

2. In the event that the Permittee receives originals of reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from industrial users subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432-447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended), or from a Significant Industrial User, the Permittee shall forward the originals of these reports within ninety (90) days of their receipt to EPA, and copy the State.

3. Beginning the first full calendar quarter following 6 months after EPA has notified the Permittee that a multi-lab validated method for wastewater is available, the Permittee shall commence annual sampling of the following types of industrial discharges into the POTW:

    - Commercial Car Washes
    - Platers/Metal Finishers
    - Paper and Packaging Manufacturers
    - Tanneries and Leather/Fabric/Carpet Treaters
    - Manufacturers of Parts with Polytetrafluoroethylene (PTFE) or teflon type coatings (i.e. bearings)
    - Landfill Leachate
    - Centralized Waste Treaters
    - Contaminated Sites
    - Fire Fighting Training Facilities
    - Airports
    - Any Other Known or Expected Sources of PFAS

    Sampling shall be for the following PFAS chemicals:

Industrial User Effluent Characteristic	Maximum Daily	Monitoring Requirements	
		Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	Report ng/L	1/year	Composite
Perfluorononanoic acid (PFNA)	Report ng/L	1/year	Composite
Perfluorooctanesulfonic acid (PFOS)	Report ng/L	1/year	Composite
Perfluorooctanoic acid (PFOA)	Report ng/L	1/year	Composite
Perfluoroheptanoic acid (PFHpA)	Report ng/L	1/year	Composite
Perfluorodecanoic acid (PFDA)	Report ng/L	1/year	Composite

    The industrial discharges sampled and the sampling results shall be summarized and submitted to EPA and copy the state as an electronic attachment to the March discharge monitoring report due April 15 of the calendar year following the testing.

F. SLUDGE CONDITIONS

1. The Permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR § 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the Permittee's sludge use and/or disposal practices, the Permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices:

    a. Land application - the use of sewage sludge to condition or fertilize the soil

b. Surface disposal - the placement of sewage sludge in a sludge only landfill

c. Sewage sludge incineration in a sludge only incinerator

4. The requirements of 40 CFR Part 503 do not apply to facilities that dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities that do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR Part 503 requirements include the following elements:

   a. General requirements

   b. Pollutant limitations

   c. Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)

   d. Management practices

   e. Record keeping

   f. Monitoring

   g. Reporting

   The specific 40 CFR Part 503 requirements that are applicable to the Permittee will depend on the use or disposal practice(s) followed and the quality of sludge produced by a facility. The EPA Region 1 guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the Permittee to assist it in determining the applicable requirements.

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year, as follows:

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

   Sampling of the sewage sludge shall use the procedures detailed in 40 CFR § 503.8.

7. Under 40 CFR § 503.9(r), the Permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the Permittee contracts with another "person who prepares sewage

sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the Permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the Permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by February 19 (see also "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

G. SPECIAL CONDITIONS

1. The effluent limit for *E. coli* shall be subject to a schedule of compliance whereby the limit takes effect 12 months after the effective date of the permit. During this first year, the Permittee must comply with interim fecal coliform limits of 200 cfu/100 mL (monthly average) and 400 cfu/100 mL (daily maximum).

2. Total Phosphorus Compliance Schedule

   The effluent limit for total phosphorus, effective from April 1 through October 31, shall be subject to a schedule of compliance whereby the limit takes effect 36 months after the effective date of the permit. For the period starting on the effective date of this permit and ending 36 months after the effective date, the Permittee shall continue to comply with the existing monthly average limit of 0.2 mg/L. The schedule includes one year to evaluate potential treatment process changes (such as chemical addition), one year to implement any process changes necessary to meet the more stringent limit of 0.1 mg/L, and one year to optimize the facility after those changes have been implemented to come into compliance with the new limit. The schedule of compliance is as follows:

   a. Within twelve (12) months of the effective date of the permit, the Permittee shall submit to EPA and MassDEP a status report evaluating the potential treatment process changes (such as chemical addition) necessary to achieve the permit limit.

   b. Within twenty-four (24) months of the effective date of the permit, the Permittee shall complete any process changes necessary to achieve the total phosphorus limit and submit a progress report to EPA and MassDEP detailing these changes.

   c. Within thirty-six (36) months of the effective date of the permit, the Permittee shall complete optimization of the plant and comply with the phosphorus limit. Additionally, the Permittee shall submit a final report that summarizes the process changes and plant optimization efforts.

3. The effluent flow meter installation is subject to a schedule of compliance whereby it shall be operational 12 months after the effective date of the permit. During this first year, the Permittee may continue to report values from the influent flow meter.

H. REPORTING REQUIREMENTS

Unless otherwise specified in this permit, the Permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

   The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and the State electronically using NetDMR no later than the 15th day of the following month. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or the State. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. See Part I.H.6. for more information on State reporting. Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the report due date specified in this permit.

3. Submittal of Biosolids/Sewage Sludge Reports

   By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

4. Submittal of Requests and Reports to EPA Water Division (WD)

   a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

      (1) Transfer of permit notice;

      (2) Request for changes in sampling location;

      (3) Request for reduction in testing frequency;

      (4) Report on unacceptable dilution water / request for alternative dilution water for

WET testing.

(5) Report of new industrial user commencing discharge

(6) Report received from existing industrial user

b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

5. Submittal of Reports to EPA Enforcement and Compliance Assurance Division (ECAD) in Hard Copy Form

a. The following notifications and reports shall be signed and dated originals, submitted as hard copy, with a cover letter describing the submission:

(1) Written notifications required under Part II.B.4.c, for bypasses, and Part II.D.1.e, for sanitary sewer overflows (SSOs). Starting on 21 December 2025, such notifications must be done electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

(2) Collection System Operation and Maintenance Plan

(3) Report on annual activities related to O&M Plan

This information shall be submitted to EPA ECAD at the following address:

U.S. Environmental Protection Agency
Enforcement and Compliance Assurance Division
Water Compliance Section
5 Post Office Square, Suite 100 (04-SMR)
Boston, MA 02109-3912

6. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

7. Verbal Reports and Verbal Notifications

a. Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to the State. This includes verbal reports and notifications that require reporting within 24 hours (e.g., Part II.B.4.c.(2), Part II.B.5.c.(3), and Part II.D.1.e).

b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1510
and
MassDEP Emergency Response at 888-304-1133

I. STATE 401 CERTIFICATION CONDITIONS

1. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, beginning six (6) months after the permittee has been notified by EPA of a multi-lab validated method for wastewater, or two (2) years after the effective date of the 2021 Federal NPDES permit, whichever is earlier, the permittee shall conduct monitoring of the influent, effluent, and sludge for PFAS compounds as detailed in the tables below. If EPA's multi-lab validated method is not available by twenty (20) months after the effective date of the 2021 Federal NPDES permit, the permittee shall contact MassDEP (massdep.npdes@mass.gov) for guidance on an appropriate analytical method. Notwithstanding any other provision of the 2021 Federal NPDES Permit to the contrary, monitoring results shall be reported to MassDEP electronically, at massdep.npdes@mass.gov, or as otherwise specified, within 30 days after they are received.

Influent and Effluent (Outfall 001)

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/L	Quarterly[1]	24-hour Composite
Perfluoroheptanoic acid (PFHpA)	ng/L	Quarterly	24-hour Composite
Perfluorononanoic acid (PFNA)	ng/L	Quarterly	24-hour Composite
Perfluorooctanesulfonic acid (PFOS)	ng/L	Quarterly	24-hour Composite
Perfluorooctanoic acid (PFOA)	ng/L	Quarterly	24-hour Composite
Perfluorodecanoic acid (PFDA)	ng/L	Quarterly	24-hour Composite

Sludge

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/g	Quarterly	Composite[2]
Perfluoroheptanoic acid (PFHpA)	ng/g	Quarterly	Composite
Perfluorononanoic acid (PFNA)	ng/g	Quarterly	Composite
Perfluorooctanesulfonic acid (PFOS)	ng/g	Quarterly	Composite
Perfluorooctanoic acid (PFOA)	ng/g	Quarterly	Composite
Perfluorodecanoic acid (PFDA)	ng/g	Quarterly	Composite

2. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, beginning six (6) months after permittee has been notified by EPA of a multi-lab validated method for wastewater, or two (2) years after the effective date of the 2021 Federal NPDES permit, whichever is earlier, the permittee shall commence annual monitoring of all Significant Industrial Users[3,4] discharging into the POTW. Monitoring shall be in accordance with the table below. If EPA's multi-lab validated method is not available by twenty (20) months after the effective date of the 2021 Federal NPDES permit, the permittee shall contact MassDEP (massdep.npdes@mass.gov) for guidance on an appropriate analytical method. Notwithstanding any other provision of the 2021 Federal NPDES permit to the contrary, monitoring results shall be reported to MassDEP electronically at massdep.npdes@mass.gov within 30 days after they are received.

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/L	Annual	24-hour Composite
Perfluoroheptanoic acid (PFHpA)	ng/L	Annual	24-hour Composite
Perfluorononanoic acid (PFNA)	ng/L	Annual	24-hour Composite
Perfluorooctanesulfonic acid (PFOS)	ng/L	Annual	24-hour Composite
Perfluorooctanoic acid (PFOA)	ng/L	Annual	24-hour Composite
Perfluorodecanoic acid (PFDA)	ng/L	Annual	24-hour Composite

ATTACHMENT A

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcement/water/dmr.html *for further important details on alternate dilution water substitution requests.*

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

ATTACHMENT B

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL

USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25 values and ≥ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value**,** for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

NPDES PART II STANDARD CONDITIONS
(April 26, 2018)[1]

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[1] Updated July 17, 2018 to fix typographical errors.

A. GENERAL REQUIREMENTS

1. Duty to Comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA or Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

a. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

b. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (83 Fed. Reg. 1190-1194 (January 10, 2018) and the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note. See Pub. L.114-74, Section 701 (Nov. 2, 2015)). These requirements help ensure that EPA penalties keep pace with inflation. Under the above-cited 2015 amendments to inflationary adjustment law, EPA must review its statutory civil penalties each year and adjust them as necessary.

(1) Criminal Penalties

(a) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than 2 years, or both.

(b) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

(c) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing

endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(d) *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(2) *Civil Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(3) *Administrative Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty as follows:

(a) *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(b) *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit

condition.

3. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from responsibilities, liabilities or penalties to which the Permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

5. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

6. Confidentiality of Information

a. In accordance with 40 C.F.R. Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or Permittee;
(2) Permit applications, permits, and effluent data.

c. Information required by NPDES application forms provided by the Director under 40 C.F.R. § 122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

7. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The Permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

8. State Authorities

Nothing in Parts 122, 123, or 124 precludes more stringent State regulation of any activity

covered by the regulations in 40 C.F.R. Parts 122, 123, and 124, whether or not under an approved State program.

9. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. *Bypass not exceeding limitations.* The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (c) and (d) of this Section.

c. Notice

(1) *Anticipated bypass*. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass. As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(2) *Unanticipated bypass*. The Permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or required to do so by law.

d. *Prohibition of bypass.*

(1) Bypass is prohibited, and the Director may take enforcement action against a Permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The Permittee submitted notices as required under paragraph 4.c of this Section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 4.d of this Section.

5. Upset

a. *Definition*. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or

improper operation.

b. *Effect of an upset.* An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph B.5.c. of this Section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. *Conditions necessary for a demonstration of upset.* A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the Permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The Permittee submitted notice of the upset as required in paragraph D.1.e.2.b. (24-hour notice).
(4) The Permittee complied with any remedial measures required under B.3. above.

d. *Burden of proof.* In any enforcement proceeding the Permittee seeking to establish the occurrence of an upset has the burden of proof.

C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least 5 years (or longer as required by 40 C.F.R. § 503), the Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

e. The Clean Water Act provides that any person who falsifies, tampers with, or

knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. *Planned Changes*. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 C.F.R. § 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 122.42(a)(1).

(3) The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. *Anticipated noncompliance*. The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. *Transfers.* This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Clean Water Act. *See* 40 C.F.R. § 122.61; in some cases, modification or revocation and reissuance is mandatory.

d. *Monitoring reports*. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices. As of December 21, 2016 all reports and forms submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by State law.

(2) If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 C.F.R. § 136, or another method required for an industry-specific waste stream under 40 C.F.R. Subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. *Twenty-four hour reporting.*

(1) The Permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. A written report shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all

reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. *See* 40 C.F.R. § 122.41(g).
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. *See* 40 C.F.R. § 122.44(g).

(3) The Director may waive the written report on a case-by-case basis for reports under paragraph D.1.e. of this Section if the oral report has been received within 24 hours.

f. *Compliance Schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. *Other noncompliance.* The Permittee shall report all instances of noncompliance not reported under paragraphs D.1.d., D.1.e., and D.1.f. of this Section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph D.1.e. of this Section. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph D.1.e. and the applicable required data in Appendix A to 40 C.F.R. Part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), §122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this Section.

h. *Other information.* Where the Permittee becomes aware that it failed to submit any

relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

i. *Identification of the initial recipient for NPDES electronic reporting data*. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in Appendix A to 40 C.F.R. Part 127) to the appropriate initial recipient, as determined by EPA, and as defined in 40 C.F.R. § 127.2(b). EPA will identify and publish the list of initial recipients on its Web site and in the FEDERAL REGISTER, by state and by NPDES data group (see 40 C.F.R. § 127.2(c) of this Chapter). EPA will update and maintain this listing.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Director shall be signed and certified. *See* 40 C.F.R. §122.22.

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under paragraph A.6. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Director. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

For more definitions related to sludge use and disposal requirements, see EPA Region 1's NPDES Permit Sludge Compliance Guidance document (4 November 1999, modified to add regulatory definitions, April 2018).

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and federal standards and limitations to which a "discharge," a "sewage sludge use or disposal practice," or a related activity is subject under the CWA, including "effluent limitations," water quality standards, standards of performance, toxic effluent standards or prohibitions, "best management practices," pretreatment standards, and "standards for sewage sludge use or disposal" under Sections 301, 302, 303, 304, 306, 307, 308, 403 and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in

"approved States," including any approved modifications or revisions.

Approved program or *approved State* means a State or interstate program which has been approved or authorized by EPA under Part 123.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass see B.4.a.1 above.

C-NOEC or *"Chronic (Long-term Exposure Test) – No Observed Effect Concentration" means* the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 C.F.R. § 501.2, required to have an approved pretreatment program under 40 C.F.R. § 403.8 (a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to 40 C.F.R. § 403.10 (e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. § 122.2, classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director, because of the potential for its sewage sludge use or disposal practice to affect public health and the environment adversely.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483and Public Law 97-117, 33 U.S.C. 1251 *et seq*.

CWA and regulations means the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily Discharge means the "discharge of a pollutant" measured during a calendar day or any

other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Direct Discharge means the "discharge of a pollutant."

Director means the Regional Administrator or an authorized representative. In the case of a permit also issued under Massachusetts' authority, it also refers to the Director of the Division of Watershed Management, Department of Environmental Protection, Commonwealth of Massachusetts.

Discharge

(a) When used without qualification, *discharge* means the "discharge of a pollutant."

(b) As used in the definitions for "interference" and "pass through," *discharge* means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Act.

Discharge Monitoring Report ("DMR") means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by Permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise "effluent limitations."

Environmental Protection Agency ("EPA") means the United States Environmental Protection

Agency.

Grab Sample means an individual sample collected in a period of less than 15 minutes.

Hazardous substance means any substance designated under 40 C.F.R. Part 116 pursuant to Section 311 of CWA.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Indirect discharger means a nondomestic discharger introducing "pollutants" to a "publicly owned treatment works."

Interference means a discharge (see definition above) which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment and disposal.

LC_{50} means the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.

Maximum daily discharge limitation means the highest allowable "daily discharge."

Municipal solid waste landfill (MSWLF) unit means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 C.F.R. § 257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be

publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

Municipality

(a) When used without qualification *municipality* means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of CWA.

(b) As related to sludge use and disposal, *municipality* means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal Agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management Agency under Section 208 of the CWA, as amended. The definition includes a special district created under State law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in Section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program."

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants;"

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source;" and

(d) Which has never received a finally effective NPDES permit for discharges at that "site."

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Director in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Director shall consider the factors specified in 40 C.F.R. §§ 125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System."

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge (see definition above) which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (40 C.F.R § 122.28). "Permit" does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or "proposed permit."

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 C.F.R. § 122.3).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

(except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq*.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train*, 8 E.R.C. 2120 (D.D.C. 1976), *modified* 12 E.R.C. 1833 (D.D.C. 1979)); also listed in Appendix A of 40 C.F.R. Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (b) not a "POTW."

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly owned treatment works (POTW) means a treatment works as defined by Section 212 of the Act, which is owned by a State or municipality (as defined by Section 504(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in Section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary industry category means any industry which is not a "primary industry category."

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 C.F.R. Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does

not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 C.F.R. § 122.2.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substance designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 C.F.R. §§ 110.10 and 117.21) or Section 102 of CERCLA (*see* 40 C.F.R. § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to section 405(d) of the CWA, and is required to obtain a permit under 40 C.F.R. § 122.1(b)(2).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe as defined in the regulations which meets the requirements of 40 C.F.R. § 123.31.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Toxic pollutant means any pollutant listed as toxic under Section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Director may designate any person subject to the standards for sewage sludge use and

disposal in 40 C.F.R. Part 503 as a "treatment works treating domestic sewage," where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 C.F.R. Part 503.

Upset see B.5.a. above.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Waste pile or *pile* means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States or waters of the U.S. means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands;"

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

    (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

    (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

    (3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test.

*Zone of Initial Dilution (*ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards.

2. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)
TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont.	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen

kg/day	Kilograms per day
lbs/day	Pounds per day
mg/L	Milligram(s) per liter
mL/L	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
Surfactant	Surface-active agent
Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
µg/L	Microgram(s) per liter
WET	"Whole effluent toxicity"
ZID	Zone of Initial Dilution

RESPONSE TO COMMENTS
NPDES PERMIT NO. MA0101923
ROCKLAND WASTEWATER TREATMENT PLANT
ROCKLAND, MASSACHUSETTS

The U.S. Environmental Protection Agency's New England Region (EPA) is issuing a Final National Pollutant Discharge Elimination System (NPDES) Permit for the Rockland Wastewater Treatment Plant (WWTP) located in Rockland, Massachusetts. This permit is being issued under the Federal Clean Water Act (CWA), 33 U.S.C., §§ 1251 *et seq.*

In accordance with the provisions of 40 Code of Federal Regulations (CFR) §124.17, this document presents EPA's responses to comments received on the Draft NPDES Permit # MA0101923 ("Draft Permit"). The Response to Comments explains and supports EPA's determinations that form the basis of the Final Permit. From August 25, 2021 through September 23, 2021, EPA solicited public comments on the Draft Permit.

EPA received comments from:

- Town of Rockland, dated September 23, 2021

Although EPA's knowledge of the facility has benefited from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit that warranted a reopening of the public comment period. EPA does, however, make certain clarifications and changes in response to comments. These are explained in this document and reflected in the Final Permit. Below EPA provides a summary of the changes made in the Final Permit. The analyses underlying these changes are contained in the responses to individual comments that follow.

A copy of the Final Permit and this response to comments document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the Final Permit may be also obtained by writing or calling Doug MacLean, U.S. EPA, 5 Post Office Square, Suite 100 (Mail Code: 06-4), Boston, MA 02109-3912; Telephone: (617) 918-1608; Email maclean.douglas@epa.gov.

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I. Summary of Changes to the Final Permit

1. A compliance schedule has been added in section I.G.3 of the Final Permit for installation of an effluent flow meter. See Response 3.
2. The TRC language in Footnote 7 of Part I.A.1 of the Final Permit has been adjusted to account for chlorine grab sampling when necessary and to require that each grab samples shall be taken at least 2 hours from the previous grab sample. See Response 5.
3. Pretreatment language in section I.E of the permit has been revised to no longer require a pretreatment program. Attachments C & D have also been removed from the Final Permit. See Response 11.

II. Responses to Comments

Comments are reproduced below as received; they have not been edited.

A. Comments from Keith Nastasia, Sewer Superintendent, Town of Rockland:

Comment 1

As the permittee of the aforementioned NPDES permit, the Town of Rockland has reviewed the Draft NPDES permit for the Rockland Wastewater Treatment Plant (WWTP). The Draft NPDES Permit includes a number of items of concern to us, which we question, and that we believe should not be changed, or which require additional explanation and justification from EPA. The changes in question are summarized as follows:

1. The plant flow characteristics are requested to be reported as rolling average, to be consistent with other communities that discharge to South Coastal Basin (page 2 of 20 of the draft permit).

2. The "Effluent Flow" term (on page 2 of 20) is requested to be changed to plant flow.

3. Objection to the lowering of the Total Aluminum limit to 87.2 ug/L mg/I (as described on page 2 of 20).

4. Language adjustment to match previous permit foot notes related to Total Chlorine Residual (page 7 of 20).

5. Objection to the lowering of the Total Phosphorous summer season limit to 0.1 mg/I, as described on page 3 of 20 of the draft permit.

6. Comment on the new requirement to sample for and report levels of PFAS compounds (including PFHxS, PFHpA, PFNA, PFOS, PFOA and PFDA), as described on pages 8 of 20 of the draft permit.

7. Adjustment to Unauthorized Discharges public posting to Town website, as discussed on page 10 of 20 of the draft permit.

8. Comment on new provisions related to the Operation and Maintenance of the sewer system, as described on pages 1 O and 11 of 20 of the draft permit.

9. Request for change to Collection System Mapping verbiage on page 11 of 20.

10. Industrial Facilities correction, affecting the Industrial Pretreatment Program requirement

Response 1

EPA acknowledges this comment and will respond to each individual point (1-10) as they are raised in more detail in the comments below.

Comment 2

Item 1 - Flow Reporting: With the new permit, it is respectfully requested that flows are to be reported as rolling monthly averages to be consistent with NPDES permits for other Massachusetts communities. The modification to using a monthly flow limit was made in the prior permit, and the Town requests the standard language be restored to the permit for flow.

Response 2

In 2007, EPA issued a permit modification to change flow monitoring from a 12-month rolling average to a monthly average, in response to Administrative Order Docket 06-33 ("the Order" or "the AO"). As stated, section II.A of the Statement of Basis for Rockland's 2007 Permit Modification, "EPA proposes to withdraw the annual average flow limit and reissue the condition as an average monthly limit of 2.5 MGD in order to more closely track the Town's efforts to reduce extraneous flows to its collection system. This change is also consistent with a request made by the Town during settlement negotiations that the rolling annual average limit be replaced with a monthly average limit."

The Rockland WWTP had 28 monthly average flow violations in the 60-month review period used for this permit reissuance (June 2016 – July 2021). This frequency of violations is consistent with the review period used during Rockland's 2006 permit renewal, when Rockland had flow violations in 16 out of 36 months, from January 2003 through December 2005. These continued flow violations indicate that Rockland has not made meaningful progress on resolving effluent flow issues and continues to need to be monitored more closely via a monthly effluent flow limit.

The comment does not provide a rationale for the requested change to a rolling annual average flow limit, other than noting that it would be consistent with NPDES permits for other Massachusetts communities. EPA acknowledges that many other Massachusetts dischargers have rolling annual average limits but considers the unique background and existing AO described above to justify the continuance of a monthly average limit in this case. Given the lack of improvement seen in effluent flow, EPA does not see a reason to change the approach adopted in 2007, and the effluent flow limit will remain as a monthly average limit in the Final Permit.

Comment 3

Item 2 -Effluent Flow: The draft permit refers to Effluent Flow in the permit limits. The Rockland I/WI/TP currently does not have an effluent flow meter, so this term is not accurate. The Town respectfully requests that the term be changed to "FLOW", as was included in the prior permit.

Response 3

EPA clarifies that influent flow and effluent flow, while related, are not identical. Flow is listed as an "Effluent Characteristic" in the permit and effluent flow must be measured. As stated in the Fact Sheet at 8,

> "…EPA uses effluent flow both to determine whether an NPDES permit needs certain effluent limitations and to calculate the limitations themselves. EPA practice is to use effluent flow as a reasonable and important worst-case condition in EPA's reasonable potential and WQBEL calculations to ensure compliance with WQSs under § 301(b)(1)(C). Should the effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be reduced, and the calculated effluent limitations may not be sufficiently protective (i.e., might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. To ensure that the assumptions underlying EPA's reasonable potential analyses and permit effluent limitation derivations remain sound for the duration of the permit, EPA may ensure the validity of its "worst-case" wastewater effluent flow assumptions through imposition of permit conditions for effluent flow. In this regard, the effluent flow limitation is a component of WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit is also necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs."

EPA notes the absence of sludge and particulate matter in effluent is going to make effluent flow different than influent. In general, effluent flow is lower than influent flow, and as such, measuring effluent flow may help the Facility with its effluent flow compliance issues. As effluent flow is the regulated pollutant, it must be measured directly by the Facility, and the Facility will need to install an effluent flow meter.

Based on the comment, it is clear that the Facility does not have an effluent flow meter and will need time to acquire and install one. As such, a 12-month compliance schedule for installation of an effluent flow meter has been included in the Final Permit, section I.G.3.

Comment 4

Item 3 -Aluminum: The Total Aluminum limit has been modified from 88 ug/L to 87.2 ug/L. It should be noted that Fact Sheet references that effluent concentrations for aluminum are well below permit limits. The data suggests that there is no reasonable potential to exceed the current

limit (or the proposed limit). The apparent lack of reasonable potential suggests that this aluminum limit be eliminated from the permit.

Moreover, the Town disagrees with the need to lower the Total Aluminum limit when the facility consistently produces high quality effluent with no history of total Aluminum exceedances. Additionally, these arbitrary Total Aluminum limits are inconsistent with Massachusetts' proposed Surface Water Quality Standards (SWQS), which include a chronic criterion of 460 ug/L for the South Coastal Basin. As such, the resulting calculated (and appropriate) limits for aluminum will increase, further reinforcing the lack of reasonable potential for the plant effluent to cause an exceedance. EPA has not substantiated that aluminum is a water quality concern in the receiving water, and the proposed Massachusetts standards reinforce the position that no specific limit is needed.

We request that the Total Aluminum limit be removed from the permit. If the limit is retained, the 88 ug/1 within the current permit should not be reduced.

Response 4

The total aluminum limit in the Draft Permit is a water quality-based effluent limitation that reflects the Massachusetts Surface Water Quality Standards (SWQS) that are currently in effect for the purpose of NPDES permitting. MassDEP promulgated final revised SWQS, including revised aluminum criteria, on November 12, 2021. However, the revised SWQS still need to go through the EPA review and approval process before they can be used in NPDES permits. The SWQS that are in effect for the purpose of NPDES permitting at 314 CMR Section 4.05(e) use the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002 as a basis for allowable receiving water concentrations not enumerated in previous sections of the chapter. According to the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002, the acute and chronic criteria for total aluminum in freshwater are 87 µg/L and 750 µg/L currently.

EPA is obligated pursuant to 40 CFR § 122.44(d) to include any effluent limit in a permit that is necessary to comply with the water quality standards (WQSs) that are in effect at the time the permit is issued. If there is a reasonable potential to violate WQSs, then pursuant to 40 CFR § 122.44(d) an effluent limitation is "necessary," and EPA is obligated to include a limit in the permit. EPA does not forestall permit issuance, pending development, submission and approval of revised WQS, particularly where, as here, the previous permit has long since expired. To do so would subject the permitting process to significant delay and uncertainty. The criteria development and adoption process often take years. The Massachusetts' WQS now in effect require that EPA base effluent limitations for metals on the criteria published in the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002, unless site-specific criteria are established or MassDEP determines that natural background concentrations are higher than the criteria (314 CMR § 4.05(5)(e)). MassDEP has not issued site-specific aluminum criteria for the French River or determined that natural background concentrations are higher than the current aluminum criteria.

Based on the reasons described above, the aluminum limit is necessary and will remain in the Final Permit. Once the Massachusetts Water Quality Standard revisions are approved by EPA, the Permittee may request a permit modification or permit reissuance to reevaluate the aluminum limit. EPA notes that because the existing aluminum limit is already effective, any future reevaluation must be consistent with anti-backsliding provisions found at CWA §§ 402(o) and 303(d)(4) and the Massachusetts antidegradation provisions found at 314 CMR 4.04.

Regarding the portion of the comment related to reasonable potential, the new limit was not set based on actual discharges from the Facility, but rather based on testing the adequacy of the limit from the 2006 Permit to continue to protect water quality standards. As stated in Fact Sheet section 5.1.11.2, "For any metal with an existing limit in the 2006 Permit, the same mass balance equation is used to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (Cd) allowable to meet WQS based on current conditions." If the facility were to discharge at the 2006 Permit limit of 88 µg/L under critical conditions, EPA determined that water quality violations may occur (as shown in Fact Sheet Appendix B). As such, the limit was lowered to a level where, should discharges occur at the new limit, water quality standards would be maintained.

This approach is further justified in Appendix B of the Fact Sheet, which stated the following:

> For any pollutant(s) with an existing WQBEL, EPA notes that the analysis described in 40 CFR § 122.44(d)(1)(i) has already been conducted in a previous permitting action demonstrating that there is reasonable potential to cause or contribute to an excursion of WQS. Given that the permit already contains a WQBEL based on the prior analysis and the pollutant(s) continue to be discharged from the facility, EPA has determined that there is still reasonable potential for the discharge of this pollutant(s) to cause or contribute to an excursion of WQS. Therefore, the WQBEL will be carried forward unless it is determined that a more stringent WQBEL is necessary to continue to protect WQS or that a less stringent WQBEL is allowable based on anti-backsliding regulations at CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). For these pollutant(s), if any, the mass balance calculation is not used to determine whether there is reasonable potential to cause or contribute to an excursion of WQS, but rather is used to determine whether the existing limit needs to be more stringent to continue to protect WQS.
>
> From a technical standpoint, when a pollutant is already being controlled because of a previously established WQBEL, EPA has determined that it is not appropriate to use new effluent data to reevaluate the need for the existing limit because the reasonable potential to cause or contribute to an excursion of WQS for the uncontrolled discharge was already established in a previous permit. If EPA were to conduct such an evaluation and find no reasonable potential for the controlled discharge to cause or contribute to an excursion of WQS, that finding

could be interpreted to suggest that the effluent limit should be removed. However, the new permit without the effluent limit would imply that existing controls are unnecessary, that controls could be removed and then the pollutant concentration could rise to a level where there is, once again, reasonable potential for the discharge to cause or contribute to an excursion of WQS. This could result in an illogical cycle of applying and removing pollutant controls with each permit reissuance. EPA's technical approach on this issue is in keeping with the Act generally and the NPDES regulations specifically, which reflect a precautionary approach to controlling pollutant discharges.

This comment does not result in any changes to the Final Permit.

Comment 5

Item 4 - Total Chlorine Residual: The existing permit has appropriate comments related to the effluent characteristic for Total Residual Chlorine which were not carried forward to this draft. It is requested that the following two statements be included from the previous permit language:

- "The permittee shall substitute three TRC grab samples per day, for any day that they are unable to comply with the continuous recording requirement."

- "For effluent limitations less than 20 ug/1, compliance/non-compliance will be determined based on the ML. Sample results of 20 ug/1 or less shall be reported as zero on the discharge monitoring report."

Response 5

Regarding the first statement, EPA agrees that this provision is appropriate to ensure TRC data is collected even when continuous monitoring equipment is not functioning properly. Therefore, the Final Permit has been revised to include the requested provision, "The permittee shall substitute three TRC grab samples per day, for any day that they are unable to comply with the continuous recording requirement."

Additionally, to ensure the three grab samples are representative of the discharge throughout the day, EPA has also included a requirement that each grab sample shall be taken at least 2 hours from the previous grab sample.

Regarding the second statement, the permit will not be changed. In section I.A of the Final Permit:

-Footnote 2 states, "In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part

136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.

-Footnote 3 states, "When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter"

-Footnote 7 states "The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges that have been previously chlorinated or that contain residual chlorine. The compliance level for TRC is 20 µg/L."

These three footnotes combine to say that the required ML for TRC testing is 20 µg/L, and that any reading below 20 µg/L should be reported as less than the ML (e.g., "< 20 µg/L" if the ML is 20 µg/L).

This second part of the comment does not result in any change to the Final Permit.

Comment 6

Item 5 – Phosphorus: The existing permit has a summer season Phosphorous limit of 0.2 mg/L. The draft permit proposes lowering this seasonal limit to 0.1 mg/L (100 ug/L). The Rockland WWTP consistently achieves a phosphorus effluent concentration within the 0.2 mg/L limit, yet a further reduction of the limit will result in a need for significant changes to the WWTP. The fact sheet does not provide specific information related to water quality impacts in the French Stream or South Coastal Basin related to phosphorus. We respectfully request that the summer season Phosphorous limit remain at 0.2 mg/L.

If the proposed lower phosphorus limit is retained in the new permit, the Town will require a longer period to implement this change efficiently. Under Section G., Special Conditions (on page 17 of 20 of the draft permit), a compliance schedule tor Total Phosphorus is provided with a total of thirty-six (36) months. We respectfully request that these periods be extended to forty-eight (48) months, with the specific milestones adjusted to fifteen (15) months, thirty-six (36) months, and forty-eight (48) months, respectively.

Response 6

The justification for a phosphorus limit of 0.1 mg/L is presented in Fact Sheet section 5.10.1.2, and the calculations are presented in Fact Sheet Appendix B. Within the justification for the new limit is the following passage,

> "EPA's 1986 Quality Criteria for Water (the "Gold Book") recommends maximum threshold concentrations that are designed to prevent or control adverse nutrient-related impacts from occurring. Specifically, the Gold Book recommends in-stream phosphorus concentrations of no greater than 0.05 mg/L in any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharging directly to lakes or impoundments, and 0.025 mg/L within a lake or reservoir. For this segment of the French Stream, 0.1 mg/L would apply downstream of the discharge."

Using this instream target, EPA conducted an analysis to determine whether a more stringent effluent limit would be necessary to ensure that the discharge does not cause or contribute to an excursion of Water Quality Standards (WQS). Given the lack of available dilution under critical low flow conditions (*i.e.*, dilution factor of 1.05), it was determined that the limit of 0.1 mg/L is necessary to continue to protect WQS in the receiving water.

Regarding the length of the compliance schedule, EPA agrees with the comment that there may be multiple pathways to achieve compliance and some of those pathways are achievable within 36 months whereas other pathways may take a longer time. EPA notes that a compliance schedule in a permit must comply with 40 CFR § 122.47(a) and (a)(1) which indicates that a permitting authority must make a reasonable determination that a schedule of compliance is "appropriate" and that the schedule proposed requires compliance "as soon as possible." Given the potential for compliance within 36 months through chemical addition, any extension of the schedule would not ensure that the schedule requires compliance "as soon as possible." Therefore, the compliance schedule in the Final Permit has not been changed. However, if the Permittee is unable to comply with the limit once it becomes effective, they may contact EPA's Enforcement and Compliance Assurance Division (ECAD) to discuss a potential administrative order with additional time to achieve the phosphorus limit through alternate means.

Comment 7

Item 6- PFAS: The draft permit includes additional requirements to sample for and report on per- and poly-fluoroalkyl substances (PFAS) in influent flow, effluent flow and sludge from the WWTP. As indicated in the fact sheet. an approved test for wastewater PFAS testing has yet to be developed. It is well known that PFAS components are present in the environment, but WWTPs should not be the target of enforcement. We support the need for limiting PFAS compounds in consumer goods and industrial uses. We understand that testing industrial users likely to contribute PFAS may be needed eventually. The Town of Rockland supports the need to provide for legislation to remove these components from commerce as the primary method of reducing the presence of these compounds in our environment.

The impacts of this monitoring requirement will be significant for all WWTPs. One of the major concerns with this monitoring requirement is the impact on sludge disposal. Once PFAS is demonstrated to be in wastewater sludge, the ability to properly dispose of sludge from not only this WWTP, but all Massachusetts WWTPs may be severely compromised. The number of facilities that can properly dispose of PFAS compounds is severely limited and will result in a significant cost increase for sludge disposal for all facilities (if they can get a contract for disposal). If facilities are not able to dispose of sludge in a timely manner, the environmental (and potential public health) impacts of stockpiling sludge on-site will be significant.

We respectfully request that the PFAS monitoring requirement be removed from the NPDES permit and that the focus of legislation related to PFAS be on removal from consumer products and industrial uses. At such time as those most important provisions are in place, a more

reasonable approach to addressing the presence of PFAS compounds in wastewater may be appropriate.

Response 7

EPA has broad authority under the CWA and NPDES regulations to prescribe the collection of data and reporting requirements in NPDES Permits. See, e.g., CWA § 308. As discussed in the Fact Sheet at 37-39, the purpose of this monitoring and reporting requirement is "to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits on a facility-specific basis." These permitting decisions may include whether there is reasonable potential to cause or contribute to a violation of the State water quality standards in the next permit reissuance, and if there is, to inform the development of numeric effluent limits or pollutant minimization practices, or some combination.

EPA notes that the concern regarding PFAS is a much broader issue than the scope of this NPDES permit. EPA is working to address PFAS, including source reduction, as outlined in EPA's 2019 PFAS Action Plan and the 2020 PFAS Action Plan Update[1]. Much work still needs to be done beyond the scope of this permit related to studying the impact to the environment, the impact to human health, and addressing source control of PFAS compounds. EPA agrees that reducing the source of PFAS is a necessary aspect of addressing the overall environmental impact, but not the only aspect. Given that PFAS has been in use since the 1940s and has been used in a wide array of consumer and industrial products, source reduction will not fully resolve the persistent impact of PFAS chemicals already in the environment. Therefore, in addition to source reduction EPA must also assess the potential environmental impact where PFAS may accumulate, such as at WWTFs.

The comment that sludge disposal costs may increase or that the ability to dispose of sludge may be compromised based on PFAS monitoring is speculative. The comment seems to suggest that as long as PFAS is not demonstrated to be in sludge then the Permittee can continue to dispose of the sludge as if it does not contain PFAS regardless of any potential impact to the environment in order to avoid potential risks associated with stockpiling sludge on-site. EPA agrees that stockpiling sludge on-site is not appropriate but notes that simply ignoring the likely presence of PFAS contamination in sludge is also not appropriate. Rather, EPA confirms that PFAS monitoring is necessary to better understand the level of PFAS in sludge and that this data should be used to inform future decisions regarding appropriate sludge disposal practices.

There are no changes to the Final Permit as a result of this comment.

Comment 8

Item 7 -Unauthorized Discharges: The draft permit discusses that any unauthorized discharges are to be posted on a publicly available website and that this information shall remain on the

[1] Available at https://www.epa.gov/pfas/epas-pfas-action-plan.

website for a minimum of 12 months. The Town respectfully requests to have this posting adjusted to a minimum of 3 months.

Response 8

EPA considers a minimum of 12 months to be reasonable to ensure that the public has open access to a full year of unauthorized discharge postings, to track such discharges over the full range of seasonal flow variations that occur each year. Given that the Town did not provide any rationale for this request, there are no changes to the Final Permit as a result of this comment.

Comment 9

Item 8 -Operation and Maintenance of the Sewer System:
The draft permit includes new provisions related to the operation and maintenance of the sewer system. The Town and its operations contractor have a current system in place to operate and maintain, and on occasion improve its wastewater collection system. These provisions are governed sufficiently by Massachusetts regulations and good practice, which have historically proven sufficient to meet the public interests. In fact, many of the required elements are already part of the necessary compliance with 314 CMR 12.00 (Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers), making the permit conditions redundant. Additional regulation of the system operations is not needed within the NPDES permit. We request that these redundant provisions be removed from the final permit.

Response 9

It is common for state regulations and federal regulations to have a certain level of overlap. Any overlapping requirements between Massachusetts' regulations and EPA's permit requirements should be easy to accomplish since the Town has presumably met those requirements already. To the extent the Permittee must update or amend its Operation and Maintenance (O&M) Plan to comply with the permit requirements, EPA suggests that the facility have a single O&M Plan that complies with all state and federal regulations in order to avoid any redundancy that may occur by having one plan that complies with state requirements and a separate plan that complies with federal regulations.

There are no changes to the Final Permit as a result of this comment.

Comment 10

Item 9 -Collection System Mapping: The Town respectfully requests that the second to last sentence of Section C.4 -Collection System (page 11 of 20) is adjusted to the following: 'The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies for review by federal, state, or local agencies, and not available for public access/viewing". This change will allow consistency with security provisions of the federal Infrastructure Protection acts.

Response 10

The provision at I.C.4 of the permit states "The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies." The comment requests the addition of "and not available for public access/viewing." EPA notes that the provision, as written in the Draft Permit, does not require the Permittee to make the map available to the public. Therefore, no change to the Final Permit is necessary as a result of this comment.

Comment 11

Item 10 -Industrial Facilities: There has been a local change in Industrial Users of the Rockland sewer system. It is noted that under Section 3.1, Location and Type of Facility (on page 11 of 37 of the Fact Sheet), the third paragraph refers to a no longer existent Significant User. There are now zero Significant Industrial Users in the Rockland system. Serano, Inc. closed their pretreatment facility operations in July 2011, and moved all research laboratories to a new facility in Billerica, MA.

Response 11

EPA acknowledges that the only Significant Industrial User is no longer in operation in Rockland. Based on this, the Permittee is no longer required to have a pretreatment program and the language in section I.E of the Final Permit no longer includes the pretreatment program requirement. Attachments C and D have also been removed from the Final Permit.

Although this requirement has been removed from the Final Permit, EPA encourages the Town to maintain a pretreatment program. In the event new users come into the area, the Town will already have the mechanisms in place to accommodate such industries without needing to reinitiate a pretreatment program. To maintain the program while there are no current industrial users, all the Town will need to do is submit a brief annual report stating there are no industrial users in the system.

Comment 12

The Town of Rockland is currently engaged in planning for the future of its wastewater collection and treatment systems. As part of these studies, the possibility has been identified of a need for more discharge capacity at the WWTP. The Town would like to engage EPA and DEP in a discussion related to the most appropriate method to address the capacity needs, including the possibility of a future permit change.

The Town of Rockland is committed to being a partner in protecting public health and the environment through proper support of the local and regional wastewater treatment works. We urge EPA to consider these comments and make the revisions to the permit requested herein.

We are available to discuss these comments at your convenience.

Response 12

As written in Fact Sheet Section 5.1.1, "EPA issued Administrative Order, Docket No. 06-33 ("2006 AO"), to the Town on September 29, 2006, in response to violations of

flow limitations in the 2006 Permit and a previous NPDES permit, issued in 1999." Section IV.3 of the Order states:

"The Plan shall, at a minimum, include:

a. An itemized listing of the recommendations contained in any infiltration/inflow, sewer system evaluation survey, wastewater collection or treatment system capacity evaluation, or wastewater collection system ("Collection System") maintenance report prepared by, or on behalf of, the Town since January 1, 1995 and the status of the Town's implementation of each of the recommendations contained in the reports, including the date that the recommendation was implemented;

b. The Town's rationale for not implementing any specific recommendation contained in the above-referenced reports. For those recommendations that will be implemented in the future, the Town must provide a schedule for the recommendation's implementation;

c. A flow monitoring plan including an implementation schedule that assesses the effectiveness of the Town's completed sewer rehabilitation efforts;

d. The specific recommendations of the May, 2006 "Draft Town of Rockland, Massachusetts Infiltration and Inflow Control Plan" (the "Draft Report") prepared by Metcalf & Eddy that will be implemented by the Town. If the Town chooses not to implement a specific recommendation of the Draft Report, the Town must provide its rationale for the decision not to implement the recommendation. For those recommendations that will be implemented in the future, the Town shall provide a schedule for their implementation and estimate the capital and operation and maintenance costs associated with their implementation;

e. Provisions and a schedule for the development and implementation of an enforceable program for eliminating sump pump and roof leader connections from the Collection System that is based upon flow contributions to the Collection System;

f. Identification of the ten (10) largest water users located within the Town and measures that the Town will implement to encourage water use audits and conservation measures at these facilities; and

g. Provisions and a schedule for the implementation of additional infiltration/inflow controls and water conservation/reuse programs, as necessary, to achieve compliance with the Flow limits in the NPDES permit."

Given that the directives in the AO repeatedly mentioned Infiltration/Inflow, it is clear that EPA intended the Town to reduce Infiltration/Inflow as a means of meeting its NPDES permit limit for design flow.

Additionally, EPA notes that adjusting the effluent flow limit in the permit must be based on an actual increase in the design flow capacity of the facility as well as the completion of an antidegradation study that evaluates potential impacts to the receiving water of an increase in effluent flow. Due to effluent limits being based on design flow, and the potential need to maintain mass loads for pollutants such as phosphorus, a flow increase may result in a decrease in the Facility's dilution factor and a subsequent tightening of effluent limits. The Facility needs to consider this possibility and be prepared to meet the new, lower pollutant limits, before seriously engaging in plans to expand design flow. If the Facility still desires a higher design flow after considering and in combination with legitimate efforts to reduce I/I in accordance with the AO, EPA recommends developing a basis for the request, and working with MassDEP to conduct an antidegradation review. Relevant antidegradation provisions are discussed in Section 2.2.2 of the Fact Sheet. EPA can discuss these requirements in greater detail when the Town is ready to do so.

This comment results in no changes to the Final Permit.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1

IN THE MATTER OF	)	**DOCKET NO. CWA-AO-R01-FY22-05**
	)	
Town of Rockland, Massachusetts	)	**FINDINGS OF VIOLATION**
NPDES Permit No. MA0101923	)	
	)	**AND**
Proceedings Under Sections 308(a) and	)	
309(a)(3) of the Clean Water Act,	)	**ORDER FOR COMPLIANCE**
33 U.S.C. §§ 1318(a) and 1319(a)(3)	)	
	)	

STATUTORY AUTHORITY

The following FINDINGS are made, and ORDER issued pursuant to Section 308(a) and Section 309(a)(3) of the Clean Water Act, (the "Act"), 33 U.S.C. §§ 1318, 1319(a)(3). Section 309(a)(3) of the Act grants the Administrator of the U.S. Environmental Protection Agency ("EPA") the authority to issue orders requiring persons to comply with Sections 301, 302, 306, 307, 308, 318 and 405 of the Act and any permit condition or limitation implementing any of such sections in a National Pollutant Discharge Elimination System ("NPDES") permit, issued under Section 402 of the Act, 33 U.S.C. § 1342. Section 308(a) of the Act, 33 U.S.C. § 1318(a), authorizes EPA to require the submission of any information required to carry out the objectives of the Act. These authorities have been delegated to the EPA Region 1 Administrator, and, in turn, to the EPA, Region 1 Director of the Enforcement and Compliance Assurance Division (the "Director").

The Order herein is based on findings of violation of Section 301(a) of the Act, 33 U.S.C. § 1311(a), and the conditions of NPDES Permit No. MA0101923. Pursuant to Section 309(a)(5)(A) of the Act, 33 U.S.C. § 1319(a)(5)(A), the Order provides a schedule for compliance that the Director has determined to be reasonable.

DEFINITIONS

Unless otherwise defined herein, terms used in this Order shall have the meaning given to those terms in the Act, 33 U.S.C. §§ 1251 *et seq.,* and the regulations promulgated thereunder, and any applicable NPDES permit. For the purposes of this Order, "NPDES Permit" means the Town of Rockland's NPDES Permit, No. MA0101923, and all amendments or modifications thereto, and renewals thereof, as are applicable and in effect at the time. This Order shall remain in effect should the Town obtain coverage under the NPDES General Permit for Medium Wastewater Treatment Facilities (WWTFs) in Massachusetts ("Medium WWTF GP MAG590000"), in which case "NPDES Permit" shall refer to Medium WWTF GP MAG590038.

FINDINGS

The Director makes the following findings of fact:

1. The Town of Rockland, Massachusetts (the "Town") is a municipality, as defined in section 502(4) of the Act, 33 U.S.C. § 1362(4), established under the laws of the Commonwealth of Massachusetts, and, therefore, a "person" under Section 502(5) of the Act, 33 U.S.C. § 1362(5).
2. The Town is the owner and operator of a Publicly Owned Treatment Works ("POTW"), which includes a wastewater collection system ("Collection System") consisting of sewerage conveyance pipelines, pump stations, and a Wastewater Treatment Facility ("WWTF") from which pollutants, as defined in Section 502(6) and (12) of the Act, 33 U.S.C. §§ 1362(6) and (12), are discharged to waters of the United States.as described in Section 502(7) of the Act, 33 U.S.C. § 1362(7), from outfall serial number 001, which is a "point source" as defined in Section 502(14) of the Act, 33 U.S.C. § 1362(14).
3. Section 301(a) of the Act, 33 U.S.C. §1311(a), makes unlawful the discharge of

pollutants to waters of the United States except in compliance with, among other things, the terms and conditions of a NPDES permit issued pursuant to Section 402 of the Act, 33 U.S.C. §1342.

4. On January 26, 2006, the Town was issued NPDES Permit No. MA0101923 by the Director of the Water Division (formerly Office of Ecosystem Protection) of EPA, Region I, under the authority given to the Administrator of EPA by Section 402 of the Clean Water Act, 33 U.S.C. §1342. This authority has been delegated by the administrator of EPA to the Regional Administrator of EPA, Region 1 and, in turn, to the Director of the Water Division. On February 15, 2007, EPA issued a modification to the NPDES Permit that changed the permitted flow limitation from a 12-month rolling average of 2.5 million gallons per day (MGD) to a monthly average limitation of 2.5 MGD ("2007 Permit Modification").

5. The NPDES Permit was reissued on November 29, 2021, with an effective date of February 1, 2022. The flow limitations in the reissued permit are unchanged from the previous permit.

6. Part I.A.1 of the NPDES Permit establishes effluent limitations and monitoring requirements for the discharge of treated effluent from outfall serial number 001.

7. The NPDES Permit authorizes the Town to discharge pollutants, including Ammonia Nitrogen and Total Suspended Solids (TSS), from outfall serial number 001.
The NPDES Permit also establishes a flow volume and Whole Effluent Toxicity limits while discharging from the POTW to French Stream.

8. On September 29, 2006, EPA issued Administrative Order Docket No. 06-33 ("2006 AO") to the Town in response to violations of Total Suspended Solids (TSS) and flow limitations in Part I.A.1 of the NPDES permit.

9. In response to the 2006 AO, the Town submitted a "Plan for Compliance" on February 12, 2007 that included: summaries of previously conducted sewer system studies; a description of plans to remove additional sources of inflow and infiltration ("I/I"); an annual flow monitoring plan to assess the effectiveness of sewer rehabilitation efforts; a listing of specific tasks to be conducted, based on a May 2006 draft I/I plan, including a sump pump identification and removal program and implementation of an August 2006 sewer connection moratorium.

10. The Permittee has continued to discharge wastewater volumes that exceeded the monthly average flow limitation of 2.5 MGD in Part I.A.1 of the NPDES Permit. Over the five-year period, from June 1, 2017, to May 31, 2022, the Permittee violated the monthly average flow limitation for 32 of 60 months. During this same period, the Town also violated its daily maximum and weekly average limitations for Ammonia Nitrogen for three months, its Whole Effluent Toxicity limitations for three months and its TSS limitations for one month. A summary of NPDES permit violations is attached (Enclosure 1).

11. On April 29, 2021, EPA issued a Request for Information under Section 308 of the CWA requiring the submission of information regarding actions that the Town had taken since 2006 to identify and remove I/I that enters the Town's Collection System.

12. The Town developed a High Flows Management Plan (HFMP) in 1999 (updated in 2016) that identifies actions to be taken at the WWTF and associated pumping stations in the

event of high flows. The HFMP describes procedures to divert high flows into excess process tanks and divert these flows to the outfall when the storage capacity of these tanks is exceeded.

13. On May 19, 2021, the Town of Rockland Sewer Commission established a New Connection Moratorium that became effective on July 1, 2021.

14. The average flow for 2020 was 2.4 MGD. The Town of Rockland Infiltration and Inflow Control Plan Summary Report for Calendar Year 2020 (January 2021) ("I/I Annual Report") estimated that approximately 1.3 MGD of this flow, or approximately 54 percent, is comprised of infiltration to the sewer system. I/I reports for previous years indicate comparable contributions of infiltration into the sewer system.

15. In September 2021, AECOM, a consultant to the Town, completed a Sewer System Evaluation Survey ("2021 SSES") that identified and recommended specific pipe segments and service connections for rehabilitation.

16. The 2021 SSES identified approximately 219,000 gallons per day (gpd) of infiltration to the collection system from main pipelines, manholes, and lateral connections could be cost-effectively removed.

17. The Town has also provided to EPA a copy of a draft "Agreement between the Town of Rockland, Massachusetts and Wright-Pierce for Comprehensive Wastewater Management Plan ("CWMP")" which includes as Exhibit B a "Scope of Services (SOS)/Plan of Study (POS)" ("CWMP Scope of Services").

ORDER

Accordingly, pursuant to Sections 308 and 309(a)(3) of the Act, it is hereby ordered that:

18. By August 1, 2022, the Town shall submit a plan and schedule to EPA and Massachusetts Department of Environmental Protection ("MassDEP") to implement either the work described in the "Summary" section of the 2021 SSES or an alternative plan designed to remove at least the quantity of I/I identified in the "Summary" section of the 2021 SSES ("I/I Removal Plan"). The Town shall implement the I/I Removal Plan upon submission to EPA, subject to modifications pursuant to any comments provided by EPA.

19. By September 1, 2022, the Town shall develop and submit to EPA and MassDEP an updated CWMP Scope of Services which includes an evaluation of alternatives to ensure its compliance with the monthly flow limit of the NPDES Permit. At a minimum, the CWMP Scope of Services shall include consideration of the following:

    a) Additional studies to identify sources of I/I from the Collection System not addressed under the 2021 SSES described in paragraph 15, above.

    b) Identification of opportunities to utilize inline storage within the Collection System to reduce peak flows to the treatment plant during wet weather.

    c) Identification of opportunities to utilize offline storage to reduce peak flows to the treatment plant during wet weather.

    d) Investigation of opportunities for inground injection.

    e) Additional connection restrictions beyond those included in the May 2021 New Connection Moratorium.

    f) Other means to address flow violations at the treatment plant.

20. By September 30, 2025, the Town shall develop and submit to EPA and MassDEP a Report which includes an evaluation of additional alternatives to ensure its compliance

with the monthly flow limit of the NPDES Permit (the "Additional Alternatives Report"). At a minimum, the Additional Alternatives Report shall include consideration of the following:

a) Investigation of diversion of all or partial flows from the Collection System to another municipal collection system, including regionalization, or to that of the Massachusetts Water Resources Authority collection system.

b) Investigation of moving the discharge point of the wastewater treatment plant to an alternative receiving waterbody.

21. The Additional Alternatives Report shall include at a minimum a description of the options considered, costs associated with each option and time frames associated with implementing such options. The Report shall include recommendations of which options should be implemented by the Town. The Report shall also include an explanation of, and the reasoning supporting, which options were not being adopted. The Town shall update its CWMP to reflect any recommendations from the Additional Alternatives Report that it will implement related to flow.

22. By April 30, 2023, the Town shall submit to EPA and MassDEP the final CWMP.

23. By September 30, 2023, the Town shall develop and submit a plan and schedule to EPA and MassDEP describing what measures from the CWMP it plans on implementing. The Town shall implement such plan and schedule upon submission to EPA, subject to modifications pursuant to any comments provided by EPA and any modifications adopted based on the Additional Alternatives Report.

24. By July 1, 2023, the Town shall submit a rate study to EPA evaluating a full range of alternative spending scenarios on projects related to improvements to the Collection

System and wastewater treatment plant, and the projected impacts to sewer rates in the Town.

25. Total Phosphorus Compliance Schedule: To allow the Town adequate time to determine how to meet its phosphorus limit of 0.1mg/L (April 1-Oct 31) EPA is providing the Town an additional 11 months to comply with its obligation under Part I.G.2.a of the Permit as follows:

> Within 23 months of the effective date of the permit (i.e., by January 1, 2024), the Permittee shall submit to EPA and MassDEP a status report evaluating the potential treatment process changes (such as chemical addition) necessary to achieve the permit limit.

The status report shall include a description of the treatment process change(s) the Town has selected to meet the phosphorus limit and the schedule for implementing such process change(s).

26. Until further notice, beginning November 30, 2022, and every six months thereafter (i.e. each November 30, and May 31 each year), the Town shall submit a Semi-Annual Compliance Report to EPA and MassDEP detailing the actions taken by the Town during the prior six month period and planned during the next six month period to comply with this Order and to address NPDES permit flow violations and any other permit violations that occur associated with elevated flows to the treatment plant. The Semi-Annual Compliance Report shall, at a minimum, include the following:

a. A summary listing of all monthly flow violations that occurred during the previous six months, including a statement regarding whether wastewater receiving less than secondary treatment was combined with the final effluent during any bypass events.

b. The date of any bypasses of secondary treatment and the quantity of effluent discharged that received less than full secondary treatment.

c. A detailed description of the actions taken during the previous six months calendar year to address requirements of this Order.

d. A map or maps of the Collection System along with an overlay showing the location of projects to repair or replace infrastructure causing or contributing to effluent flow violations.

e. The result of efforts to address I/I issues in the Collection System, including a table identifying and quantifying each source of I/I removed by those actions and the costs of removing the sources, individually and collectively.

f. A description of the actions taken by the Town to comply with the sewer connection moratorium described in paragraph 13, above.

g. A table showing any development projects before the Rockland Sewer Commission that have been approved but are waiting for authorization to connect to the Collection System including the revenue paid to the Town for the connection, gallons per day to be connected to the Collection System and the volume of I/I that must be removed associated with the project.

h. A table showing any development projects before the Rockland Sewer Commission pending approval to connect to the Collection System including the estimate revenue paid to the Town for the connection, gallons per day to be connected to the Collection System and the volume of I/I that must be removed associated with the project.

i. A spreadsheet showing the specific balance of money available to the Town to use towards I/I projects based on revenue generated from approval of any development projects.

j. A description of actions taken towards implementation of the Additional Alternatives Report, such as contacts with other municipalities regarding the opportunities for diversion of all or partial flows from the Collection System to another municipal collection system, including regionalization, and a description of any actions taken towards evaluation of moving the discharge point of the wastewater treatment plant to an alternative receiving waterbody.

k. The actions that will be taken during next reporting period to address requirements of this Order.

l. A description of revisions to any of the Town's plans to address I/I in response to any new information obtained during the previous six months.

NOTIFICATION PROCEDURES

27. Where this Order requires a specific action to be performed within a certain time frame, the Town shall submit to EPA a written notice of compliance or noncompliance with such action within seven (7) days following the applicable deadline; however, written notice of compliance is not necessary if the action required by the Order includes submission of a document, report, or other written material, and the Town has timely submitted such document, report, or written material to EPA.

28. If noncompliance is reported, the written notice submitted to EPA must include the following information:

a. A description of the noncompliance.

b. A description of any actions taken or proposed by the Town to comply with the required action.

c. A description of any factors that tend to explain or mitigate the noncompliance.

d. The date by which the Town will perform the required action.[1]

29. After a notification of noncompliance has been submitted to EPA, the Town must achieve compliance as expeditiously as possible, but by no later than the date submitted to EPA pursuant to paragraph 23., and submit to EPA the required document, report, or written material, as applicable, or a written notice that compliance with the action has been achieved.

30. Submissions required by this Order shall be in the following format:

a. Verbal notification to EPA shall be to David Turin at (617) 918-1598.

b. Written notification to EPA shall be to David Turin at: turin.david@epa.gov.

c. When notification in an electronic format is not appropriate, submissions shall be sent to EPA at the following address:

David Turin
U.S. Environmental Protection Agency
Water Compliance Section - Mail code: 04-3
Enforcement and Compliance Assurance Division
5 Post Office Square - Suite 100
Boston MA 02109 - 3912

31. Submissions to MassDEP required by this Order shall be in writing to David Burns and shall be provided in an electronic format to MassDEP at the following addresses:

david.burns2@mass.gov

[1] Note that this is not an extension to the original deadline.

When notification in an electronic format is not appropriate, submission shall be sent to MassDEP at the following address:

David Burns
Massachusetts Department of Environmental Protection
Southeast Region Main Office
20 Riverside Drive
Lakeville, MA 02347

32. EPA shall notify the Town in writing of any changes to the contact persons or email addresses provided above in paragraphs 27 or 28.

GENERAL PROVISIONS

33. This Order does not constitute a waiver or a modification of the terms and conditions of the NPDES Permit. The NPDES Permit remains in full force and effect.

34. EPA reserves the right to seek any and all remedies available under Section 309 of the Act, 33 U.S.C. § 1319, as amended, for any violation cited in this Order. In addition, EPA reserves its authority under the CWA to request a federal court to impose a moratorium on new sewer hook ups.

35. The Town may seek federal judicial review of this Order pursuant to Chapter 7 of the Administrative Procedure Act, 5 U.S.C. §§ 701-706.

36. This Order shall become effective upon receipt by the Town and will supersede the 2006 AO in its entirety.

_____

Karen McGuire, Director
Enforcement and Compliance Assurance Division
U. S. Environmental Protection Agency, Region 1

Appendix C
Intermunicipal Agreement

AGREEMENT
FOR
WASTEWATER TREATMENT AND DISPOSAL

THIS AGREEMENT, made and entered into this _____ day of _____, _____, by and between the Town of Rockland, an incorporated Township within Plymouth County, Commonwealth of Massachusetts, hereinafter referred to as "Rockland", acting through its Board of Sewer Commissioners, and the Town of Abington, an incorporated Township within Plymouth County, Commonwealth of Massachusetts, hereinafter referred to as "Abington", acting through its Board of Selectmen,

WITNESSETH, THAT,

WHEREAS, Rockland owns, operates and maintains a water pollution control facility which has capacity to treat an average wastewater flow of 1.0 million gallons per day and is presently upgrading its facility to provide additional treatment for an average flow of 2.5 million gallons per day, and,

WHEREAS, Abington is under orders from the Massachusetts Water Resources Commission, Division of Water Pollution Control to provide treatment of its wastewater and Abington proposes to construct and expand its municipal wastewater collection system and,

WHEREAS, Abington desires to connect this proposed collection system to Rockland's Water Pollution Control Facility, and,

WHEREAS, Rockland is agreeable to the aforesaid connection to its water pollution control facility upon the terms and conditions hereinafter stated.

NOW THEREFORE, in consideration of the mutual promises and agreements contained herein, and for other valuable consideration, the receipt of which is herein arranged by the respective parties, Rockland and Abington pursuant to the authority contained in Section 4 of Chapter 40 of the General Laws of the Commonwealth of Massachusetts, do hereby mutually agree as follows:

1. Rockland agrees to receive and treat at Rockland's Water Pollution Control Facility wastewater from Abington at an average daily rate not to exceed 110,000 (one hundred and ten thousand) gallons per day as hereinafter set forth, and for this purpose to permit Abington to connect its sewerage system to an existing manhole as mutually agreed upon. Abington shall design, construct, operate and maintain all sewers, force mains and other appurtenances necessary for conveying its wastewater to the point of connection and shall obtain all permits and otherwise fulfill all

requirements to construct these facilities within the Town of Rockland. EXHIBIT A, attached hereto, is a map outlining that portion of Abington which is to be served by the Rockland sewerage system. Under no circumstances shall wastewaters emanating from outside the service area indicated in EXHIBIT A be discharged into the Rockland sewerage system.

2. Abington shall at its own expense furnish and install a suitable flow-measuring device, continuous recorder, totalizer and sewage sampler acceptable to Rockland to sample and record the flow of wastewater from Abington to Rockland's facilities. The meter, recorder, totalizer and sampler shall be located within the Town of Abington. Abington shall be responsible for the operation of the meter, recorder, totalizer and sampler and shall pay all operation, maintenance, service and repair costs thereon. In the event of a failure of the meter, recorder or totalizer to function properly, it is hereby mutually agreed that the flow shall be estimated upon the basis of past experience and sound engineering practice. At least one twenty-four hour composite sample shall be taken and analyzed twice annually, at six-month intervals. Each sample shall be divided into three portions of equal volume and analyzed separately to ensure reliable results. Rockland shall at all times be afforded access to the meter, recorder, totalizer, sewage sampler, and to Abington's sewerage system for purposes of inspection and checkout. Rockland has a suitable device to measure the total volume of waste treated at the plant, and shall at all times, afford Abington access to the meter, recorder, totalizer, sewage sampler and to flow records for inspection and checkout. Rockland shall provide a suitable device to sample untreated plant flow and shall at all times permit Abington to observe sample analyses procedures.

3. Under no conditions shall septage from Abington be permitted into Rockland's sewerage system or water pollution control facility; unless agreed to in writing by Rockland.

4. Characteristics of wastes delivered to the treatment plant by Abington shall conform to the requirements of wastes permitted by Rockland under its sewer ordinance, as issued and amended from time to time.

5. Abington agrees to adopt such rules, regulations and/or bylaws as are necessary to secure compliance by system users with the standards provided for within this Agreement or as otherwise may be amended and to ensure conformity with the requirements of any other governmental agency which might have jurisdiction covering the system. Abington agrees to take all reasonable means to inspect its system during construction and operation and to enforce such rules, regulations and/or by-laws.

Rockland shall have the right to require Abington, at Abington's own expense, to take appropriate legal action against any system user to enforce compliance with the terms of this Agreement.

When any of the capacities allocated to Abington under Article 6 are equaled or exceeded, Abington shall impose a ban on all further connections to its system which are tributary to the Rockland Sewerage System.

6. Rockland hereby agrees that as long as Abington conforms to the terms of this Agreement, Rockland shall receive and dispose of wastes delivered to the plant to the best of its ability. It is hereby agreed and understood that sewerage facilities have been or will be constructed by Rockland to treat wastewaters in conformance with NPDES permit requirements. Rockland shall provide sewer capacity to convey Abington's wastewater from the point of connection to the water pollution control facility. Capacities allocated to Abington shall be as follows:

WATER POLLUTION CONTROL FACILITY
(Design Year 2000)

	Treatment facility capacity	Capacity allocated to Abington
Flow (million gal/day)		
Average	2.50	0.11
Peak hour	6.0	0.55
Biochemical Oxygen Demand		
lbs/day, average	4,698	207
Suspended Solids		
lbs/day, average	5,538	244
TKN as Nitrogen		
lbs/day, average	655	29
Phosphorus		
lbs/day, average	209	9

SEWERS
(Design Year 2025)

REACH (See EXHIBIT B)	Sewer capacity (cfs)	Sewer capacity allocated to Abington (cfs)
18-12	19.3	0.85
12-9	19.2	0.87
9-8	19.2	0.88
8-7	9.6	0.95
7-6	8.7	0.97
6-81	2.5	1.12
81-80	2.5	1.17
at point of connection	-	1.36

7. For use of Rockland's sewerage facilities, Abington agrees to pay to Rockland the following:

   a) In consideration of the costs (not paid for with Federal and/or State aid) for the planning, design and construction of existing sewage collection and transport facilities (See EXHIBIT B, REACHES 18-12, 12-9, 9-8, 8-7, 7-6, and 6-81) which Rockland now operates and maintains and which Abington desires to use jointly with Rockland, Abington shall pay to Rockland the sum of $46,750 (forty-six thousand seven hundred and fifty dollars).

   b) In consideration of the costs (not paid for with Federal and/or State aid) for planning, design and construction of those portions of the existing Water Pollution Control Facility which Rockland now operates and maintains and which Abington desires to use jointly with Rockland, Abington shall pay to Rockland the sum of $26,225 (twenty-six thousand two hundred and twenty-five dollars.)

   c) The project cost of the proposed facilities shall include all costs (not paid for with Federal and/or State aid) involved in the facilities planning, final design and construction phases of the proposed sewerage facilities, and shall also include legal fees, bond fees, interest and all other costs incidental to the completed project. Abington's share of the project cost of the proposed facilities shall be the following:

      (1) Additions to the Water Pollution Control Facility (Contract 77-1) the sum of $57,274 (fifty-seven thousand two hundred and seventy-four dollars).

(2) Sanitary Sewers – Contract 77-2 (see EXHIBIT B REACH 81-80. From Station 0+00 to Station 17=47 as shown on Sheets 2 of 31 through 4 of 31 of Contract 77-2) the sum of $4,100 (four thousand one hundred dollars).

d) As an interest payment, Abington shall pay to Rockland the sum of $3,810 (three thousand eight hundred and ten dollars).

e) Payment to Rockland by Abington for the $138,159 (one hundred and thirty eight thousand one hundred and fifty-nine dollars) due under Articles 7a, 7b, 7c and 7d shall be made as a lump sum which shall be due and payable on July 1, 1982. This payment shall be due even if this Agreement is terminated as hereinafter provided. In the event full payment is not received by Rockland from Abington By July 1, 1982, interest at the rate of 5.7 (five and seven tenths) percent per annum, shall be paid to Rockland by Abington on the unpaid balance.

f) Abington shall not connect its sewerage system to the Rockland sewerage system until all payments due under Articles 7a, 7b, 7c, 7d, and 7e of this Agreement have been paid in full to Rockland by Abington.

g) Abington shall make semi-annual payments towards the costs of operation and maintenance of the plant on the following bases:

1) Charges to Abington shall be made on the basis of formulas contained in Rockland's System of Sewer User Charges to be issued by Rockland and amended from time to time and taking into account the quantity and strength of the wastes discharged to Rockland's sewerage system. Charges shall be adjusted annually, to reflect the actual operation and maintenance costs for the previous billing periods and shall be so calculated that Abington's share of the operation and maintenance costs shall bear the same ratio to the total operation and maintenance costs as Abington's actual use of the facilities bears to the total use. Use of the facilities shall be determined from flow records and sewage sample analyses for BOD, suspended solids, TKN and phosphorus in accordance with the System of Sewer User Charges, an approved copy of which will hereby be made part of this Agreement.

2) For the purposes of this Agreement, operation and maintenance costs shall include, but not be limited to the

treatment process should damage occur to the Rockland Sewerage System or should disruption occur to the treatment process due to the wastewater from Abington.

12. No failure or delay in performance shall be deemed to be a breach of this Agreement when such failure or delay is occasioned by or due to any Act of God, strike, lockout, war, riot, epidemic, explosion, sabotage, breakage or accident to machinery or lines or pipe, the biding order of any court or governmental authority, or any other cause whether of the kind herein enumerated or otherwise not within the control of the Party against whom a breach is alleged.

13. The parties hereto agree that at the request of either Party any dispute arising between Rockland and Abington relating to interpretation of this Agreement shall be submitted to arbitration. Each Party shall appoint one arbitrator, and the two appointed arbitrators shall appoint a third arbitrator.

    In the event that the two appointed arbitrators fail to agree upon a third arbitrator, the selection of the same shall be made by the American Arbitration Association. The costs of any such arbitrator shall be borne equally between the parties.

    The decision of the arbitrators shall be final and binding.

14. The tern of this Agreement shall commence with the date this contract is entered into and shall expire at the end of the term of the bond issue (not less than twenty years) unless previously extended by mutual agreement. It is understood by the parties to this Agreement that some time prior to its expiration, if and when requested by the Town of Abington, the governing bodies of the two participating communities shall negotiate an extension of the Agreement in order to provide for service beyond the contract period. Termination of this agreement may be requested by Abington at any time during the tem of this Agreement provided that a minimum of six (6) months written notice be given to Rockland by Abington prior to actual termination. This Agreement may be amended from time to time with the written consent of both participating parties.

Appendix D
Sewer Use and Connection Policies

TOWN OF ROCKLAND, MA
SEWER USE ORDINANCE

Board of Sewer Commissioners

February 2011

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ORDINANCE NO. 2008

SECTION 1—GENERAL PROVISIONS

1.1 Purpose and Policy

This ordinance sets forth uniform requirements for the use of public and private sewers and drains, private wastewater disposal, the installation and connection of building sewers and the use of the Publicly Owned Treatment Works (POTW) for the Town of Rockland, County of Plymouth, State of Massachusetts and enables the Town to comply with all applicable State and Federal laws, including the Clean Water Act (33 United States Code [U.S.C.] section 1251 et seq.) and the General Pretreatment Regulations (Title 40 of the *Code of Federal Regulations* [CFR] Part 403). The objectives of this ordinance are:

A. To prevent the introduction of pollutants into the Publicly Owned Treatment Works that will interfere with its operation;

B. To prevent the introduction of pollutants into the Publicly Owned Treatment Works that will pass through the Publicly Owned Treatment Works, inadequately treated, into receiving waters, or otherwise be incompatible with the Publicly Owned Treatment Works;

C. To protect both Publicly Owned Treatment Works personnel who may be affected by wastewater and sludge in the course of their employment and the general public;

D. To promote reuse and recycling of industrial wastewater and sludge from the Publicly Owned Treatment Works;

E. To provide for fees for the equitable distribution of the cost of operation, maintenance, and improvement of the Publicly Owned Treatment Works; and

F. To enable the Town to comply with its National Pollutant Discharge Elimination System permit conditions, sludge use and disposal requirements, and any other Federal or State laws to which the Publicly Owned Treatment Works is subject.

This ordinance shall apply to all Users of the Publicly Owned Treatment Works. The ordinance authorizes the issuance of individual wastewater discharge permits, provides for monitoring, compliance, and enforcement activities; establishes administrative review procedures; requires User reporting; and provides for the setting of fees for the equitable distribution of costs resulting from the program established herein.

1.2 Administration

Except as otherwise provided herein, the Rockland Sewer Commissioners shall administer, implement, and enforce the provisions of this ordinance. Any powers granted to or duties imposed upon the Commission may be delegated by the Commission to the Superintendent.

1.3 Abbreviations

The following abbreviations, when used in this ordinance, shall have the designated meanings:

BOD – Biochemical Oxygen Demand
BMP – Best Management Practice
BMR – Baseline Monitoring Report

CFR – *Code of Federal Regulations*
CIU – Categorical Industrial User
COD – Chemical Oxygen Demand
EPA – U.S. Environmental Protection Agency
gpd – gallons per day
I/I- Infiltration and Inflow
IU – Industrial User
mg/l – milligrams per liter
NPDES – National Pollutant Discharge Elimination System
NSCIU – Non-Significant Categorical Industrial User
POTW – Publicly Owned Treatment Works
RCRA – Resource Conservation and Recovery Act
SIU – Significant Industrial User
SNC – Significant Noncompliance
TSS – Total Suspended Solids
U.S.C. – United States Code
WWTF – Wastewater Treatment Facility

1.4 Definitions

Unless a provision explicitly states otherwise, the following terms and phrases, as used in this ordinance, shall have the meanings hereinafter designated.

1. Act or "the Act." The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. section 1251 et seq. as well as any guidelines, limitations and standards promulgated by the USEPA pursuant to the Act.

2. Applicant The owner as herinafter defined who makes out a building sewer permit application with the intention of sewering improved property.

3. Approval. Written approval.

4. Approval Authority United States Environmental Protection Agency Region l Coordinator.

5. Authority The Board of Sewer Commissioners of the Town of Rockland, or their authorized agent or representative.

6. Authorized or Duly Authorized Representative of the User.

   (1) If the User is a corporation:

   (a) The president, secretary, treasurer, or a vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
   (b) The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiate and direct other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; can ensure that the necessary systems are established or actions taken to gather complete and accurate information

for individual wastewater discharge permit requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) If the User is a partnership or sole proprietorship: a general partner or proprietor, respectively.

(3) If the User is a Federal, State, or local governmental facility: a director or highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or their designee.

(4) The individuals described in paragraphs 1 through 3, above, may designate a Duly Authorized Representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization is submitted to the Commission.

7. Biochemical Oxygen Demand or BOD. The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures for five (5) days at 20 degrees centigrade, usually expressed as a concentration (e.g., mg/l).

8. Best Management Practices or BMPs means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions listed in Section 2.1 A and B [40 CFR 403.5(a)(1) and (b)]. BMPs include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

9. Board. The Rockland Board of Sewer Commissioners or their authorized agent or representative.

10. Building Drain. The part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste and other drainage pipes inside the walls of the building and conveys it to the building sewer, beginning five feet outside the inner face of the building wall.

11. Building Sewer or Service Connection. The pipe extension from the building drain to the public sewer or other place of disposal for the purpose of conveying wastewater.

12. Business/Commercial Establishment. The primary use of the property is not defined as residential or industrial.

13. Categorical Pretreatment Standard or Categorical Standard. Any regulation containing pollutant discharge limits promulgated by EPA in accordance with sections 307(b) and (c) of the Act (33 S.C. section 1317) that apply to a specific category of Users and that appear in 40 CFR Chapter I, Subchapter N, Parts 405-471.

14. Categorical Industrial User. An Industrial User subject to a categorical Pretreatment Standard or categorical Standard.

15. Chemical Oxygen Demand or COD. A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.

16. Combined Sewer. A sewer receiving both surface runoff and sewage.

17. Commission. The Rockland Sewer Commission and its duly authorized representatives.

18. Control Authority. The Board of Sewer Commissioners.

19. Cooling water. The water discharge from any system of condensation, air conditioning, cooling, refrigeration or other sources. Such water shall contain no polluting substances which could produce BOD, SS or toxic pollutants or substances limited in these amended rules and regulations.

20. Control Manhole. Manhole which is installed along a sewer and which provides access for the observation, sampling, and measurements of the wastes.

21. Daily Maximum. The arithmetic average of all effluent samples for a pollutant collected during a calendar day.

22. Daily Maximum Limit. The maximum allowable discharge limit of a pollutant during a calendar day. Where Daily Maximum Limits are expressed in units of mass, the daily discharge is the total mass discharged over the course of the day. Where Daily Maximum Limits are expressed in terms of a concentration, the daily discharge is the arithmetic average measurement of the pollutant concentration derived from all measurements taken that day.

23. Domestic Wastewater. Normal water-carried household and toilet wastes discharged from any improved property, excluding ground surface or stormwater.

24. Drain Layer. A person licensed by the Town of Rockland to lay building sewers from existing public sewers to building drains.

25. Easement. An acquired legal right for the specific use of land owned by others.

26. Environmental Protection Agency or EPA. The U.S. Environmental Protection Agency or, where appropriate, the Regional Water Management Division Director, the Regional Administrator, or other duly authorized official of said agency.

27. Excessive. Amounts or concentrations of any constituent of wastewater which in the judgement of the Town will cause damage to any wastewater facility which will be produced in excessive quantities in the sludge produced a the Wastewater Treatment Facility which will be harmful to a wastewater treatment process which cannot be removed in the wastewater treatment works of the Town to the degree required to met the limited stream classification standard of the receiving water, which can otherwise endanger life, limb, the environment or public property, or which can constitute a nuisance.

28. Existing Source. Any source of discharge that is not a "New Source."

29. Facilities. Structures and conduits for the purpose of collecting, treating, neutralizing or disposing of domestic wastewater and/or industrial or other wastewaters as are disposed of by means of structures and conduits including treatment and disposal works, necessary intercepting, outfall and outlet sewers and pumping stains integral to such facilities with sewers, equipment, furnishings thereof and other appurtenances connected therewith.

30. Floatable Oil. Oil, fat, wax, or grease in a physical state such that it will separate by gravity from wastewater by treatment in an approved pretreatment facility A wastewater shall be considered free of floatable oil if it is properly pretreated and the wastewater does not interfere with the collection system.

31. Flow Equalization Facilities. Facilities in which variations in flow and composition of a liquid are averaged.

32. Grab Sample. A sample that is taken from a wastestream without regard to the flow in the wastestream and over a period of time not to exceed fifteen (15) minutes.

33. Garbage. The animal *and* vegetable wastes resulting from the handling, preparation, cooking and serving of food and from the handling, storage and sale of produce. It is composed largely of putrescible organic matter and its natural moisture content.

34. Hauler. Any person who contracts for the disposal of septage and has obtained a septage handler/pumping permit and a septage dumping permit from the Board of Sewer Commissioners.

35. Improved Property. Any property located within the Town upon which there is erected a structure intended for continuous or periodic habitation, occupancy or use by human beings or animals and from whiçh structure domestic wastewater and/or industrial wastes shall be or may bed discharged.

36. Incompatible Pollutant Any pollutant, other than biochemical oxygen demand, suspended solids, pH, coliform bacteria, or additional pollutants identified in the permit, which the POTW was not designed to treat, and does not adequately remove.

37. Industrial Establishment. Any room, group of rooms, building or other enclosure used or intended for use in the operation of one (1) business enterprise for manufacturing, processing, cleaning, laundering, assembling or preparing any product, commodity or article or from which any process waste, as distinct from domestic wastewater, may be discharged.

Indirect Discharge. The introduction of pollutants into the POTW from any non-domestic source regulated under Section 307 (b) (c) and (d) of the Act.

38. Improved Property Any property located within the Town upon which there is erected a structure intended for continuous or periodic habitation, occupancy or use by human beings or animals and from which structure domestic wastewater and/or industrial wastes shall be or may be discharged.

39. Incompatible Pollutant. Any pollutant, other than biochemical oxygen demand, suspended solids, pH, coliform bacteria, or additional pollutants identified in the permit, which the POTW was not designed to treat, and does not adequately remove.

40. Industrial User. A manufacturing, processing, or other nonresidential facility (such as hospitals,

commercial laundries, and tank and barrel cleaning operations) which discharges non-sanitary industrial wastes into a public sewer.

41. Industrial Wastes. The liquid or solid wastes from industrial processes, trade, or business, as distinct from sanitary sewage.

42. Interference. A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(1) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use of disposal; and

(2) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued there under (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the .SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

43. Indirect Discharge or Discharge. The introduction of pollutants into the POTW from any nondomestic source.

44. Instantaneous Limit. The maximum concentration of a pollutant allowed to be discharged at any time, determined from the analysis of any discrete or composite sample collected, independent of the industrial flow rate and the duration of the sampling event.

45. Interference. A discharge that, alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the POTW, its treatment processes or operations or its sludge processes, use or disposal; and therefore, is a cause of a violation of the Town's NPDES permit or of the prevention of sewage sludge use or disposal in compliance with any of the following statutory/regulatory provisions or permits issued thereunder, or any more stringent State or local regulations: section 405 of the Act; the Solid Waste Disposal Act, including Title II commonly referred to as the Resource Conservation and Recovery Act (RCRA); any State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the Solid Waste Disposal Act; the Clean Air Act; the Toxic Substances Control Act; and the Marine Protection, Research, and Sanctuaries Act.

46. Invert. The bottom inside of the sewer pipe.

47. Local Limit. Specific discharge limits developed and enforced by the Board upon industrial or commercial facilities to implement the general and specific discharge prohibitions listed in 40 CFR 403.5(a)(1) and (b).

48. Medical Waste. Isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes, potentially contaminated laboratory wastes, and dialysis wastes.

49. Monthly Average. The sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

50. Monthly Average Limit. The highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

51. National Categorical Pretreatment Standard. Any regulation containing pollutant discharge limits promulgated by the USEPA.

52. National Pollution Discharge Elimination System. A permit issued pursuant to Section 402 of the Act.

53. Natural Outlet. Any outlet into a watercourse, pond, ditch, lake or other body or surface or groundwater.

54. New Source.

1. Any building, structure, facility, or installation from which there is (or may be) a discharge of pollutants, the construction of which commenced after the publication of proposed Pretreatment Standards under section 307(c) of the Act that will be applicable to such source if such Standards are thereafter promulgated in accordance with that section, provided that:

(a) The building, structure, facility, or installation is constructed at a site at which no other source is located; or
(b) The building, structure, facility, or installation totally replaces the process or production equipment that causes the discharge of pollutants at an Existing Source.

(c) The production or wastewater generating processes of the building, structure, facility, or installation are substantially independent of an Existing Source at the same site. In determining whether these are substantially independent, factors such as the extent to which the new facility is integrated with the existing plant, and the extent to which the new facility is engaged in the same general type of activity as the Existing Source, should be considered.

2. Construction on a site at which an Existing Source is located results in a modification rather than a New Source if the construction does not create a new building, structure, facility, or installation meeting the criteria of Section (1)(b) or (c) above but otherwise alters, replaces, or adds to existing process or production equipment.

3. Construction of a New Source as defined under this paragraph has commenced if the owner or operator has:

(a) Begun, or caused to begin, as part of a continuous onsite construction program

(i) any placement, assembly, or installation of facilities or equipment; or

(ii) significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or

(b) Entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under this paragraph.

55. Noncontact Cooling Water. Water used for cooling that does not come into direct contact with any raw material, intermediate product, waste product, or finished product.

56. Owner. Any person vested with ownership, legal or equitable, sole or partial, or of any improved property.

57. Pass Through. A discharge which exits the POTW into waters of the United States in quantities or concentrations which alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

58. Person. Any individual, firm, company, association, society, corporation or group, or any Federal, State or local governmental agencies or their representatives, or other entity.

59. pH. The logarithm to the base 10, of the reciprocal of the concentration of hydrogen ions expressed in gram atoms per liter of solution.

60. Phosphorus (denoting Total Phosphorus). The total of organic phosphorus and inorganic phosphorus.

61. Proponent. A potential User.

62. Pollutant shall mean any material or substance that may cause an alteration of the chemical, physical, biological or radiological integrity of the POTW or its receiving waters.

63. Pollutant. Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, Medical Wastes, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, municipal, agricultural and industrial wastes, and certain characteristics of wastewater (e.g., pH, temperature, TSS, turbidity, color, BOD, COD, toxic, or odor).

64. Pretreatment. The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to, or in lieu of, introducing such pollutants into the POTW. This reduction or alteration can be obtained by physical, chemical, or biological processes; by process changes; or by other means, except by diluting the concentration of the pollutants unless allowed by an applicable Pretreatment Standard.

65. Pretreatment Requirements. Any substantive or procedural requirement related to pretreatment imposed on a User, other than a Pretreatment Standard.

66. Pretreatment Standards or Standards. Pretreatment Standards shall mean prohibited discharge standards, categorical Pretreatment Standards, and Local Limits.

67. Private Wastewater Disposal System. The structure, equipment and processes required to treat wastewater generated on the owner's improved property. The system by be comprised of a septic tank and leaching field, or any other method approved by the Board of Health.

68. Prohibited Discharge Standards or Prohibited Discharges. Absolute prohibitions against the discharge of certain substances; these prohibitions appear in Section 2.1 of this ordinance.

69. Properly Shredded Garbage. The wastes from the preparation, cooking and dispensing of food that has been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half (1/2) inch (1.27 centimeters) in any dimension.

70. Property. An area of land as marked on the assessment drawings in the office of the Town Assessor, Town of Rockland Massachusetts.

71. Publicly Owned Treatment Works or POTW. A treatment works, as defined by section 212 of the Act (33 U.S.C. section 1292), which is owned by the Town. This definition includes any devices or systems used in the collection, storage, treatment, recycling, and reclamation of sewage or industrial wastes of a liquid nature and any conveyances, which convey wastewater to a treatment plant.

72. Public Sewer. A sewer in which all owners of abutting properties have equal rights, and is controlled by public authority.

73. Receiving Water Quality Standards. The Massachusetts Water Quality Standards as provided by M.G.L. Chapter 21, Section 27.

74. Receiving Waters. Any watercourse, river, pond, ditch, lake, aquifer, or other body of surface or groundwater receiving discharge of wastewaters.

75. Sanitary Sewer. A sewer which carries sewage and to which storm, surface and groundwaters are not intentionally admitted.

76. Septage. The wastes primarily of sewage origin, which are removed from a cessspool, septic tank or similar receptacle.

77. Septic Tank Waste. Any sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

78. Sewage. Human excrement and gray water (household showers, dishwashing operations, etc.).

79. Sewer. A pipe or conduit for carrying sewage.

80. Shall is Mandatory May is permissive.

81. Significant Industrial User (SIU).

Except as provided in paragraphs (3) and (4) of this Section, a Significant Industrial User is:

1. An Industrial User subject to categorical Pretreatment Standards; or

2. An Industrial User that:

(a) Discharges an average of twenty-five thousand (25,000) gpd or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater);
(b) Contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or
(c) Is designated as such by the Commission on the basis that it has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or Requirement.

3. The Commission may determine that an Industrial User subject to categorical Pretreatment Standards is a Non-Significant Categorical Industrial User rather than a Significant Industrial User on a finding that the Industrial User never discharges more than 100 gallons per day (gpd) of total categorical wastewater (excluding sanitary, non-contact cooling and boiler blowdown wastewater, unless specifically included in the Pretreatment Standard) and the following conditions are met:

(a) The Industrial User, prior to Commission's finding, has consistently complied with all applicable categorical Pretreatment Standards and Requirements;
(b) The Industrial User annually submits the certification statement required in Section 6.14 B [see 40 CFR 403.12(q)], together with any additional information necessary to support the certification statement; and
(c) The Industrial User never discharges any untreated concentrated wastewater.

4. Upon a finding that a User meeting the criteria in Subsection (2) of this part has no reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or Requirement, the Commission may at any time, on its own initiative or in response to a petition received from an Industrial User, and in accordance with procedures in 40 CFR 403.8(f)(6), determine that such User should not be considered a Significant Industrial User.

82. Significant Non Compliance. An industrial user is in significant noncompliance if its violation meets one or more of the following criteria:

The Superintendent shall publish annually, in a newspaper of general circulation that provides meaningful public notice within the jurisdictions served by the POTW, a list of the Users which, at any time during the previous twelve (12) months, were in Significant Noncompliance with applicable Pretreatment Standards and Requirements. The term Significant Noncompliance shall be applicable to all Significant Industrial Users (or any other Industrial User that violates paragraphs (C), (D) or (H) of this Section) and shall mean:

A. Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all the measurements taken for the same pollutant parameter taken during a six- (6-) month period exceed (by any magnitude) a numeric Pretreatment Standard or Requirement, including Instantaneous Limits as defined in Section 2;

B. Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of wastewater measurements taken for each pollutant parameter during a six (6) month period equals or exceeds the product of the numeric Pretreatment Standard or Requirement including Instantaneous Limits, as defined by Section 2 multiplied by the applicable criteria (1.4 for BOD, TSS, fats, oils and grease, and 1.2 for all other pollutants except pH).
C. Any other violation of a Pretreatment Standard or Requirement as defined by Section 2 (Daily Maximum, long-term average, Instantaneous Limit, or narrative standard) that [the Superintendent] determines has caused, alone or in combination with other discharges, Interference or Pass Through, including endangering the health of POTW personnel or the general public;

D. Any discharge of a pollutant that has caused imminent endangerment to the public or to the environment, or has resulted in the Superintendent's exercise of its emergency authority to halt or prevent such a discharge; E. Failure to meet, within ninety (90) days of the scheduled date, a compliance schedule milestone contained in an individual wastewater discharge permit or enforcement order for starting construction, completing construction, or
attaining final compliance;

F. Failure to provide within forty-five (45) days after the due date, any required reports, including baseline monitoring reports, reports on compliance with categorical Pretreatment Standard deadlines, periodic self-monitoring reports, and reports on compliance with compliance schedules;

G. Failure to accurately report noncompliance; or

H. Any other violation(s), which may include a violation of Best Management Practices, which the Superintendent determines will adversely affect the operation or implementation of the local pretreatment program.

83. Slug Load or Slug Discharge. Any discharge at a flow rate or concentration, which could cause violation of the prohibited discharge standards in Section 2.1 of this ordinance. A Slug Discharge is any Discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch Discharge, which has a reasonable potential to cause Interference or Pass Through, or in any other way violate the POTW's regulations, Local Limits or Permit conditions.

84. Spill. The release, accidental or otherwise, of any material not normally released to the facilities, which by virtue of its volume concentration or physical or chemical characteristics, creates a hazard to the facilities their operation or their personnel. Such characteristics shall include, but are not limited to, volatile, explosive, toxic or otherwise unacceptable materials.

85. State. The Massachusetts Department of Environmental Protection.

86. Storm Drain. A sewer which carries storm and surface waters and drainage, but excluded sewage and industrial wastes other than unpolluted cooling water.

87. Storm Water. Any flow occurring during or following any form of natural precipitation, and resulting from such precipitation, including snowmelt.

88. Superintendent. The person designated by the Town to supervise the operation of the POTW, and who is charged with certain duties and responsibilities by this ordinance**.** The term also means a Duly Authorized Representative of the Commission.

89. Total Suspended Solids or Suspended Solids. The total suspended matter that floats on the surface of, or is suspended in, water, wastewater, or other liquid, and that is removable by laboratory filtering.

90. Total Kjeldahl Nitrogen. The Total of ammonia and organic nitrogen but does not include nitrate and nitrite nitrogen.

91. Town. The Town of Rockland, County of Plymouth, State of Massachusetts.

92. Toxic Pollutant. A pollutant or combination of pollutants listed as toxic in regulations promulgated by the USEPA.

93. User or Industrial User. A source of indirect discharge.

94. Unpolluted Water. Water not containing any pollutants limited or prohibited by the effluent standards in effect, or water whose discharge will not cause any violation of receiving water quality standards

95. Wastes. Substances in liquid, solid, or gaseous form which can be carried in water.

96. Wastewater. Liquid and water-carried industrial wastes and sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, which are contributed to the POTW.

97. Wastewater Treatment Plant or Treatment Plant. That portion of the POTW, which is designed to provide treatment of municipal sewage and industrial waste.

SECTION 2—GENERAL SEWER USE REQUIREMENTS

2.1 Private Sewage Disposal

Where a public sanitary is not available the building sewer shall be connected to a private wastewater disposal system complying with the provisions of the Board of Health.

2.2 Protection from Damage

A. No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance or equipment which is a part of the POTW. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct.

B. No unauthorized person may enter or remain in or upon any land or structure of the sewerage works. Any person violating this provision shall he subject to charges of trespass.

2.3 Use of Public Sewers

A. It shall be unlawful for any person to place, deposit, or permit to be deposited in any unsanitary manner on public or private property within the Town or in any area under the jurisdiction of said Town, any human or animal excrement, garbage, or objectionable waste.

B. It shall be unlawful to discharge to any natural outlet within the Town, or in any area under the jurisdiction of said Town, any wastewater or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this Regulation and with State and Federal laws and regulations.

C. Sewers For Intended Uses Only. No person shall discharge into any public sewer of the Town, or into any fixture that thereafter discharges into any public sewer, any waste or substance other than for which the particular sewer is intended, designed or provided.

D. Applicable Permits Required. No person shall discharge into any public sewer of the Town, or into any fixture that thereafter discharges into any public sewer, any waste or substance until all applicable federal, state and local permits have been obtained.

E. Use of Sanitary Sewers. Except as specifically provided with reference to some particular sewer sanitary sewers shall be used only for the conveyance and disposal of domestic wastewater, and for industrial wastes that are not objectionable as hereinafter provided. No sanitary sewer shall be used to receive and convey or dispose of any storm or surface water, subsoil drainage, or cooling water or boiler blowdown.

F. Any user with basement plumbing contributing sewage into the public sewer or sewage works is required to install a backflow preventor.

G. Use of Storm Drains. Storm water and all other unpolluted drainage shall be discharged to storm drains. An NPDES permit is required prior to discharging industrial cooling water, process waters, or storm water runoff generated in areas of industrial activity (as defined in 40 CFR Part 122) to a storm sewer or natural outlet.

H. Use Designation. If the intended or designated use of any particular sewer or drain and allowable discharge thereto is unclear, the Board will consider the pertinent facts and make a determination. Said determination will be final and binding.

I. Except as hereinafter provided, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool, or other facility intended or used for the disposal of wastewater in any area where a public sewer is available, as described in paragraph (I) below.

L. The owner(s) of all houses, buildings, or properties used for human occupancy, employment, recreation, or other purposes, situated within the Town and abutting on any street, alley, or right-of way in which there is now located or may in the future be located a public sanitary sewer of the Town, is hereby required at the owner(s)' expense to install suitable toilet facilities therein, and to connect such facilities directly with the proper public sewer in accordance with the provisions of this Regulation, within ninety (90) days subsequent to the date of official notice to do so, provided that said gravity public sewer is within one hundred (100) feet of the building.

K. Where a public sanitary sewer is not available under the provisions of paragraph (I) above, the building sewer shall be connected to a private wastewater disposal system complying with the rules promulgated thereto. The owner(s) shall operate and maintain the private wastewater disposal facilities in a sanitary manner at all times, at no expense to the Town. At no time shall any quantity of industrial waste be discharged to a private, domestic wastewater disposal facility.

L. In the event a User is not connected to the public water supply, but is connected to the public sewer, said User shall install and maintain a water meter, at his expense, from which the Town may monitor the use of the sewer. The type of meter and the method of installation shall be acceptable to the Water Department.

M. The Commission, after receiving a written request from a User, may credit the User for disposal charges associated with water that is not discharged to the wastewater collection system from his property. The volume of non-sewer use water must be measured with a second water meter, or other means that is acceptable to the Water Department and the Commission. The User will receive a credit on his user charge bill for non-sewer use water. All water meter and plumbing costs shall be borne by the User.

N. A portable water meter is available (subject to certain restrictions) from the Sewer Department on a limited temporary basis to those Users who do not have a permanent non-sewer use water meter. The User is responsible for reading and reporting the meter readings annually. Readings and requests for abatements shall be submitted (in writing) to the Sewer Department by December 31rst of each year. Approved abatements will be credited during the next billing cycle. The Board reserves the right to enter the User's property to verify the meter readings.

O. At such time as a public sewer becomes available to a property serviced by a private wastewater disposal system, the owner shall connect to the public sewer, as provided in paragraph (I) above. Any septic tanks, cesspools, and similar private wastewater disposal facilities shall be cleaned of sludge and filled with clean mineral soils, and their use shall be discontinued.

P. No statement contained in the preceding paragraphs of this Section shall be construed to interfere with any additional requirements that may be imposed by the Board.

Q. No person(s) shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance or equipment that is part of the POTW.

R. No person(s) shall make connection of roof downspouts, interior or exterior foundation drains, driveway drains, sump pumps or other sources of surface run-off or groundwater to a building sewer or building drain that in turn is connected directly or indirectly to a public sanitary sewer.

S. No person shall obstruct the free flow of air through any drain or soil pipe.

2.4 New Sewers and Sewer Connections

A. Any person proposing an extension of the public sewer shall notify the Commission least forty-five (45) days prior to the proposed beginning of construction. Included with this notification shall be two sets of construction plans-and-specifications in sufficient detail to allow the Board to determine whether or not the proposed extension complies with the technical provisions of this Ordinance, and good sanitary engineering practice. The plans and specifications shall be stamped by a registered professional engineer. It is recommended that any person proposing an extension of the public sewer submit a preliminary conceptual design for tentative approval by the Board. If deemed necessary by the Board, the definitive plans and specifications shall be reviewed by the Board's engineer, at the expense of the owner/contractor/applicant. The cast of engineering services shall be paid in full before review or final approval of plans is given.

B. I/I Removal Requirements for large Sewer Users

Any proponent that proposes to add additional flow to the sewer system greater than 440 gallons per day (average daily flow) must remove 11 gallons of infiltration/inflow (I/I) for every 1 gallon of wastewater flow they propose to add to the system. Sources of I/I are identified by the Town. Proponents must eliminate (remove sump pumps, foundation drains or other source of I/I by redirecting pipelines or constructing new drain pipes, rehabilitate manholes and pipelines, etc.) these sources in order to comply with this program, allowing their source(s) of wastewater flow to be connected to the system, while maintaining a flow rate to the WWTP at or below the permitted capacity as regulated by the Town's EPA/DEP NPDES permit. In the event the existing sources of I/I for removal are not known at the time the proponent requests a sewer connection permit, the Town may, at its sole discretion, allow the proponent to pay a one-time fee to the Town in lieu of waiting for I/I sources to become available for the proponent to remove. The funds collected in this way will be used to finance the future removal of I/I sources. The fee is to be determined by the Town as part of the Town's Policy and Procedure process. The fee is currently $10 per gallon per day (gpd) of new discharge. The Town may allow this fee to be paid in place of performing the work necessary to comply with the eleven for one I/I reduction program requirement.

C. No person(s) shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining written permission from the Board.

D. Applications, Permits and Approvals

1. All applications for approval are to be submitted to the Town Office of Planning & Zoning. The information will be reviewed by the Board to evaluate availability of sewer services and the impact upon the sewer system.

2. There shall be three classes of connection permits:

(a) residential;
(b) business/commercial; and
(c) industrial. In either case, the owner or his agent shall apply for a connection on a specific form furnished by the Town. The permit application shall be supplemented by any plans specifications or other information considered pertinent in the judgement of the Board. The Board may require the owner to submit sewer connection plans and specifications to their engineer for review. All costs associated with the sewer connection review shall be paid for by the owner.

(d) All costs and expenses incident to the installation and connection of the building sewer shall be paid for by the owner. The owner shall indemnify the Town from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

(e) If a permit is issued, it shall be valid for no more than thirty (30) calendar days from date of issue. If voided, the fees are nontransferable. A drain layer can not have more than three (3) connection permits outstanding without written permission from the Board. The permit shall be available for inspection at the site of work. Drain layers may install building sewers only during normal working hours. Emergency working hours may he approved on a case by case basis by the Board.

3. For single residential and other small services, the owner(s) or his agent shall make application on a Sewer Connection Permit Application furnished by the Town to allow at least thirty (30) business days for review of service connection. Service connection to be installed only after Board approval and payment of all applicable fees. A small service is a service to a facility that is supplied with a 1" or smaller water service line and uses less than 30 gallons per minute of water. An access and inspection fee in accordance with the provisions of the Sewer Connection Permit Application shall be paid to the Town at the time the application is filed.

4. For large developments, institutional, industrial, large commercial facilities and new sewer main installations, the application shall be made at least sixty (60) business days for review of project proposals before final approval and construction commences. A new Utilities Permit Application shall be submitted if there are any revisions, changes or additional requirements relative to the proposed project. The revised application shall be made to allow at least sixty (60) business days for review before project approval. Access and inspection fees in accordance with the provisions of the Board's Fee Regulation are due to be paid to the Board at the time the application is filed.

(a) All applications, comments, designs, plans, proposals and revisions thereof are to be submitted to the Town Office of Planning and Zoning.

(b) The submittal shall be reviewed by the Board. The Board shall submit written review comments, rejections and approvals to the Town Office of Planning and Zoning.

(c) The Board may, at its discretion, require the additional review of the project by other agencies and Boards.

(d) Projects that require MADEP Engineering review shall be considered for approval by the Board only after such review is completed.
Discharges < 15,000 gpd need only Town approval.
Discharges >15,000 gpd but < 50,000 gpd must file a one time certification statement with MADEP within 60 days after the connection starts to be used.
Discharges > 50,000 gpd must obtain a MADEP permit before construction.

(e) Sewer construction in a Zone 1 of a Public Water Supply Well or a Zone A of a Public Surface Water Supply is prohibited except to eliminate an existing pollution problem.

(f) Projects that require review by the Board of Selectmen shall be considered for approval by the Board only after such review is completed.

(g) Construction of the proposed project shall not initiate until such time as all access and inspection fees are paid and all Board approvals are complete.

(h) Inspections shall be as per Appendix A.

5. Applications for large developments, institutional, industrial, large commercial facilities and new sewer main installations shall submit the following information:
    a. Design flow calculations
    b. Nature of flow
    c. Design drawings with minimum scales:
        1. Horizontal 1" = 40'
        2. Vertical 1" = 4'
    d. Design drawings shall include:
        1. Complete site drawings including all utility lines
        2. Sewer profiles showing all vertical separation of utilities
        3. Complete system specifications
        4. All appropriate details
    e. Plans submitted by a Professional Engineer licensed in Massachusetts.
    f. A detailed design documenting the basis for the selection, sizing, and general design of the infrastructure. This shall include, at a minimum, the number of units and expected flows, factors and assumptions used in sizing sewers, force mains, pump stations, and other infrastructure.
    g. The permit application shall be supplemented by any plans, specifications or other information considered pertinent in the judgement of the Board.
    h. A detailed project schedule that clearly identifies the dates or time frames associated with Planning Committee Submittals and Approvals, construct start dates, testing and start-up of infrastructure, acceptance by the Board, and expected commissioning of systems.

E. All costs and expenses incidental to the installation and connection of the building sewer shall be borne by the owner(s). The owner(s) shall indemnify the Town from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer. The Board reserves the right to recover costs associated with the review of any submittals, analysis of capacity to serve, inspection, and field-testing and start-up.

F. A separate and independent building sewer shall be provided for every building, except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway. In such cases,

the front building sewer may be extended to the rear building and the whole considered as one building sewer, but the Town does not and will not assume any obligation or responsibility for damage caused by or resulting from any such single connection.

G. Separation of Lines. Sewer Lines shall be located with a minimum 10 feet horizontal separation from any existing or proposed potable water lines. Whenever sewers must cross water mains, the sewer shall be constructed as follows:

(a). Sewer pipe shall be Class 52 Ductile Iron for a minimum distance of nine feet for each side of the crossing.

(b). Joints shall be mechanical type water pressure rated with zero leakage when tested at 25 pounds per square inch for gravity sewers and 12 times the working pressure for force mains. Joints shall not be located within nine feet of the crossing.

(c). Vertical separation of the sewer and water lines shall not be less than 18".

H. During construction of a new sanitary sewer, the Town may construct the service connections for existing buildings to the curb or the property line or the edge of a right-of-way. Construction of the building sewer, including connection to the structures served, shall be the responsibility of the owner of the improved property to be connected; and such owner shall indemnify and save harmless the Town, its officers, and agents from all loss or damage that may result, directly or indirectly, due to the construction of a building sewer on his premises or its connection to the service connection. The owner shall thereafter be obligated to pay all costs and expenses of operation, repair and maintenance, and of reconstruction, if needed of the building sewer and service connection.

I. Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sewage conveyed by such building drain shall be lifted by an approved means and discharged to the building sewer at the owner's expense.

J. The connection of the building sewer into the public sewer shall conform to the requirements of the building and plumbing code, other applicable rules and regulations of the Town, and the procedures set forth in Section 2.3 of this document. All such connections shall be made gas-tight and watertight and verified by proper testing. Any deviation from the prescribed procedures and materials must be approved by the Board before installation.

K. The applicant for the building sewer permit shall notify the Board when the building sewer is ready for inspection and connection to the public sewer. Such notice shall be provided not less than 3 working days in advance of the time any connection is to be made to any public sewer. The connection and testing shall be made under the supervision of the Board or his representative. This requirement shall also apply to repairs or alterations to building connections, drains or pipes thereto.

L. Suitable provisions shall be made at the point of connection for testing, which responsibility shall rest with the holder of the sewer connection permit.

M. No building sewer shall be covered until it has been inspected and approved by the Board. If any part of building sewer is covered before being inspected and approved, it shall be uncovered for inspection at the cost and expense of the owner of the improved property to be connected to the public sewer.

N. The Board shall maintain a record of all connections made to public sewers and drains under this Regulation and all repairs and alterations made to building connections or drains connected to or discharging into public sewers and drains of the Town or intended to so discharge. All persons concerned shall assist the Board in securing the data needed for such records.

O. All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the Town at the expense of the owner.

P. A street opening permit shall be obtained from the Town at least twenty four (24) hours before opening the street except under emergency conditions as determined by the Board and approved by the Rockland Police Department.

Q. Proposed new discharges from residential or commercial sources involving wastewater discharges exceeding (15,000 gpd), any new industrial discharge, or any alteration in either flow or waste characteristics of existing industrial wastes that are being discharged into the POTW must be approved by MADEP. Any plans for substantial sewerage, or new pump stations must be submitted to MADEP or approval.

R. Abandonment of Service. No person shall dismantle or move any building having a service entrance into a public sewer without first notifying the Board. Before the building is dismantled or moved, the entrance of the sewer service into such building shall be sealed with a watertight masonry plug or rubber cap. The seal shall be installed under the supervision of the Board. If the building sewer is determined to be unserviceable by the Board, the owner shall, at his own expense, remove such service and seal the opening at the public sewer.

2.5 Licensing of Persons Authorized to make connections to the public sewers

A. Whenever public sewers are to be constructed the Commission may make such investigations as it deems necessary to determine the ability of the contractor to perform the work, and the contractor shall furnish the Commission all such information the Board may request, including but not limited to bonding capability, proof of insurance, references and a list of equipment to be used. The Commission reserves the right to reject the contractor if the evidence submitted fails to satisfy the Board that he is properly qualified to complete the work as proposed.

B. As a minimum, the Contractor shall have been engaged in the mainline public sewer construction business for at least three years; shall have good references; shall have adequate equipment to complete the work; shall have personnel experience in mainline sewer construction and shall be bondable for the full amount of the estimated construction.

C. Plumbers and Private Contractors of established reputation and experience will be licensed by the Board as authorized sewer main and sewer service installers. (Licensed Drain Layer).

D. Applicants for licenses as sewer main and sewer service installers (Licensed Drain Layer) are required to pay a filing fee in accordance with the current fee schedule, payable to the Town, all of which will be refunded to the applicants if rejected.

E. The contractor shall provide a reference from at least three (3) other Towns which the firm has done sewer work or proof of current licensure as a drain layer in another Massachusetts town.

F. All building sewer installation work shall be performed by Licensed Drain Layers with a statement that the licensee shall supervise and be responsible for all work performed under the license.

G. As a condition of approval by the Board, applicants for licenses shall file with the Town an insurance certificate naming the Town as an additional insured party with General Commercial Liability Coverage with a minimum of $ 1,000,000 and also riders for underground explosion and collapse (UEC) coverage; proof of Worker's Compensation Insurance up to the statutory limits; all of which shall remain in full force and effect for a period of least one year from the date of approval. No insurance policy shall be cancelled without thirty (30) days prior written notice to the Board. These Certificates shall contain a provision that coverage afforded under the policies will not be canceled until at least fifteen days prior written notice has been given to the Town. Said insurance shall indemnify the Town against any and all claims, liability or actions for damages incurred in or in any way connected with the performance of the work by a sewer system installer, and for or by reason of any act or omission of said sewer system installer in the performance of his or her work.

H. If approved by the Board, applicants for licenses as sewer main and sewer service installers (Licensed Drain Layer Installer) shall obtain a License and Permit Bond in the amount of Five Thousand ($5,000.00) Dollars or an amount equal to 100% of the construction cost of any proposed sewer connection located within or on public property, or an amount approved by the Board, whichever is greater, and shall remain in full force and effect for a period of one (1) year from date of acceptance by the Town of the contractor's last service connection. This bond will guarantee that the Contractor will comply with the bylaws and regulations of the Town regarding "Sewer Use Ordinance". The license and permit bond shall be duly executed by the Principal of the Contractor and by a Surety Company qualified to do business under the Laws of the Commonwealth of Massachusetts. Said bond shall be submitted to the Superintendent with the Contractor's letter requesting approval as a licensed sewer main and sewer service installer, (Licensed Drain Layer Installer), and shall be acceptable to the Superintendent.

(1) In order for a Private Contractor to do any work in, on, under or around streets, sidewalks and property belonging to the Town, it will be necessary for the Contractor to furnish simultaneously with the submittal of the License and Permit Bond, a Certificate of Insurance listing the Town as an additional insured party with the following coverage:

a. General Liability - $1,000,000
Property Damage - $1,000,000
Bodily Injury - $1,000,000 per occurrence $2,000,000 aggregate

b. Automobile Liability - $500,000 Property Damage
Bodily Injury - $500,000

c. Workmen's Compensation and Employer's Liability

d. Insurance shall include coverage for collapse and underground structures.

e. Insurance shall include coverage for projects/completed operations.

f. or any other amounts as determined necessary by the Town's insurance agency.

(2) All above insurance coverage shall remain in full force and effect for a period of at least one (1) year from the date of acceptance by the Town of the last service connection installed by the Contractor. The Contractor shall take all responsibility for the work, and shall take all

precautions for preventing injuries to persons and property in or about the work area. The Contractor shall pay all debts for labor and materials contracted for or by him. The Contractor shall hold harmless and indemnify the Town and its Officers and Agents for all claims relating to labor, alleged infringement of inventions, patents, or from injuries to any person or corporation caused by the negligent acts of the contractor, or any of his agents or employees, or any subcontractor, or any agents or employees of any subcontractor, in performing said work for the Town, such obligation to hold harmless and indemnify the Town shall include only liability incurred as a result of the improper use of materials, procedures or labor.

I. The Contractor shall NOT perform any work in, on, under or around streets, sidewalks and property belonging to the Town until a License and Permit Bond and a Certificate of Insurance is approved by the Board and the Contractor has received written notice that they are approved and are on file at the Board.

J. Approved applicants will renew their Utility Installers Licenses by submitting a revised License and Permit Bond Certificate of Insurance, and License Fee by January 1st of each ensuing year.

2.6 Sewer Construction

A. General

(1) Project Coordination. The Board provides wastewater collection, interception, and treatment services. In general, the Board will accept additional sewerage infrastructure when designed in accordance to State/Local Code, general engineering practice, and Board standards. This specification includes limited Board standards intended to convey the general nature and quality of acceptable infrastructure. The Board will not accept or operate any infrastructure until the project has been completed and tested in accordance with any submittals and Board standards and details in this section. As-built drawings must be provided in hardcopy and electronic form to and approved by the Board before any infrastructure will be accepted or operated by the Board.

(2) Inspection. An inspector from the Board, a consultant working for the Board, or an inspector retained by the Town (with responsibility for the oversight of sewerage infrastructure to be installed) will be assigned to each project to ensure that all work is completed and materials are installed in compliance with all submittals and these specifications. The Board, or its representative, before incorporation into the work, must approve any deviation from the approved plans or specifications. All costs related to the engineering inspection shall be born by the applicant, an estimated amount will be set by the Board and will be payable prior to the issuance of the permit.

(3) The Contractor shall schedule with the Board for inspection services a minimum of 3 working days prior to construction. The Board cannot guarantee an inspector for the project without this notice. Start-up and acceptance testing of systems will require a 3 working day notice. All testing shall be observed by the Board or its representatives.

(4) As-Builts. Within 30 days of the completion of construction, the Owner/contractor/applicant must submit to the Board one set of as-built record drawings. The drawings shall show the actual in place plan and profile of the public sewer as well as house service connections. Ties shall be provided for all manholes and house services. Depth of house service shall also be provided. The drawings shall also be provided in the latest Auto CADD.

B. Non-Conformance

The Board will notify the contractor of any non-conformances. All nonconformances will be followed up in writing. All non-conformances shall be corrected at the Contractor's expense.

C. Standard Specifications and Details

(1) Submittals:

a. Manufacturer's product data and installation instructions.

b. Certified copies of tests on pipe units.

c. Construction Records: Record depth and location of the following:

1. House service capped ends, clean-outs, bends in house service, connection points to sewer main.
2. Bends, thrust blocks in force mains.
3. Repairs to existing pipes.

Record neatly in a permanently bound notebook and submit at Substantial Completion. Provide access to records for the Board at all times. Submit copies to the Board on a weekly basis.

d. Shop Drawings: Submit for precast manholes and all precast concrete items. Show components to be used, elevations of top of precast sections, base and pipe inverts, location of pipe penetrations for each manhole. Verify finish grade elevation at each proposed manhole location in the field.

e. Product Data: Submit manufacturers' product data and installation instructions for frames, covers, grates, precast items, manhole sleeves and joint sealants.

(2) Products Pipe and Fittings

a. General: Provide fittings of same type and class of materials as pipe. Provide commercially manufactured wyes or tee/wyes for service connections. Fitting must have single piece gasket.

b. PVC Non-Pressure Pipe and House Services (Sewer):
4" through 12" Diameter:ASTMD 3034 orASTMD3033, strength requirement SDR 35; push-on joints, ASTM D3212; gaskets, ASTM F477.
Pipe stiffness, measured in accordancewithASTMD2412, shall be a minimum of 45 psi at 5% deflection.

c. Ductile Iron Pipe (Force-main): AWWA C151; thickness Class 52 AWWA C150; double cement lined, AWWA C104; push-on joints or mechanical joints with rubber gaskets, AWWA C111; fittings, AWWA C110.

d. Allowable Pipe Leakage Maximum allowable infiltration rates shall not exceed 300 gallons per inch diameter per mile per day for all types of pipe used in sewer systems.

e. Pipe Sizes. Eight-inch diameter is minimum acceptable for new gravity sewer mains. Four-inch diameter is minimum for building sewer where full flowing velocity will not be less than two feet per second and future extensions not anticipated.

(3) Manholes

a. Manhole and precast concrete structures capable of supporting AASHTO HS-20 loading. All precast concrete shall comply with ASTMC913 "Standard Specification for Precast Concrete Water and Wastewater Structures."

b. Precast Manhole Components: Shall comply with ASTM C478.

c. Base Sections: Precast monolithic construction to a point at a minimum of 6 inches above the crown of the incoming pipe.

d. Barrel Sections: Precast with no steps.

e. Top Sections: Precast eccentric cone with no steps.

f. Pipe to Manhole Connections: Flexible manhole sleeves shall be CP series manufactured by Interpace Corp., or approved equal. Size to fit diameter and type of pipe without use of gaskets.

g. Joints Between Precast Sections: Watertight, ship-lap-type seal with two rings of one-inch diameter butyl rubber sealant.
h. The exterior of all precast manhole sections shall be coated with a bituminous waterproof coating. The bituminous coating shall conform to ASTM Designation: D 41.

(4) Drop and Valve Manholes
a. General: Conform to requirements for manholes. Provide pipe and accessories as shown on Drawings.

b. Riser Support Bracket: 10 gauge, Type 304, No. 3 finish stainless steel.

(5) Inverts: Prefabricated plastic inverts are preferred.
a. 180 Degree Straight Through Manholes: One piece molded fiberglass invert with integral pipe connections that are factory precast integral with the manhole base, Fiberliner 2000 Invert System as manufactured by Fiberliner 2000 New England, Inc, Tel. (508) 349-7401; or approved equal.

b. Non Straight Through Manholes: One-piece plastic composite invert, Reliner as manufactured by Reliner Duran, Inc. Tel. (860) 434-0277; or approved equal.
Provide concrete backfill with brick table.

1. Concrete: 3000 psi.
2. Sewer Brick: ASTM C32, Grade SS, hard brick.
3. Mortar: Type M, ASTM C270. Use Type II Portland cement, Type S lime. Proportions for Mortar: 1 part Portland cement, 1/4 part hydrated lime, 3 to 3 3/4 parts sand.

(6) Risers: Rubber riser rings are preferred.
a. Rubber adjustment riser rings manufactured from a rubber fibrepolyurethane prepolymer composite, Infra-Riser as manufactured by GNR Technologies Inc. or approved equal.

b. No more than 3 courses of brick may be used. Any work must be acceptable to the Board.

(7) Frames, Covers, and Grates:
a. Material: Cast iron, ASTM A48 Class 30.

b. Manhole Frames and Cover: Manhole frames and coven shall be catalog no. **LT1O2** as manufactured by E.L. Lebaron Foundry Co., Brockton, MA 02403, or approved equal product. Manhole frame shall have a clear opening of 24 inches. The surface of the cover shall have the word "SEWER" cast thereon for sanitary sewers. Use of Cast Iron manhole frames and coven are subject to written approval from the Board. Elevations of less than twelve (12) inches 1mm.the precast concrete manhole and the roadway shall be accomplished with red clay sewer brick and mortar only. Elevations greater than twelve (12) inches shall be made with precast concrete riser tings, designed for that purpose.

(8) Miscellaneous:

a. Joint Sealants:

1. Butyl Rubber Sealant: One (1) inch diameter strips manufactured by Kent Seal, or approved equal.

2. Butyl Rubber Caulking: Conform to AASHTO M-198, Type B.

a. Sewer Manhole Inverts: Provide inverts as specified or as shown. Configuration to be as required by connecting pipes and as shown on Drawings.

b. Flexible Couplings: Use and location shall be approved by the Board.

1. Type A: Dresser Style 53 as manufactured by Dresser, or approved equal.

2. Type B: Neoprene sleeve with stainless steel bands by Fernco, or approved equal.

c. Pipe Supports: Saddle type, steel, painted, adjustable, by ITT Grinnell, or approved equal.

d. Geo-textile Fabric: Miraft 140N, or approved equal.

e. Force-main Marking Tape: Lineguard III by Tri-Sales, Inc., 2"wide, green; detectable with magnetic locators, or approved equal.

f. Rigid Insulation: Extruded closed-cell rigid foamed polystyrene, 2 inch thickness, width of trench, Styrofoam HI-60, by Dow Chemical, or approved equal.

D. Installation and Construction of Gravity Pipe and Fittings:

(1) General Methods:

a. Install in accordance with manufacturer's recommendations. Use a laser beam or transit for line and grade unless otherwise permitted by the Board. Secure each length of pipe with bedding before placing next length. Plug open ends when work is suspended. Bed pipe as shown on Drawings.

b. Grade and Line:

1. Grade and Line shall be sufficient to provide minimum velocities of 2.0 fps. Lay pipe to line and grade shown on the Drawings as reviewed and approved by the Board. If grade is not shown, determine elevations of start and finish points for each run of pipe. Lay pipe to a uniform grade between these points.

Minimum Pipe Slope

Pipe Diameter	Slope
4-inch	0.008
6-inch	0.005
8-inch	0.004
10-inch	0.0028
12-inch	0.0022
18-inch	0.0012
24-inch	0.0008

(2) Line and grade may be adjusted as approved by the Board, when required by field conditions.

(3) In all cases where slope and size result in average velocities in excess of 10 feet per second or more, provide protection against erosion and shock. When houses are spaced a considerable distance apart, the minimum slope shall be slightly steeper for effective drainage and pipe maintenance.

(4) Depth of Lines. Provide sufficient depth to drain basements in all cases practical. Minimum coverage above the pipe shall be 24 inches below finished grade.
a. Conditions: Lay pipe in the dry. Do not use installed pipe to remove water from work area.

b. Flush and clean all pipe and remove all debris and materials. Flushing and cleaning methods shall be in accordance to Board Standards and approved by the Board. Gravity flushing is not acceptable.

c. Connections to Manholes: Any connections shall be in accordance with Board Standards. Connections to existing structures must not result in additional infiltration. Any joints shall be located within 3 feet of inside surface of manholes and catch basins.

d. House Service Fittings and Lines:

1. The minimum size of sewer service lines 6".

2. Depth and location of service to be determined in field, as approved by the Board.

3. Provide tee/wye or wye fittings on main line pipe. Extend services to a edge of Right-of-Way as determined by the Board.

4. All new building sewer laterals shall be installed with a vertical cleanout riser located at the property line. The cleanout riser shall be of six (6”) inch minimum diameter.

5. Provide clean outs as required.

6. Plug, or cap, and stake ends of new service. Provide stake that extends from plug or cap to 1 foot above ground surface. Provide the Board with measurements of pipe installed and in obtaining swing ties to ends of leads.

7. All service connections must be shown on as-built drawings.

8. Existing building sewers may be used in connection with new buildings only when they are found, on examination and test by the Board to meet all requirements of this Regulation.

E. Grinder Pumps

(1) In cases where the existing sewer will not drain by gravity to the sewerage system, a pump system shall be employed.

(2) Any backup into the building will be the sole responsibility of the Property Owner. The Town is not liable or responsible in any way for damage due to the sewage backups served by grinder/ejector pumps or the force main line itself.

(3) The operation, maintenance, repair and replacement of the pump and appurtenances shall be the sole responsibility of the homeowner.

F. Installation of Forcemains and Pressure Pipe:

(1) Grade and Line: Lay pipe to line and grade as approved by the Board. Do not allow positive-negative grade discontinuities.

(2) Install warning tape continuously from the pump stations to the end of each force main. At ends of rolls and repairs, splice tape with 3-foot overlap connected with duct tape. Extend to grade of each manhole.

(3) Thrust Protection: Provide thrust protection at all bends in force-mains in accordance with Standards and as approved by the Board.

G. Utilities to be Abandoned:

Close open ends of abandoned underground utilities that are not indicated to be removed. Provide sufficiently strong water tight closures, such as rubber caps with sufficient strength to with stand hydrostatic or earth pressure that may result after ends of abandoned utilities have been closed. CONTRACTOR may remove abandoned utilities with written permission of the Board or Town.

H. Insulation:

(1) Install as shown on approved Drawings.

(2) Provide 2-inch minimum thickness for sewer, force-main, and water main, compacted sand layers directly above and below insulation.

I. Testing of Sanitary Sewers:

(1) General: Test all sanitary sewer pipes after backfilling. Install all house service leads on main line before testing. Perform tests in presence of the Board. A maximum of 1000 feet of pipe may be installed but not tested at any time.

2. Gravity Sewer Leakage Tests: Use low pressure air test as follows:
a. Plug ends of section to be tested.
b. Supply air slowly to the pipe to be tested until the air pressure inside the pipe is 4.0 psi greater than the average back pressure of any groundwater submerging the pipe.
c. Disconnect air supply and allow a minimum of two minutes for stabilization of pressure.
d. Following stabilization period measure drop in pressure over the test period within the following times:

Nominal Pipe Size (in.)	Test Period (min.)
4	4
6	4
8	6
10	6
12	7
15	8
18	9
21	11
24	13

e. Acceptable drop: No more than 1.0 psi.

(3) Force-main and Pressure Sewer Tests: Use hydrostatic test as follows:
a. Fill section of pipe with water and expel all air.
b. Pressurize to 1.5 times the normal operating pressure but not less than 60 psi.
c. Measure leakage over a 2-hour test period.
d. Acceptable leakage: Less than 10 gallons per day per inch diameter per mile of pipe tested.

(4) Deflection Test for PVC Gravity Sewer Pipe: Test 100%of pipe with mandrel "GO-NO-GO" gauge allowing maximum deflection per ASTM D3034.

(5) TV Inspection: All sewers and drains shall be inspected by an approved CONTRACTOR using TV pipe inspection. Defects in materials and/or workmanship found during the inspection shall be corrected by the CONTRACTOR.

(6) Repair and/or replace all pipes not passing tests, using materials and methods approved by the Board, and retest.

J. Installation of Manholes/Precast Structures:

1. Placement: Place precast bases and structures on compacted bedding material so bottom of structure is plumb and pipe inverts are at proper elevations. Place manhole barrel and top sections in the appropriate height combinations. Plug all lifting holes inside and out with non-shrink grout. Construct manhole inverts in accordance with specifications.

2. Joints: Follow manufacturer’s instructions for sealing joints between precast sections. Provide two rings of 1 inch diameter butyl rubber sealant. Point joints inside and out with butyl caulk.

3. Frame and Covers:

a. Set to final grade as shown on the Drawings and as specified. Provide adequate temporary covers to prevent accidental entry until final placement of frame and cover is made.

b. Use two rings of 1inch diameter butyl rubber sealant between frame and rubber riser. Provide downward force to frame so as to compress the joint, provide a watertight seal, and prevent future settlement. Point compressed joint with butyl rubber caulk sealant.

c. Set manhole frames and covers to final grade only after pavement base course has been applied, or after final grading of gravel roads.
4. Inverts: As specified.

5. Steps: Manhole steps are prohibited.

K. Leakage Testing - Manholes:

(1) General: Tests must be observed by the Board. Manholes must be complete, including backfill, for final test acceptance except for shelf and invert. Plug all pipes and other openings in the manhole walls prior to test.

(2) Exfiltration Test:
a. Plug pipes into and out of MH and secure plugs.
b. Lower groundwater table (GWT) to below MH. Maintain GWT at this level throughout test.
c. Provide means of determining GWT level at any time throughout test.
d. Fill MH with water to top of cone.
e. Allow a period of time for absorption (determined by CONTRACTOR).
f. Refill to top of cone.
g. Determine volume of leakage in an 8 hour (min) test period and calculate rate.
h. Acceptable leakage rate: Not more than 1 gallon per vertical foot per 24 hours.

L. The Board reserves the right to require an infiltration test if the Board is not satisfied with the exfiltration test.

(3) Vacuum Test:
a. Manholes may be vacuum tested in lieu of the exfiltration test. The vacuum tests must be performed prior to backfilling the manhole, filling joints, and constructing them a manhole inverts and benches. All pipe connections shall be made prior to the test.

b. Plug pipe openings and securely brace the plugs and pipe.

c. Set the tester onto the top section of them a manhole and inflate the compression band to effect a seal between the structure and the vacuum base.

d. Connect the vacuum pump to the outlet port, open the valve, start the motor and draw a vacuum of 10" mercury.

e. Close the valve and monitor the vacuum gauge.

f. The test shall pass if the vacuum holds at 10" mercury or drops no lower than 9" within the following times:

Depth of Manhole (feet) Time(min.)

0 - 10	3.0
10 - 15	3.5
15 - 20	4.0
20 – 25	4.5
>25	5.0

g. If the vacuum drops in excess of the prescribed rate, the CONTRACTOR shall locate the leak, make proper repairs, and retest the manhole.

h. If the unit fails the test after repair, the unit shall be water exfiltration tested.

M. Manholes Repairs:

(1) Determine causes of all leaks and repair them. Perform earthwork required if manhole has been backfilled.

(2) Perform repairs using methods and materials approved by the Board. Remove and replace or reconstruct manhole if necessary. Remove and replace defective sections if required by the Board.

N. Trenching and Backfill:

(1) The pipe shall be laid as shown in the Typical Sewer Main and Service Detail drawing.

(2) Pipe laying shall proceed upgrade with the spigot ends pointing in the direction of the flow.

(3) Bedding shall consist of 3/4 inch stone placed to a depth of at least 6 inches below the bottom of the pipe and to the springline.

(4) Filtration fabric shall be placed to cover the stone and pipe to separate the sand blanket from the stone.

(5) The pipe shall be covered with a blanket of sand to 12 inches over the crown of the pipe with sand that is free of organic materials and stones.

(6) Backfill material for installation in roads, shoulders and traveled ways shall be natural material excavated from the trench during construction excluding debris, pieces of pavement, organic matter, top soil, all wet or soft muck, peat, clay and stones greater than 12 inches in diameter. Suitable backfill material is added in 12 inch lifts, compacting each lift to maximum density with an approved vibratory roller or compactor.

(7) Controlled Density Fill. Shall be a mixture of Portland cement, fly ash aggregates, water and admixtures proportioned to provide a non-segregation, self consolidating, free flowing and excavatable material that will result in hardened, dense non-settling fill. CDF is approved as an alternative to Crushed gravel and may be used in any location on the project as an option to the Contractor for stabilization material.

O. Road and Trench Construction Guidelines

(1) Pavement cuts shall be parallel or perpendicular to the line of the trench. In the case of transverse or diagonal trenching, the pavement shall be saw cut to provide a flat diamond

shaped patch with a two - (2') foot minimum overlap on undisturbed material that will permit only one wheel of a vehicle at a time to strike the patch area. Backfill shall be compacted in maximum one- (1') foot lifts to obtain a minimum of 95% of the optimum density as measured by the modified proctor test. Backfill shall be of approved granular material free of stone larger than six (6) inches in diameter and free of organic material. Materials immediately under pavement (gravels and processed gravels) shall be replaced in kind or to a minimum depth of 12″ of crushed gravel meeting Town and MAHD Specifications. Material shall be compacted to a minimum of 95% of the optimum density as measured by the modified proctor test. The Town may require compaction and materials testing of excavation backfill. An independent company approved by the Town at the expense of the Owner, shall perform all materials testing.

(2) Within the sawed limits of the final patch, the existing pavement and any temporary material shall be removed and replaced to an equal depth with a minimum of three (3") inches of hot bituminous pavement (two (2") inches of base and one- (1") inch of wearing course). The bituminous pavement mixture used shall comply with the MAHD Standard Specifications for Road and Bridge Construction, testing and certification of compliance with these standards may be required. Bituminous pavement shall be laid and compacted in a maximum of two- (2") inch thick layers. After compaction the new patch shall match the line and grade of the adjacent roadway exactly. The face of all joints and exposed pavement to be overlaid shall be coated with an approved asphalt emulsion (tack coat).

(3) All disturbed traffic stripping, traffic signage and traffic signal equipment (detector loops, conduit, etc.) shall be replaced with like or better materials.

(4) In other areas, the existing surface shall be restored by placing similar material to a depth equal to that of the existing material prior to excavation. Cross-country trenches are to be compacted in lifts as above. Additional material added to cross-country trenches shall be gravel that shall comply with MAHD Specifications. Any existing grass areas shall be loamed, graded and revegetated. Any asphalt or concrete sidewalks shall have a surface of equal depth, kind and quality placed. Additionally, the work shall conform to instructions issued by the Town for authorized representative

(5) The owner is responsible for any necessary repairs and/or modifications to the road trench patch for the period of one year. Any repairs and/or modifications shall be made at no expense to the Town. Any repairs and/or modifications shall be made to the standards of the Board.

(6) All trench work shall conform to trench safety standards of the Commonwealth of Massachusetts and the Town of Rockland.

2.7 Prohibited Discharge Standards

Pollutants, substances, or wastewater prohibited by this section shall not be processed or stored in such a manner that they could be accidentally discharged to the POTW.

A. General Prohibitions. No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater that causes pass-through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other federal, State, or local pretreatment standards or requirements.

B. Additional Prohibitions. No User shall introduce or cause to be introduced into the POTW the following pollutants, substances, or wastewater:

(1) Pollutants which create a fire or explosive hazard in the POTW, including, but not limited to, wastestreams with a closed-cup flashpoint of less than 140 degrees F (60 degrees C) using the test methods specified in 40 CFR 261.21;

(2) Wastewater having a pH less than-5.5 or otherwise causing corrosive structural damage to the POTW or equipment. If continuous pH chart recorder is being used, any occurrence of pH over 10.0 for a period of thirty minutes or more per day is prohibited. At no time shall any discharge cause the influent at the POTW headworks to go above 9.0.

(3) Solid or viscous substances in amounts which will cause obstruction of the flow in the POTW resulting in Interference but in no case solids greater than1/2inch (es) (0.5") or 0.39 centimeter(s) (0.39 cm) in any dimension;

(4) Pollutants, including oxygen-demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, will cause Interference with the POTW;

(5) Wastewater having a temperature greater than 150 degrees F (65 degrees C), or which will inhibit biological activity in the treatment plant resulting in Interference, but in no case wastewater which causes the temperature at the introduction into the treatment plant to exceed 104 degrees F (40 degrees C);

(6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, or any other oil in excess of 5 mg/L or in amounts that will cause Interference or Pass Through;

(7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;

(8) Trucked or hauled pollutants, except at discharge points designated by the Commission in accordance with Section 3.4 of this ordinance;

(9) Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;

(10) Wastewater which imparts color which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions, which consequently imparts color to the treatment plant's effluent, thereby violating the Town's NPDES permit; Color (in combination with turbidity) shall not cause the treatment plant effluent to reduce the depth of the compensation point for photosynthetic activity by more than ten percent (10%) from the seasonably established norm for aquatic life.

(11) Wastewater containing any radioactive wastes or isotopes except in compliance with applicable State or Federal regulations;

(12) Storm Water, surface water, ground water, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, non-contact cooling water, and unpolluted wastewater, unless specifically authorized by the Commission;

(13) Sludges, screenings, or other residues from the pretreatment of industrial wastes;

(14) Medical Wastes, except as specifically authorized by the Commission in an individual wastewater discharge permit;

(15) Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail toxic test;

(16) Detergents, surface-active agents, or other substances which that might cause excessive foaming in the POTW;

(17) Waters or wastes containing fats, wax, grease or oils, not specifically prohibited in Section 2.1 (B) (6) in excess of 100 mg/L or containing other substances which may solidify or become viscous between 32 degrees Fahrenheit or 0 degrees Centigrade, and 150 degrees Fahrenheit or 65 degrees Centigrade. Waters or wastes containing such substances, excluding normal household wastes, shall exclude all visible floating oils, fats and greases. The use of chemicals or physical means to bypass or release fats, oils and greases into the POTW is prohibited.

(18) Hazardous Waste or Wastewater resulting from treatment of hazardous or Toxic wastes, as designated under State and Federal law, and discharged to the POTW by dedicated pipe, truck or rail.

(19) Septage or septage byproducts from haulers or other dischargers except as specifically approved by the Commission.

(20) Clean Water Prohibition: No user shall make a connection of clean water (I/I) such as a sump pump, basement drain, foundation drain, yard or area drain, roof downspout, or other source of surface runoff or groundwater to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer unless such connection is approved by the Town for purposes of disposal of polluted surface drainage.

2.8 Federal Categorical Pretreatment Standards

The categorical pretreatment standards are found at 40 CFR Chapter I, Subchapter N, Parts 405-471 and are hereby incorporated into the Regulation.

A. Where a categorical pretreatment standard is expressed only in terms of either the mass or the concentration of a pollutant in wastewater, the Board may impose equivalent concentration or mass limitations in accordance with 40 CFR 403.6(c).

B. When wastewater subject to a categorical pretreatment standard is mixed with wastewater not regulated by the same standard, the Board shall impose an alternate limit using the combined wastestream formula in 40 CFR 403.6(e).

C. A user may obtain a variance from a categorical pretreatment standard if the user can prove, pursuant to the procedural and substantive provisions in 40 CFR 403.13, that factors relating to its discharge are fundamentally different from the factors considered by EPA when developing the categorical pretreatment standard.

D. A user may obtain a net gross adjustment to a categorical standard in accordance with 40 CFR

403.15. The USEPA shall be the Control Authority for industrial users subject to categorical pretreatment standards. As the Control Authority, industrial users are responsible to the EPA for compliance with categorical pretreatment standards and the requirements of 40 CFR Part 403. Categorical industrial users shall provide the Town with copies of any reports to, or correspondence with EPA relative to compliance with the categorical pretreatment standards. The industrial user is responsible for determining the applicability of categorical pretreatment standards. The user may request that EPA provide written certification on whether the user is subject to the requirements of a particular category. The Town shall provide timely notification to appropriate industrial users of applicable categorical pretreatment standards. Upon promulgation of the federal categorical pretreatment standards for a particular industrial subcategory, the federal standard, if more stringent than limitations imposed under this Regulation for sources in that subcategory, shall, on the compliance date of the categorical pretreatment standards, immediately supersede the limitations imposed under this Regulation. Compliance with categorical pretreatment standards shall be achieved within one (1) year of the date such standards are effective, unless a shorter compliance schedule is specified in the standards. An industrial user subject to categorical pretreatment standards shall not discharge wastewater directly or indirectly to the Town's POTW subsequent to the compliance date of such standards unless an amendment to its Industrial Discharge Permit has been issued by the Town.

2.9 State Pretreatment Standards

Users must comply with State Pretreatment Standards codified at 314 7.00, 12.00 and 12.08.

2.10 Local Discharge Restrictions

All persons discharging industrial process wastes into public or private sewers connected to the Town's POTW shall comply with applicable federal requirements and State standards for pretreatment of wastes as they may be amended from time to time in addition to the requirements of this Regulation. Local numerical discharge limitations established by the Town as set forth herein (referred to as "local limits"), and all State pretreatment standards and USEPA categorical pretreatment standards shall apply, whichever is most stringent. In developing the list of pollutants of concern for which local limits are established, the Town has considered the allowable headworks loading at the wastewater treatment facility. Pollutants that exceed fifty percent (50%) of their allowable headworks loading at the wastewater treatment facility are considered to be of concern and have resulted in development of local limits. If any waters or wastes are discharged or are proposed to be discharged to the POTW that exceed the standards or restrictions established in Sections 2.3, 2.4, and 2.5 of this Regulation, which in the judgment of the Board may have a deleterious effect upon the POTW, processes, equipment, or receiving waters, or that otherwise create a hazard to worker safety or health, or constitute a public nuisance, the Board may: Reject or prevent any discharge to the POTW after notice has been served to the discharger and the discharger has had reasonable opportunity to respond;

Require pretreatment prior to discharge to the POTW (Section 3.0);
Require control (e.g., equalization) over the quantities and rates of discharge; and/or
Require payment to cover additional cost of handling and treating the wastes.

If the Board allows the pretreatment or equalization of waste flows, the design and installation of the systems and equipment shall be subject to the review and approval of the Board and the State (see Section 3).

A. Local Limits. The following numerical pollutant discharge limitations are established to protect against pass-through and interference. No person shall discharge wastewater containing constituents at daily concentrations greater than indicated below:

1.365	mg/l	arsenic
225	mg/l	BOD *
0.043	mg/l	cadmium
3.322	mg/l	chromium
0.793	mg/l	copper
0.444	mg/l	cyanide
2.937	mg/l	lead
0.101	mg/l	mercury
2.231	mg/l	nickel
0.299	mg/l	silver
266	mg/l	total suspended solids *
3.438	mg/l	zinc
100	mg/l	oil & grease (animal or vegetable origin)
85	mg/l	total kjeldahl nitrogen, TKN
10	mg/l	phosphorus

* surchargeable limit

All concentrations for metallic substances are for "total" metal unless indicated otherwise. The Sewer Commission may impose mass limitations in addition to (or in place of) the concentration-based limitations above.

B. The Commission may develop Best Management Practices (BMPs), by ordinance or in individual wastewater discharge permits to implement Local Limits and the requirements of Section 2.1. The Board shall calculate and administer daily concentration limits (i.e., local limits) when required as described below to ensure that the combined industrial pollutant discharge loadings do not cause or contribute to exceedences of these limitations. For industrial discharge applications, the local limits [presented above] shall apply at the end of the process train prior to dilution with non-industrial wastewaters. Daily concentrations are the concentration of a pollutant discharged, determined from the analysis of a flow composited sample (or other sampling procedure approved by the Board) representative of the discharge over the duration of a 24-hour day or industrial operating schedule of less than 24 hours. All concentration limits for metals represent a total metal unless indicated otherwise. The Board may impose mass limitations in addition to, or in accordance with Section 2.8, in place of the concentration-based limitations. Local limits are developed based on the identification of industrial users known to be discharging each pollutant (industrial contributory flow procedure). Unless specifically identified in an industrial discharge permit, an industrial user shall not discharge the locally limited pollutants at concentrations 20 percent greater than the background concentrations used for local limits development.

C. Pollution Prevention Action. Pollutants for which pollution prevention efforts are required of all significant industrial users and other industrial and non-industrial users at the discretion of the Board include:

Endocrine disrupting chemicals, which are found in pharmaceuticals, pesticides, plastics, personal care products and many industrial byproducts. Failure to control these pollutants through pollution prevention activities will result in development and application of a local limit when a pollutant loading to the POTW exceeds fifty percent (50%) of the allowable headworks loading.

2.11 Town's Right of Revision

The Commission reserves the right to establish, by ordinance or in individual wastewater discharge permits more stringent Standards or Requirements on discharges to the POTW consistent with the purpose of this ordinance.

2.12 Dilution

No User shall ever increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with a discharge limitation unless expressly authorized by an applicable Pretreatment Standard or Requirement. The Commission may impose mass limitations on Users who are using dilution to meet applicable Pretreatment Standards or Requirements, or in other cases when the imposition of mass limitations is appropriate.

SECTION 3—PRETREATMENT OF WASTEWATER

3.1 Pretreatment Facilities

Users shall provide wastewater treatment as necessary to comply with this ordinance and shall achieve compliance with all categorical Pretreatment Standards, Local Limits, and the prohibitions set out in Section 2.6 of this ordinance within the time limitations specified by EPA, the State, or the Commission, whichever is more stringent. Any facilities necessary for compliance shall be provided, operated, and maintained at the User's expense. Detailed plans describing such facilities and operating procedures shall be submitted to the Commission for review, and shall be acceptable to the Commission before such facilities are constructed. The review of such plans and operating procedures shall in no way relieve the User from the responsibility of modifying such facilities as necessary to produce a discharge acceptable to the Town under the provisions of this ordinance.

3.2 Additional Pretreatment Measures

A. Whenever deemed necessary, the Commission may require Users to restrict their discharge during peak flow periods, designate that certain wastewater be discharged only into specific sewers, relocate and/or consolidate points of discharge, separate sewage wastestreams from industrial wastestreams, and such other conditions as may be necessary to protect the POTW and determine the User's compliance with the requirements of this ordinance.

B. The Commission may require any person discharging into the POTW to install and maintain, on their property and at their expense, a suitable storage and flow-control facility to ensure equalization of flow. An individual wastewater discharge permit may be issued solely for flow equalization.

C. Grease, oil, and sand interceptors shall be provided when, in the opinion of the Commission, they are necessary for the proper handling of wastewater containing excessive amounts of grease and oil, or sand; except that such interceptors shall not be required for residential users. All interception units shall be of a type and capacity approved by the Commission, and shall be so located to be easily accessible for cleaning and inspection at the Users expense.

D. Grease, oil and/or sand traps/interceptors -shall be provided in all garages, filling stations, restaurants, cleaning establishments and wizen, in the opinion of the Board, they are necessary for the proper handling of liquid wastes containing grease or floatable oil in excessive amounts or any flammable wastes, sand or other harmful ingredients that are discharged from floor drains, sinks or other plumbing fixtures into the treatment works**.**

E. All traps/interceptors shall be of a type and capacity approved by the Board and shall be located as to be readily and easily accessible for cleaning and inspection.

F. Grease and oil traps/interceptors shall be constructed and installed in accordance with all applicable Federal, State and Local regulations, including but not limited to Title V of the State Sanitary Code, the Massachusetts Plumbing Code, and the Plumbing and Drainage Institute (PDI) Specification G-1O1. Both shall be made of impervious materials capable of withstanding abrupt and extreme changes in temperature. Grease and oil traps/interceptors shall be equipped with an aerated flow control device which promotes the removal of grease/oil and reduces wastewater velocities due to flow surges. Exterior grease, oil, and sand traps/interceptors shall have a minimum of a one thousand (1,000) gallons capacity. Interior grease, oil, and sand traps/interceptors shall be sized according, to

flow capacity. All traps shall be of substantial construction, water tight, and equipped with easily removable covers which when bolted into place shall be gaslight and watertight. It is prohibited to add any surfactants, enzyme; bacteriological cultures, dispersants, or cleaning agents to plumbing lines that cause or contribute to the pass-through of oils and greases or inhibit or interfere with the proper operation of a grease trap. Deviations from the above descriptions shall require written approval from the Board.

F. Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter.

G. At no time shall two readings on an explosion hazard meter at the point of discharge into the POTW, or at any point in the POTW, be more than ten percent (10%) nor any single reading over ten percent (10%) of the Lower Explosive Limit (LEL) of the meter.

3.3 Accidental Discharge/Slug Discharge Control Plans

The Commission shall evaluate whether each SIU needs an accidental discharge/slug discharge control plan or other action to control Slug Discharges. The Commission may require any User to develop, submit for approval, and implement such a plan or take such other action that may be necessary to control Slug Discharges. Alternatively, the Commission may develop such a plan for any User. An accidental discharge/slug discharge control plan shall address, at a minimum, the following:

A. Description of discharge practices, including nonroutine batch discharges;

B. Description of stored chemicals;

C. Procedures for immediately notifying the Commission of any accidental or Slug Discharge, as required by Section 6.6 of this ordinance; and

D. Procedures to prevent adverse impact from any accidental or Slug Discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants, including solvents, and/or measures and equipment for emergency response.

3.4 Pollution Prevention Plans

The Commission may require any person discharging wastes into the POTW to develop and implement, at that persons own expense, a pollution prevention plan. The Commission may require users to submit as part of the pollution prevention plan information that demonstrates adherence to the following elements:

A. Management Support. For changes to be effective, the visible support of top management is required. Management's support should be explicitly stated and include designation of a pollution prevention coordinator, goals, and time frames for reductions in volume and toxicity of wastestreams, and procedures for employee training and involvement.

B. Process Characterization. A detailed process waste diagram shall be developed that identifies and characterizes the input of raw materials, the outflow of products, and the generation of wastes.

C. Waste Assessment. Estimates shall be developed for the amount of wastes generated by each process. This may include establishing and maintaining waste accounting systems to track sources, the rates and dates of generation, and the presence of hazardous constituents.

D. Analysis of Waste Management Economics. Waste management economic returns shall be determined based on the consideration of:

1. Reduced raw material purchases;

2. Avoidance of waste treatment, monitoring and disposal costs;

3. Reductions in operations and maintenance expenses;

4. Elimination of permitting fees and compliance costs; and

5. Reduced liabilities for employee/public exposure to hazardous chemicals and cleanup of waste disposal sites.

E. Development of Pollution Prevention Alternatives. Current and past pollution prevention activities should be assessed, including estimates of the reduction in the amount and toxicity of waste achieved by the identified actions. Opportunities for pollution prevention must then be assessed for identified processes where raw materials become or generate wastes. Technical information on pollution prevention should be solicited and exchanged, both from inside the organization and out.

F. Evaluation and Implementation. Technically and economically feasible pollution prevention opportunities shall be identified and an implementation timetable with interim and final milestones shall be developed. The recommendations that are implemented shall be periodically reviewed for effectiveness. The review and approval of such pollution prevention plans by the Town shall in no way relieve the user from the responsibilities of modifying facilities as necessary to produce a discharge acceptable to the Town in accordance with the provisions of this Ordinance.

3.5 Vandalism

No person shall willfully or negligently break, damage, destroy, uncover, deface, tamper with, or prevent access to any structure, appurtenance or equipment, or other part of the POTW. Any person found in violation of this requirement shall be subject to the sanctions set out in Sections 10 through 12 of this ordinance.

SECTION 4—INDIVIDUAL WASTEWATER DISCHARGE PERMITS

4.1 Wastewater Analysis

When requested by the Commission, a User must submit information on the nature and characteristics of its wastewater within 30 days of the request. The Commission is authorized to prepare a form for this purpose and may periodically require Users to update this information. Failure to complete this survey shall be reasonable grounds for terminating service to the user and shall be considered a violation of the ordinance.

4.2 Individual Wastewater Discharge Permit Requirement

A. No Significant Industrial User shall discharge wastewater into the POTW without first obtaining an individual wastewater discharge permit from the Commission, except that a Significant Industrial User that has filed a timely application pursuant to Section 4.3 of this ordinance may continue to discharge for the time period specified therein.

B. The Commission may require other Users to obtain individual wastewater discharge permits as necessary to carry out the purposes of this ordinance.

C. Any violation of the terms and conditions of an individual wastewater discharge permit shall be deemed a violation of this ordinance and subjects the wastewater discharge permittee to the sanctions set out in Sections 10 through 12 of this ordinance. Obtaining an individual wastewater discharge permit does not relieve a permittee of its obligation to comply with all Federal and State Pretreatment Standards or Requirements or with any other requirements of Federal, State, and local law.

4.3 Individual Wastewater Discharge Permitting: Existing Connections

Any User required to obtain an individual wastewater discharge permit who was discharging wastewater into the POTW prior to the effective date of this ordinance and who wishes to continue such discharges in the future, shall, within ninety (90) days after said date, apply to the Commission for an individual wastewater discharge permit in accordance with Section 4.5 of this ordinance, and shall not cause or allow discharges to the POTW to continue after ninety (90) days of the effective date of this ordinance except in accordance with an individual wastewater discharge permit issued by the Commission.

4.4 Individual Wastewater Discharge Permitting: New Connections

Any User required to obtain an individual wastewater discharge permit who proposes to begin or recommence discharging into the POTW must obtain such permit prior to the beginning or recommencing of such discharge. An application for this individual wastewater discharge permit in accordance with Section 4.5 of this ordinance must be filed at least 90 days prior to the date upon which any discharge will begin or recommence. All proposed new connections to the POTW must comply with the Massachusetts Sewer System Extension and Connection Permit Program regulations cited in 314 CMR 7.00.

4.5 Wastewater Discharge Permitting: Extrajurisdictional Users

Any existing user located beyond the Town limits required to obtain a wastewater discharge permit shall submit a wastewater discharge permit application, in accordance with Section 4.6 of this ordinance, within ninety (90) days of the effective date of this ordinance. New users located beyond

the Town limits required to obtain a wastewater discharge permit shall submit such applications to the Commission ninety (90) days prior to any proposed discharge into the POTW.

4.6 Individual Wastewater Discharge Permit Application Contents

A. All Users required to obtain an individual wastewater discharge permit must submit a permit application. The Commission may require Users to submit all or some of the following information as part of a permit application:

1. Identifying Information.
   a. The name and address of the facility, including the name of the operator and owner.

   b. Contact information, description of activities, facilities, and plant production processes on the premises;

2. Environmental Permits. A list of any environmental control permits held by or for the facility.

3. Description of Operations.
   a. A brief description of the nature, average rate of production (including each product produced by type, amount, processes, and rate of production), and standard industrial classifications of the operation(s) carried out by such User. This description should include a schematic process diagram, which indicates points of discharge to the POTW from the regulated processes.
   b. Types of wastes generated, and a list of all raw materials and chemicals used or stored at the facility which are, or could accidentally or intentionally be, discharged to the POTW;
   c. Number and type of employees, hours of operation, and proposed or actual hours of operation;
   d. Type and amount of raw materials processed (average and maximum per day);
   e. Site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, floor drains, and appurtenances by size, location, and elevation, and all points of discharge;

4. Time and duration of discharges;

5. The location for monitoring all wastes covered by the permit;

6. Flow Measurement. Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula set out in Section 2.2C (40 CFR 403.6(e)).

7. Measurement of Pollutants.
   a. The categorical Pretreatment Standards applicable to each regulated process and any new categorically regulated processes for Existing Sources.
   b. The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the Standard or by The Commission, of regulated pollutants in the discharge from each regulated process.
   c. Instantaneous, Daily Maximum, and long-term average concentrations, or mass, where required, shall be reported.

d. The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in Section 6.10 of this ordinance. Where the Standard requires compliance with a BMP or pollution prevention alternative, the User shall submit documentation as required by the Commission or the applicable Standards to determine compliance with the Standard.
e. Sampling must be performed in accordance with procedures set out in Section 6.11 of this ordinance.

8. Any other information as may be deemed necessary by the Commission to evaluate the permit application.

B. Incomplete or inaccurate applications will not be processed and will be returned to the User for revision.

4.7 Application Signatories and Certifications

A. All wastewater discharge permit applications, User reports and certification statements must be signed by an Authorized Representative of the User and contain the following certification statement:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment for knowing violations."

B. If the designation of an Authorized Representative is no longer accurate because a different individual or position has responsibility for the overall operation of the facility or overall responsibility for environmental matters for the company, a new written authorization satisfying the requirements of this Section must be submitted to The Commission prior to or together with any reports to be signed by an Authorized Representative.

4.8 Individual Wastewater Discharge Permit Decisions

The Commission will evaluate the data furnished by the user and may require additional information. Within a specified time from the receipt of a complete wastewater discharge permit application, the Commission will determine whether or not to issue a wastewater discharge permit. The Commission may deny any application for a wastewater discharge permit.

4.9 Hauled Wastewater

A. Septic tank waste may be introduced into the POTW only at locations designated by the Commission, and at such times as are established by the Commission. Such waste shall not violate Section 2 of this ordinance or any other requirements established by the Town. The Commission may require septic tank waste haulers to obtain individual wastewater discharge permits.

B. The Commission may require haulers of industrial waste to obtain individual wastewater discharge permits. The Commission may require generators of hauled industrial waste to obtain individual

wastewater discharge permit. The Commission also may prohibit the disposal of hauled industrial waste. The discharge of hauled industrial waste is subject to all other requirements of this ordinance.

C. Industrial waste haulers may discharge loads only at locations designated by the Commission. No load may be discharged without prior consent of the Commission. The Commission may collect samples of each hauled load to ensure compliance with applicable Standards. The Commission may require the industrial waste hauler to add chemicals to any load and to provide a waste analysis of any load prior to discharge.

D. Industrial waste haulers must provide a waste-tracking form for every load. This form shall include, at a minimum, the name and address of the industrial waste hauler, permit number, truck identification, names and addresses of sources of waste, and volume and characteristics of waste. The form shall identify the type of industry, known or suspected waste constituents, and whether any wastes are RCRA hazardous wastes.

E. No person shall discharge or cause or allow to be discharged, directly or indirectly, into the POTW any Septage, septage byproducts, commercial or industrial wastes which originates outside the limits of the POTWs jurisdiction, except with the specific written approval of the Commission.

F. No person shall discharge or cause or allow to be discharged, directly or indirectly, into the POTW any septage which includes any Industrial Waste.

G. Fees for dumping hauled wastes will be established as part of the user fee system as authorized in Section 15 of this ordinance.

SECTION 5—INDIVIDUAL WASTEWATER DISCHARGE

5.1 Individual Wastewater Discharge Permit Duration

An individual wastewater discharge permit shall be issued for a specified time period, not to exceed two (2) years from the effective date of the permit. An individual wastewater discharge permit may be issued for a period less than two (2) years, at the discretion of the Commission. Each individual wastewater discharge permit will indicate a specific date upon which it will expire.

5.2 Individual Wastewater Discharge Permit Contents

An individual wastewater discharge permit shall include such conditions as are deemed reasonably necessary by the Commission to prevent Pass Through or Interference, protect the quality of the water body receiving the treatment plant's effluent, protect worker health and safety, facilitate sludge management and disposal, and protect against damage to the POTW.

A. Individual wastewater discharge permits must contain:

1. A statement that indicates the wastewater discharge permit issuance date, expiration date and effective date;

2. A statement that the wastewater discharge permit is nontransferable without prior notification to the Town in accordance with Section 5.5 of this ordinance, and provisions for furnishing the new owner or operator with a copy of the existing wastewater discharge permit;

3. Effluent limits, including Best Management Practices, based on applicable Pretreatment Standards;

4. Self monitoring, sampling, reporting, notification, and record-keeping requirements. These requirements shall include an identification of pollutants (or best management practice) to be monitored, sampling location, sampling frequency, and sample type based on Federal, State, and local law.

5. The process for seeking a waiver from monitoring for a pollutant neither present nor expected to be present in the Discharge in accordance with Section 6.4 B.

6. A statement of applicable civil and criminal penalties for violation of Pretreatment Standards and Requirements, and any applicable compliance schedule. Such schedule may not extend the time for compliance beyond that required by applicable Federal, State, or local law.

7. Requirements to control Slug Discharge, if determined by the Commission to be necessary.

B. Individual wastewater discharge permits may contain, but need not be limited to, the following conditions:

1. Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;

2. Requirements for the installation of pretreatment technology, pollution control, or construction of appropriate containment devices, designed to reduce, eliminate, or prevent the introduction of pollutants into the treatment works;

3. Requirements for the development and implementation of spill control plans or other special conditions including management practices necessary to adequately prevent accidental, unanticipated, or nonroutine discharges;

4. Development and implementation of waste minimization plans to reduce the amount of pollutants discharged to the POTW;

5. The unit charge or schedule of User charges and fees for the management of the wastewater discharged to the POTW;

6. Requirements for installation and maintenance of inspection and sampling facilities and equipment, including flow measurement devices;

7. A statement that compliance with the individual wastewater discharge permit does not relieve the permittee of responsibility for compliance with all applicable Federal and State Pretreatment Standards, including those which become effective during the term of the individual wastewater discharge permit.

8. Other conditions as deemed appropriate by the Commission to ensure compliance with this ordinance, and State and Federal laws, rules, and regulations.

5.3 Permit Issuance Process

A. Permit Appeals. The Commission shall provide public notice of the issuance of an individual wastewater discharge permit. Any person, including the User, may petition the Commission to reconsider the terms of an individual wastewater discharge permit within 30 days of notice of its issuance.

1. Failure to submit a timely petition for review shall be deemed to be a waiver of the administrative appeal.

2. In its petition, the appealing party must indicate the individual wastewater discharge permit provisions objected to, the reasons for this objection, and the alternative condition, if any, it seeks to place in the individual wastewater discharge permit.

The effectiveness of the individual wastewater discharge permit shall not be stayed pending the appeal.

1. If the Commission fails to act within 90 days, a request for reconsideration shall be deemed to be denied. Decisions not to reconsider an individual wastewater discharge permit not to issue an individual wastewater discharge permit, or not to modify an individual wastewater discharge permit shall be considered final administrative actions for purposes of judicial review.

Aggrieved parties seeking judicial review of the final administrative individual wastewater discharge permit decision must do so by filing an action in the Brockton Division of the

Plymouth County Superior Court within thirty (30) days after receipt of notice of the final decision of the Commission. All actions for judicial review shall be governed by the provisions of M.G.L. c. 30A, §14.

5.4 Permit Modification

A. The Commission may modify an individual wastewater discharge permit for good cause, including, but not limited to, the following reasons:

1. To incorporate any new or revised Federal, State, or local Pretreatment Standards or Requirements;

2. To address significant alterations or additions to the User's operation, processes, or wastewater volume or character since the time of the individual wastewater discharge permit issuance;

3. A change in the POTW that requires either a temporary or permanent reduction or elimination of the authorized discharge;

4. Information indicating that the permitted discharge poses a threat to the POTW, personnel, or the receiving waters

5. Violation of any terms or conditions of the individual wastewater discharge permit;

6. Misrepresentations or failure to fully disclose all relevant facts in the wastewater discharge permit application or in any required reporting;

7. Revision of or a grant of variance from categorical Pretreatment Standards pursuant to 40 CFR 403.13;

8. To correct typographical or other errors in the individual wastewater discharge permit; or

9. To reflect a transfer of the facility ownership or operation to a new owner or operator where requested in accordance with Section 5.5.

5.5 Individual Wastewater Discharge Permit Transfer

Individual wastewater discharge permits may be transferred to a new owner or operator only if the permittee gives at least 90 days advance notice to the Commission and the Commission approves the individual wastewater discharge permit transfer. The notice to the Commission must include a written certification by the new owner or operator which:

A. States that the new owner and/or operator have no immediate intent to change the facility's operations and processes;

B. Identifies the specific date on which the transfer is to occur; and

C. Acknowledges full responsibility for complying with the existing individual wastewater discharge permit.

Failure to provide advance notice of a transfer renders the individual wastewater discharge permit void as of the date of facility transfer.

5.6 Individual Wastewater Discharge Permit Revocation

The Commission may revoke an individual wastewater discharge permit for good cause, including, but not limited to, the following reasons:

A. Failure to notify the Commission of significant changes to the wastewater prior to the changed discharge;

B. Failure to provide prior notification to the Commission of changed conditions pursuant to Section 6.5 of this ordinance;

C. Misrepresentation or failure to fully disclose all relevant facts in the wastewater discharge permit application;

D. Falsifying self-monitoring reports and certification statements;

E. Tampering with monitoring equipment;

F. Refusing to allow the Commission timely access to the facility premises and records;

G. Failure to meet effluent limitations;

H. Failure to pay fines;

I. Failure to pay sewer charges;

J. Failure to meet compliance schedules;

K. Failure to complete a wastewater survey or the wastewater discharge permit application;

L. Failure to provide advance notice of the transfer of business ownership of a permitted facility; or

M. Violation of any Pretreatment Standard or Requirement, or any terms of the wastewater discharge permit or this ordinance.

Individual wastewater discharge permits shall be voidable upon cessation of operations or transfer of business ownership. All individual wastewater discharge permits issued to a User are void upon the issuance of a new individual wastewater discharge permit to that User.

5.7 Individual Wastewater Discharge Permit Reissuance

A User with an expiring individual wastewater discharge permit shall apply for individual wastewater discharge permit reissuance by submitting a complete permit application, in accordance with Section 4.5 of this ordinance, a minimum of 90 days prior to the expiration of the User's existing individual wastewater discharge permit.

5.8 Regulation of Waste Received from Other Jurisdictions

A. If another municipality, or User located within another municipality, contributes wastewater to the POTW, the Commission shall enter into an intermunicipal agreement with the contributing municipality.

B. Prior to entering into an agreement required by paragraph A, above, the Commission shall request the following information from the contributing municipality:

1. A description of the quality and volume of wastewater discharged to the POTW by the contributing municipality;

2. An inventory of all Users located within the contributing municipality that are discharging to the POTW; and

3. Such other information as the Commission may deem necessary.

C. An intermunicipal agreement, as required by paragraph A, above, shall contain the following conditions:

1. A requirement for the contributing municipality to adopt a sewer use ordinance which is at least as stringent as this ordinance and Local Limits, including required Baseline Monitoring Reports (BMRs) which are at least as stringent as those set out in Section 2.4 of this ordinance. The requirement shall specify that such ordinance and limits must be revised as necessary to reflect changes made to the Town's ordinance or Local Limits;

2. A requirement for the contributing municipality to submit a revised User inventory on at least an annual basis;

3. A provision specifying which pretreatment implementation activities, including individual wastewater discharge permit issuance, inspection and sampling, and enforcement, will be conducted by the contributing municipality; which of these activities will be conducted by the Commission; and which of these activities will be conducted jointly by the contributing municipality and the Commission;

4. A requirement for the contributing municipality to provide the Commission with access to all information that the contributing municipality obtains as part of its pretreatment activities;

5. Limits on the nature, quality, and volume of the contributing municipality's wastewater at the point where it discharges to the POTW;

6. Requirements for monitoring the contributing municipality's discharge;

7. A provision ensuring the Commission access to the facilities of Users located within the contributing municipality's jurisdictional boundaries for the purpose of inspection, sampling, and any other duties deemed necessary by the Commission; and

8. A provision specifying remedies available for breach of the terms of the intermunicipal agreement.

SECTION 6—REPORTING REQUIREMENTS

6.1 Baseline Monitoring Reports

A. Within either one hundred eighty (180) days after the effective date of a categorical Pretreatment Standard, or the final administrative decision on a category determination under 40 CFR 403.6(a)(4), whichever is later, existing Categorical Industrial Users currently discharging to or scheduled to discharge to the POTW shall submit to the Commission a report which contains the information listed in paragraph B, below. At least ninety (90) days prior to commencement of their discharge, New Sources, and sources that become Categorical Industrial Users subsequent to the promulgation of an applicable categorical Standard, shall submit to the Commission a report which contains the information listed in paragraph B, below. A New Source shall report the method of pretreatment it intends to use to meet applicable categorical Standards. A New Source also shall give estimates of its anticipated flow and quantity of pollutants to be discharged.

B. Users described above shall submit the information set forth below.

1. Identifying Information. The name and address of the facility, including the name of the operator and owner.

2. Environmental Permits. A list of any environmental control permits held by or for the facility.

3. Decision of Operations. A brief description of the nature, average rate of production, and standard industrial classifications of the operation(s) carried out by such user. This description should include a schematic process diagram which indicates points of discharge to the POTW from the regulated processes.

4. Flow Measurement. Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula set out in 40 CFR 403.6(e).

5. Measurement of Pollutants.

(a) The categorical pretreatment standards applicable to each regulated process.

(b) The results of sampling and analysis identifying the nature and concentration (and/or mass, where required by the standard or by the Town) of regulated pollutants in the discharge from each regulated process. Instantaneous, daily maximum, and long term average concentrations (or mass, where required) shall be reported. The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in Section 6.10 of this ordinance.

(c) Sampling must be performed in accordance with procedures set out in Section 6.11 of this ordinance.

6. Certification. A statement, reviewed by the user's authorized representative and certified by a qualified professional, indicating whether pretreatment standards are being met on a consistent basis, and, if not, whether additional Operation and Maintenance (O&M) and/or additional pretreatment, is required to meet the pretreatment standards and requirements.

7. Compliance Schedule. If additional pretreatment and/or O&M will be required to meet the pretreatment standards, the shortest schedule by which the user will provide such additional pretreatment and/or O&M. The completion date in this schedule shall not be later than the compliance date established for the applicable pretreatment standard. A compliance schedule pursuant to this section must meet the requirements set out in Section 6.2 of this ordinance.

8. Signature and Certification. All baseline monitoring reports must be signed and certified in accordance with Section 4.7 of this ordinance.

6.2 Compliance Schedule Progress Reports

The following conditions shall apply to the compliance schedule required by Section 6.1(B)(4) of this ordinance:

A. The schedule shall contain progress increments in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable pretreatment standards (such events include, but are not limited to, hiring an engineer, completing preliminary and final plans, executing contracts for major components, commencing and completing construction, beginning and conducting routine operation);

B. No increment referred to above shall exceed nine (9) months;

C. The user shall submit a progress report to the Commission no later than fourteen (14) days following each date in the schedule and the final date of compliance including, as a minimum, whether or not it complied with the increment of progress, the reason for any delay, and, if appropriate, the steps being taken by the user to return to the established schedule; and ,

D. In no event shall more than nine (9) months elapse between such progress reports to the Commission.

6.3 Reports on Compliance with Categorical Pretreatment Standard Deadline

Within ninety (90) days following the date for final compliance with applicable categorical Pretreatment Standards, or in the case of a New Source following commencement of the introduction of wastewater into the POTW, any User subject to such Pretreatment Standards and Requirements shall submit to The Commission a report containing the information described in Section 4.5A (6) and (7) and 6.1(B)(2) of this ordinance. For Users subject to equivalent mass or concentration limits established in accordance with the procedures in Section 2.2 , this report shall contain a reasonable measure of the User's long-term production rate. For all other Users subject to categorical Pretreatment Standards expressed in terms of allowable pollutant discharge per unit of production (or other measure of operation), this report shall include the User's actual production during the appropriate sampling period. All compliance reports must be signed and certified in accordance with Section 6.14 A of this ordinance. All sampling will be done in conformance with Section 6.11.

6.4 Periodic Compliance Reports

A. All significant industrial user(s) shall, at a frequency determined by the Commission but in no case less than twice per year (in June and December), submit a report indicating the nature and concentration of pollutants in the discharge which are limited by pretreatment standards and the measured or estimated average and maximum daily flows for the reporting period. In cases where the Pretreatment Standard requires compliance with a Best Management Practice (BMP) or pollution prevention alternative, the User must submit documentation required by the Commission or the Pretreatment Standard necessary to determine the compliance status of the User. All periodic compliance reports must be signed and certified in accordance with Section 4.7 of this ordinance.

All wastewater samples must be representative of the user's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a user to keep its monitoring facility in good working order shall not be grounds for the user to claim that sample results are unrepresentative of its discharge.

B. If a user subject to the reporting requirement in this section monitors any pollutant more frequently than required by the POTW, using the procedures prescribed in Section 6.11 of this ordinance, the results of this monitoring shall be included in the report.

6.5 Reports of Changed Conditions

Each User must notify the Commission of any significant changes to the User's operations or system, which might alter the nature, quality, or volume of its wastewater at least 30 days before the change.

A. The Commission may require the User to submit such information as may be deemed necessary to evaluate the changed condition, including the submission of a wastewater discharge permit application under Section 4.5 of this ordinance.

B. The Commission may issue an individual wastewater discharge permit under Section5.7 of this ordinance or modify an existing wastewater discharge permit under Section 5.4 of this ordinance in response to changed conditions or anticipated changed conditions.

C. No user shall implement the planned changed condition(s) until and unless the Commissioner has responded to the user's notice.

D. For the purposes of this requirement, significant changes include, but are not limited to, flow increases of ten percent (10%) or greater, and the discharge of any previously unreported pollutants.

6.6 Reports of Potential Problems

A. In the case of any discharge, including, but not limited to, accidental discharges, discharges of a non routine, episodic nature, a non customary batch discharge, a Slug Discharge or Slug Load, that might cause potential problems for the POTW, the User shall immediately telephone and notify the Commission of the incident. This notification shall include the location of the discharge, type of waste, concentration and volume, if known, and corrective actions taken by the User.

B. Within five (5) days following such discharge, the User shall, unless waived by the Commission, submit a detailed written report describing the cause(s) of the discharge and the measures to be taken by the User to prevent similar future occurrences. Such notification shall not relieve the User of any expense, loss, damage, or other liability which might be incurred as a result of damage to the POTW, natural resources, or any other damage to person or property; nor shall such notification relieve the User of any fines, penalties, or other liability, which may be imposed pursuant to this ordinance**.**

C. Failure to notify the Town of potential problem discharges shall be deemed a violation of this ordinance.

D. A notice shall be permanently posted on the User's bulletin board or other prominent place advising employees who to call in the event of a discharge described in paragraph A, above. Employers shall ensure that all employees, who could cause such a discharge to occur, are advised of the emergency notification procedure.

E. Significant Industrial Users are required to notify the Commission immediately of any changes at its facility affecting the potential for a Slug Discharge.

6.7 Reports from Unpermitted Users

All Users not required to obtain an individual wastewater discharge permit shall provide appropriate reports to the Commission as the Commission may require.

6.8 Notice of Violation/Repeat Sampling and Reporting

If sampling performed by a User indicates a violation, the User must notify the Commission within twenty-four (24) hours of becoming aware of the violation. The User shall also repeat the sampling and analysis and submit the results of the repeat analysis to the Commission within thirty (30) days after becoming aware of the violation.

6.9 Notification of the Discharge of Hazardous Waste

The discharge of hazardous waste to the POTW is prohibited.

6.10 Analytical Requirements

All pollutant analyses, including sampling techniques, to be submitted as part of a wastewater discharge permit application or report shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto, unless otherwise specified in an applicable categorical Pretreatment Standard. If 40 CFR Part 136 does not contain sampling or analytical techniques for the pollutant in question, or where the EPA determines that the Part 136 sampling and analytical techniques are inappropriate for the pollutant in question, sampling and analyses shall be performed by using validated analytical methods or any other applicable sampling and analytical procedures, including procedures suggested by the Commission or other parties approved by EPA. Except where the Commission has approved a certified QAQC program, all analyses must be performed by a Massachusetts DEP certified lab.

6.11 Sample Collection

Samples collected to satisfy reporting requirements must be based on data obtained through appropriate sampling and analysis performed during the period covered by the report, based on data that is representative of conditions occurring during the reporting period

A. Except as indicated in Section B and C below, the User must collect wastewater samples using 24-hour flow-proportional composite sampling techniques, unless time-proportional composite sampling or grab sampling is authorized by the Commission. Where time-proportional composite sampling or grab sampling is authorized by the Commission, the samples must be representative of the discharge. Using protocols (including appropriate preservation) specified in 40 CFR Part 136 and appropriate EPA guidance, multiple grab samples collected during a 24-hour period may be composite prior to the analysis as follows: for cyanide, total phenols, and sulfides the samples may be composite in the laboratory or in the field; for volatile organics and oil and grease, the samples may be composited in the laboratory. The Commission, as appropriate, as documented in approved EPA methodologies may authorize composite samples for other parameters unaffected by the compositing procedures. In addition, grab samples may be required to show compliance with Instantaneous Limits.

B. Samples for oil and grease, temperature, fats, cyanide, total phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

C. For sampling required in support of baseline monitoring and 90-day compliance reports required in Section 6.1 and 6.3 [40 CFR 403.12(b) and (d)], a minimum of four (4) grab samples must be used for pH, cyanide, total phenols, oil and grease, sulfide and volatile organic compounds for facilities for which historical sampling data do not exist; for facilities for which historical sampling data are available, The Commission may authorize a lower minimum. For the reports required by paragraphs Section 6.4 (40 CFR 403.12(e) and 403.12(h)), the Industrial User is required to collect the number of grab samples necessary to assess and assure compliance by with applicable Pretreatment Standards and Requirements

6.12 Date of Receipt of Reports

Written reports will be deemed to have been submitted on the date postmarked. For reports, which are not mailed, postage prepaid, into a mail facility serviced by the United States Postal Service, the date of receipt of the report shall govern.

6.13 Recordkeeping

Users subject to the reporting requirements of this ordinance shall retain, and make available for inspection and copying, all records of information obtained pursuant to any monitoring activities required by this ordinance, any additional records of information obtained pursuant to monitoring activities undertaken by the User independent of such requirements, and documentation associated with Best Management Practices established under Section 2.4 C. Records shall include the date, exact place, method, and time of sampling, and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses. These records shall remain available for a period of at least three (3) years. This period shall be automatically extended for the duration of any litigation concerning the User or the Commission, or where the Commission has specifically notified the User of a longer retention period.

6.14 Certification Statements

Certification of Permit Applications, User Reports and Initial Monitoring Waiver—The following certification statement is required to be signed and submitted by Users submitting permit applications in accordance with Section 4.7; Users submitting baseline monitoring reports under Section 6.1 B (5). Users submitting reports on compliance with the categorical Pretreatment Standard deadlines under Section 6.3 Users submitting periodic compliance reports required by Section 6.4 A–D and Users submitting an initial request to forego sampling of a pollutant on the basis of Section 6.4B(4)**.** The following certification statement must be signed by an Authorized Representative as defined in Section 1.4 C:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SECTION 7—COMPLIANCE MONITORING

7.1 Power and Authority of Inspectors

A. The Board and other duly authorized employees of the Town bearing proper credentials identification shall be permitted to enter all properties at all times and without unreasonable delay for the purposes of inspection, observation, measurement, sampling, reviewing and copying records, reviewing procedures and testing in accordance with the provisions of these Regulations. These provisions shall be liberally construed to permit an inspector to evaluate compliance with these Regulations.

B. While performing the necessary work on private properties, inspectors shall observe all safety policies applicable of the premises established by the company and the company shall be held harmless for injury or death to the Town employees and the Town shall indemnify the company against loss or damages to its property by Town employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions.

C. Inspectors shall observe all policie*s* applicable to the premises established by the company and the company shall be held harmless for injury or death to the Town employees and the Town shall indemnify the company against loss or damages to its property by Town employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions.

D. The Board or other duly authorized employees are authorized to obtain information concerning industrial processes which have a direct bearing on the kind and source of discharge to the sewerage system.

E. The Board and other duly authorized employees of the Town being proper credentials and identification shall be permitted to enter all private properties for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair, maintenance of any portion of the sewerage works lying within said property.

F. Where Abington wastewaters are to be treated at the POTW, the Town of Rockland shall have joint authority at all times and without unreasonable delay to enter all business/commercial and industrial properties, for the purpose of, but not limited to inspection, observation, measurement, sampling, repair, and maintenance of any portion **of** the sewage works within said property, including reviewing and copying record, reviewing procedures, and testing in accordance with provisions of this Ordinance.

7.2 Right of Entry: Inspection and Sampling

The Commission shall have the right to enter the premises of any User to determine whether the User is complying with all requirements of this ordinance and any individual wastewater discharge permit

or order issued hereunder. Users shall allow the Commission ready access to all parts of the premises for the purposes of inspection, sampling, records examination and copying, and the performance of any additional duties.

A. Where a User has security measures in force, which require proper identification and clearance before entry into its premises, the User shall make necessary arrangements with its security guards so that, upon presentation of suitable identification, the Commission shall be permitted to enter without delay for the purposes of performing specific responsibilities.

B. The Commission shall have the right to set up on the User's property, or require installation of, such devices as are necessary to conduct sampling and/or metering of the User's operations.

C. The Commission may require the User to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the User at its own expense. All devices used to measure wastewater flow and quality shall be calibrated annually to ensure their accuracy.

D. Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the User at the written or verbal request of the Commission and shall not be replaced. The costs of clearing such access shall be born by the User.

E. Unreasonable delays in allowing the Commission access to the User's premises shall be a violation of this ordinance.

7.3 Right of Access

If the Commission has been refused access to a building, structure, or property, or any part thereof, and is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program of the Commission designed to verify compliance with this ordinance or any permit or order issued hereunder, or to protect the overall public health, safety and welfare of the community, the Commission may seek issuance of a search warrant from the Plymouth District Court or any other magistrate authorized to issue said warrant.

SECTION 8—CONFIDENTIAL INFORMATION

Information and data on a User obtained from reports, surveys, wastewater discharge permit applications, individual wastewater discharge permits, and monitoring programs, and from Commission's inspection and sampling activities, shall be available to the public without restriction, unless the User specifically requests, and is able to demonstrate to the satisfaction of the Commission, that the release of such information would divulge information, processes, or methods of production entitled to protection as trade secrets under applicable State law. Any such request must be asserted at the time of submission of the information or data. When requested and demonstrated by the User furnishing a report that such information should be held confidential, the portions of a report which might disclose trade secrets or secret processes shall not be made available for inspection by the public, but shall be made available immediately upon request to governmental agencies for uses related to the NPDES program or pretreatment program, and in enforcement proceedings involving the person furnishing the report. Wastewater constituents and characteristics and other effluent data, as defined at 40 CFR 2.302 shall not be recognized as confidential information and shall be available to the public without restriction.

SECTION 9—PUBLICATION OF USERS IN SIGNIFICANT NONCOMPLIANCE

The Commission shall publish annually, in a newspaper of general circulation that provides meaningful public notice within the jurisdictions served by the POTW, a list of the Users, which, at any time during the previous twelve (12) months, were in Significant Noncompliance with applicable, Pretreatment Standards and Requirements. The term Significant Noncompliance shall be applicable to all Significant Industrial Users (or any other Industrial User that violates paragraphs (C), (D) or (H) of this Section) and shall mean:

A. Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all the measurements taken for the same pollutant parameter taken during a six- (6-) month period exceed (by any magnitude) a numeric Pretreatment Standard or Requirement, including Instantaneous Limits as defined in Section 2;

B. Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of wastewater measurements taken for each pollutant parameter during a six- (6-) month period equals or exceeds the product of the numeric Pretreatment Standard or Requirement including Instantaneous Limits, as defined by Section 2 multiplied by the applicable criteria (1.4 for BOD, TSS, fats, oils and grease, and 1.2 for all other pollutants except pH);

C. Any other violation of a Pretreatment Standard or Requirement as defined by Section 2 (Daily Maximum, long-term average, Instantaneous Limit, or narrative standard) that The Commission determines has caused, alone or in combination with other discharges, Interference or Pass Through, including endangering the health of POTW personnel or the general public;

D. Any discharge of a pollutant that has caused imminent endangerment to the public or to the environment, or has resulted in the Commission's exercise of its emergency authority to halt or prevent such a discharge;

E. Failure to meet, within ninety (90) days of the scheduled date, a compliance schedule milestone contained in an individual wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance;

F. Failure to provide within thirty (30) days after the due date, any required reports, including baseline monitoring reports, reports on compliance with categorical Pretreatment Standard deadlines, periodic self-monitoring reports, and reports on compliance with compliance schedules;

G. Failure to accurately report noncompliance; or

H. Any other violation(s), which may include a violation of Best Management Practices, which the Commission determines will adversely affect the operation or implementation of the local pretreatment program.

SECTION 10—ADMINISTRATIVE ENFORCEMENT REMEDIES

10.1 Notification of Violation

A. When the Superintendent finds that a user has violated (or continues to violate) any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the Superintendent may serve upon that user a Notice of Violation. This Notice of Violation may be verbal or in written form. If so required, within fourteen (14) days of the receipt of this notice, or by the response date cited on this notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted by the user to the Superintendent. Submission of this plan in no way relieves the user of liability for any violations occurring before or after receipt of the Notice of Violation. Nothing in this section shall limit the authority of the Town to take any action, including emergency actions or any other enforcement action, without first issuing a Notice of Violation.

B. Any user found to have a source of clean water (I/I) such as a sump pump, basement drain, foundation drain, yard or area drain, roof downspout or other source of surface runoff or groundwater or other source connected to the building sewer, shall be served by the Town with a written Notice of Violation stating the nature of the violation and providing a reasonable time limit for the satisfactory correction (removal) thereof. The offender shall, within the period of time stated in such Notice, permanently cease and correct all violations.

10.2 Consent Orders

The Commission may enter into Consent Orders, assurances of compliance, or other similar documents establishing an agreement with any User responsible for noncompliance. Such documents shall include specific action to be taken by the User to correct the noncompliance within a time period specified by the document. Such documents shall have the same force and effect as the administrative orders issued pursuant to Sections 10.4 and 10.5 of this ordinance and shall be judicially enforceable.

10.3 Show Cause Hearing

The Commission may order a User which has violated, or continues to violate, any provision of this ordinance, an individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, to appear before the Commission and show cause why the proposed enforcement action should not be taken. Notice shall be served on the User specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action, and a request that the User show cause why the proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least ~~7~~ 3 days prior to the hearing. Such notice may be served on any Authorized Representative of the User as defined in Section 1.4 C and required by Section 4.7 A. A show cause hearing shall not be a bar against, or prerequisite for, taking any other action against the User.

10.4 Compliance Orders

When the Commission finds that a User has violated, or continues to violate, any provision of this ordinance, an individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, the Commission may issue an order to the User responsible

for the discharge directing that the User come into compliance within a specified time. If the User does not come into compliance within the time provided, sewer service may be discontinued unless adequate treatment facilities, devices, or other related appurtenances are installed and properly operated. Compliance orders also may contain other requirements to address the noncompliance, including additional self-monitoring and management practices designed to minimize the amount of pollutants discharged to the sewer. A compliance order may not extend the deadline for compliance established for a Pretreatment Standard or Requirement, nor does a compliance order relieve the User of liability for any violation, including any continuing violation. Issuance of a compliance order shall not be a bar against, or a prerequisite for, taking any other action against the User.

10.5 Cease and Desist Orders

When the Commission finds that a User has violated, or continues to violate, any provision of this ordinance, an individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, or that the User's past violations are likely to recur, the Commission may issue an order to the User directing it to cease and desist all such violations and directing the User to:

A. Immediately comply with all requirements; and

B. Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and/or terminating the discharge. Issuance of a cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the User.

Issuance of a cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the User.

10.6 Administrative Fines

A. When the Commission finds that a user has violated or continues to violate any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the Commission may fine such user in an amount not to exceed five thousand ($5000) dollars per day. Such fines shall be assessed on a per violation, per day basis. In the case of monthly or other long term average discharge limits, fines shall be assessed for each day during the period of violation.

B. Any user found to have failed to permanently remove a connection of clean water (I/I) such as a sump pump, basement drain, foundation drain, yard or area drain, roof downspout or other source of surface runoff or groundwater from the building sewer within the period of time stated in the Notice of Violation, whether intentionally, unintentionally or accidentally, shall be assessed a penalty of $50/month of violation until the connection is permanently removed and the clean water is redirected to a legal discharge location and the redirection is confirmed by the Town. The monthly fines will be added to the quarterly water and sewer bills and will be payable upon receipt. The Town may also assess additional fines.

C. Unpaid charges, fines, and penalties shall, after thirty (30) calendar days, be assessed an additional penalty of ten percent (10%) of the unpaid balance, and interest shall accrue thereafter at a rate of fifteen percent (15%) per year, compounded monthly on the unpaid balance, computed as of the due date. A lien against the user's property will be sought for unpaid charges, fines, and penalties.

D. Users desiring to dispute such fines must file a written request for the Commission to reconsider the fine along with full payment of the fine amount within thirty (30) days of being notified of the fine. Where a request has merit, the Commission shall convene a hearing on the matter within thirty (30) days of receiving the request from the user. In the event the user's appeal is successful, the payment, together with any interest accruing thereto, shall be returned to the user. The Town may add the costs of preparing administrative enforcement actions, such as notices and orders, to the fine.

E. Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the user.

10.7 Emergency Suspensions

The Commission may immediately suspend a User's discharge, after informal notice to the User, whenever such suspension is necessary to stop an actual or threatened discharge, which reasonably appears to present, or cause an imminent or substantial endangerment to the health or welfare of persons. The Commission may also immediately suspend a User's discharge, after notice and opportunity to respond, that threatens to interfere with the operation of the POTW, or which presents, or may present, an endangerment to the environment.

A. Any User notified of a suspension of its discharge shall immediately stop or eliminate its contribution. In the event of a User's failure to immediately comply voluntarily with the suspension order, the Commission may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW, its receiving stream, or endangerment to any individuals. The Commission may allow the User to recommence its discharge when the User has demonstrated to the satisfaction of the Commission that the period of endangerment has passed, unless the termination proceedings in Section 10.8 of this ordinance are initiated against the User.

B. A User that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful contribution and the measures taken to prevent any future occurrence, to the Commission prior to the date of any show cause or termination hearing under Sections 10.3 or 10.8 of this ordinance.

Nothing in this Section shall be interpreted as requiring a hearing prior to any Emergency Suspension under this Section.

10.8 Termination of Discharge

In addition to the provisions in Section 5.6 of this ordinance, any User who violates the following conditions is subject to discharge termination:

A. Violation of individual wastewater discharge permit conditions;

B. Failure to accurately report the wastewater constituents and characteristics of its discharge;

C. Failure to report significant changes in operations or wastewater volume, constituents, and characteristics prior to discharge;

D. Refusal of reasonable access to the User's premises for the purpose of inspection, monitoring, or sampling; or

E. Violation of the Pretreatment Standards in Section 2 of this ordinance.

Such User will be notified of the proposed termination of its discharge and be offered an opportunity to show cause under Section 10.3 of this ordinance why the proposed action should not be taken. Exercise of this option by the Commission shall not be a bar to, or a prerequisite for, taking any other action against the User.

SECTION 11—JUDICIAL ENFORCEMENT REMEDIES

11.1 Injunctive Relief

When the Commission finds that a User has violated, or continues to violate, any provision of this ordinance, an individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, the Commission may petition the Plymouth County Superior Court through the Town's Attorney for the issuance of a temporary or permanent injunction, or any other equitable remedy as appropriate, which restrains or compels the specific performance of the individual wastewater discharge permit, order, or other requirement imposed by this ordinance on activities of the User. The Commission may also seek such other action as is appropriate for legal and/or equitable relief, including a requirement for the User to conduct environmental remediation. A petition for injunctive relief shall not be a bar against, or a prerequisite for, taking any other action against a User.

11.2 Civil Penalties

A. A User who has violated, or continues to violate, any provision of this ordinance, an individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement shall be liable to The Commission for a maximum civil penalty of $5000.00 per violation, per day. In the case of a monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.

B. The Commission may recover reasonable attorneys' fees, court costs, and other expenses associated with enforcement activities, including sampling and monitoring expenses, and the cost of any actual damages incurred by the Town.

C. In determining the amount of civil liability, the Court shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration of the violation, any economic benefit gained through the User's violation, corrective actions by the User, the compliance history of the User, and any other factor as justice requires.

D. Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a User.

11.3 Criminal Prosecution

A. A User who willfully or negligently violates any provision of this ordinance, an individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement shall, upon conviction, be guilty of a misdemeanor, punishable by a fine of not more than ($ 5,000) per violation, per day.

B. A User who willfully or negligently introduces any substance into the POTW which causes personal injury or property damage shall, upon conviction, be subject to the maximum allowable penalty under State law and/or be subject to imprisonment. This penalty shall be in addition to any other cause of action for personal injury or property damage available under State law.

C. A User who knowingly makes any false statements, representations, or certifications in any application, record, report, plan, or other documentation filed, or required to be maintained, pursuant to this ordinance, individual wastewater discharge permit, or order issued hereunder, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this ordinance shall, upon conviction, be punished by a fine of not more than $5,000.

11.4 Remedies Nonexclusive

The provisions in Sections 9 through 12 of this ordinance are not exclusive remedies. The Town reserves the right to take any, all, or any combination of these actions against a noncompliant user. Enforcement of pretreatment violations will generally be in accordance with the Town's enforcement response plan. However, the Town reserves the right to take other action against any user when the circumstances warrant. Further, the Town is empowered to take more than one enforcement action against any noncompliant user. These actions may be taken concurrently.

SECTION 12—SUPPLEMENTAL ENFORCEMENT ACTION

12.1 Penalties for Late Reports

A penalty of $1000.00 per day shall be assessed to any User for each day that a report required by this ordinance, a permit or order issued hereunder is late, beginning five days after the date the report is due. Actions taken by the Commission to collect late reporting penalties shall not limit the Superintendent's authority to initiate other enforcement actions that may include penalties for late reporting violations.

12.2 Performance Bonds

The Commission may decline to issue or reissue an individual wastewater discharge permit to any User who has failed to comply with any provision of this ordinance, a previous individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, unless such User first files a satisfactory bond, payable to the Commission, in a sum not to exceed a value determined by the Commission to be necessary to achieve consistent compliance.

12.3 Liability Insurance

The Commission may decline to issue or reissue an individual wastewater discharge permit to any User who has failed to comply with any provision of this ordinance, a previous individual wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, unless the User first submits proof that it has obtained financial assurances sufficient to restore or repair damage to the POTW caused by its discharge.

12.4 Payment of Outstanding Fees and Penalties

The Commission may decline to issue or reissue an individual wastewater discharge permit to any User who has failed to pay any outstanding fees, fines or penalties incurred as a result of any provision of this ordinance, a previous individual wastewater discharge permit, or order issued hereunder.

12.5 Water Supply Severance

Whenever a user has violated or continues to violate any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, water service to the user may be severed. Service will only recommence, at the user's expense, after it has satisfactorily demonstrated its ability to comply.

12.6 Public Nuisances

A violation of any provision of this ordinance, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, is hereby declared a public nuisance and shall be corrected or abated as directed by the Commission. Any person(s) creating a public nuisance shall be subject to the provisions of the Town Code governing such nuisances, including reimbursing the Town for any costs incurred in removing, abating, or remedying said nuisance.

SECTION 13—AFFIRMATIVE DEFENSES TO DISCHARGE VIOLATIONS

13.1 Upset

A. For the purposes of this Section, upset means an exceptional incident in which there is unintentional and temporary noncompliance with categorical Pretreatment Standards because of factors beyond the reasonable control of the User. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. An upset shall constitute an affirmative defense to an action brought for noncompliance with categorical Pretreatment Standards if the requirements of paragraph (C), below, are met.

C. A User who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and the User can identify the cause(s) of the upset;

2. The facility was at the time being operated in a prudent and workman-like manner and in compliance with applicable operation and maintenance procedures; and

3. The User has submitted the following information to the Commission within twenty-four (24) hours of becoming aware of the upset [if this information is provided orally, a written submission must be provided within five (5) days]:

   (a) A description of the indirect discharge and cause of noncompliance;

   (b) The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

   (c) Steps being taken and/or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

D. In any enforcement proceeding, the User seeking to establish the occurrence of an upset shall have the burden of proof.

E. Users shall have the opportunity for a judicial determination on any claim of upset only in an enforcement action brought for noncompliance with categorical Pretreatment Standards.

F. Users shall control production of all discharges to the extent necessary to maintain compliance with categorical Pretreatment Standards upon reduction, loss, or failure of its treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

13.2 Prohibited Discharge Standards

A User shall have an affirmative defense to an enforcement action brought against it for noncompliance with the general prohibitions in Section 2.1(A) of this ordinance or the specific prohibitions in Sections 2.1(B)(3) through 18 of this ordinance if it can prove that it did not know, or have reason to know, that its discharge, alone or in conjunction with discharges from other sources, would cause Pass Through or Interference and that either:

B. A Local Limit exists for each pollutant discharged and the User was in compliance with each limit directly prior to, and during, the Pass Through or Interference; or

C. No Local Limit exists, but the discharge did not change substantially in nature or constituents from the User's prior discharge when the Town was regularly in compliance with its NPDES permit, and in the case of Interference, was in compliance with applicable sludge use or disposal requirements.

13.3 Bypass

A. For the purposes of this Section,

1. Bypass means the intentional diversion of wastestreams from any portion of a User's treatment facility.

2. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

B. A User may allow any bypass to occur which does not cause Pretreatment Standards or Requirements to be violated, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of paragraphs (C) and (D) of this Section.

C. Bypass Notifications

1. If a User knows in advance of the need for a bypass, it shall submit prior notice to the Commission, at least ten (10) days before the date of the bypass, if possible.

2. A User shall submit oral notice to the Commission of an unanticipated bypass that exceeds applicable Pretreatment Standards within twenty-four (24) hours from the time it becomes aware of the bypass. A written submission shall also be provided within five (5) days of the time the User becomes aware of the bypass. The written submission shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and, if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass. The Commission may waive the written report on a case-by-case basis if the oral report has been received within twenty-four (24) hours.

D. Bypass

1. Bypass is prohibited, and the Commission may take an enforcement action against a User for a bypass, unless

   (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
   (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
   (c) The User submitted notices as required under paragraph (C) of this section.

2. The Commission may approve an anticipated bypass, after considering its adverse effects, if the Commission determines that it will meet the three conditions listed in paragraph (D)(1) of this Section.

SECTION 14—WASTEWATER TREATMENT RATES – See Town's Rate Sheet

SECTION 15—MISCELLANEOUS PROVISIONS

15.1 Pretreatment Charges and Fees

The Town may adopt reasonable fees for reimbursement of costs of setting up and operating the Town's Pretreatment Program, which may include:

A. Fees for wastewater discharge permit applications including the cost of processing such applications;

B. Fees for monitoring, inspection, and surveillance procedures including the cost of collection and analyzing a User's discharge, and reviewing monitoring reports and certification statements submitted by Users;

D. Fees for reviewing and responding to accidental discharge procedures and construction;

E. Fees for filing appeals;

F. Fees to recover administrative and legal costs (not included in Section 15.1 B) associated with the enforcement activity taken by the Superintendent to address IU noncompliance; and

G. Other fees as the Town may deem necessary to carry out the requirements contained herein. These fees relate solely to the matters covered by this ordinance and are separate from all other fees, fines, and penalties chargeable by the Town.

15.2 Severability

If any provision of this ordinance is invalidated by any court of competent jurisdiction, the remaining provisions shall not be affected and shall continue in full force and effect.

SECTION 16—EFFECTIVE DATE

A. This ordinance shall be in full force and effect immediately following its passage, approval, and publication, as provided by law.

B. Any Rules and regulations consistent with this Ordinance may be adopted and/or amended by the Board in conformance with Section 10 Chapter 83 of the General Laws of the Commonwealth of Massachusetts.

C. Revised, passed and adopted at a duly authorized meeting of the Board of Sewer Commissioners, of the Town of Rockland, State of Massachusetts held on the 10th day of February 2011.

BOARD OF SEWER COMMISSIONERS
ROCKLAND, MASSACHUSETTS

Walter Simmons

William E. Stewart

Ronald Savicke

TOWN MEETING ADOPTION_____

Appendix E
WWTP Evaluation Report

ROCKLAND, MA

APRIL 2021

Comprehensive Wastewater Treatment Plant Assessment and Evaluation

WRIGHT-PIERCE
Engineering a Better Environment

COMPREHENSIVE WASTEWATER TREATMENT PLANT ASSESSMENT AND EVALUATION REPORT

FOR THE

TOWN OF ROCKLAND, MASSACHUSETTS

APRIL 2021

PREPARED BY:

WRIGHT-PIERCE

600 Federal Street, Suite 2151
Andover, MA 01810
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ROCKLAND, MA
COMPREHENSIVE WASTEWATER TREATMENT PLANT
ASSESMENT AND EVALUATION

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SECTION 1

EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Town of Rockland owns a Wastewater Treatment Plant (WWTP) which serves the Town of Rockland and parts of the Town of Abington. The WWTP is located at 587 Summer Street. The WWTP is operated by Suez. The WWTP was originally constructed in the mid-1960s (drawings are dated 1964) and the plant was upgraded in the late 1970's to a two-stage nitrification activated-sludge plant (drawings are dated 1977). The Town has not completed a comprehensive plant assessment of the WWTP since the 1977 secondary system upgrade. In the interim, several assets, such as sludge and chemical pump replacements, have been upgraded through equipment replacement/upgrades. The Administration Building was expanded in 2000.

The Rockland WWTP is authorized to discharge treated effluent through its outfall to the French Stream. Effluent discharges from the wastewater treatment plant must meet standards set forth in state and federal water quality legislation. These standards establish minimum effluent discharge requirements which must be satisfied at all times. In accordance with Section 402 of the Clean Water Act, the plant's effluent quality requirements are contained in a National Pollutant Discharge Elimination System (NPDES) permit which was issued to the Town jointly by the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) in January 2006 (MA0101923) and modified and reissued in April 2007. The permit (and modifications) expired on July 1, 2011. A new NPDES permit has not yet been issued by EPA/DEP. A copy of the Final 2007 NPDES permit is contained in **Appendix A.**

1.2 PURPOSE AND ORGANIZATION OF REPORT

In 2019, the Town of Rockland elected to commission this WWTP Evaluation and Assessment to identify and plan for needed improvements at the WWTP. The comprehensive assessment included conducting a condition assessment of existing process and building systems; and developing a capital improvement plan (CIP) to address the condition, age, useful life and efficiency of each unit process and associated equipment currently installed at the wastewater treatment plant.

1.3 CONCLUSIONS AND RECOMMENDATIONS

Based on the work completed as a part of this project, the following conclusions and recommendations are provided:

1. The WWTP has provided reliable service since the early 1980s; however, many of the equipment and building systems are well beyond the end of their expected useful life and will require comprehensive upgrades in order to provide continued reliable service for the planning period. Typical service life for most WWTP equipment and building systems are between 25 to 30 years. The equipment and building systems at the Rockland WWTP have been in operation for over 40 years.
2. Furthermore, the existing WWTP infrastructure (tanks, buildings, electrical systems) have not been addressed since the 1977 upgrade and are also in desperate need of repair/improvements. This includes significant corrosion and concrete damage, inoperable mechanical HVAC systems, leaking roofs, water intrusion in the underground electrical duct banks, and various building and life safety code compliance issues. The consequence of failure varies from unit process to unit process. However, there are numerous very high priority items that could have severe ramifications if failure occurred prior to an upgrade.
3. A comprehensive upgrade of the WWTP should begin immediately. Based on the significant needs at the WWTP, a comprehensive upgrade will be a multi-year process.
4. The annual average flow currently treated at the WWTP is slightly below the facilities permitted flow capacity. An increase in the permitted flow capacity is not expected given the French Stream's water quality, flow volume and impoundment locations. Therefore, aggressive removal of infiltration and inflow (I/I) should continue independent of the timing and/or scope of the WWTP improvements.
5. It is recommended that the Town immediately proceed with the development of a Comprehensive Wastewater Management Plan (CWMP). The CWMP is one of several requirements that would help position the Town for zero percent financing for the nutrient related portions of the WWTP upgrades. The CWMP can include evaluation of remote treatment and/or effluent disposal options in addition to I/I reduction to manage WWTP permitted flows to achieve long term compliance with the WWTP's effluent permit.

6. The Town of Rockland's WWTP currently utilizes an anaerobic digestion process to reduce the volume and mass of the solid material (i.e., sludge) that must be removed from the facility each week. Reducing the amount of material that must be trucked offsite will reduce the WWTP's annual operating costs.
   a) The estimated capital costs to upgrade this treatment component outweighs the annual cost savings achieved through reduced sludge disposal costs, at the current market sludge disposal rate (i.e., $/wet ton of material hauled offsite).
   b) There is significant volatility in the local sludge disposal market. This is due to the changing landscape regarding PFAS chemicals and limited final sludge disposal locations. This volatility is likely to continue for the next few years. It is expected that sludge disposal cost will steadily increase from year to year.
   c) As sludge disposal costs increase over the coming years there may come a point in which the anaerobic digestion process would have a positive return on investment. It is unknown at which point over the next 20 years (typical project cycle) a positive net return would occur. It could be as short as three to five years or closer to 10 years.
   d) Eliminating the anaerobic digestion process in favor of a simplified solids handling scheme will have a lower initial capital cost.
   e) In January of 2018 a feasibility report entitled "Evaluation of the Feasibility of Combined Heat and Power at the Rockland Wastewater Treatment Plant" was submitted to the Town and the Massachusetts Clean Energy Center. The feasibility study evaluated expansion of the anaerobic digestion complex to include the acceptance of merchant sludge. The hauled-in merchant sludge could potentially provide a revenue source for the Town through sludge tipping fees and power generation. That report concluded that the existing general state of repairs required for the anaerobic digestion complex was cost prohibitive. As such, expansion of the anaerobic digestion complex to include the acceptance of merchant sludge was not recommended.
   f) The anaerobic digestion process also provides additional non-economic benefits including reduce odor generation and use of a green technology.
   g) The current project cost estimate includes abandoning the anaerobic digestion process and upgrading the WWTP to a simplified solid handling scheme. Retaining and upgrading the

anaerobic digestion process would add $3.0M to $5.0M in capital project costs, depending on options chosen.

h) The current schedule includes initiating design related services in mid-2022. A review of the anaerobic digestion cost-benefit analysis should be conducted at that time based on an updated understanding of the current sludge disposal market. This analysis should also reevaluate the financial implication of incorporating power generation independent of receiving merchant sludge.

7. The Town of Rockland is facing the prospect of a lower total phosphorus limit and a total nitrogen limit. Section 4 summarizes recommendations to achieve compliance with both parameters (nutrients). It is recommended that the Town move forward with a biological process that assists in the removal of these two nutrient parameters regardless of the timing of a future change to the current permit limit. It is almost certain that these parameters will be included in the facility permit within the 20-year planning window.
8. A tertiary treatment process was identified as being a required wastewater component if the Town receives a 0.1 mg/l seasonal total phosphorus limit. A tertiary treatment process is not required to achieve compliance with the current NPDES permit. As such, this unit process could be installed later commensurate with the issuance of a 0.1 mg/l TP limit.
   a) The presented tertiary project costs are based on the inclusion of a ballasted flocculation process to achieve permit compliance. This technology represents a conservative approach with respect to the estimated project costs.
   b) It is recommended that during the initial stages of the design phase of the WWTP upgrade, pilot testing be conducted to ascertain the actual site-specific phosphorus removal performance of cloth filtration technology. At this time, without actual site-specific pilot testing, it is unknown if cloth filtration can achieve consistent compliance with a 0.1 mg/l effluent total phosphorus limit.
   c) If proven successful, cloth filtration would represent a lower cost tertiary treatment solution.

1.4 PROJECT COSTS AND FINANCING

Planning level project costs have been estimated for the recommended facilities upgrades/improvements. A summary of the recommended improvements is provided in Section 5.

Total project costs by major unit processes are presented in **Table ES-1**. The total project cost estimate for the comprehensive upgrade is presented in **Table ES-2**.

It is recommended that the Town take advantage of low interest financing through the Massachusetts Department of Environmental Protection (DEP) Clean Water State Revolving Fund (CWSRF) program. CWSRF loans have a standard term of twenty years and an interest rate of approximately 2 percent. A CWSRF project can become eligible for a zero percent rate (for nutrient related portions of the upgrade, including Total Phosphorous reduction) if the community meets five specific criteria. One key criterion is the development of a CWMP. As such, it is recommended that the Town proceed with the development of a CWMP to position themselves for a loan through the CWSRF program (2 percent standard, 0 percent for the nutrient related portions of the project).

TABLE ES-1

PROJECT COST ESTIMATE BY UNIT PROCESS

PROJECT COMPONENT	COST
Screening and Grit Facility (New)	$4,900,000
Influent Pump Station Modifications	$2,200,000
Primary Clarifier Modifications	$2,300,000
Secondary System Modifications	$13,400,000
Secondary Clarifier Modifications	$2,700,000
Tertiary Building (New)	$6,300,000
Chemical Building (New)	$1,900,000
Chlorine Contact Tanks and Effluent P.S.	$300,000
Sludge Storage Tanks	$2,300,000
Administration Building Modifications	$5,200,000
Garage and Electrical Building (New)	$3,200,000
General	$4,400,000

TABLE ES-2

TOTAL COST ESTIMATE – COMPREHENSIVE UPGRADE

PROJECT COMPONENT		COST
CONSTRUCTION		$38,240,000
CONSTRUCTION CONTINGENCY	5.0%	$1,910,000
ENGINEERING SERVICES	20.0%	$7,648,000
MATERIALS TESTING	0.5%	$191,000
ASBESTOS & LEAD PAINT ABATEMENT		$0
DIRECT EQUIPMENT PURCHASE		$0
LAND ACQUISITION/ EASEMENTS		$0
LEGAL/ ADMINISTRATIVE	1.0%	$382,000
SUBTOTAL		**$48,371,000**
FINANCING	1.5%	$726,000
ENGINEER'S ESTIMATE OF PROJECT COST[2]		$49,100,000

Notes:

1. Cost estimate is based on ENR INDEX 11,625 (12/2020)
2. Cost estimate is based on eliminating the anaerobic digestion process in favor of an alternative solids handing scheme. Refurbishing the existing anaerobic digestion process would add an additional $3.0M to $5.0M to the total project cost.

1.5 PROJECT IMPLEMENTATION

The estimated project schedule for WWTP upgrades/improvements is shown in **Table ES-3**. The schedule is subject to change based on the Town's review and final selection of WWTP upgrades. The proposed schedule assumes the development of a CWMP in 2021, design phase engineering services in 2022, and construction beginning in early 2024. A two-year construction schedule has been assumed as part of this implementation schedule and completion of the upgrades in a single project (vs. multiple project phases).

TABLE ES-3

PROPOSED SCHEDULE

MILESTONE	DATE
Completion of the WWTP Evaluation	Winter 2021
Town Appropriates CWMP Funding at Annual Town Meeting	May 2021
CWMP Development and Completion	July 2021 – June 2022
Town Appropriates Design Phase Funding at Annual Town Meeting	May 2022
Preliminary Design Phase Engineering Begins	July 2022
DEP SRF Loan Project Evaluation Form (PEF) Submitted	August 2022
Preliminary Design Report (30% design completion)	December 2022
Draft DEP SRF Loan Intended Use Plan (IUP) Notification	December, 2022
Final DEP SRF Loan IUP	January 2023
Final Design and Permitting Begins	January 2023
SRF Application Submission (90% Design completion)	By October 15, 2023
100% Design and Permitting Complete	December, 2023
DEP Issues Project Approval Certificate (PAC)	By December 31, 2023
Bidding	January 2024 - March 2024
Start Construction	April 2024
Substantial Completion of Construction	February - March 2026
Final Completion of Construction	April 2026
One-year Warranty Period	April 2027

WRIGHT-PIERCE
Engineering a Better Environment

SECTION 1
INTRODUCTION

1.1 INTRODUCTION

The Town of Rockland owns a Wastewater Treatment Plant (WWTP) which serves the Town of Rockland and parts of the Town of Abington. The WWTP is located at 587 Summer Street. The WWTP is operated by Suez. The WWTP was originally constructed in the mid-1960s (drawings are dated 1964) and the plant was upgraded in the late 1970's to a two-stage nitrification activated-sludge plant (drawings are dated 1977). The WWTP was designed for an annual average flow of 2.5 MGD and a peak hourly flow of 6.0 MGD.

The Town has not completed a comprehensive plant assessment of the WWTP since the 1977 secondary system upgrade. In the interim, several assets, such as sludge and chemical pump replacements, have been upgraded through equipment replacement upgrades. The following upgrades have also been completed:

- the expansion of the Administration Building in 2000
- an upgrade to the anaerobic digestion mixing system in 2013.

The key goals of the current plant evaluation include:

- Calculating the current flows and loads received by the facility and assess the expected growth in flows and loads over the next 20-year planning period.
- Assessing key permit issues facing the WWTP and conduct an alternatives evaluation of the improvements needed to meet current and potential future permitting/regulations (discharge limits, etc.). This includes a pending effluent total phosphorus limit and likely a future total nitrogen (TN) limit.
- A comprehensive assessment of all existing equipment and unit processes at the WWTP; conducting a condition assessment of existing process and building systems; and developing a capital improvement plan (CIP) to address the condition, age, useful life and

efficiency of each unit process and associated equipment currently installed at the wastewater treatment plant.

- Conducting a screenings analysis of potential alternatives to provide influent pumping, flow measurement, screening, and grit removal at the WWTP to accommodate planned future growth, ease of operation and maintenance activities versus cost implications.

- Conducting a screenings analysis of potential alternatives to provide biological phosphorus and nitrogen removal.

- Conducting a screenings analysis of alternative tertiary treatment processes for low level phosphorus removal.

- Conducting a screenings analysis of the existing anaerobic digestion process. This will include an evaluation of the economics associated with rehabilitating the existing digestion system and/or enhancements to the digestion process.

- Conducting a screenings analysis of potential sludge dewatering alternatives.

- Compilation of overall recommended improvements into a capital improvements plan based on current and anticipated future needs over the 20-year planning period.

1.2 PROJECT/UPGRADE HISTORY

The original Rockland WWTP, as it was constructed in 1964, consisted of an influent pumping facility, two primary clarifiers, two aeration tanks, two secondary clarifiers, and an anaerobic digestion system. The WWTP was upgraded in 1977 to a two-stage nitrification activated-sludge process for ammonia removal. The two-stage process was abandoned shortly after this upgrade to a single sludge nitrification activated sludge process and, in 2000, the Administration Building was expanded.

In general, most of the wastewater equipment currently in use at the facility consists of items that were installed as part of the 1977 upgrade. The existing infrastructure (i.e., structures, tanks, buildings, etc.) currently being used date from the original 1964 construction and the 1977

upgrade. A brief description of plant improvements since its original construction in 1964 is provided below.

Improvements constructed in **1964** (Sewage Treatment Facilities, Contract 64-1, Metcalf and Eddy) include:

- Influent screening and pump station with process equipment, electrical, and HVAC equipment
- Two primary clarifier tanks (currently not used)
- Two aeration tanks (currently used for wet weather flow diversion)
- Two secondary clarifiers (have since been demolished)
- Administration Building
- Two-stage anaerobic digestion process
- Chlorine contact tanks
- Site piping to accommodate the new structures and tanks constructed
- Site electrical distribution system

Improvements constructed in **1977** (Water Pollution Control Facilities, Contract 77-1, Metcalf and Eddy) include:

- Two new Primary Settling Tanks
- Two new Secondary Settling Tanks
- Two Nitrification Reactors
- Two Nitrification Settling Tanks
- New Chlorine Contact Tank, Effluent Pumping, and post Aeration Structure
- Expansion of the Administration Building
- Two additional anaerobic digestion tanks
- New Electrical Building
- Replacement of existing pumping systems and equipment throughout the facility
- New site piping to accommodate the new buildings and structures constructed.
- New site electrical distribution and stand-by generator
- Other improvements to electrical, HVAC, and Instrumentation.

Improvements constructed in **2000** (2000 Expansion Program of the Administration Building R.A.D. Jones Architects, Inc.) include:

- Expansion of the Administration Building including new:
  - Laboratory Facilities
  - Conference and reception area
  - Break Room
  - Shower and locker area

Improvements constructed in **2013** (WWTP Digester Mixing System Replacement, HTA) include:

- New mixing system for Primary Digester No.2

1.3 EFFLUENT STANDARDS

1.3.1 NPDES Permit

The Rockland WWTP is authorized to discharge treated effluent through its outfall to the French Stream. Effluent discharges from the wastewater treatment plant must meet standards set forth in state and federal water quality legislation. These standards establish minimum effluent discharge requirements which must be satisfied at all times. In accordance with Section 402 of the Clean Water Act, the plant's effluent quality requirements are contained in a National Pollutant Discharge Elimination System (NPDES) permit which was issued to the Town jointly by the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) in January 2006 (MA0101923) and modified and reissued in April 2007. The permit (and modifications) expired on July 1, 2011. A new NPDES permit has not yet been issued by the EPA/DEP. A copy of the Final 2007 NPDES permit is included in **Appendix A.**

1.3.2 Current NPDES Effluent Limitations

As the EPA and MassDEP have not issued an updated permit to the Town of Rockland, the Town continues to operate under the 2007 permit. The permit limits for the WWTP effluent (Outfall #001 to the French Stream) are summarized in **Table 1-1**.

TABLE 1-1

NPDES EFFLUENT LIMITS FOR WWTP

Parameter	Monthly Average	Weekly Average	Daily Maximum
Flow, mgd	2.5	-	Report
BOD_5, mg/l	20	20	30
BOD_5, lbs./day	417	417	626
TSS, mg/l	20	20	30
TSS, lbs./day	417	417	626
pH, Std. Units	6.5-8.3	6.5-8.3	6.5-8.3
Fecal Coliform, #/100 mL	200	-	400
Total Residual Chorine, mg/L	0.011	-	0.019
Ammonia – Nitrogen, mg/l Oct 1 – March 31 April 1 - May 31 June 1 – Sept 30	 3.3 2.5 1.0	 3.3 2.5 1.0	 5.7 5.7 1.5
Phosphorus, Total, mg/l April 1- Oct 31 Nov 1 – March 31	 0.2 1.0	-	Report
Copper, Total, ug/l	12	-	19
Aluminum, Total, ug/l	88	-	Report

1.3.3 Anticipated Phosphorus Limit

As noted above, the 2007 NPDES permit includes a phosphorus limit of 0.2 mg/l (April-October). The WWTP currently achieves this limit through a multi-point chemical addition process. Direct discussions with the MassDEP regarding a potential future more stringent phosphorus limit have not occurred as part of this WWTP assessment. However, through previous discussions between the Town and MassDEP, it has been identified that a reduction of the WWTP's total phosphorus limit could be included in the next permit. Potentially, the phosphorus limit could be:

1. Reduced to 0.1 mg/l for the period of April through October. This limit would be in-line with other low-level phosphorus limits applied within the Commonwealth and would represent the practical limit of technology for removal of this parameter.

2. Reduced to 0.2 mg/l for the period of November through March. The MassDEP has recently issued new permits to existing WWTP's with current phosphorus limits in which the wintertime effluent limits were reduced to be more in-line with current summertime effluent limits.

As part of this assessment, improvements required to achieve an effluent total phosphorus limit of 0.1 mg/l will be evaluated and alternative solutions identified. Almost uniformly, compliance with a total phosphorus limit of 0.1 mg/l will require the installation of a tertiary treatment process (a new process installed between the nitrification settling tanks and the chlorine contact tanks). The assessment of the WWTP did not account for a change to the November through March total phosphorous limit. A reduction in the wintertime total phosphorus limit would increase the WWTP's operating costs as chemical addition, and subsequently increased sludge production levels, would need to be continued throughout the year versus the summer period only. However, a reduction in the November through March limit should not require additional capital improvements at the WWTP.

1.3.4 Potential Future Nitrogen Limit

The current permit does not include any limits or monitoring requirements for nitrite, nitrate, total Kjeldahl nitrogen, and total nitrogen. It does include an ammonia-nitrogen limit. MassDEP has been issuing monitoring requirements and total nitrogen limits to various WWTP's throughout the Commonwealth. Given the location and characteristics of the French Stream it is prudent to consider what the impacts to the WWTP would be if it is required to achieve total nitrogen removal. On this basis, potential approaches for nitrogen removal are evaluated in Section 4.

It appears reasonable to assume a moderate total nitrogen limit of 8 mg/l rather than more severe limits of technology total nitrogen limits.

1.4 CLIENT WORKSHOP

A virtual workshop was conducted on December 11, 2020. Attendees included representatives from the Town of Rockland, Wright-Pierce, and Suez. The focus of that workshop was to review the material that is presented in Sections 2, 3, and 4 of this report. A copy of the workshop presentation has been included in **Appendix B**. The goals of that workshop were to present initial

findings and recommendations to solicit feedback. After that workshop, several items were re-evaluated and adjusted. As such, the presentation included is not a reflection of the final recommendations, but it has been included in this report for documentation purposes.

2

WRIGHT-PIERCE
Engineering a Better Environment

SECTION 2
CURRENT AND FUTURE WASTEWATER FLOWS AND LOADS

2.1 INTRODUCTION

The Rockland WWTP receives flows from the Town of Rockland and a small portion of the Town of Abington. The Town of Rockland has a contractual intermunicipal agreement with the Town of Abington to treat up to 110,000 gallons per day (gpd) of wastewater. The WWTP services 95% of the Town of Rockland with about 5,700 homes and businesses connected into the sewer system as summarized in **Table 2-1**.

TABLE 2-1
SEWERED POPULATION ESTIMATES

Parameter	Rockland	Abington
Total Population[1]	17,986	16,026
Persons per Household[1]	2.56	2.53
Population served by WWTP	17,000	1,000
Percent of Residents served by WWTP	95%	5%

Source:
1. 2010 Census

Influent wastewater characteristics, specifically biological oxygen demand (BOD_5), total suspended solids (TSS), ammonia, total phosphorus, and wastewater temperature were statistically analyzed for the period of January 2016 through June 2020. The flows and loadings data were based on monthly and daily maximum sampling and analysis values reported by the Rockland WWTP. In general, influent TSS and BOD_5 were measured twice per week while ammonia and total phosphorus were measured once per month. Influent TKN and ortho-phosphorus were not measured. Flow, wastewater temperature, and precipitation levels were measured daily. All samples are assumed to be composite flow-based samples.

Influent wastewater characteristics were summarized and evaluated to determine the annual average, minimum month (30-Day), maximum month (30-Day), and maximum (peak) day values. A brief description of each calculated parameter is listed below:

- **Annual Average**: The average of daily values for the period.

- **Maximum Day**: The maximum single day that occurs for each parameter during the study period. The single maximum day values are reported 100th percentile along with 98th percentile for the data set.
- **Minimum Monthly**: The minimum 30-day running average for the study period.
- **Maximum Monthly**: The maximum 30-day running average for the study period.
- **Peak Hourly**: Peak hourly flow (i.e., the maximum instantaneous flow that reached the WWTP) is unknown. Influent flows above approximately 6.0 MGD are diverted via a portable, trailer-mounted pump to an offline holding tank. This flow is directed back to the influent pump station following the high flow event. The total flow diverted to this tank has never exceeded the tank's volume (110,000 gal).

2.2 CURRENT FLOWS AND LOADS

The flows and loads data from January 2016 to June 2020 is summarized in **Table 2-2**.

TABLE 2-2
CURRENT INFLUENT FLOWS AND LOADS

Parameter	Flow		BOD5			TSS		
	MGD	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day	1.13	0.46	98	926	0.25	129	1,216	0.24
Minimum Month	1.34	0.54	156	1,739	0.47	251	2,803	0.56
Annual Average	2.46	-	179	3,676	-	244	5,008	-
Maximum Month[1]	4.28	1.74	153	5,460	1.49	255	9,085	1.81
Maximum Month Loading[2]	3.39	1.38	193	5,460	1.49	321	9,064	1.81
Maximum Day3 (98th %)	4.69	1.91	172	6,713	1.83	265	10,381	8.54
Maximum Day4 (100th %)	6.09	2.47	260	13,211	3.59	504	25,560	5.10
	Temperature		NH3-N			Total Phosphorus		
Parameter	C	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day	8.89	0.56	30.08	283	0.60	1.63	15	0.21
Minimum Month	9.80	0.62			-			-
Annual Average	15.76	-	22.92	470	-	3.61	74	-
Maximum Month[1]	9.80	0.62	17.65	629	1.34	3.04	109	1.47
Maximum Month Loading[2]	9.80	0.62						
Maximum Day3 (98th %)	22.22	1.41						
Maximum Day4 (100th %)	23.33	1.48						

NOTES
1. Maximum Month Flows and Loading values are based on a maximum 30-day moving average.

2. Maximum Month Loading condition represents the actual influent conditions during the maximum BOD loading condition
3. Maximum Day is based on 98th percentile
data.
4. Maximum Day is based on the maximum value of the total recorded flow for the data period.

The WWTP is designed to treat an average daily flow of 2.5 MGD. Based on the review of daily operational data between January 2016 to June 2020, the WWTP's current annual average daily flow is 2.46 MGD and the plant is currently operating at about 98% of its design capacity on an annual average basis. However, the average flow treated at the WWTP varies significantly throughout the year as shown in **Figure 2-1**.

Overall, Rockland's WWTP influent loading concentrations fall within the expected range of typical design values. **Table 2-3** shows the standard values for low, medium, and high strength wastewater as well as the WWTP's average loadings. The WWTP's average loading concentrations are typical of a medium strength wastewater.

TABLE 2-3

STANDARD VALUES FOR LOW TO HIGH STRENGTH WASTEWATER LOADS(1) COMPARED TO ROCKLAND WWTP LOADS

	Concentration (mg/L)			
	Low Strength	Medium Strength	High Strength	Rockland WWTP Average
BOD_5	110	190	350	179
TSS	120	210	400	243

Notes: 1. Metcalf & Eddy, Wastewater Engineering Treatment and Reuse, 2004.

The characteristics of the influent wastewater at the Rockland WWTP are as expected for a 2.5 MGD wastewater treatment plant serving a Town with mostly residential and commercial sources. One item of note is the discrepancy between influent TSS and BOD_5 levels. TSS levels are about 36% greater than BOD_5 levels which indicates that the wastewater may contain a higher than normal level of inert material. The source of this material is unknown, but one explanation is that the material could be entering the sewer system as part of inflow and infiltration.

Several figures were developed to visually evaluate the influent wastewater characteristics, trends, and daily or monthly variations. Key observations for each figure are provided after all the figures. The following figures were developed:

Figure 2-1: WWTP Daily Influent Flow
Figure 2-2: Influent Flow and Precipitation
Figure 2-3: Percentile Frequency Distribution-Daily Flow
Figure 2-4: Influent Wastewater Temperature
Figure 2-5: Influent BOD_5 and TSS Load (Monthly Average)
Figure 2-6: Percentile Frequency Distribution: Influent BOD_5 and TSS Loads
Figure 2-7: Primary Clarifier Removal Rates

FIGURE 2-1

WWTP DAILY INFLUENT FLOW (MEASURED AS INFLUENT)

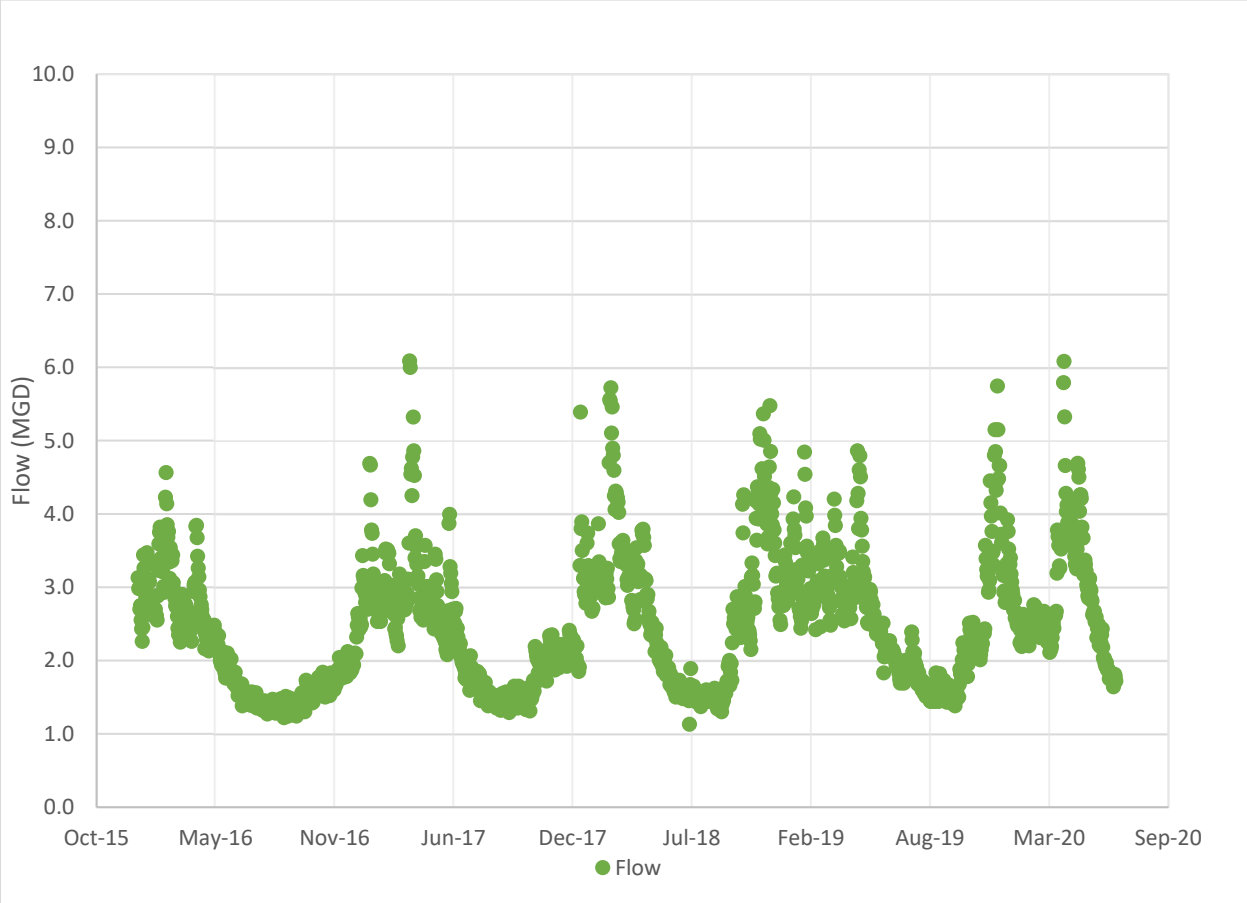


FIGURE 2-2

WWTP FLOW AND PRECIPITATION (MEASURED AS INFLUENT)

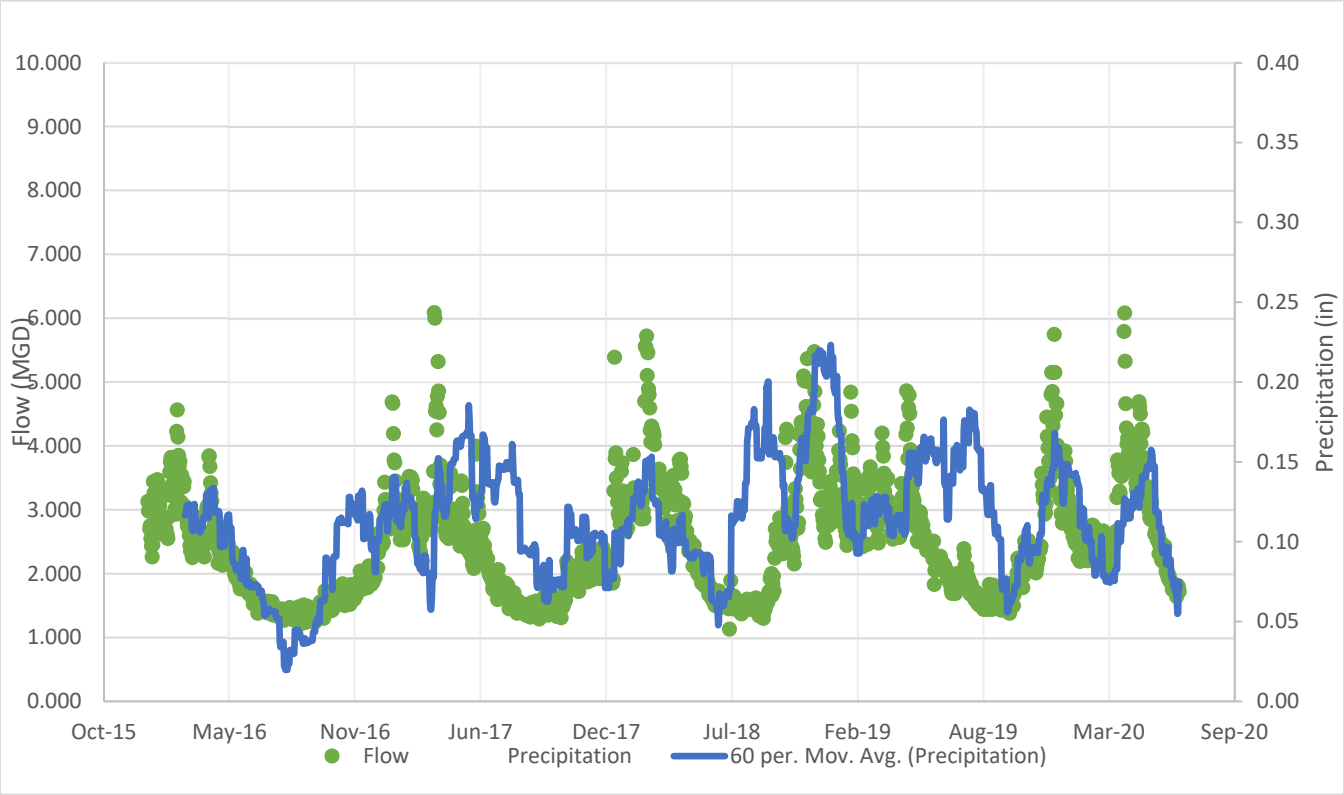


FIGURE 2-3

PERCENTILE FREQUENCY DISTRIBUTION– DAILY FLOW

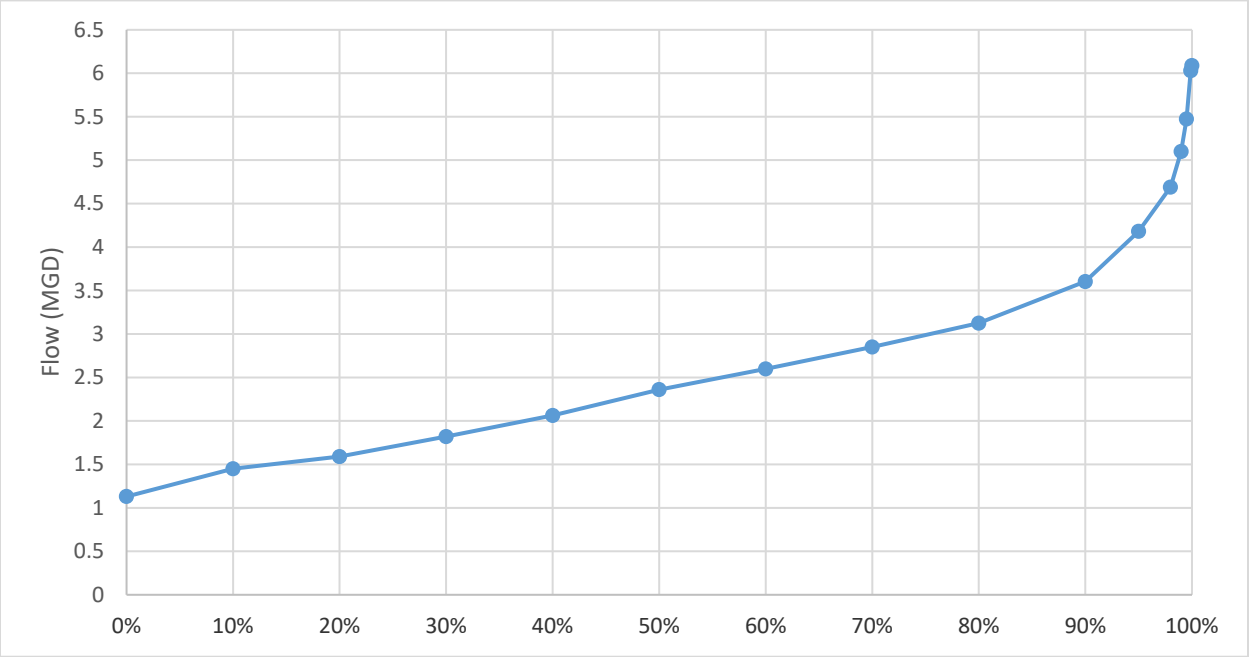


FIGURE 2-4

INFLUENT WASTEWATER TEMPERATURE ˚C

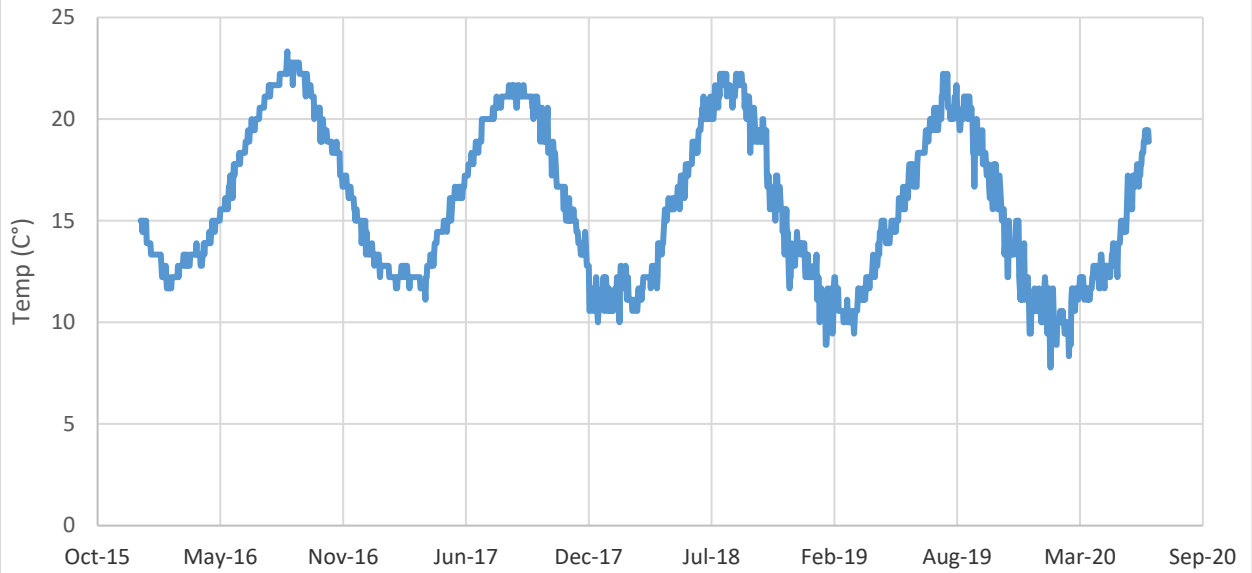


FIGURE 2-5

INFLUENT BOD_5 AND TSS LOAD – MONTHLY AVERAGE

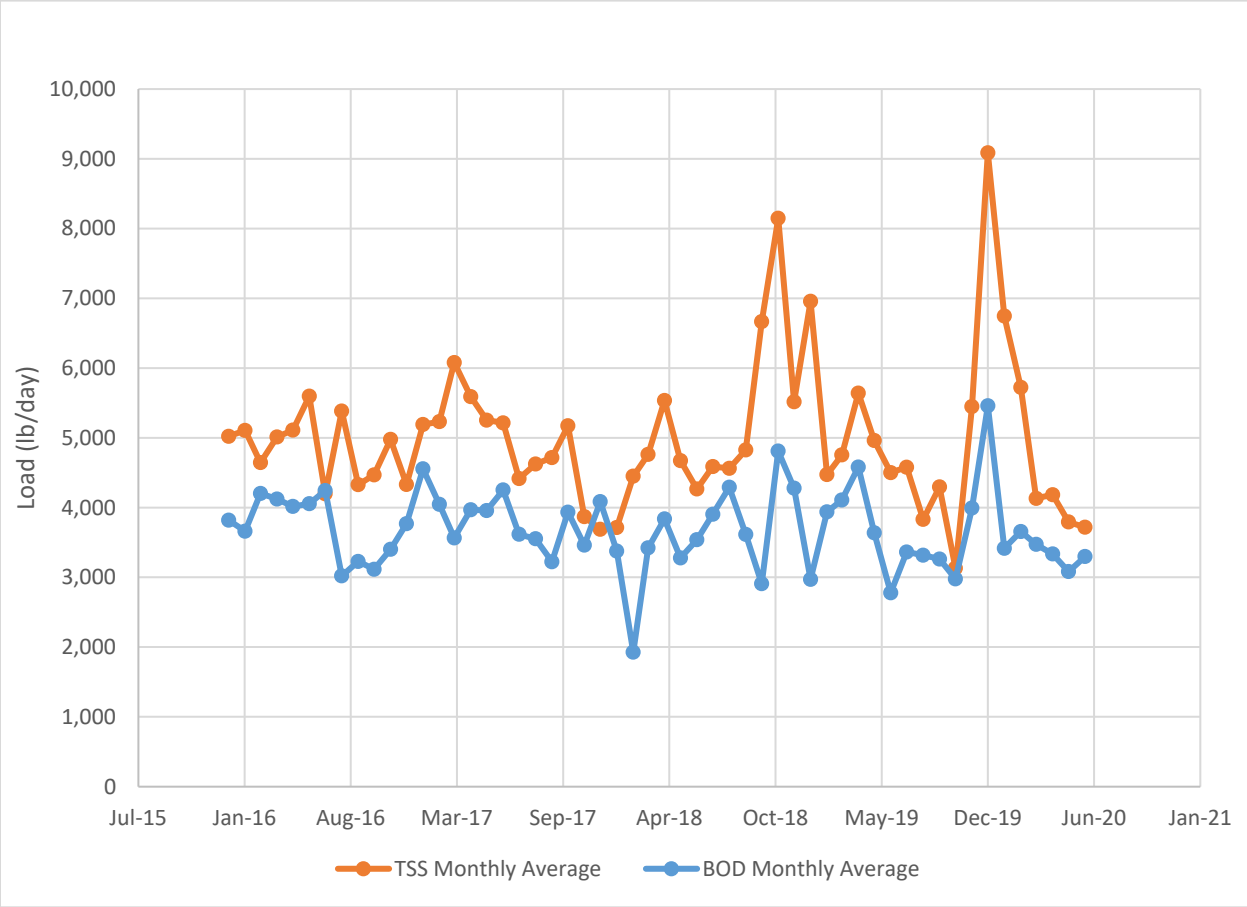


FIGURE 2-6

PERCENTILE FREQUENCY DISTRIBUTION– DAILY INFLUENT BOD_5 AND TSS LOADS

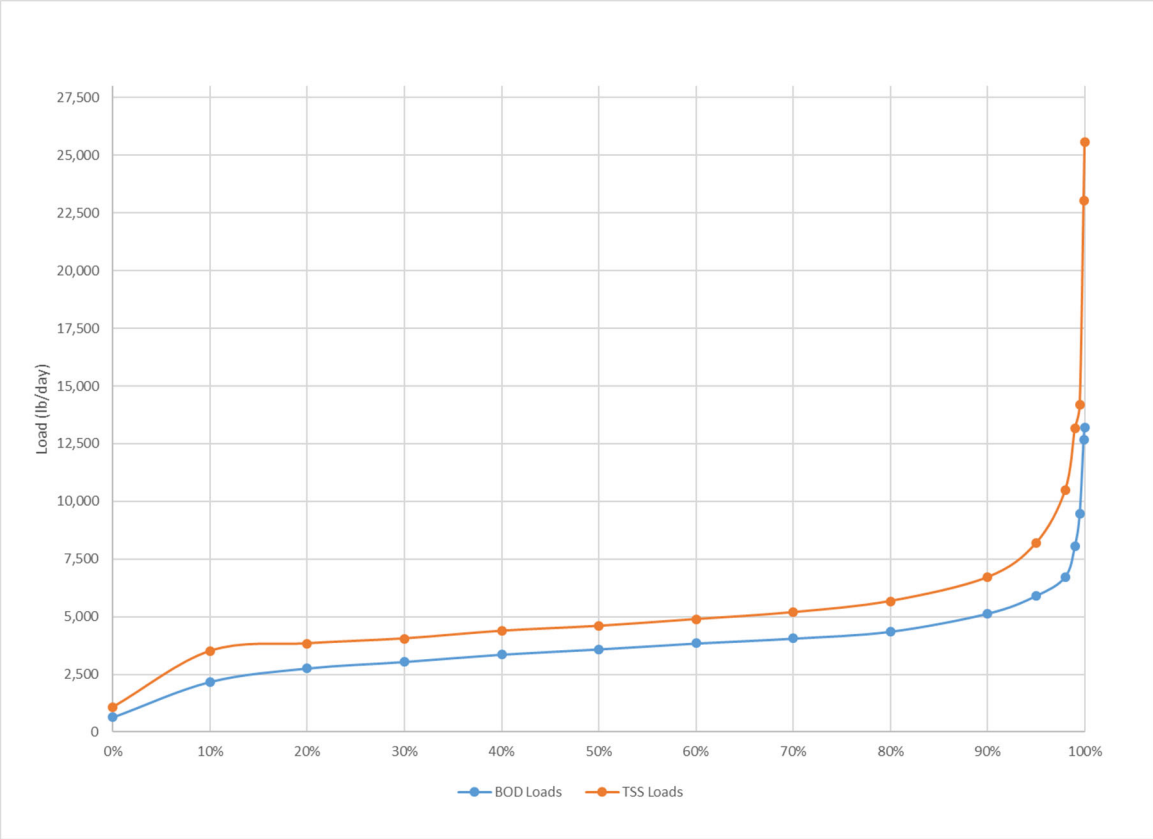
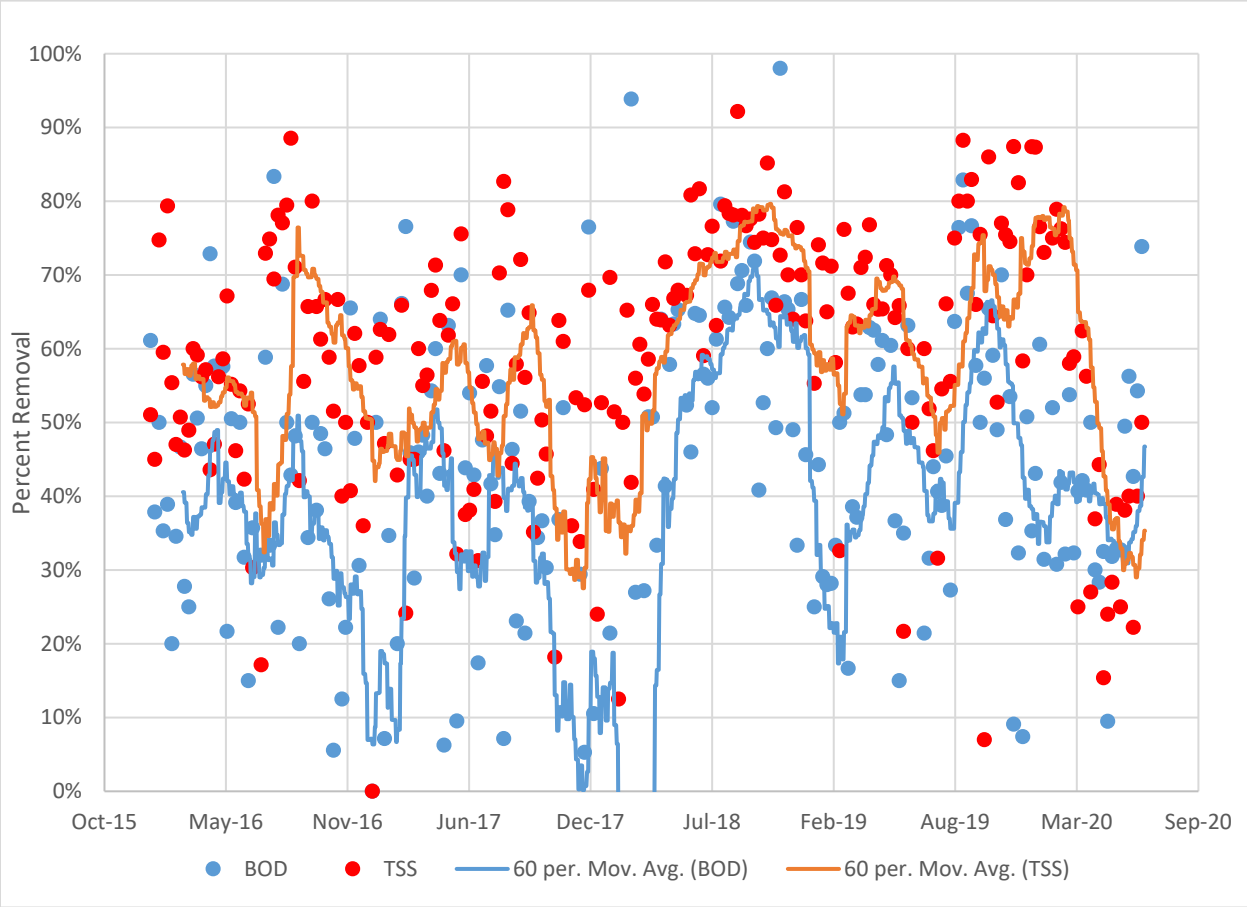


FIGURE 2-7

PRIMARY CLARIFIER REMOVAL RATES



Key Observations:

- Flow rates have varied significantly throughout the year with a strong seasonal correlation. Low summertime flows and higher winter/spring flows.
- A review of the flow rate and average precipitaiton levels confirms the strong trend of higher preciptation months commensurate with higher than average wastewater flow rates.
- Influent flow frequency followed a standard distribution with the exception of the 95th through 100th percentile events. The magnitude of change between the 95th and 100th percentile is not uncommon for WWTP's. It should be noted that during peak flow events, a portion of the flow is bypassed around the parshall flume via operation of the trailer mounted pump.
- Influent BOD_5 and TSS frequency showed a similar pattern as the flow rate. However, the magnitude of change was even greater at the 98th through 100th percentile range.

- Influent TSS and BOD_5 loadings have remained fairly consistent over the years, with a compound annual growth rate of -0.7% and -2.4%, respectively. The wastewater facility did experience several significant monthly TSS loading events in the winter of 2018 and 2019.
- Primary clarifier TSS and BOD_5 removal rates varied widely over the data set analyzed. The average TSS removal rate was 57%. The average BOD_5 removal rate was 38%. The average removal rates are right in-line with expected primary clarifier removal perfomance. However, the high variation is not typical. This may be due to the co-settling operation and lack of independent sludge storage prior to the anaerobic digestion process.
- Greater than expected primary clarifier TSS removal rates corresponded to high levels of influent TSS typically during wet weather flow events. Potentially these high flow events are readily settleable suspended solids that are easily removed in the primary clarifiers.

2.3 ANNUAL RATE OF INCREASE

As previously identified, the influent TSS and BOD_5 loads (lbs/day) have not increased over the last 5 years. Conversely, each parameter has seen a small decrease over the analysis period. Influent loading is an accurate way of estimating the amount of wastewater processed at the plant. Wastewater flows rates have been increasing over the last five years at an average annual rate of approximately 8.0%. Thus, additional water has entered the collection system without a measurable increase in the amount of material in the wastewater. This could be due to several factors but is most often attributable to increased infiltration and inflow entering the collection system. A review of the precipitation data over the last five years up to, but not including 2020, indicates that the annual rate of precipitation has increased by 14.2% percent, far greater than the rate of flow increase. However, the first half of 2020 has seen a drop in the total precipitation levels. This may change following the typical wetter fall period. Total precipitation levels vary from year to year and as such, drawing a definitive conclusion from these macro trends is difficult.

The data analysis does indicate that the influent loadings have been steady for the last several years, while the flow rate to the WWTP has varied significantly in response to seasonal precipitation levels. It is unknown if the gradual increase in total wastewater received at the facility will continue due to either precipitation impacts and/or the condition of the collection system piping.

2.4 PROJECTED DESIGN FLOWS AND LOADS

Design year flows and loads have been developed to account for projected increases in wastewater for the 20-year planning period. These projections have been developed utilizing historical growth metrics as well as estimated future increases in population and housing development in Rockland and the greater south shore municipalities. Design year flows and loads are estimates of the influent flows and loads that the WWTP will eventually receive in the year 2040.

2.4.1 Approved, Pending, and Future Sewer Build Out

The Town of Rockland identified several known projects that would impact the wastewater generated within the collection system. These projects were classified as either currently approved, pending, or near-term future projects (i.e., Southfield/Union Point). Massachusetts DEP Title 5 unit flows were applied to each project to estimate the total average and maximum wastewater flows and loads allocation for each connection. A summary of the total flow and load allocation from these projects is summarized in **Table 2-4**. These anticipated near term projects represent an approximate flow and load increase of 6% above current levels.

TABLE 2-4

APPROVED, PENDING AND FUTURE SEWER BUILD OUT

FLOWS AND LOADS

Parameter	Flow		BOD_5			TSS		
	MGD	P.F.	mg/L	lbs./day	P.F.	mg/L	lbs./day	P.F.
Minimum Day		0.00		0	0.00		0	0.00
Title 5 Unit Flows	0.23	1.67	200	392	1.67	200	392	1.67
Annual Average	0.14	-	200	235	-	200	235	-
Maximum Month	0.19	1.35	200	317	1.35	200	317	1.35
Maximum Month Loading	0.19	1.35	200	317	1.35	200	317	1.35
Maximum Day (98th %)	0.28	2.00	200	470	2.00	200	470	1.20
Maximum Day (100th %)	0.28	2.00						

Parameter	Temperature		NH3-N			Total Phosphorus		
	C	P.F.	mg/L	lbs./day	P.F.	mg/L	lbs./day	P.F.
Minimum Day			0	0	0.00		0	0.00
Title 5 Unit Flows			26	52	1.67	7.00	14	1.67
Annual Average			26	31	-	7.00	8	-
Maximum Month			26	42	1.35	7.00	11	1.35
Maximum Month Loading								
Maximum Day (98th %)								
Maximum Day (100th %)								

2.4.2 Design Year Flows and Loads Projections

Design year wastewater flows and loads projection for a 20-year planning period were developed for the Rockland WWTP as shown in Table 2-5. These future influent wastewater conditions were estimated through a review of the historical wastewater trends, future population projections, and currently identified projects by the Town.

It is recommended that the Town on Rockland plan for an annual wastewater load increase of 1.0%, or slightly over a 22% increase in the total wastewater loads received versus current levels. This value represents a conversative estimate given the available information. However, influent wastewater flow rates would be held relatively constant over the planning period and set at a maximum annual average of 2.5 MGD (the current permited annual flow rate is 2.5 MGD). This will require long term flow reduction strategies (i.e., infiltration and inflow reduction) be implemented by the Town. It is recommended that the WWTP's peak hourly flow design conditon

be increased to 7.0 MGD. Indivdiual unit treatment processes would be evaluated and improved upon in order to hydraulically pass a maximum flow of 7.0 MGD. This value is recommended based on current peak flow concerns, a margin of peak flow safety factor and the expectation that, in the future, the Town will experience higher intensity wet weather events. A summary of the design year influent loading conditions is summarized in **Table 2-5**.

TABLE 2-5
DESIGN YEAR FLOWS AND LOADS

	Flow		BOD_5			TSS		
Parameter	**MGD**	**P.F.**	**mg/L**	**lbs./day**	**P.F.**	**mg/L**	**lbs./day**	**P.F.**
Minimum Day	1.15	0.46	121	1,159	0.25	159	1,521	0.24
Minimum Month	1.36	0.54	192	2,176	0.47	310	3,507	0.56
Annual Average	2.50	-	221	4,600	-	301	6,266	-
Maximum Month[1]	4.35	1.74	188	6,832	1.49	314	11,368	1.81
Maximum Month Loading[2]	3.44	1.38	238	6,832	1.49	395	11,342	1.81
Maximum Day[3] (98th %)	4.76	1.91	211	8,400	1.83	1347	53,511	8.54
Maximum Day[4] (100th %)	7.00	2.80	283	16,530	3.59	548	31,982	5.10
	Temperature		**NH3-N**			**Total Phosphorus**		
Parameter	**C**	**P.F.**	**mg/L**	**lbs./day**	**P.F.**	**mg/L**	**lbs./day**	**P.F.**
Minimum Day	8.89	0.56	37.04	355	0.60	2.01	19	0.21
Minimum Month	9.80	0.62			-			-
Annual Average	15.76	-	28.23	589	-	4.44	93	-
Maximum Month[1]	9.80	0.62	21.73	788	1.34	3.75	136	1.47
Maximum Month Loading[2]	9.80	0.62						
Maximum Day[3] (98th %)	22.22	1.41						
Maximum Day[4] (100th %)	23.33	1.48						

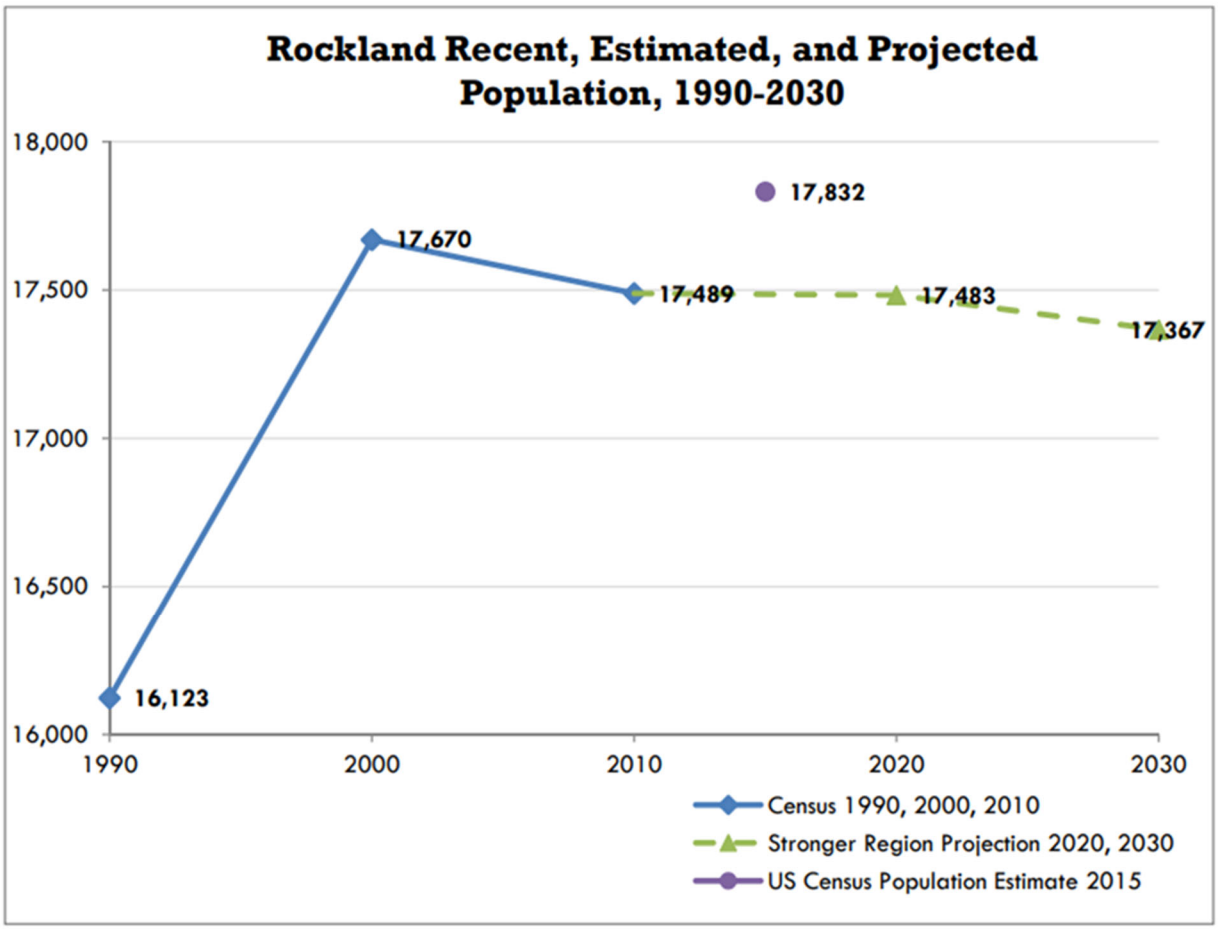
A summary of the information utilized to derive the annual load increase estimate is as follows.

1. Historical wastewater trends:
    a. As previously stated, the Rockland WWTP's influent BOD and TSS load have not increased over the past several years. Given the current sewer moratorium, this trend may be self-imposed and thus not an accurate reflection of growth demands if growth was left unchecked.

b. Influent wastewater flow rates have increased over the analysis period, at an annual rate of approximately 8.0%. It is suspected that this increase is due to precipitation levels and associated infiltration and inflow impacts.

2. Population projections:
    a. The Town of Rockland had a large population growth between 1990 and 2000, but then slightly declined by 2010. The Metropolitan Area Planning Council (MAPC) projected stable population levels through 2030. However, The U.S. Census Bureau's Population Estimates Program estimated Rockland's population in 2015 as 17,832 residents, which indicates that the population may be growing rather than declining (Figure 2-8).
    b. The US Census Bureau population estimates indicate a 0.39% annual population growth rate for the Town of Rockland.
    c. The MAPC estimated that the net population for the entire metro Boston region could increase anywhere from 6.6% to 12.6% from year 2010 to 2040.
3. Housing projections:
    a. The Metropolitan Area Planning Council projected an 8% increase in the number of households in the Town of Rockland (from 2010 to 2030). The increase in household demand, but not increased population, was attributed to the aging Town population and thus a result in the change in the type of housing desired.

FIGURE 2-8


Rockland Recent, Estimated, and Projected Population, 1990-2030
18,000
17,500
17,000
16,500
16,000
1990
2000
2010
2020
2030
16,123
17,670
17,489
17,832
17,483
17,367
Census 1990, 2000, 2010
Stronger Region Projection 2020, 2030
US Census Population Estimate 2015

3

WRIGHT-PIERCE
Engineering a Better Environment

SECTION 3

EVALUATION OF EXISTING EQUIPMENT AND UNIT PROCESSES

3.1 INTRODUCTION

The purpose of this section is to describe the existing Wastewater Treatment Plant (WWTP), assess the current condition of the WWTP, and identify items that should be addressed as part of a facility upgrade. The identification and screening of potential alternatives to meet the long-term wastewater needs of the WWTP are provided in Section 4.

A multi-discipline engineering team conducted several site visits at the WWTP between the months of August 2020 and December 2020. This included members of the wastewater process group as well as members of the architectural, structural, electrical, and mechanical/HVAC disciplines. This section summarizes the assessment of the existing wastewater unit processes and equipment with some commentary on the condition of the structures and buildings. Detailed assessments of the conditions and recommended improvements of the electrical, structural, architectural, and mechanical/HVAC systems are in separate technical memorandums located in Appendix C.

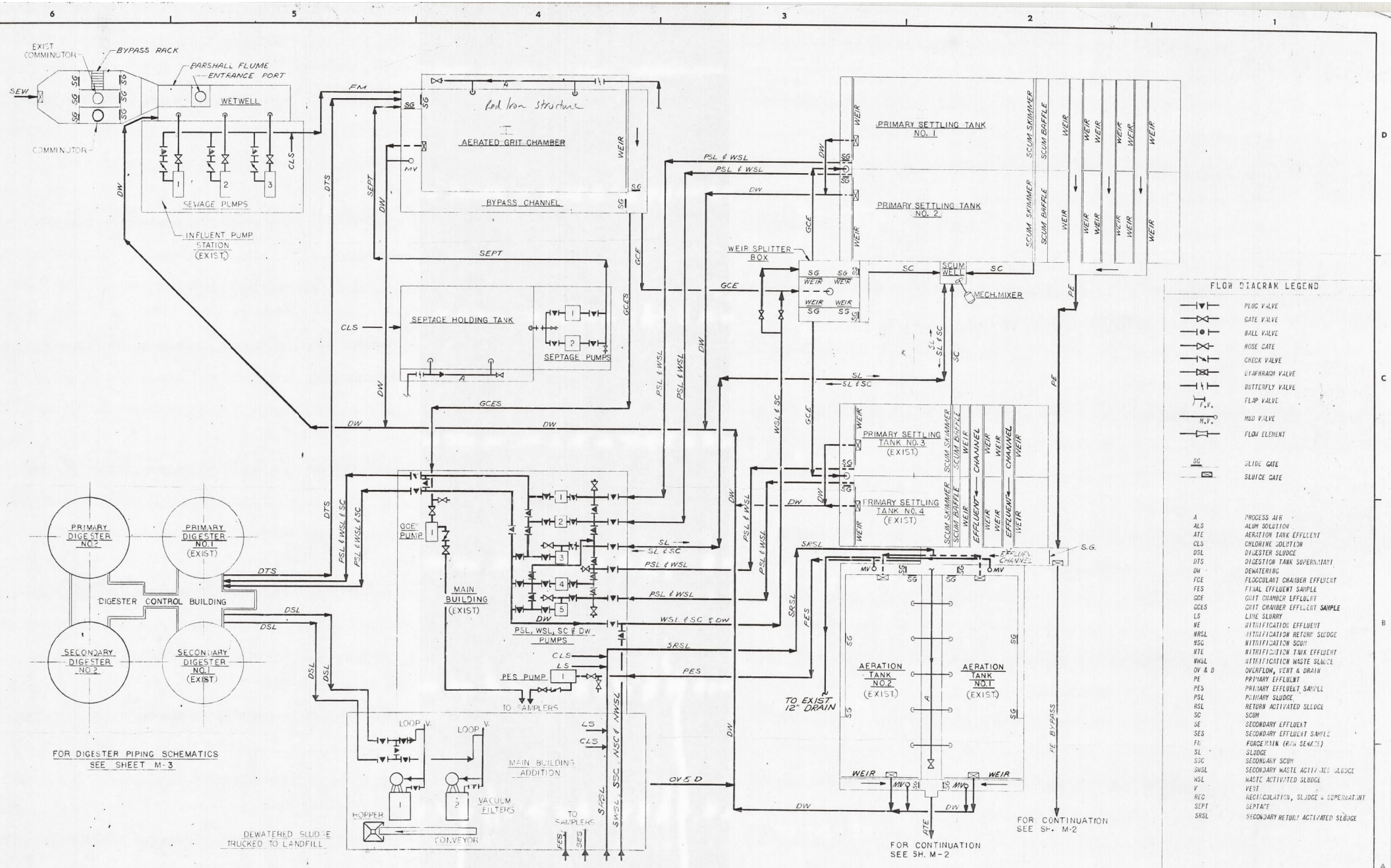
3.2 BACKGROUND

The WWTP was originally built in 1964 with a capacity to treat 1 MGD. The facility was upgraded in 1977 to a two-stage nitrification activated sludge plant with a capacity to treat 2.5 MGD to ammonia from the wastewater. The WWTP treatment process consisted of preliminary treatment, primary treatment, the two-stage activated sludge secondary treatment process, and disinfection. Sludge treatment consisted of anaerobic digestion and dewatering prior to final disposal. The facility changed the operation from two-stage to a single-stage nitrification activated-sludge process circa 1984. This was done as the same effluent quality was achieved with only the second stage online. The first stage of the activated-sludge process (aeration tanks and secondary settling tanks) were taken offline and have remained offline since that time. The aeration tanks are occasionally used as wastewater storage tanks during peak flow events.

The current WWTP treatment process consists of preliminary treatment including screening and grit removal, followed by primary clarification, secondary treatment consisting of nitrification tanks with surface aerators and nitrification settling tanks, and disinfection. Sludge treatment consists of anaerobic digestion with storage and dewatering prior to disposal at the Synagro facility in Woonsocket, RI. As stated, the existing secondary treatment process is a single stage activated sludge process utilizing the original nitrification tanks and nitrification settling tanks (tank names as identified in the 1977 plant upgrade). For purposes of this report, that naming convention has been used throughout to refer to these tanks. The unit processes at the Rockland WWTP is shown in **Figure 3-1**.

FIGURE 3-1
ROCKLAND WWTP UNIT PROCESSES

1. Influent Pump Station
2. Grit Removal
3. Septage Tank
4. Primary Clarifiers
5. Aeration Tanks
6. Secondary Settling Tanks
7. Nitrification Tanks
8. Nitrification Settling Tanks
9. Chlorine Contact Chamber
10. Sludge Digesters



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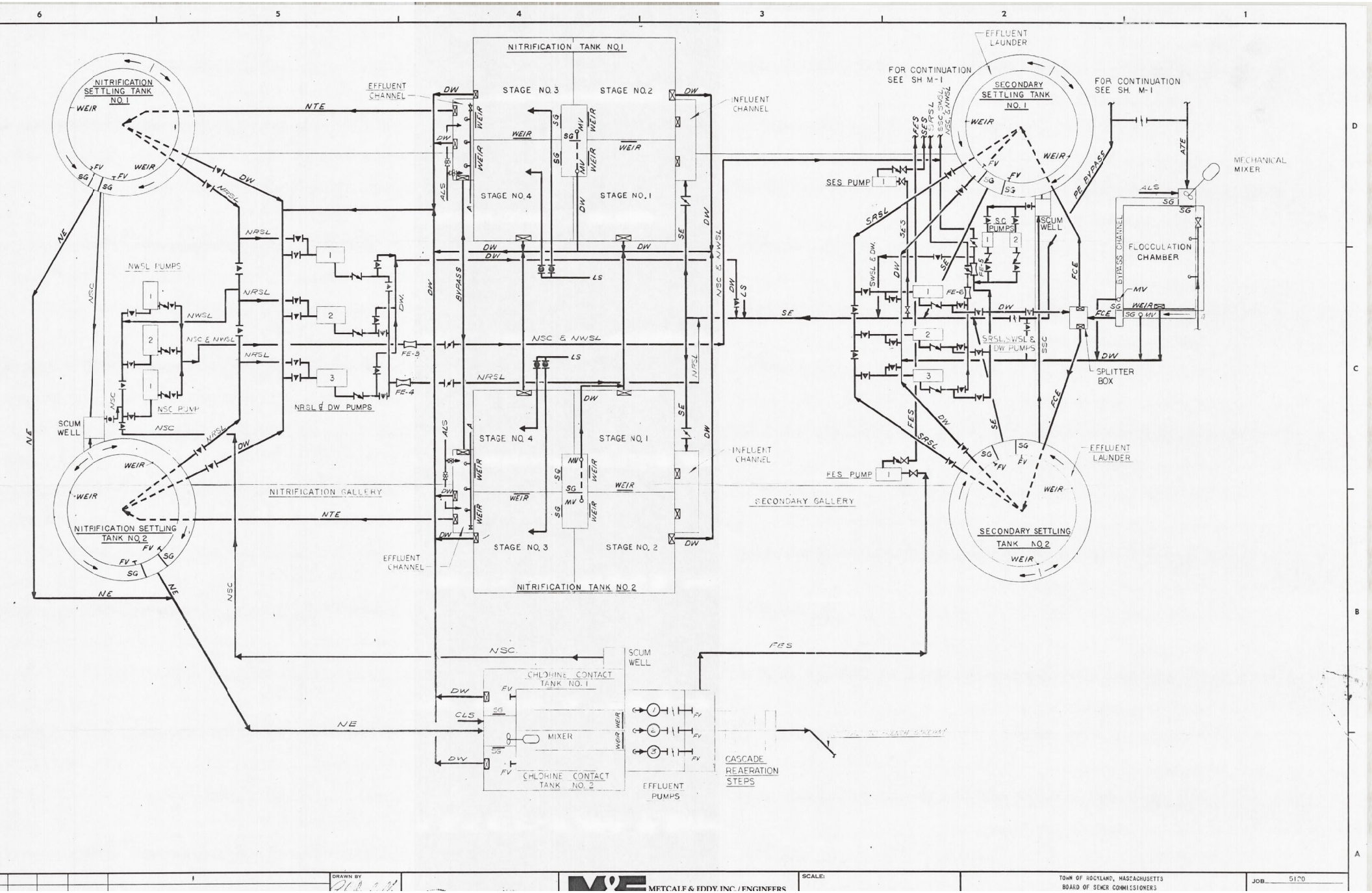
METCALF & EDDY, INC. / ENGINEERS

SCALE:

TOWN OF ROCKLAND, MASSACHUSETTS
BOARD OF SEWER COMMISSIONERS

JOB 5120



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SCALE:

TOWN OF ROCKLAND, MASSACHUSETTS
BOARD OF SEWER COMMISSIONERS

JOB 5120

3.3 EQUIPMENT LIFE EXPECTANCY

An assessment of each wastewater unit process was conducted to ascertain its condition and it's expected future life (i.e., "how much longer can that item continue to reliably operate without failure To determine the age at which a specific item has reached the end of its life, Wright-Pierce has developed typical equipment service life predictions as presented in **Table 3-1**. These values were developed based on industry guidelines and experience at other WWTPs. If a piece of equipment is in particularly good or bad condition following inspection, the typical service life for that equipment is adjusted up or down accordingly.

As previously stated, the last major upgrade at this facility was completed in the early 1980s. As such, the majority of the equipment encountered during our site inspections date to that upgrade, making it close to 40 years old. While equipment life can be extended past the presented "typical" values, the age of most of the equipment at this facility is 10 to 20 years past its "typical" life expectancy. This adds considerable risk to the ongoing successful operation of the WWTP. The consequences of failure vary considerably from one item to the next. For example, failure of a chemical pump while disruptive, can be readily replaced with limited downtime. However, some of the larger more complicated items could have severe implications should they fail. This includes the existing mechanical aerators, primary and secondary clarifier mechanisms, electrical systems, and several items within the anaerobic digestion complex.

TABLE 3-1

TYPICAL EQUIPMENT SERVICE LIFE SUMMARY

Equipment Description	Service Life (Years)
Air Relief Valve	10
Blower	25
Clarifier Bridge	30
Chemical Feed System	10
Concrete Structure, Building, Basin, Drywell/Wetwell	60
Drive Mechanism	20
Electrical Equipment	30
Electric Panel	25
Electrical System	25
Generator	35
Grounds	300
Heating, Ventilating, and Air Conditioning	15
Instrumentation and Controls	10
Lab and Kitchen Equipment	20
Maintenance/Tools	10
Motor	20
Office Equipment	20
Odor Control System	15
Process Equipment	20
Piping	50
Pumps	20
Safety Equipment/Gear	10
Slide Gate	30
Tank	25
Transformer, Transfer Switch	25
Valve - All	25
VFD, Motor Starter	20
Vehicle	10

3.4 PRELIMINARY TREATMENT

3.4.1 Influent Pump Station

Wastewater flows through a 30-inch diameter influent gravity sewer into the influent manhole (IMH) where an internal weir wall directs flows less than 6.0 MGD through the influent channels to a wetwell in the influent pump station building where the flow is pumped by three vertical mixed flow pumps to the aerated grit chamber. The IMH was originally constructed in 1964. The concrete in the internal structure is slightly worn down and needs to be repaired. The influent manhole internal structure is shown in **Figure 3-4**.

Influent flows greater than 6.0 MGD overflow the internal weir wall in the IMH and flows through a 24-inch diameter gravity sewer line to the bypass influent manhole (BIMH). In this manhole, excess influent and recycle flows from the facility sludge processing units combine and gravity flow directly to the wetwell of the Influent Pump Station, bypassing screening and the influent Parshall flume. The BIMH was originally constructed in 1964. The concrete in this internal structure is slightly worn down and shows moderate degradation. The bypass influent manhole internal structure is shown in **Figure 3-5**.

FIGURE 3-4

INFLUENT MANHOLE

FIGURE 3-5

INFLUENT BYPASS MANHOLE

The Influent Pump Station is a multi-level structure consisting of an upper level motor room (also includes the motor control center (MCC) and associated instrumentation/controls), intermediate level influent channels and screenings and a lower level pump room and a lower level wetwell. The Influent Pump Station was constructed in 1964 and is showing significant corrosion issues, which is to be expected given its age and its location as the first unit process at the WWTP.

The three influent channels consist of a main channel with a JWC chain and rake screen, a second channel with grinder/auger unit, and a third bypass channel with manually-cleaned bar rack. The influent channel system was not designed to include a mechanical screen. As such, the inclusion of the mechanical screen results in very limited space for operators to conduct maintenance or other operational activities in this area. The concrete in the channels show significant surface degradation with exposed aggregate. The metal structures (isolation gates, channel covers, channel frames, etc.) show extensive corrosion degradation with significant steel loss. If this structure were to remain, the concrete and metal structures would need to be repaired and replaced, respectively. The influent channels and equipment are shown in **Figure 3-6**.

The JWC screen in the main channel is a continuous chain and rake screen suitable to handling up to 4.0 MGD in a channel 1.9-feet wide and 4.0-feet deep. This screen was installed in 2012 and is in decent condition. As the influent flow exceeds 4.0 MGD the channel grinder/auger unit in the second channel is opened to allow higher flow through and into the Parshall flume and wetwell. The grinder/auger unit can handle flow exceeding 4.0 MGD up to 6.0 MGD. The grinder/auger unit was installed in 2015 and is in good condition.

FIGURE 3-6

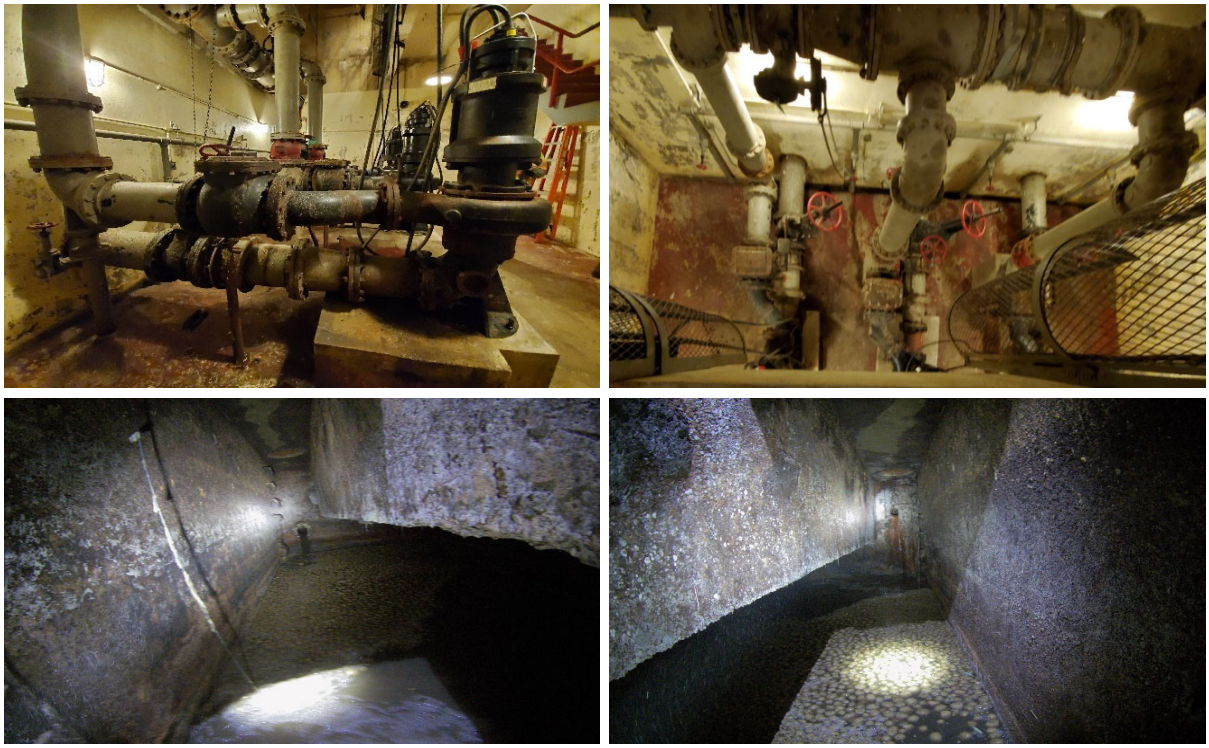
INFLUENT CHANNELS

The influent wetwell and pump room are shown in **Figure 3-7**. The pump room has three centrifugal pumps which were installed on 2009 and are in the middle of their life expectancy (typically 20 years in this application). The influent pump station piping and valves were replaced as part of the 1977 upgrade. Forty years of continual service is well beyond the life expectancy of the valving and closing in on the service of life of ductile iron pipe. Furthermore, the lack of grit removal prior to the influent pump station is an additional concern given the age of the valves and piping. It is expected that the piping and valves in this location would wear faster than other areas of the plant, potentially leading to failure due to erosion of the piping and valve material from the inside out. The level of internal material loss cannot be determined from an external inspection. Any leakage of wastewater in this area due to failure of the piping would be very problematic. This area should be considered a high priority issue.

Each pump is capable of pumping 3 MGD of influent from the wetwell to the grit removal chamber; however, the influent force main to the grit chamber can only handle approximately 6.0 MGD. When influent flow increases above 6.0 MGD, Godwin pumps are setup with suction hoses and strainers directly in the influent manhole and discharge directly to either off-line primary clarifiers or aeration tanks.

FIGURE 3 7

INFLUENT WETWELL AND PUMP ROOM



3.4.2 Grit Removal and Septage Receiving Chambers

Grit is removed in an aerated grit chamber, originally constructed in 1977, which has a maximum capacity of 6.0 MGD. The aeration system uses coarse bubble diffusers at the middle of the chamber and blowers in the main building. The chamber has a volume of 1,482 cubic feet and is 27-feet long, 9.0-feet wide, and 9.0-feet high. The concrete surfaces of the aerated grit removal chamber are showing moderate degradation, exposing the aggregate. The blowers were replaced in 2005 and are at the third quarter of their life expectancy. The grit removal clamshell hoist has been out of service since 2015 due to the conditions of the metal structure. The aerated grit removal chamber is shown in **Figure 3-8**. The grit collected at the bottom of the chamber is removed via vactor trucks. This removal is a manual operation that requires the influent to bypass the grit chamber.

Grit removal is an essential unit process that protects downstream equipment and ensures processes are protected from excessive wear resulting in increased longevity and reduced maintenance

activities. However, if this unit were to fail prior to a planned WWTP upgrade, the WWTP would still be able to operate. There is currently no redundancy if this unit were to be taken out of service.

The current aerated grit unit follows traditional sizing criteria (i.e., detention time and tank geometry) up to wastewater flow rates of 6 MGD. Plant operations staff have identified grit accumulation in the primary clarifier tanks and anaerobic digestion tanks. Typically, high flow events bring a disproportionate amount of grit to a WWTP compared to average daily conditions. The grit accumulation identified by the plant staff could be a result of grit not being captured in the current aerated grit facility or grit that entered the facility during wet weather bypass pumping events.

FIGURE 3-8
AERATED GRIT REMOVAL CHAMBER

Ferric chloride is added in the gravity main from the aerated grit chamber to the primary clarifier splitter box and from the nitrification tanks to the nitrification settling tanks. Ferric Chloride addition is critical for the removal of phosphorus. Ferric chloride is pumped by new peristaltic pumps and stored in two fiberglass reinforced plastic (FRP) tanks located in the basement of the Main Building Addition as shown in **Figure 3-9.** The tanks were originally installed in 1977. The tanks are showing signs of leaking at penetrations and have exceeded their typical service life. Ferric chloride is added using four peristaltic chemical pumps installed in 2020 (two large pumps with a capacity of 33.3 GPH and two smaller pumps with a capacity of 30.1 GPD).

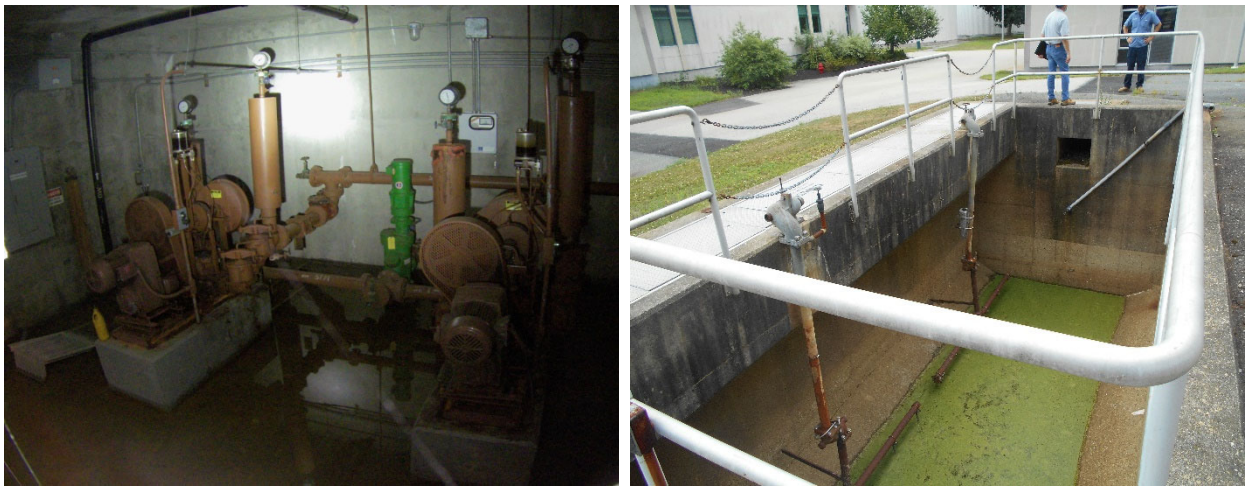
FIGURE 3-9

FERRIC CHLORIDE TANKS

Septage is not currently being treated in the facility as it was discontinued in the early 1980s. The septage holding chamber and pump station were originally constructed in 1964. The chamber has a volume of 3,331 cubic feet and is 27-feet long, 12.5-feet wide and 8.75-feet high. The concrete of the structures is in good condition; however, the septage grit blowers and pumps are seized and out of service. The septage holding tanks and pump station are shown in **Figure 3-10**.

FIGURE 3-10

SEPTAGE HOLDING TANK AND PUMP STATION



3.4.3 Preliminary Treatment Operation

The following operational issues were identified with respect to the preliminary treatment system:

- The facility has a maximum hydraulic capacity of 6.0 MGD. When the influent flow increases above 6.0 MGD, the staff in the facility use portable Godwin pumps to pump influent from the influent manhole to either off-line primary clarifiers or aeration tanks. This is a not an ideal situation and should be addressed in the next facility upgrade.
- The influent that exceed the influent manhole capacity overflows to the bypass manhole into the wetwell, bypassing the influent flume. This additional influent flow is measured by the facility once it is returned to the head of the facility following the peak flow event. Thus, the total flow is measured. However, the maximum instantaneous flow is not measured. This issue should be addressed in the next facility upgrade.
- The grit removal chamber can handle a maximum flow of 6.0 MGD. Influent flows above 6.0 MGD overflow the chamber running down the driveway causing washout near the septage chamber. This issue should be addressed in the next facility upgrade.
- Grit settles out at the bottom of the grit removal chamber and is removed via vactor trucks. This removal is a manual operation that requires the influent to bypass the grit chamber. The removal of grit in the facility should be updated to an automatic operation and addressed in the next facility upgrade.

3.5 PRIMARY SETTLING TANKS AND PRIMARY AND WASTE SLUDGE PUMPS

3.5.1 Primary Settling Tanks

From the grit chamber, wastewater flows to the primary splitter box where it is diverted to one of the two large primary settling tanks for primary treatment which includes removal of settleable solids, floating materials and scum. The facility has four primary settling tanks, two larger units constructed in 1977 and two smaller units constructed in 1964. Currently, the two large primary settling tanks are in service, the two small settling tanks are off-line and are used to store influent during peak flow events. Each large primary settling tank is rectangular with chain and flight mechanisms and has a volume of 17,088 cubic feet and is 89-feet long, 16-feet wide with a side water depth of 12-feet. The Facility has had many issues with the mechanisms over the years and

staff have performed periodic maintenance on the units to increase their longevity. The mechanisms in each settling tank are original to their construction. The mechanisms consist of a conveyor chain assembly connected to flights that push the sludge toward the sludge hopper as the chains move. The chains of the mechanisms were replaced for plastic chains in 1998, other components are original to the plant and have not been replaced since 1977. The rotating scum trough that collects the scum pushed by the flights is seized preventing scum removal from the settling tanks. The mechanisms are beyond their useful life and need to be addressed in the next facility upgrade. The concrete of the large settling tanks has some visible cracks along the sidewalls above the water level. The concrete surface of the walls under the water level show significant degradation and loss of aggregate. The large primary settling tanks are shown in **Figure 3-11.**

The large primary settling tanks are used to co-settle waste-activated sludge (WAS) from the secondary settling tanks. This operation has the benefit of thickening the WAS as well as creating a blended sludge prior to the anaerobic digestion process. The co-settling of waste-activated sludge can negatively affect the solids removal performance of the primary settling tanks, as was noted in Section 2, potentially exceeding their design capacity. This is mitigated by the addition of ferric chloride which can condition the sludge and enhance settling.

FIGURE 3-11

LARGE PRIMARY SETTLING TANKS

The primary settling tanks are sized such that one settling tank can handle average daily flows. However, during wet-weather two settling tanks are needed to treat incoming wastewater flow. The primary clarifiers are sized appropriately to handle peak flow events based on current engineering standards. However, they are not adequately sized to handle the current peak flow events when used to co-settle waste activated sludge. While some reduced solids capture performance is expected during high flow events, it is not recommended that the current practice be eliminated prior to an upgrade. The current practice of adding coagulation chemistry upstream of the clarifiers should continue as it should provide a solids removal performance benefit to the clarifiers, helping offset high flow event impacts.

The primary splitter box can handle a maximum flow of 6.0 MGD which can be directed to the primary settling tanks. Higher flows will flood out the scum trough causing grease to washout and get into downstream units.

FIGURE 3-12

SMALL PRIMARY SETTLING TANKS

3.5.2 Primary Sludge Pumps

The primary sludge pumps transport co-settled thickened sludge and scum from the large primary settling tanks to the anaerobic digesters. There are five pumps, three new pumps were installed in 2018, connected to the large primary settling tanks and two old originally installed in 1964, connected to the small primary settling tanks. The pumps are simplex plunger type with a capacity of 75 gpm at total dynamic head of 230 feet. The pumps are located in the basement at the main building. The new pumps are in good condition, but the old pumps are beyond their useful life and should be replaced. The primary sludge piping and valves were installed in 1977. These items are beyond their typical service life and should be replaced. The primary sludge pumps are shown in **Figure 3-13**.

FIGURE 3-13
PRIMARY SLUDGE PUMPS

3.6 AERATION AND NITRIFICATION TANKS

After initial settling in the primary settling tanks, wastewater flows to the influent channel at the nitrification tanks where it mixes with the return activated sludge from the nitrification settling tanks. The nitrification tanks consist of two tanks in parallel with four zones in series in each tank. The first zone is operated as an anoxic zone (no residual dissolved oxygen) followed by three aerobic zones in series. The sludge-wastewater mixture, also known as mixed liquor, enters the anoxic zone of each nitrification tank where bacteria use the carbonaceous organic matter to remove nitrogen, then flows into the three aerobic zones in series where oxygen transferred through the agitation from the surface aerators is used by bacteria for the oxidation of carbonaceous organic matter and nitrogen.

After treatment in the nitrification tanks, the mixed liquor flows into the nitrification settling tanks for separation of biological sludge from the clear treated effluent. Each nitrification tank has a volume of 68,625 cubic feet and is 75-feet long, 75-feet wide with a side water depth (SWD) of 12.2-feet. The first three zones have surface mixer-aerators with 25 Hp motors, the last zone has 30 Hp motors. The speed of each mixer-aerator is automatically adjusted using VFDs based on the level of oxygen measured by the dissolved oxygen probes located in the aerobic zones.

The nitrification tanks were constructed in 1977. These tanks are showing significant levels of corrosion and structural cracks. In addition, the majority of the isolation gates and valves in the

tanks are seized and inoperable. The surface aerators in the first three zones were installed as part of the 1977 upgrade and are beyond their useful life and need to be replaced or removed. The surface aerator in the last zones were installed in 2000 and are close to the end of their useful life.

Successful treatment of the wastewater at the Rockland WWTP is dependent on all surface aerators operating continuously, 24/7/365. Failure of any one of these units will result in significant challenges to achieve compliance with the effluent permit. The life of these units can be extended through replacement of the internal components (i.e., gear boxes), assuming compatible parts can be located. If complete failure of the surface aerator occurs, replacement of one of these devices would be a significant undertaking involving significant lead time on acquiring a replacement unit, draining a tank and use of a crane. This issue is further exacerbated due to the condition of the gates in the nitrification tanks which limit the plant operator's ability to isolate and drain a single tank. It is recommended that Rockland develop a contingency plan that could be executed if one of these units failed before a plant upgrade is completed.

It is recommended to replace the surface aerators for a more efficient and flexible aeration system able to meet the expected total nitrogen and total phosphorus effluent limits. The nitrification tanks are shown in **Figure 3-14**.

The facility has two old aeration tanks connected to the small primary settling tanks and secondary settling tanks. These aeration tanks were originally constructed in 1964 and were used to treat primary effluent from the small primary settling tanks as part of the first stage of the two-stage aeration system configuration. These tanks were taken offline in 1984 after determining that treatment could be achieved by operating only the second stage of the facility. The aeration tanks are offline and currently used for bypass storage during peak flow events. Each aeration tank has a volume of 20,864 cubic feet and is 81.5-feet long, 20-feet wide with a side water depth of 12.8-feet. The tanks have some significant cracks along their structures. The aeration piping at the bottom of the tanks is not functional. The old aeration tanks are not currently suitable for treatment but could be repurposed in the next facility upgrade. The aeration tanks are shown in **Figure 3-15**.

FIGURE 3-14

NITRIFICATION TANKS

FIGURE 3-15

AERATION TANKS

3.7 SECONDARY AND NITRIFCATION SETTLING TANKS

Treated mixed liquor from the nitrification tanks flows through the effluent channel into its corresponding nitrification settling tanks. In the nitrification settling tanks, incoming mixed liquor is separated into clarified effluent and settled sludge. The settled sludge at the bottom of the tanks is pumped back to the nitrification tanks to maintain a desired mixed liquor suspended solids (MLSS) concentration. The recycle stream is known as return activated sludge (RAS) and the

fraction of the stream that is wasted is known as waste-activated sludge (WAS). The nitrification settling tanks consist of two circular tanks, each one has a volume of 34,207 cubic feet and is 60-feet in diameter with a side water depth of 12.1-feet. The nitrification settling tanks were constructed in 1977 and show some concrete degradation. The concrete above the liquid level shows moderate surface degradation and at the tank floor has some deep cracks. In addition, the catwalk, center well structure and collector arms are showing moderate corrosion. The drive units of the clarifier mechanism were replaced in 2018 and are in good condition. The other steel components are original to the tanks and are beyond their useful life. The replacement of the drive units should allow for acceptable treatment performance in the short-term until repairs of the concrete and steel can be performed. However, if failure of any of the metal structure occurs prior to a facility upgrade, effluent quality, and the facilities ability to process high flow events will be severely compromised. The nitrification settling tanks are shown in **Figure 3-16**.

FIGURE 3-16

NITRIFICATION SETTLING TANKS

The facility has two secondary settling tanks. The secondary settling tanks were originally constructed in 1977 as part of the first stage of the two-stage aeration system configuration. These tanks were taken offline in 1984 and are currently not used. The secondary settling tanks consist of two circular tanks, each one has a volume of 35,338 cubic feet and is 60-feet in diameter with a side water depth of 12.5-feet. The tanks have a considerable amount of vegetation growing in their troughs with significant concrete degradation along their walls and floor. One of the tanks has significant vegetation and cracks in the floor. The steel components show advanced corrosion and

are not functional. The old secondary settling tanks are not currently suitable for treatment but could be repurposed in the next facility upgrade. The secondary settling tanks are shown in **Figure 3-17**.

FIGURE 3-17

SECONDARY SETTLING TANKS

3.7.1 Return Activated Sludge Pumps

The activated sludge system includes two below grade sludge pumping galleries, the secondary gallery and nitrification gallery. The return activated sludge (RAS) pumps are located in their corresponding nitrification and secondary galleries. All pumps are horizontal non-clog centrifugal type.

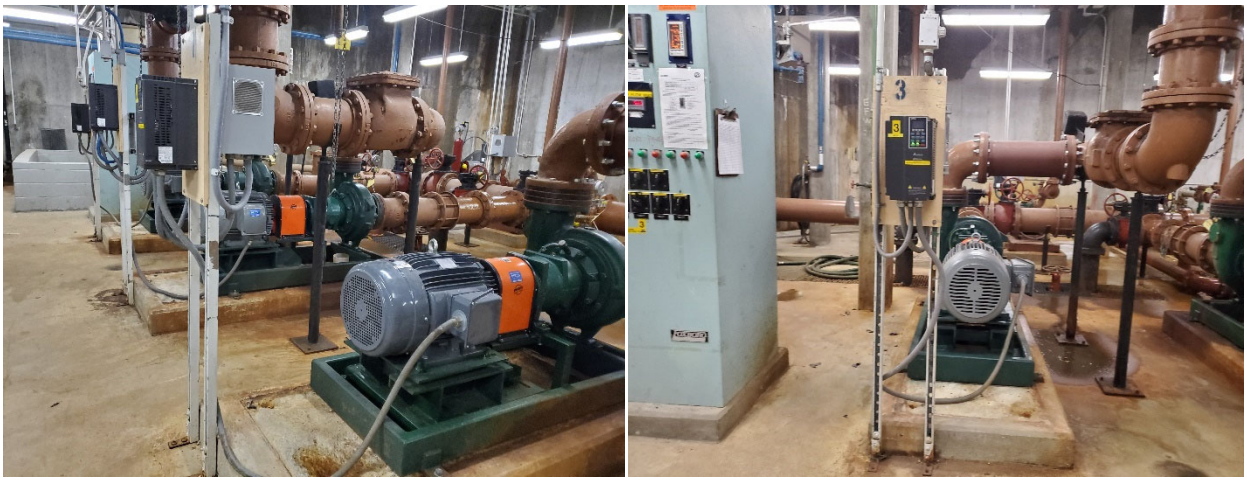
The secondary return activated sludge pumps (3 total) transport settled sludge from the secondary settling tanks to the aeration tanks. The RAS pumps at the secondary gallery were installed in 1977. These pumps are seized and out of service.

The nitrification-return activated sludge pumps (3 total) transport settled thickened sludge from the nitrification settling tanks to the influent channel of the nitrification tanks. The RAS pumps in the nitrification gallery were replaced in 2015 and have a capacity of 1,300 gpm at total dynamic head of 25 feet. Draining of the nitrification tanks and nitrification settling tanks is achieved through the use of these pumps. The piping and valves in this pump station are original to the 1977 plant upgrade and should be considered beyond their life expectancy.

The nitrification RAS pumps are shown in **Figure 3-18**.

FIGURE 3-18

NITRIFICATION-RETURN ACTIVATED SLUDGE PUMPS



3.8 WASTE-ACTIVATED SLUDGE AND SCUM PUMPS

The nitrification waste-activated sludge and scum pumps transport settled sludge and scum, respectively from the nitrification settling tanks to the primary clarifier influent splitter box. In the primary clarifiers, the WAS is co-settled with the primary solids prior to transfer to the anaerobic digestors. The two nitrification-WAS pumps were replaced in 2015. Two new nitrification scum pumps were installed in 2019. The WAS and scum pumps are horizontal non-clog centrifugal and positive displacement types, respectively. The WAS pumps have a capacity of 175 gpm at a total dynamic head of 47 feet. The scum pumps have a capacity of 100 gpm at a total dynamic head of approximately 50 feet. There are two old scum pumps originally installed in 1977 that used to take the scum from the secondary settling tanks to the primary clarifiers. These scum pumps are seized and out of service. The \nitrification WAS pumps are shown in **Figure 3-19**.

FIGURE 3-19

NITRIFICATION-WASTE ACTIVATED SLUDGE PUMPS

3.9 DISINFECTION AND EFFLUENT PUMPING STATION

3.9.1 Chlorine Contact Tank

The chlorine contact tank consists two parallel tanks used to disinfect wastewater. Influent wastewater flows to a common headbox and is then directed via gates to one of two tanks, as shown in **Figure 3-20**. Chlorine is injected at the headbox in the form of sodium hypochlorite. Wastewater travels around concrete baffle walls through the contact tank to achieve maximum contact time. The chlorine contact tank was constructed in 1977 and is showing structural deficiencies such as concrete spalling above the water surface. Each train should be taken offline so a full inspection may be completed to assess the condition of the concrete below the high-water elevation.

Scum collectors are located at the back end of the chlorine contact tanks and can be manually actuated to remove scum from the surface of the wastewater. Scum is collected in the troughs and recycled back into the treatment facility for processing. The scum collectors are original to the tanks. The scum collectors are beyond their useful life and need to be replaced.

FIGURE 3-20

CHLORINE CONTACT TANKS

3.9.2 Effluent Pumping Station

After treatment through the chlorine contact tank, final wastewater effluent flows by gravity to a wetwell in the Effluent Pumping Station, as shown in **Figure 3-21**. The Effluent Pumping Station consists of three submersible vertical propeller type pumps manufactured by Ebara that pump final effluent from the effluent wetwell to the cascade reaeration steps. The effluent pumps were installed in 2015, each pump has a capacity of 2,100 gpm at total dynamic head of 20 feet. The pumps, and associated valves and piping are in good condition and near-term replacement is not required.

In the cascade reaeration steps, the final effluent is reaerated to increase its oxygen content before being discharged through a 30-inch diameter outfall pipe to the French Stream. Effluent samples are taken from the effluent channels after the final step of cascade reaeration using a 24-hour composite sampler. The effluent sampler was installed in early 2000s and is in fair condition. The Cascade Reaeration Steps are shown in **Figure 3-22**

FIGURE 3-21

EFFLUENT PUMP STATION

FIGURE 3-22

CASCADE REAERATION STEPS

3.9.3 Chemical Disinfection Systems

Secondary effluent in the chlorine contact tank is treated with sodium hypochlorite to help kill pathogens and then with sodium bisulfite to reduce the level of residual chlorine before final discharge. Sodium hypochlorite is added into the chlorine contact tanks influent box. The chemical disinfection system consisting of two high density polyethylene (HDPE) storage tanks and two sodium hypochlorite pumps, as shown in **Figure 3-23** and **Figure 3-24**. The sodium hypochlorite storage tanks and chemical pumps are located in the first floor of the Main Building Addition. This location is a fair distance to the chemical application point which can lead to non-ideal chemical

dosage response times to due changing conditions in the chlorine contact tank (i.e., variation in residual chlorine levels or flow variations). The sodium hypochlorite tanks were installed sometime prior to 2010 and are in good condition. The sodium hypochlorite pumps were installed in the last five years and are peristaltic pumps with a capacity of 33.3 GPH.

FIGURE 3-23

SODIUM HYPOCHLORITE TANK

FIGURE 3-24

SODIUM HYPOCHLORITE PUMPS

Sodium bisulfite is added to the chlorinated effluent from the chlorine contact tanks to remove residual chlorine prior to final effluent discharge into the French Stream. Sodium bisulfate is added using two peristaltic pumps with a capacity of 13.8 GPH each, as shown in **Figure 3-25**. The sodium bisulfite is stored in 55-gallon plastic drums. The bisulfite is added to the downstream end of the chlorine contact tanks. The pumps were installed in the last five years and are in the shed

next to the cascade reaeration steps. The 55-gallon drums of bisulfite are stored outside without secondary containment. This system should be replaced with a bulk storage system with secondary containment within an industrial grade building.

FIGURE 3-25

SODIUM BISULFITE DRUMS

FIGURE 3 26

SODIUM BISULFITE PUMPS

3.10 ANAEROBIC DIGESTERS AND SLUDGE PUMP SYSTEMS

Co-settled sludge from the primary clarifiers is pumped to the anaerobic digestion complex for solids reduction prior to dewatering treatment. The facility has four anaerobic digesters, two small digesters constructed in 1964 and two large units constructed in 1977. The four digesters are located at the four corners of the digester complex. There are two buildings that make up the interior of the complex. These were constructed in 1964 and 1977. Currently, one large anaerobic digester is in service, one small anaerobic digester is used to store digested sludge prior to dewatering and other two digesters are off-line.

The Rockland WWTP produces approximately 4,200 lbs./day of sludge (combination of primary and secondary) that is fed to the anaerobic digestors at an average feed concentration of 2.5% for a daily average volume of 20,000 gallons. The percent volatile solids reduction through the digestion process averages approximately 47% (2016 through 2020).

The large digesters are cylinder shaped tanks of 45-feet diameter that were originally designed as primary and secondary digesters. The large primary digester is currently in service and has a volume capacity of 457,000 gallons with a water depth of 38-feet. This digester has a fixed steel cover that is showing significant corrosion and delamination. The steel cover needs to be repaired in the next facility upgrade. The digester has a mixing system that was replaced in 2013 and is in good condition. The large secondary digester is out of service with a damaged floating cover. This digester has a volume capacity of approximately 412,000 gallons with a water depth of 34.6-feet. The internal mechanisms and external connections to this digester are damaged and need to be replaced. The covers of the large anaerobic digesters are shown in **Figure 3-27**.

FIGURE 3-27

LARGE ANAEROBIC DIGESTERS

The small digesters are cylinder shaped tanks of 35-feet diameter that were also designed as primary and secondary digesters. The small primary digester is currently used to store digested sludge from the large primary digester. This digester has a volume capacity of approximately 145,000 gallons with a water depth of 20-feet. This small digester has a fixed steel cover that is in fair condition. The internal mixing system and other internal mechanisms are original and are likely beyond their useful life. The small secondary digester is out of service with a damaged floating cover. This digester has a volume capacity of approximately 130,000 gallons with a water depth of 18.2-feet. The small secondary digester plumbing connections are out of the digester flow loop and need to be replaced. The cover of the small anaerobic digesters and interior of the small primary digester are shown in **Figure 3-28**.

FIGURE 3-28

SMALL ANAEROBIC DIGESTERS

Sludge in the anaerobic digesters is recirculated through heat exchangers to adjust the sludge temperature to the desired target value. The facility has two sludge heat exchanger systems, one small installed in 1964 used to treat the sludge within the small digester; and one large originally installed in 1977 used to treat the sludge within the large digesters. The sludge heat exchangers are located in the basement of the digester building. Currently, the large sludge heat exchanger system is in service. This heat exchanger system was replaced in 2016 and is in good condition. The small heat exchanger system is out of service and plumbed out of the digester flow loop. The entire small heat exchanger system and its plumbing needs to be replaced. The large sludge heat exchanger is shown in **Figure 3-29**.

FIGURE 3-29

LARGE SLUDGE HEAT EXCHANGER

The facility has four sludge recirculation pumps, two small units installed in 1964 used to recirculate the sludge within the small digesters; and two large units installed in 1977 used to recirculate the sludge within the large digesters. The sludge recirculation pumps are in the basement of the digester building. The sludge recirculation pumps are torque-flow type pumps with a capacity of 125 gpm at total water head of 36 feet. Currently, the large sludge recirculation pumps are in service. These pumps are beyond their useful life expectation and need to be replaced in the next facility upgrade. The large sludge recirculation pumps are shown in **Figure 3-30**. The small sludge recirculation pumps are out of service and disconnected from the digester flow loop. These pumps need to be replaced in the next facility upgrade.

FIGURE 3-30

LARGE SLUDGE RECIRCULATION PUMPS

The sludge in the large digesters is treated for approximately 25 days. After this period, the final digested sludge experiences an average volatile solids reduction of approximately 47%. The volatile solids reduction has improved over the last several years (presumably due to the heat exchanger replacement), achieving between 50% and 60% reduction.

The facility has four digested sludge transfer pumps. Two small units installed in 1964 used to transfer sludge from the small digesters and two large units installed in 1977 used to transfer sludge from the large digesters. The digested sludge transfer pumps are shown in **Figure 3-31**. The sludge transfer pumps are simplex plunger type pumps with a capacity of 83 gpm at total dynamic head of 231 feet. Currently, the large sludge transfer pumps are used to transfer sludge from the large primary anaerobic digester to the small primary digester where the digested sludge is stored before is transferred to the dewatering units. The large sludge transfer pumps are beyond their useful life and need to be replaced.

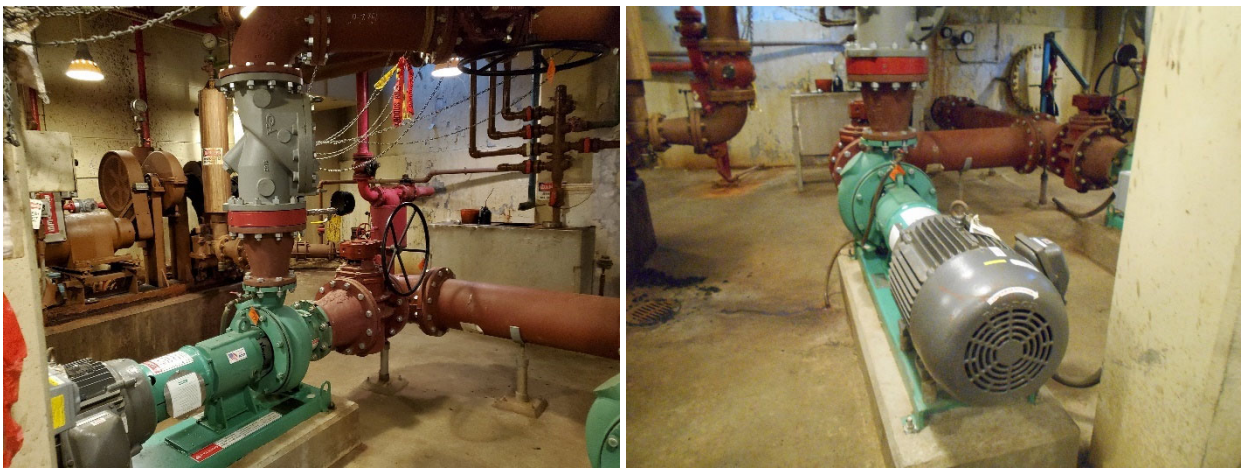
The facility has two inline grinding units, installed in 2014, that macerate solids prior to pumping to the dewatering units. The sludge chopping pumps are shown in Figure 3-32. The pumps are in the basement of the Digester Building. The chopper pumps are centrifugal non-clogging type pump with a capacity of approximately 1,000 gpm at total dynamic head of 50 feet. The sludge chopper pumps were replaced in 2014 and are in good condition. The digested sludge transfer chopper pumps were replaced in 2018 and are also in good condition.

FIGURE 3-31

DIGESTED SLUDGE TRANSFER PUMPS

FIGURE 3-32

SLUDGE CHOPPER PUMPS



3.11 SLUDGE DEWATERING

Digested sludge stored in the small primary digester is pumped to the Belt Filter Presses (BFPs) in the Main Building where the sludge is dewatered to "cake". The sludge is sent to one of two flocculation tanks, where polymer is added to the sludge to promote flocculation prior to the BFPs. The presses dewater by applying pressure to the sludge between two belts to squeeze out the water. Sludge sandwiched between two tensioned porous belts are passed over and under rollers at greater pressure to remove the water. Water is recycled back to the influent wetwell, while the resulting dewatered cake is collected and transferred via a belt conveyance system. The facility has two Belt Filter Presses (Ashbrook Klampress) which were installed in 1994. The facility has had many issues with the BFPs over the years and has performed periodic maintenance on the units to increase their longevity. The filter presses are 26 years old and thus are beyond their typical service life and need to be replaced. The Belt Filter Presses are shown in **Figure 3-33**.

The BFP's achieve a 20% dry cake, which is excellent for a belt filter press dewatering anaerobically digested sludge. Dewatering activities typically occur two to three days per week. The Rockland WWTP disposes of approximately 1,850 wet tons of sludge per year or slightly greater than 5 tons/day.

Dewatered sludge is transferred from the BFPs via a belt conveyor system to a roll-off container in the Sludge Removal Room. Once the containers are full, the dewatered sludge is hauled to the

Synagro facility in Woonsocket, RI for final disposal. There is one conveyor system for both filter presses. The conveyor was installed in last facility upgrade in 1977. The conveyor system is beyond its typical service life and needs to be replaced in the next facility upgrade. The belt conveyor is shown in **Figure 3-34**.

FIGURE 3-33

BELT FILTER PRESSES

FIGURE 3-34

BELT CONVEYOR

Polymer is added to the sludge prior to dewatering to promote sludge flocculation and produce a dryer cake. The Town uses approximately 100 gal./month of liquid emulsion polymer. This polymer is cleaner than dry polymer to work with (no dust and dehumidification issues) and produces good cake solids at the dewatering presses. Polymer is pumped into a batch tank where is mixed and diluted with water for easier distribution.

Progressive cavity pumps transfer diluted polymer to the flocculation tanks upstream of the BFPs. The progressive cavity pumps are a low-shear pump that pump the polymer solution without breaking the long polymer chains that form and are used to coagulate sludge. The polymer mixing system, polymer feed and transfer pumps were installed in 2017 and are located next to the Filter Press Room.

3.12 ADMINSTRATION BUILDING

Ancillary equipment in the Administration Building includes the following:

3.12.1 Air Compressor

An air compressor system is located in the basement of the Equipment Room of the Administration Building and is used to supply compressed air to various needs throughout the facility. The air compressor system was installed in 1977 and is beyond its useful life. The air compressor system is shown in **Figure 3-35**.

FIGURE 3-35

AIR COMPRESSOR

3.12.2 Plant Water

Two plant water pumps are located in the basement of the Nitrification Gallery. A manual twin basket strainer is located upstream of the pump skid to remove particulate material and protect the pumps from foreign objects that may be drawn in from the uncovered chlorine contact tank. The plant water pumps were installed in 1977 and are beyond their typical life expectancy. They are intended to supply plant water to various components of the treatment facility including the BFPs, polymer make-down system, grit washer, and hydrants throughout the site. The plant water pumps are shown in **Figure 3-36**.

FIGURE 3-36
PLANT WATER PUMPS

A new plant water skid system is recommended to provide plant water to various unit processes in the facility.

3.12.3 Lime Addition System

Lime is primarily used in the facility to increase the alkalinity in the nitrification tanks and to help phosphorus precipitation in the secondary clarifiers. Lime in the aeration tanks increases the wastewater pH and alkalinity facilitating the biological activity for nitrification. When ferric chloride is added to precipitate phosphorus, lime counteracts the low pH induced by ferric increasing its effectiveness in removing phosphorus. In addition, lime can complex with phosphorus increasing the phosphorus precipitation in the secondary clarifiers. Lime in the facility is added as calcium hydroxide in a lime slurry. The lime slurry is produced from the mixing of dry

hydrated lime with water. The facility has a lime storage silo outside the Administration Building. The silo was installed in 1977 and has a storage capacity of approximately 2,500 cubic feet. Lime from the silo is transported through an auger system to the lime slurry tanks. In the tanks, lime is mixed with water to produce the lime slurry. The lime slurry solution is then pumped to the nitrification tanks using progressive cavity pumps. The facility has two lime slurry tanks with mixing systems that were installed in 1977 and are in fair condition. The lime slurry storage tanks are shown in **Figure 3-37**. There are four lime slurry feed pumps which were installed in 2018 and are in good conditions. The lime equipment and silo are beyond their typical life expectancy (except for the recently installed feed pumps) and should be replaced. The lime slurry feed pumps are shown in **Figure 3-38**.

Lime addition for pH/alkalinity control at WWTP has been reduced over that last few decades given its related issues including significantly increasing sludge quantities, propensity to clog pipes and pumps, potential to overdose and the difficult and messy operation to create the lime slurry from dry lime. It is recommended the Town consider an alternative chemical such as magnesium hydroxide for pH/alkalinity adjustment.

FIGURE 3-37

LIME SLURRY STORAGE TANKS

FIGURE 3-38

LIME SLURRY FEED PUMPS

3.12.4 Polymer Addition System

Polymer is added to the treated effluent before the nitrification settling tanks to enhance the phosphorus precipitation in the clarifiers. The facility adds approximately 1 gal./day of polymer using peristaltic pumps. A polymer fill pump is used to transfer polymer from the delivery trucks up to the polymer storage tank as shown in **Figure 3-39**. The polymer pumps and storage tank are in the equipment room of the Administration Building. The polymer fill and feed pumps were installed in 2015 and are in good condition. The polymer pumps are shown in **Figure 3-40**.

FIGURE 3-39

POLYMER STORAGE TANKS

FIGURE 3-40

POLYMER PUMPS

3.12.5 Aeration System

The facility has three aeration blowers, two old units installed in 1977 and one new unit installed in 2010. The two older blowers are seized and out of service. The new blower is used to supply air to the aerated grit chamber. The blowers are in the equipment room of the Administration Building, as shown in **Figure 3-41**.

FIGURE 3-41

BLOWERS

3.13 ELECTRICAL SYSTEMS AND STANDBY GENERATOR

The electrical systems at the Rockland WWTP were installed as part of the 1977 plant upgrade. This includes the main switchgear, underground electrical duct banks and the motor control centers located in various buildings throughout the facility. The Administration Building addition in 2000 included modifications to that building's electrical components. In general, all the electrical systems are beyond their life expectancy. A detailed discussion of the existing electrical system, life expectancy, consequence of failure and recommended improvements are provided in the electrical assessment memorandum, Appendix C.

The facility has one standby engine generator that provides power to the entire facility when the main power supply is suspended. The standby generator was installed in 1979 and is in the generator room of the Electrical Building as shown in **Figure 3-42**. A detailed discussion regarding the assessment of the generator is in the electrical assessment memorandum, Appendix C. The generator is beyond its useful life and should be replaced.

FIGURE 3-42

STANDBY GENERATOR

4

WRIGHT-PIERCE
Engineering a Better Environment

SECTION 4

IDENTIFICATION AND SCREENING OF POTENTIAL TREATMENT ALTERNATIVES

This section of the report summarizes the evaluation of the existing major liquid stream and solids processes at the Rockland Wastewater Treatment Plant (WWTP). The major liquid and solids stream processes of the WWTP are described in this section, in the general order of flows through the facilities.

Workshops were held with the Town to gather information on existing conditions and to evaluate each process in order to make recommendations for improvement. An alternatives analysis was conducted on several unit processes. The recommendations provided in this section assume that replacement of these items would not occur until year 2025. As such, items that are not currently at the end of their useful life as of the date of this report, may be at or close to the end of their useful life once an upgrade commences. Improvements related to the architectural, structural, electrical and mechanical/HVAC systems can be found in Appendix C.

4.1 PRELIMINARY TREATMENT

Preliminary treatment at the Rockland WWTP consists of an influent pump station and a single aerated grit tank. The influent pump station, constructed in 1964, includes an initial mechanical screening system followed by a wetwell/drywell pump station configuration. Wastewater is pumped to an exterior downstream aerated grit removal tank.

4.1.1 Influent Pump Station

The lower portions of the pump station, specifically the wet well and dry well, are viable structures that should last several more decades without major upgrades. Thus, replacement of the influent pump station is not recommended. It is recommended that the lower wetwell be drained, cleaned and the concrete resurfaced to eliminate any exposed aggregate and address corrosion concerns. Replacing this structure would be extremely costly given the depth and size of the wetwell/drywell. Replacement of the influent pumps and associated piping is not immediately required as these

pumps are only 10 years old. However, replacement of these pumps and associated piping will be required within the 20-year planning window based on asset management planning standards.

The building above the wetwell/drywell needs an immediate upgrade. There are several code related items that need to be addressed including the need for an isolated electrical room and an HVAC system upgrade to address ventilation and fire protection codes. Furthermore, several architectural components need replacement as outlined in the discipline specific memorandum (Appendix C). This includes replacement of the roof, windows, and doors.

4.1.2 Influent Screening Facility

The influent pump station includes an intermediate level (directly above the wetwell) which provides for influent flow measurement and mechanical screening. This area is extremely congested, showing signs of severe corrosion and provides very poor access for maintenance or operational activities. In addition, the floor of this level is directly above the influent wetwell and if retained would probably require additional reinforcing (would require the wetwell to be drained and directly inspected to verify floor condition).

It is recommended that influent screening system and flow measurement be removed from this location and a new screening facility constructed upstream of the influent pump station. It is not recommended to reuse the equipment in the existing screening area for the new screening facility.

4.1.3 Grit Removal

The existing aerated grit tank is located downstream of the influent pump station in an exterior concrete structure. Originally, accumulated grit was removed via a clamshell device, but that device has since been removed due to safety concerns with the structural framing.

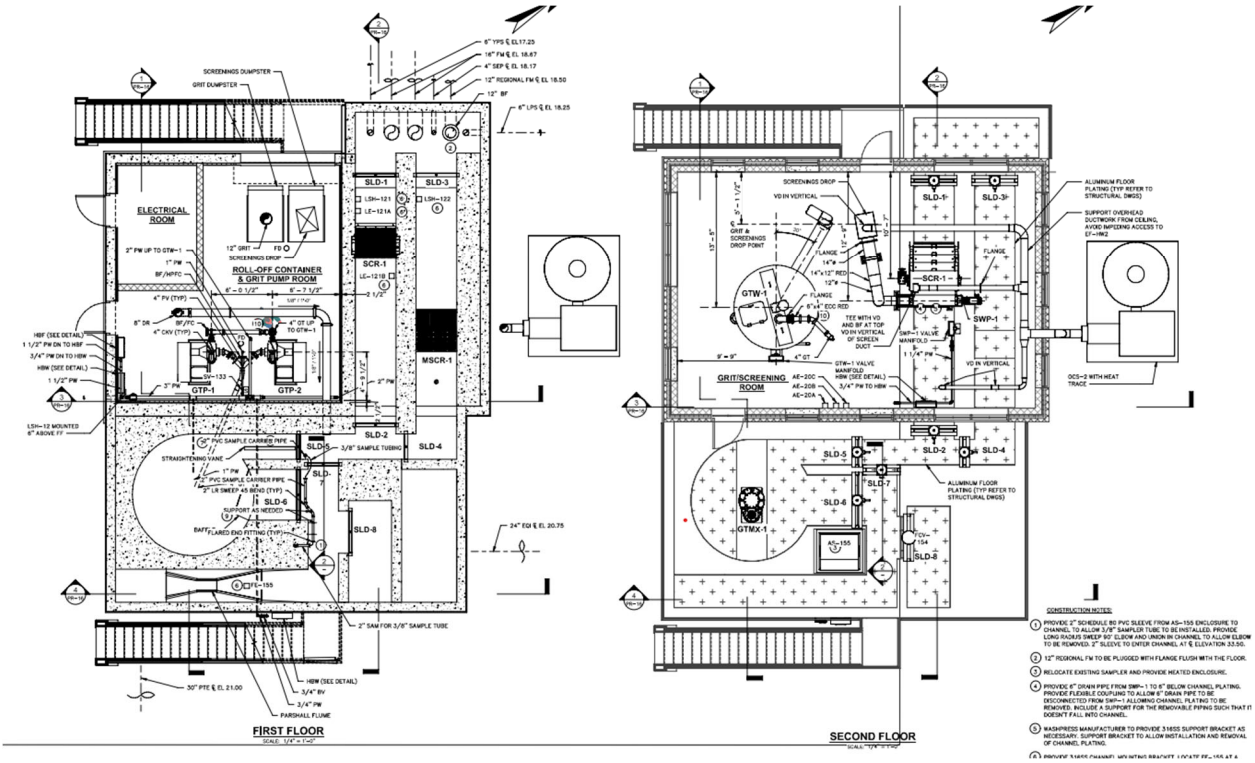
It is recommended that a new grit removal system be installed within a proposed new screening facility upstream of the existing influent pump station. Grit systems are ideally located prior to influent pumping to eliminate grit accumulation in the influent wetwell and excessive wear and tear on the influent pumps. Influent pumps are considered a high priority item given the consequence of their failure. Locating the grit system upstream of the influent pumps will necessitate a reduction in the usable wetwell volume due to a lowering of the incoming hydraulic

grade. Initial estimates indicate that the reduced wetwell volume is sufficient for a three-pump setup at a peak flow capacity of 7.0 MGD.

A single vortex type grit removal system is recommended to improve removal efficiency of incoming grit. The accumulated grit in the bottom of the vortex would be pumped to a grit washer. This device "cleans" the grit of organic material reducing potential odors. Following washing, grit would be transported to a small roll-off container for periodic offsite removal. An example of an influent screening and grit removal setup is depicted in **Figure 4-1**.

FIGURE 4-1

EXAMPLE OF AN INFLUENT SCREEN AND GRIT BUILDING



4.2 PRIMARY SETTLING TANKS AND PRIMARY WASTE SLUDGE PUMPS

4.2.1 Primary Settling Tanks

If a new screen and grit facility was constructed upstream of the existing influent pump station, influent wastewater would be pumped directly from the influent pump station to the primary settling tanks for primary treatment. This includes removal of settleable solids, floating materials,

and scum. The following modifications and upgrades are recommended for the primary settling tanks:

- Eliminate co-settling of waste activated sludge
- Replace the existing mechanical equipment in settling tank No. 1 and No. 2
- Address structural issues including concrete and crack repair, handrailing, etc.

Demolish existing settling tank No. 3 and No.4. These tanks could be abandoned in place. However, due to potential future liability and related safety issues, it is recommended that these tanks be demolished. If these liability issues are properly addressed, retainage of this structure is possible.

Sludge from the settling tanks is removed via sludge pumps located in the basement of the Administration Building. These pumps were recently replaced. However, their associated piping and valves are more than 40 years old and are due for replacement. It is assumed that the underground piping is still in satisfactory condition.

4.3 SECONDARY TREATMENT

The existing secondary treatment system at the Rockland WWTP consists of the nitrification tanks, the nitrification settling tanks, the mechanical aerators and the return and waste-activated sludge pumps. The two nitrification tanks are operated in parallel with four zones in series in each tank. The first zone is anoxic followed by three aerobic zones in series. The nitrification settling tanks are two circular 60-feet diameter tanks with a 12-feet side water depth. The existing aeration system, secondary clarifier equipment and associated gates, valves, and pumps need immediate replacement.

The secondary treatment system provides biological removal of organic matter and the conversion of ammonia to nitrate (i.e., nitrification). Nitrification is required to achieve compliance with the current effluent ammonia limits. Plant staff have indicated that at times it has been difficult to maintain satisfactory nitrification levels.

A computerized biological process model (BioWIN® Version 6.0) was used to model the existing WWTP treatment processes. The process model was developed to simulate the performance of the

WWTP using its recent operational data. The model was calibrated to match the facility observed data. The calibrated model provided predictions for effluent quality, primary effluent quality, return stream quality, in-process solids concentrations and sludge production. The calibrated model was used to determine the facility capacity with the existing infrastructure to treat future flows and loads. The model was used to develop preliminary design criteria for treatment processes that meet the potential nutrient discharge concentrations for future flows and loads.

Observations from model development include:

- The existing activated sludge process, while historically providing satisfactory treatment, is close to its maximum organic loading capacity.
- The secondary treatment process does have sufficient capacity to absorb the "approved, pending and future wastewater buildout flows and loads", as summarized in Table 2-4. This is due to the relatively modest loads from these sources.
- The existing activated sludge process, while not originally designed for, is currently operated to achieve some level of total nitrogen removal. This operation reduces the amount of supplemental alkalinity (i.e., lime addition) required to maintain compliance with the effluent pH limit.
- The secondary clarifiers side water depth is considered shallow for a total nitrogen removal process.
- The anaerobic digestion process recycles a significant amount of ammonia increasing the WWTP's oxygen demand and reducing its safety factor with respect to achieving compliance with its effluent ammonia-nitrogen permit limit.

Secondary treatment processes are designed to include a "safety factor". A safety factor is required to allow for periodic "removal from service" of equipment and tanks to allow for routine maintenance and inspection. This is currently not possible at the Rockland facility due to both the inability to operate the isolation gates as well as the increased organic loading that would be applied to the remaining in-service systems. As such, an increase in the organic loading capacity of the secondary treatment system is recommended regardless of whether influent flows and loads increased beyond current levels.

The existing activated sludge process is operated to achieve total nitrogen (TN) removal. The existing effluent permit does require the Rockland facility to remove ammonia-nitrogen, but it does not require the removal of total nitrogen. However, incorporating total nitrogen removal does provide several significant benefits including a reduction in alkalinity consumption and oxygen requirements, ultimately resulting in a lower total operational cost. As discussed in Section 1, there is a high probability that the Town of Rockland will receive a total nitrogen effluent limit within the 20-year planning period. As such, it is recommended that any improvement or modification to the secondary process provide total nitrogen removal.

The existing activated sludge process does not provide for enhanced biological phosphorus removal. Currently, compliance with the facilities effluent total phosphorus limit is achieved through multi-point chemical addition. Expanding the biological process to incorporate enhanced biological phosphorus removal will reduce the amount of chemistry required for phosphorus removal and sludge produced due to chemical addition. Ultimately, reducing the operating costs associated with the secondary treatment system. Furthermore, incorporating biological phosphorus removal will enhance the settling of the mixed liquor resulting in increased solids removal performance during high flow events.

4.3.1 Expected Effluent Quality

The existing secondary treatment process achieves compliance with the current effluent permit limits for TSS, BOD5, total phosphorus and ammonia. Total phosphorus is removed in the primary treatment and secondary treatment processes through chemical addition. The secondary treatment process also removes a modest amount of total nitrogen. However, that parameter is currently not a permit limit.

The secondary treatment processes presented herein will achieve compliance with the current and expected effluent limits for TSS, BOD5 and ammonia. Incorporating enhanced biological phosphorus removal, as described in the forthcoming alternatives analysis will not achieve compliance with the current or potential lower future total phosphorus limits. However, it will reduce the amount of chemistry required to achieve a total phosphorus limit. If the final effluent total phosphorus limit remains at 0.2 mg/l, supplemental chemistry can be added to either of the two nutrient removal processes to achieve compliance with the current total phosphorus limit. If

the total phosphorus limit is reduced to 0.1 mg/l (as expected), it is recommended that chemical addition be reduced in the primary and secondary treatment processes. Each of the alternative secondary treatment processes will achieve an effluent total phosphorus concentration between 0.5 mg/l and 1.0 mg/l, depending on the wastewater temperature and flow conditions.

An effluent total phosphorus limit of 0.1 mg/l will necessitate the inclusion of a tertiary treatment process. The chemistry added to the secondary process would be redirected to the tertiary treatment process to achieve a 0.1 mg/l total phosphorus limit. It is more effective to add chemistry to a tertiary process to achieve permit compliance versus trying to achieve as low as possible total phosphorous concentration in the secondary treatment process.

Process modeling was conducted to determine the capacity and performance of alternative secondary treatment processes. Process modeling was completed both with and without the inclusion of the anaerobic digestion process. The anaerobic digestion process recycles a significant amount of phosphorus and nitrogen due to the digestion of biological solids. The amount of recycled ammonia-nitrogen elevated the effluent total nitrogen levels. Compliance with a future 10 mg/l total nitrogen limit or lower would require the installation of either a sidestream nutrient removal process or the inclusion of a 4-stage activated sludge process with supplemental carbon addition. A cost-benefit analysis of the anaerobic digestion process was conducted (details are provided later in this section). The cost analysis identified that retaining the anaerobic digestion process was cost prohibitive. Therefore, the secondary treatment alternatives analysis assumes that anaerobic digestion will not be provided at the Rockland WWTP in the future. The secondary treatment processes evaluated below will achieve an effluent total nitrogen concentration of 8 mg/l.

4.3.2 Secondary Treatment Alternatives

Two treatment alternatives were identified for potential implementation at the WWTP to address total nitrogen and phosphorus removal. The selection of the alternatives was based on a review of proven technologies that have been implemented in facilities with similar characteristics to that of the Town of Rockland WWTP. The two treatment alternatives selected for this evaluation are as follows:

- Alternative No.1 (Conventional Approach) – Modify the existing secondary treatment process into an anaerobic/anoxic/aerobic configuration by repurposing the existing secondary clarifiers as activated sludge tanks, thereby increasing the total aeration tank volume.
- Alternative No.2 (Innovative Technology Approach) – Modify the existing aeration tanks into an Integrated Fixed-Film Activated Sludge (IFAS) process in an anaerobic/anoxic/aerobic configuration. Additional capacity would be achieved through the inclusion of an IFAS biocarrier. Upgrading to an IFAS process will require implementation of the influent screening and grit removal recommendations presented herein.

4.3.3 Alternative No.1 (Conventional Approach)

The anaerobic/anoxic/aerobic (A2O) process is a biological process consisting of anaerobic, anoxic, and aerobic zones which promote the removal of nitrogen and phosphorus from wastewater. In this alternative, the A2O process configuration will be incorporated by retrofitting the existing secondary settling tanks into anaerobic and anoxic zones as illustrated in Figure 4-2. The anaerobic zone would be a three-stage "selector" style configuration. By providing a high F/M zone at the entrance to the anaerobic zone, floc forming microorganisms can outcompete filamentous bacteria leading to the production of flocs with high compaction characteristics and low sludge volume index (SVI) values. This will enhance the solids separation performance of the downstream settling tanks, thereby improving the WWTP's effluent water quality, especially during high flow events.

The operational performance of the relatively shallow nitrification settling tanks could be further enhanced through a modification to their effluent weir structure. This modification would increase the side water depth in both the nitrification settling tanks and aeration tanks by approximately three feet. This change would provide several benefits, including:

- An increase in the sludge storage volume within the clarifier resulting in an increase in waste and return sludge concentration.
- Improved performance during high flow events by reducing the potential for influent wastewater to "scour" the sludge blanket.

- A new tertiary treatment process will require a new intermediate pump station to overcome current hydraulic grade line restrictions. If the hydraulic grade line is increased within the settling tanks, gravity flow through a future tertiary process would be achievable.

The anaerobic selectors will favor the growth of phosphate accumulating organisms (PAOs), also known as bio-P organisms. In the anaerobic selectors, these organisms grow and use energy produced by the fermentation of stored glycogen to break the high-energy bonds in internally accumulated polyphosphate, resulting in the release of phosphate (PO43-) and the consumption of short-chain volatile fatty acids (VFAs). When these organisms are then exposed to aerobic conditions, they take up phosphate, forming internal polyphosphate molecules. This luxury uptake results in more phosphate being included in the cells than was released in the anaerobic zone, so the net phosphate concentration in the liquid phase is reduced. When the microorganisms are wasted, the extra phosphate contained in the cell is also removed.

Return activated sludge (RAS) from the nitrification settling tanks is directed to the influent junction box where it mixes with primary effluent prior to entering the anaerobic selectors. In the anaerobic selectors, PAOs uptake soluble substrate and release phosphorus. Mixed liquor from the anaerobic zone flows into the anoxic zone where it mixes with a nitrate rich internal recycle (IR) stream from the aerobic zone. In the anoxic zone, denitrifying organisms reduce nitrate to nitrogen gas using substrate remaining from the anaerobic zone or from an external source, if needed. Denitrified mixed liquor from the anoxic zone flows into the aerobic zone where oxygen is supplied for use by nitrifying organisms to oxidize ammonia to nitrate.

Process modeling was conducted to determine the performance, operating characteristics and volume required to incorporate the A2O process configuration, at both the current and design year influent loading conditions. The existing aeration tanks do not have enough capacity to operate in their current configuration or an A2O configuration at the WWTP design year influent conditions. The existing aeration tanks, after the side water depth is raised by three feet, have enough capacity to nitrify (removal of ammonia). However, they would still be undersized for conversion to the A2O configuration. To properly incorporate the A2O configuration, it is recommended that, the unused settling tanks be retrofitted into anaerobic and anoxic zones to provide the additional volume needed for nitrogen and phosphorus removal. In addition, the inclusion of the anoxic zone

will increase the WWTP alkalinity levels to help minimize negative impacts to the facilities pH levels.

The process configuration for this alternative is shown in **Figure 4-2**. The basis of design at annual average conditions for this alternative is presented in **Table 4-1**.

FIGURE 4-2

BIOLOGICAL NUTRIENT REMOVAL ALTERNATIVE MODEL CONFIGURATION

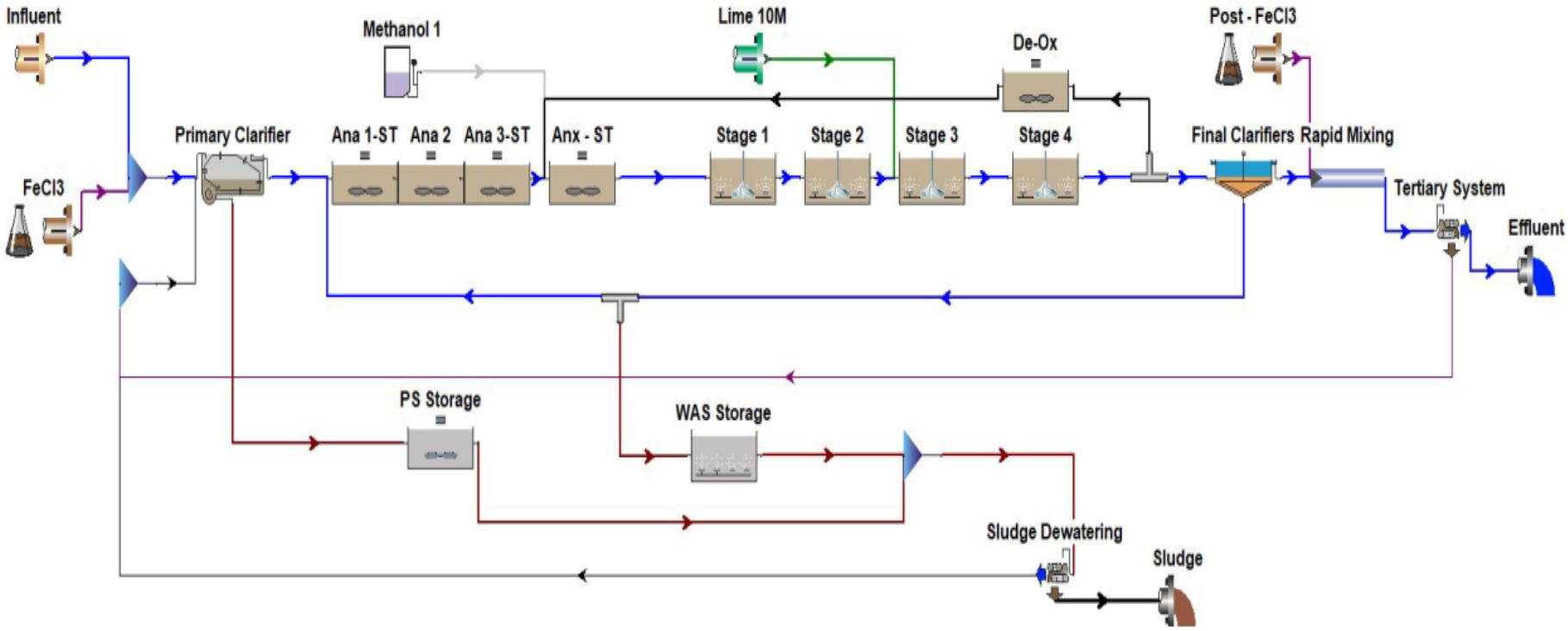


TABLE 4-1

BASIS OF DESIGN

BIOLOGICAL NUTRIENTS REMOVAL ALTERNATIVE

DESIGN ANNUAL AVERAGE CONDITION

Parameter	Value
Aeration Tanks	2
Total Tanks Volume, Mgal	1.94
Typical RAS Flow, MGD	1.0 – 2.0
Typical IR Flow, MGD	7.5
Design MLSS, mg/L	1,830
Aerobic SRT, day	8
WAS, lbs./day	2,900
OTR, lbs./day	5,100
Air Required, scfm	2,250

A proposed site layout plan for this alternative is shown in **Figure 4-3**. The major components and improvements needed to implement this alternative at the WWTP include the following:

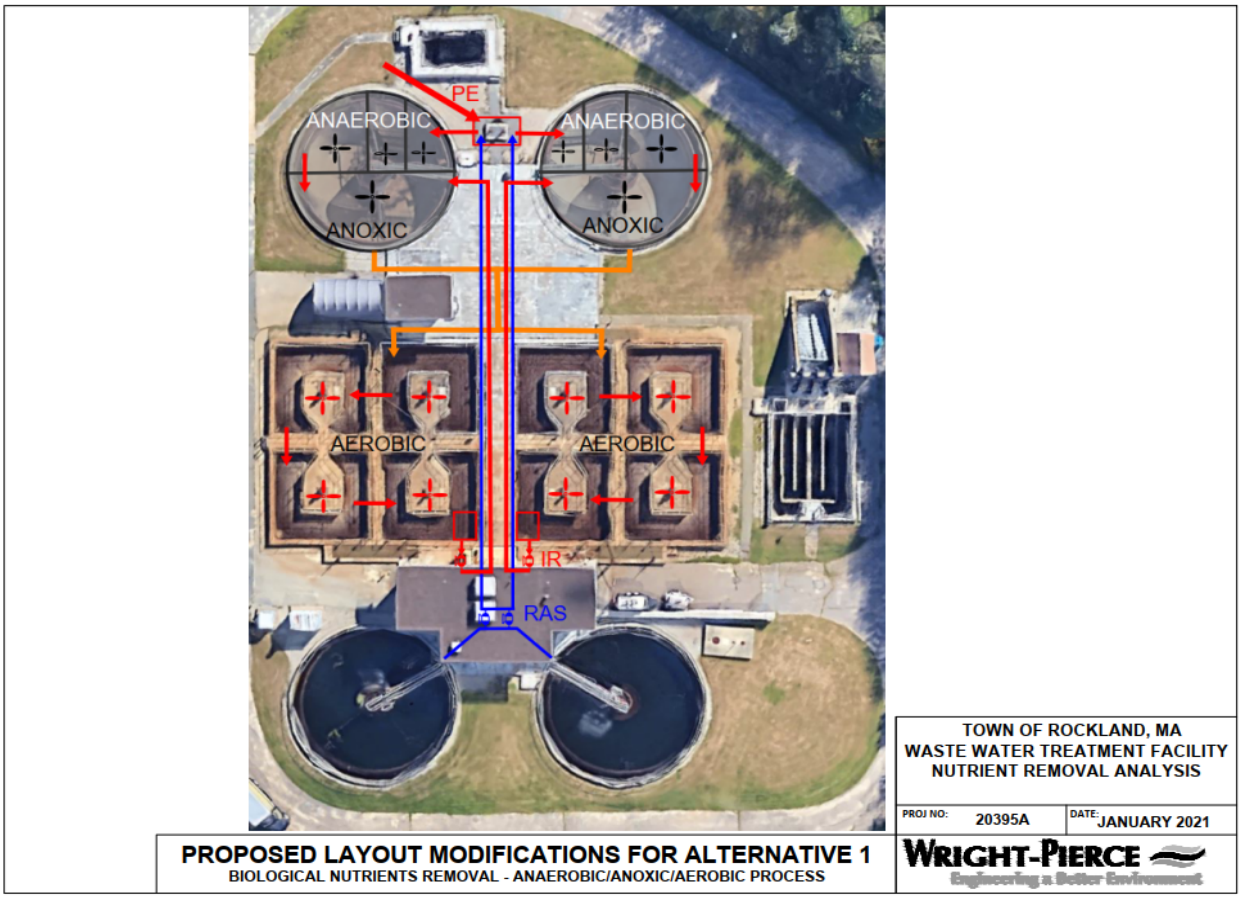
- Influent junction box upgrade including piping connections
- Retrofit the unused settling tanks into anaerobic and anoxic zones
  - Provide new submersible mixers
  - New interconnecting piping
  - Misc. structural repairs
- Aeration tank modifications
  - Replacement of the surface aerators with submerged mixer-aerators
  - New RAS system including pumps and piping
  - Two new Internal Recycle (IR) systems including new IR pumps and piping (located in the nitrification gallery)
  - New aeration system including three aeration blowers and piping
  - Misc. structural repairs
- Nitrification settling tank modifications

- Replacement of internal mechanisms and drives
- Replacement of effluent launder and weir

- Instrumentation, and electrical upgrades necessary to provide a functioning biological nutrient removal system

FIGURE 4-3

PROPOSED LAYOUT MODIFICATIONS FOR ALTERNATIVE NO.1



4.3.4 Alternative No.2 (Innovative Technology Approach)

The process configuration for this alternative is the same as Alternative No.1, an A2O process for the biological removal of nitrogen and phosphorus. However, additional biomass to achieve nitrification will be accomplished by adding integrated fixed film activated sludge (IFAS) media into the two existing aeration tanks. The media provides support to the organisms to develop a biofilm on their surface, increasing the biomass inventory without an increase in tank volume. The media are retained in designated treatment zones by wedge wire screens while flows pass through.

In the aerobic zones, the aeration system is comprised of an engineered grid of coarse bubble diffusers. The IFAS media is shown in **Figure 4-4**.

FIGURE 4-4

IFAS MEDIA

In this alternative, the existing aeration tanks will be modified into an A2O configuration with the inclusion of IFAS biocarrier. One of the existing aeration tanks (one per treatment train) would be modified for location of a three-stage anaerobic zone. The second aeration tank would be modified to the anoxic zone. Aerobic conditions would be provided in the two downstream aeration tanks as illustrated in Figure 4-5. Modification of the side water depth within the settling or aeration tanks is not required with this alternative.

The basis of design at annual average conditions for the biological nutrient removal alternative is presented in **Table 4-2**.

FIGURE 4-5

BIOLOGICAL NUTRIENTS REMOVAL WITH IFAS ALTERNATIVE MODEL CONFIGURATION

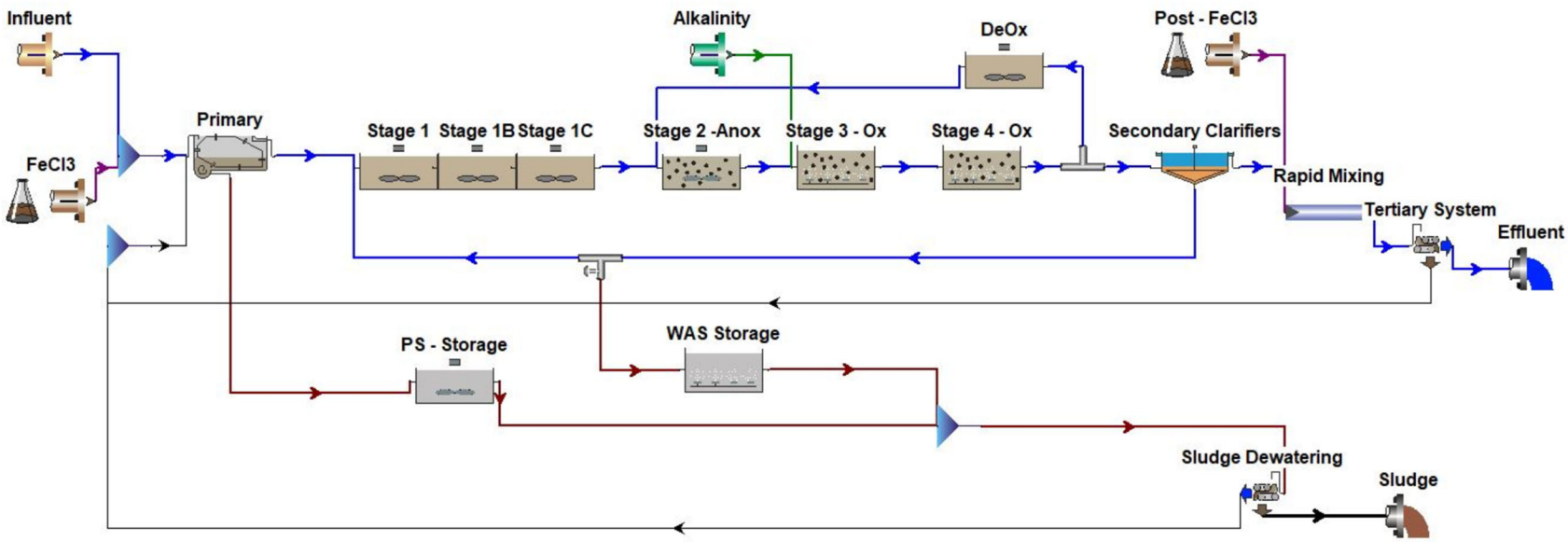


TABLE 4-2

BASIS OF DESIGN

BIOLOGICAL NUTRIENTS REMOVAL WITH IFAS ALTERNATIVE

DESIGN ANNUAL AVERAGE CONDITION

Parameter	Value
Aeration Tanks	2
Total Tanks Volume, Mgal	1.03
Typical RAS Flow, MGD	1.0 – 2.0
Typical IR Flow, MGD	7.5
Design MLSS, mg/L	2,000
Aerobic SRT, day	8
WAS, lbs./day	2,800
OTR, lbs./day	5,200
Air Required, scfm	3,540

A proposed site layout plan for this alternative is shown in **Figure 4-6**. The major components and improvements needed to implement this alternative at the WWTP include the following:

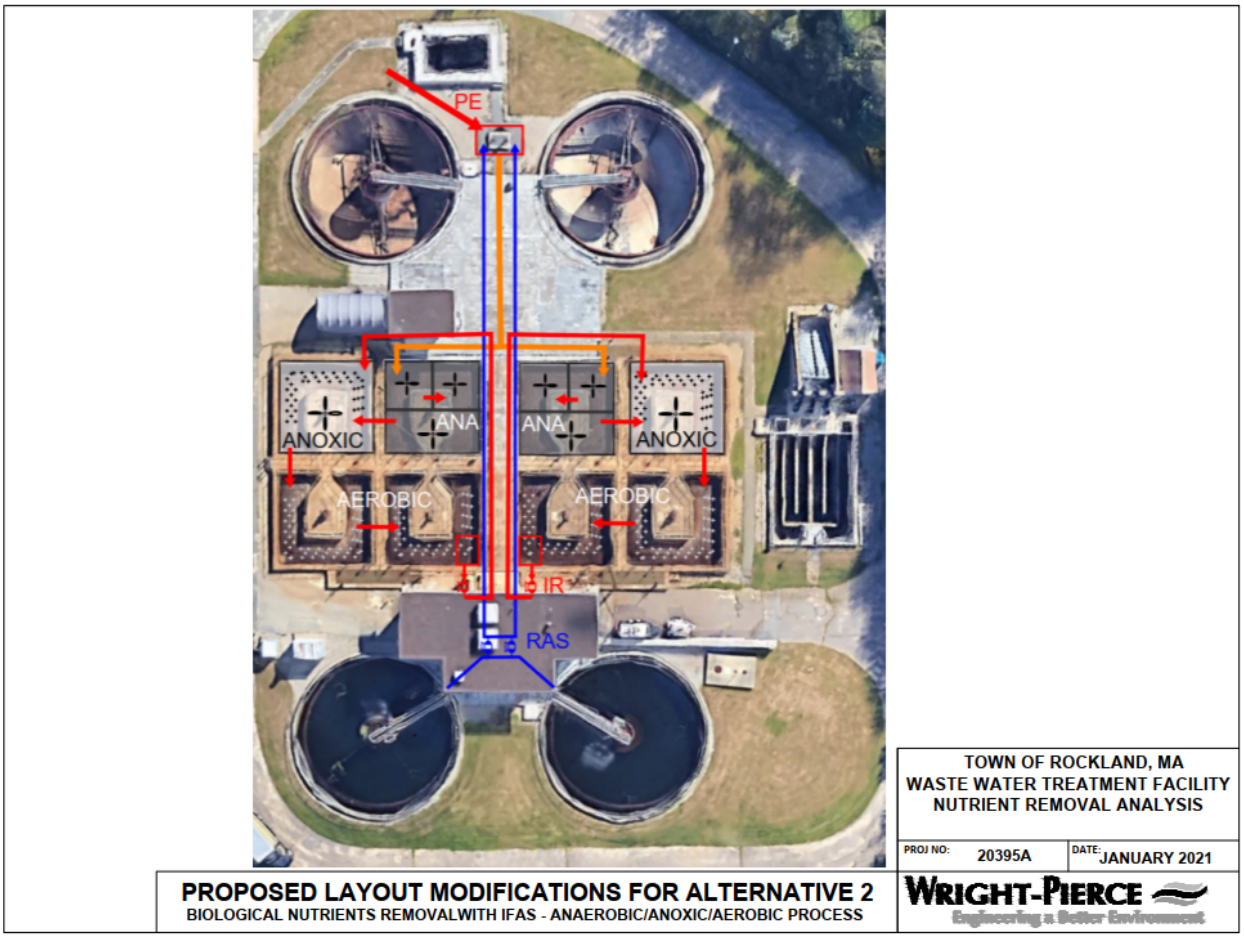
- Influent junction box upgrade including piping connections
- Aeration Tank Modifications
  - Divide first stage of each existing aeration tank into a three-zone anaerobic tank with supplemental mixing
  - Second stage would be the anoxic zone filled with media (50% fill fraction) with supplemental mixing
  - Use third and fourth stages as aerobic zones filled with media (50% fill fraction) and replace surface aerators by submerged mixer-aerators
  - New RAS system including pumps and piping
  - Two new Internal Recycle (IR) systems including new IR pumps and piping (located in the nitrification gallery)
  - New aeration system
- Nitrification Settling Tank modifications

- Replacement of internal mechanisms and drives
- Replacement of effluent launder and weir

- Instrumentation, and electrical upgrades necessary to provide a functioning biological nutrient removal with IFAS system

FIGURE 4-6

PROPOSED LAYOUT MODIFICATION FOR ALTERNATIVE NO.2



4.3.5 Aeration System

The existing mechanical surface aerators are well beyond their typical service life. Given the age of the units, it is difficult to find spare parts and other mechanical components to address ongoing maintenance needs. This equipment represents one of the most critical pieces of equipment within the WWTP. Failure of one of these items would have significant consequences. Specifically, failure of an aerator would immediately decrease the capacity and performance of the secondary

treatment process. The most likely result would be an increase in the WWTP's effluent ammonia concentration potentially resulting in a permit violation. Replacement of a failed mechanical surface aerator would be on the order of several weeks if not months. Mechanical surface aerators, while still in use today, are very seldomly replaced in-kind. This is due to their significant energy use and limited ability to adjust their output capacity as a function of influent loadings.

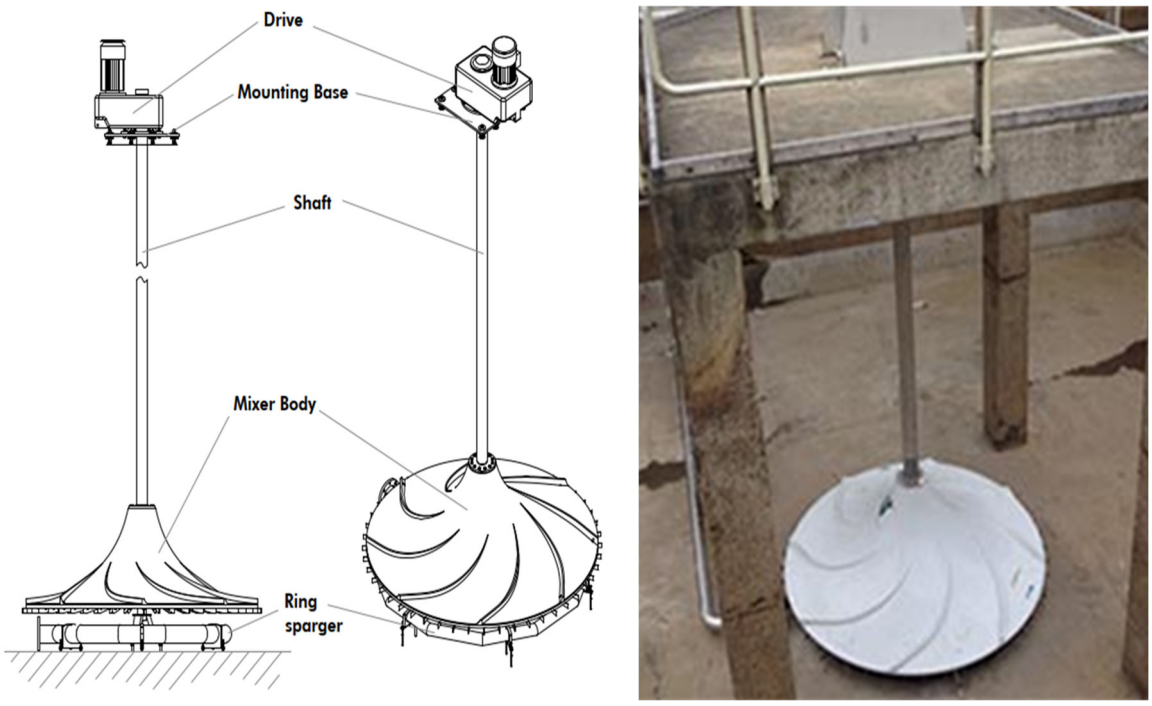
Diffused aeration and submerged hyperboloid mixer/aerators are two technologies that offer superior process performance at a significantly lower energy consumption levels than the existing mechanical aerators. Unfortunately, the energy efficiency of a diffused aeration system is directly proportional to the aeration tanks side water depth (the shallower the tank the more energy is required). As such, diffused aeration is not a viable alternative at the current aeration tank side water depth of 12feet. If the water depth was raised to 15 feet, then diffused aeration could be considered.

The submerged hyperboloid mixer/aerators have significant benefits for nutrient removal processes at an intermediate tank water depth (12 to 16feet). The submerged hyperboloid mixer/aerators can both mix and aerate or just mix the contents of the tank. This allows the plant operators to adjust the mixing and aeration levels independently of each other. This flexibly will greatly enhance the WWTP's ability to remove phosphorus and nitrogen and result in a reduced air flow and energy requirement.

These mixer/aerators can be easily installed on the existing surface aerator platforms. The fins positioned on the top of the hyperboloid mixers at the bottom of the tanks produce a bottom flow that is directed radially outwards to the sides of the tank. During aeration, air is pumped (via a new blower and stainless-steel piping system) under the hyperboloid mixers into the sparging system, and the mixers contain several fins to shear the air into fine bubbles. To provide a flexible and reliable biological nutrient removal process, it is recommended to replace the existing surface mechanical aerators with submerged hyperboloid mixer/aerators together with blowers and stainless-steel piping system. **Figure 4-7** shows the recommended submerged hyperboloid mixer/aerator technology.

FIGURE 4-7

HYPERBOLOID SUBMERGED MIXER/AERATORS



Several new blowers would be provided as part of the aeration package. There are several potential locations for these blowers including potentially in the below grade piping gallery or in the electrical room (once the generator is removed). However, each of these locations would not be considered ideal. As such, for purposes of this evaluation it has been assumed that a new blower building would be installed adjacent to the nitrification tanks.

4.3.6 Return Activated Sludge Pumps

The nitrification return activated sludge pumps (3 total) transport settled, thickened sludge from the nitrification settling tanks to the influent channel of the nitrification tanks. The RAS pumps in the nitrification gallery were installed in 2015 and have a capacity of 1,300 gpm at total dynamic head of 25 feet. Alternative 1 will require relocating the discharge of the RAS upstream of its current location, thus increasing the total dynamic head of the pumping system. New RAS pumps have been assumed due to the increased TDH. However, during detailed design, the possibility of reusing the existing pumps will be investigated further.

4.3.7 Internal Recycle Activated Sludge Pumps

The A2O process configuration for both secondary treatment alternatives will require the installation of an internal recycle system (IR). Nitrate rich mixed liquor is recycled from the end of the aeration tanks to the anoxic zone. A recycle ratio between 2 to 3 times influent flow is needed to produce a total nitrogen effluent concentration less than 8.0 mg/l.

The IR pumps can be installed in the nitrification gallery. New piping and valves within the gallery will transport MLSS back to the anoxic zone. The IR system will consist of three pumps (two duty and one standby).

4.3.8 Waste Activated Sludge and Scum Pumps

There are two nitrification WAS pumps, installed in 2015. And two new nitrification scum pumps, installed in 2019. The WAS and scum pumps are horizontal non-clog centrifugal and positive displacement types, respectively. The WAS pumps have a capacity of 175 gpm at total dynamic head of 47 feet. The scum pumps have a capacity of 100 gpm at total dynamic head of approximately 50 feet. These pumps have enough capacity to handle waste sludge flows generated at current and future loading conditions. However, a new piping system will be required to pump waste-activated sludge from the nitrification settling tanks to the sludge holding tanks.

4.3.9 Present Worth Cost Analysis

A present worth analysis was developed for each alternative approach for comparison purposes. Typically, the lowest net present worth is considered the most cost-effective alternative approach over a specific period. A detailed discussion of the cost estimating procedure, contingency levels, and assumptions is included in Section 5. The total construction cost for the secondary treatment facilities were estimated assuming a construction start date of 2023. The total project cost estimate includes construction contingency, engineering, and inspection services. An interest rate of 0.5% was applied to the estimated operation and maintenance (O&M) cost to determine each alternative's present worth.

The conceptual design construction cost estimate for the two secondary treatment alternatives are presented in **Table 4-3**. The costs include inflation to the expected mid-point of construction.

TABLE 4-3

CAPITAL COST ESTIMATES – SECONDARY TREATMENT

Alternative	Total Construction Cost
No. 1	Conventional Approach
No. 2	Innovative Technology Approach

Annual O&M costs were estimated for each alternative. O&M costs include items such as labor, electrical demand, chemicals, and products needed in the secondary treatment system. Actual costs to operate the WWTP may vary from these values, but they are sufficient for comparing the different secondary treatment alternatives. A summary of the O&M cost for each secondary treatment is presented in **Table 4-4.**

TABLE 4-4

ESTIMATED MAINTENANCE COSTS FOR SECONDARY TREATMENT

Parameter	Alternatives	
	No. 1	**No. 2**
Labor[1]	$40,000	$60,000
Electric Demand[2]	$236,000[3]	$216,000[3]
Chemical and Products Use	-	-
Total Annual O&M Cost	$276,000	$276,000

Notes:

1. An operator labor cost of $55/hr. was used in the estimates.
2. Electrical demand was estimated for all process equipment associated with the secondary treatment processes based on expected online motor horsepower and expected run times. An average electrical cost of $0.12 per k Wh was used for the comparative analysis.
3. Electrical demand cost for both alternatives include blowers, mixers, and internal recirculation pumps.

Present worth costs were developed for each alternative as shown in **Table 4-5** and include the summation of total capital costs and twenty years of annual O&M costs. Process equipment generally has a 20-year life cycle, so no salvage value has been carried for equipment.

TABLE 4-5

ESTIMATED TOTAL PRESENT WORTH COST – SECONDARY TREATMENT

Alternative	Total Construction Cost	Net Present Value	Total Present Worth
No 1 – Conventional Approach	$12,440,000	$5,200,000	$17,640,000
No. 2 – Innovative Technology Approach	$16,490,000	$5,200,000	$21,690,000

4.3.10 Secondary Treatment Alternative Recommendation

It is recommended that the Town of Rockland upgrade the existing secondary treatment process to an A2O process while expanding into the existing unused secondary settling tanks. This upgrade will achieve biological nitrogen and phosphorus removal thereby addressing future total nitrogen and phosphorus limits. Furthermore, the proposed process configuration will reduce the WWTP power consumption by eliminating the facilities mechanical aerators (far and away the largest energy consumption at the WWTP and replacing it with significantly more efficient aeration system. The A2O process will provide additional treatment capacity and improve the wastewater's settling characteristics which will greatly improve the system's ability to perform under peak influent flows.

4.3.11 Nitrification Settling Tanks

The existing nitrification settling tanks provide mixed liquor separation. Mixed liquor suspended solids from the activated sludge tanks is settled under quiescent conditions within the clarifier to separate the solids from the water, resulting in a largely clear final effluent. Solids separation performance is dictated in part by the "settleability" of the mixed liquor and the total flow going through the clarifiers. Transport of the settled sludge to the RAS pumps is in part a function of the clarifier mechanism.

The existing clarifier mechanisms are beyond their useful life and should be replaced. This includes the clarifier drive, turntable, scrapers, and walkway. New energy dissipating inlets and stamford baffles should be provided in both clarifiers. It is highly recommended that the clarifiers be reconfigured to increase their side water depth to 15 feet. This would require some structural

modifications to the effluent weir channel. Increasing the side water depth will greatly improve the clarifier performance during high flow events (reduced potential to scour the sludge blanket) and allow for additional thickening of the mixed liquor.

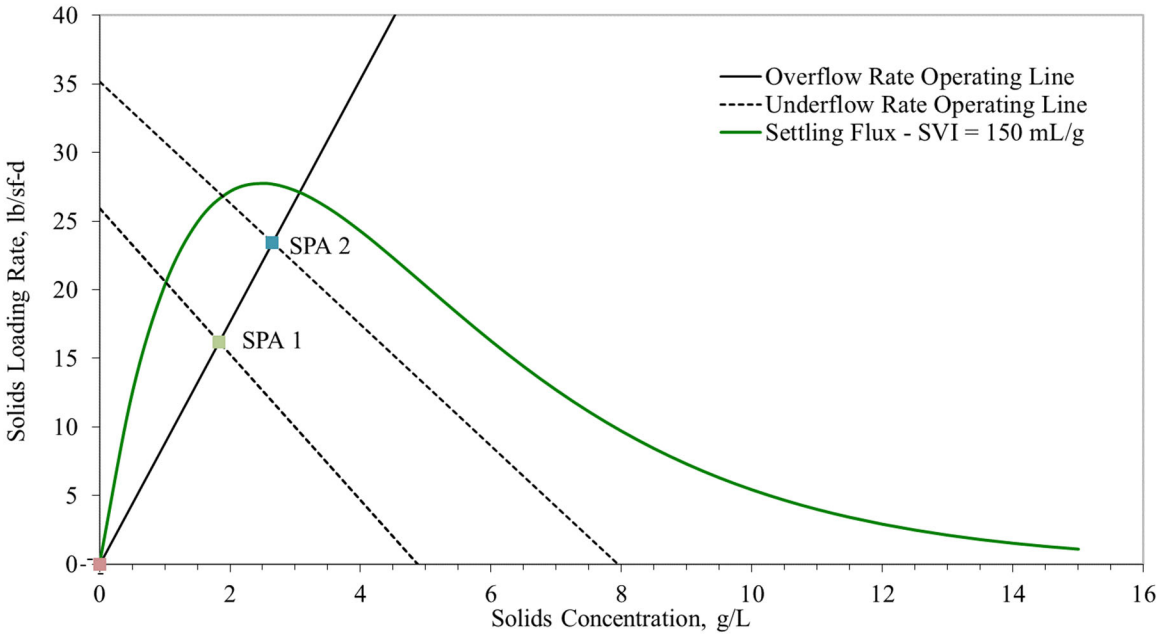
The performance of the secondary clarifiers was analyzed under steady-state conditions to establish their limit capacity. Clarifier capacity was determined via a State Point Analysis (SPA - the graphical technique used for evaluating the performance of secondary clarifiers under peak flow conditions), MLSS concentrations, sludge settling velocity, return sludge rate and SVI. The results of the SPA are graphically illustrated in **Figure 4-8**.

The point of intersection of the overflow rate (effluent over the weirs) and underflow rate (sludge withdrawn from clarifier) is the State Point. The location of the State Point in relation to the settling flux curve predict the performance of the secondary clarifier. The State Point of a well operated clarifier should be located below the settling flux curve and the underflow rate line operating below the descending limb of the settling flux curve. If the State Point is located above the settling flux curve in any condition, theoretically the material will not settle in the clarifier, but will flow out of the clarifier via the effluent weir. Similarly, if the underflow rate operating line is shown above the settling flux curve in any condition, the sludge blanket is projected to rise and exit the clarifier via the effluent weir.

The state point analysis was done for the two existing secondary clarifiers (60-foot diameter) assuming an average wastewater temperature of 16°C and a maximum MLSS value of 2,650 mg/l (design year max month condition). Alternative No. 1 will produce mixed liquor with good settleability properties with SVIs values from 75 to 150 mL/g. The clarifier capacity analysis was developed using an SVI value of 150 mL/g (worst case). The results of the SPA are shown in **Figure 4-8**. Two SPA points are highlighted indicative of the average and maximum month MLSS concentration at a peak day flow rate of 6.0 MGD. Numerically, the peak day capacity of the secondary treatment at an SVI of 150 is 6.0 MGD. The clarifiers, at an increased side water depth can handle instantaneous flows greater than 6.0 MGD, so long as the average for the day does not exceed 6.0 MGD.

FIGURE 4-8

SECONDARY CLARIFIER STATE POINT ANALYSIS



4.4 TERTIARY TREATMENT PROCESS ALTERNATIVES

Two treatment alternatives were identified for potential implementation at the WWTP to achieve an effluent total phosphorous limit of 0.1 mg/l. The selection of the alternatives was based on a review of proven technologies that have been implemented in facilities with similar characteristics to that of the Rockland WWTP. The two treatment alternatives selected for this evaluation are as follows:

- Alternative No.1 (Ballasted Clarification)
- Alternative No.2 (Cloth Media Filtration)

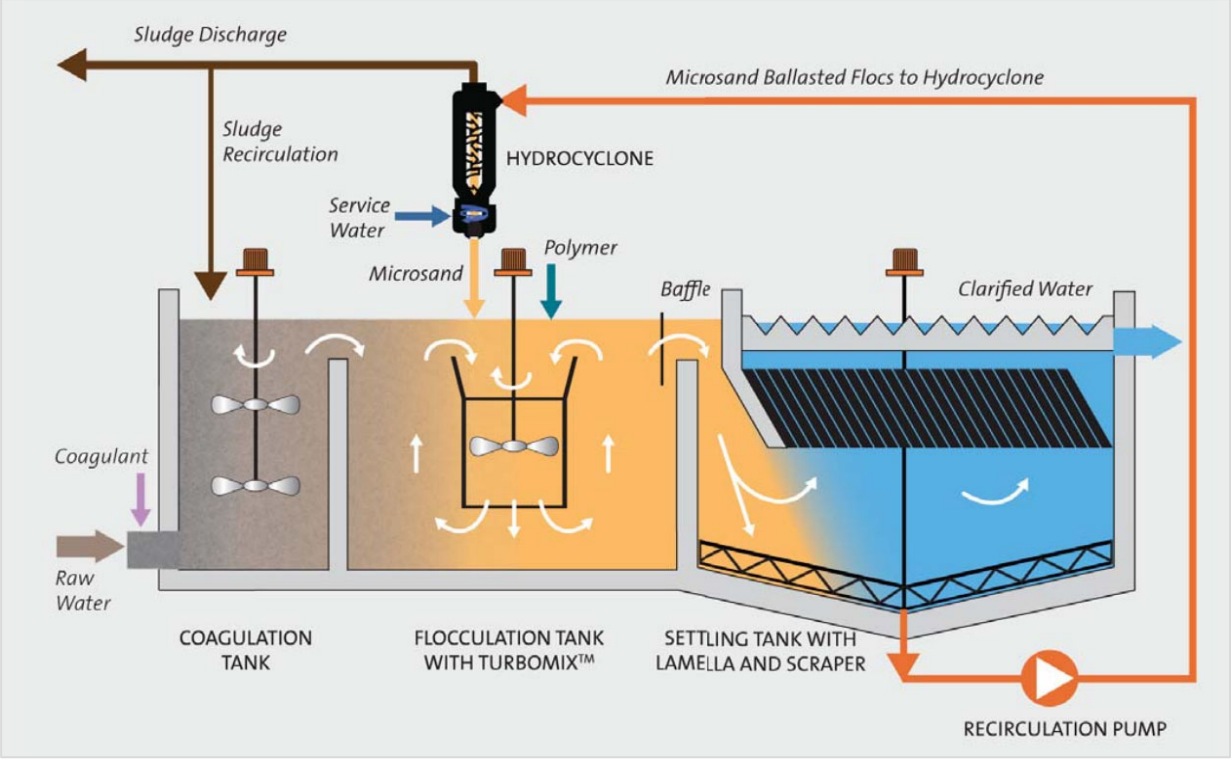
A third tertiary treatment alternative (deep bed sand filtration) was considered. This technology is a proven technology to achieve an effluent total phosphorus limit of 0.1 mg/l. However, the hydraulic grade required by this technology would require the installation of a new intermediate pump station. Increasing the hydraulic grade line through modifications to the secondary clarifiers would not provide enough hydraulic capacity to achieve gravity flow through this process. Therefore, this process was not considered as part of this evaluation.

4.4.1 Alternative 1 (Ballasted Clarification)

Ballasted Clarification is a high rate, physical-chemical clarification process for high rate removal of phosphorus. With ballasted clarification, secondary effluent is combined with a coagulant (metal salt) in a flash mix tank where micro-sand and polymer are added to promote particle destabilization and aggregation. The micro-sand binds with the particles via polymer bridging forming larger particle agglomerates that grow into higher density flocs in the maturation tanks. The resulting heavier flocs settle faster at the bottom of the lamella settlers. The sludge-micro-sand mixture collected at the bottom is pumped to hydrocyclones, where the sludge is centrifuge-separated from the micro-sand. The residual solids are pumped to the sludge storage tanks and the recovered micro-sand is recycled to the injection tank. **Figure 4-9** shows the ballasted clarification technology schematically.

FIGURE 4-9

BALLASTED CLARIFICATION



The ballasted flocculation process is a proven technology to achieve a total phosphorus limit of 0.1 mg/l, with numerous installations in New England. A two-train configuration is recommended,

each capable of treating 4.4 MGD (allows for one unit to be out of service during maximum month flow conditions). The current hydraulic grade is not sufficient to achieve gravity flow through the process. Therefore, either a new intermediate pump station or an increase in the hydraulic grade would be required. For purposes of this evaluation, it has been assumed that the side water depth of the secondary clarifiers would be increased to 15-feet allowing for gravity flow under all future conditions.

The ballasted flocculation process provides several unique advantages. This process is robust enough that if solids did escape the nitrification settling tanks during high flow events, this process would not be impacted (from a solids separation perspective) thus reducing the potential for final effluent TSS violations. The ballasted flocculation process could also be used to remove other constituents if ever deemed required in the future (i.e., copper, aluminum, etc.). Of all the potential tertiary processes, this process will have the smallest footprint. Sludge from this process would be recycled back to the primary clarifiers, aiding in primary clarifier solids removal performance. This sludge would include a minor amount of sand. The major disadvantage with this process is that it does include a fair amount of associated equipment (pumps, mixers, polymer system) and thus is usually more costly to construct and maintain versus other processes.

The basis of design for the ballasted clarification is presented in **Table 4-6**.

TABLE 4-6

BASIS OF DESIGN

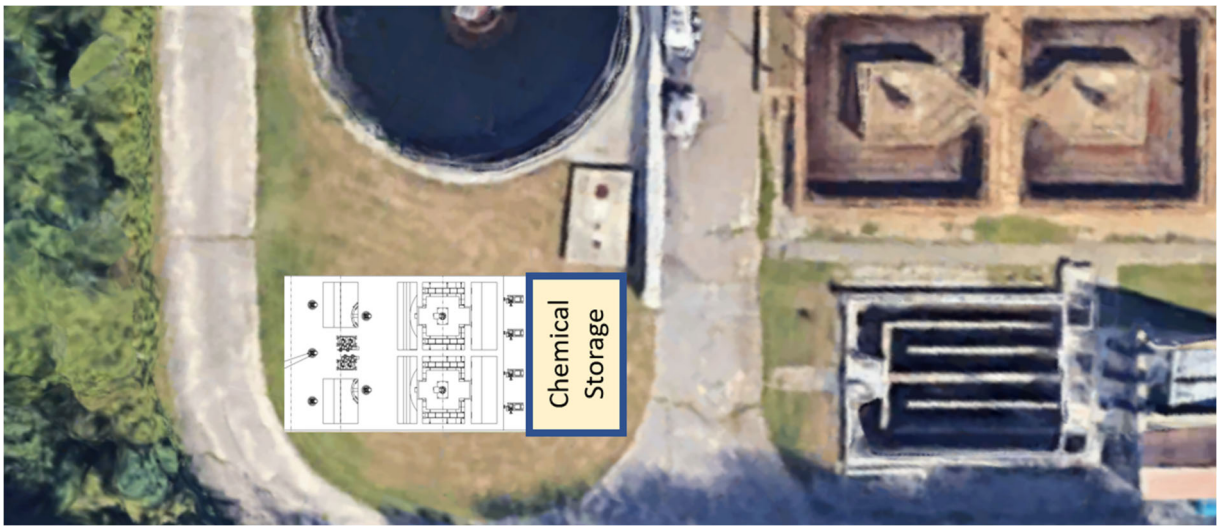
BALLASTED CLARIFICATION ALTERNATIVE

Parameter	Value
System Trains	2
Total Flow per Train, MGD	4.4
Total Flow per System, MGD	8.8
Single Train Design Parameters	
Coagulation Tank Volume, gal	6,100
Maturation Tank Volume, gal	10,700
Settling Tank Surface Area, sf	92
Sand Recirculation Flow, gpm	85
Estimated Total Sludge Waste Flow, gpm	68
Consumables at Average Design Flow (2.5 MGD)	
Polymer, lbs./day	9.0
Ferric Chloride, lbs./day	1,280
Sand Loss, lbs./day	65

A proposed site layout plan for this alternative is shown in Figure 4-10.

FIGURE 4-10

BALLASTED CLARIFICATION SITE PLAN

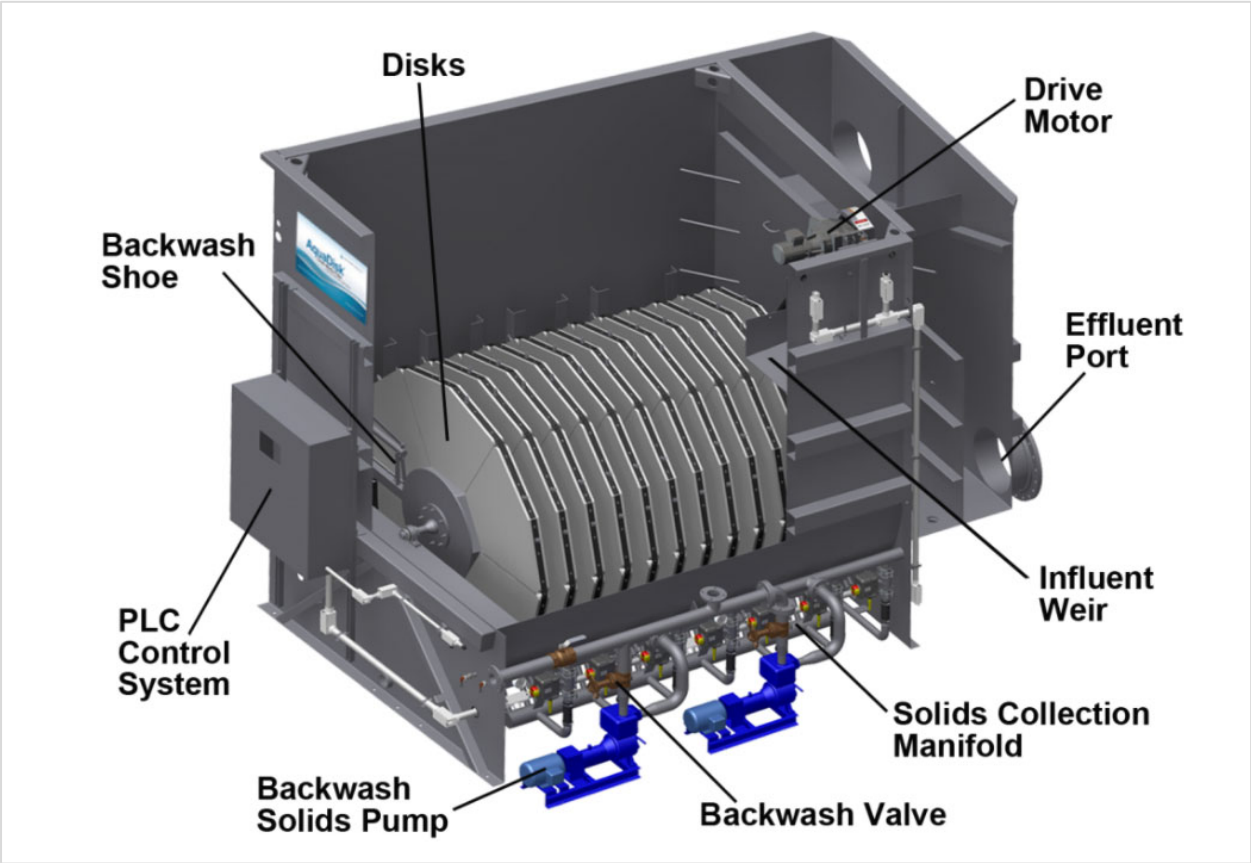


4.4.2 Alternative 2 (Cloth Media Filtration)

Cloth Media Filtration is a solid separation process that uses microfiber cloth disks to remove fine particles with nominal size of 2 microns or more. With cloth media filtration, secondary effluent is combined with a coagulant (metal salt) in a flash mix tank to promote colloidal particle destabilization and aggregation. The particles in the water bind with the coagulant forming larger particle agglomerates. As the mixture flows through the filter cloth, particle agglomerates are retained by the filter cloth while filtered water flows out of the unit through the central shaft, effluent chamber, and final overflow weir. Cleaning of the disks is periodically initiated to removed solids accumulated on their surface. The sludge on the disk surface is removed by suction and pumped to the primary settling tanks. Similarly, solids accumulated at the bottom of the filter tank would also be pumped to the primary settling tanks. **Figure 4-11** shows a schematic of the cloth media filtration technology.

FIGURE 4-11

CLOTH MEDIA FILTRATION



Cloth media filtration has been used extensively to achieve an effluent total phosphorus concentration of 0.15 mg/l. It has limited, but successful, use at WWTP's to achieve a 0.1 mg/l limit. In comparison to the ballasted flocculation, this process has significantly less experience at treating to limits of 0.1 mg/l. It's major advantage in comparison to the ballasted flocculation process is its reduced capital cost and lower operational costs. The cloth filtration process doesn't require polymer, sand addition and relies on less pumping system to achieve solids removal. However, if this technology is selected for implementation at the Rockland WWTP facility, it is recommended that Rockland determine its site-specific phosphorus removal performance based on pilot testing prior to implementation.

The basis of design for the cloth media filtration is presented in **Table 4-7**.

TABLE 4-7

BASIS OF DESIGN

CLOTH MEDIA FILTRATION ALTERNATIVE

Parameter	**Value**
System Trains	2
Maximum Flow per Train, MGD	4.4
Maximum Flow per System, MGD	8.8
Single Train Design Parameters	
Rapid Mixing Tank Volume, gal	1,650
Flocculation Tank Volume, gal	12,700
Number of Disks per Train	12
Filter Area Provided, sf	650
Maximum Hydraulic Loading per Train, gpm/sf	6.4
Consumables at Average Design Flow (2.5 MGD)	
Ferric Chloride, lbs./day	960

A proposed site layout plan for this alternative is shown in **Figure 4-12**.

FIGURE 4-12

CLOTH MEDIA FILTRATION SITE PLAN

4.4.3 Present Worth Cost Analysis

A present worth analysis was developed for each alternative approach for comparison purposes. Typically, the lowest net present worth is considered the most cost-effective alternative approach over a specific period. A detailed discussion of the cost estimating procedure, contingency levels, and assumptions is included in Section 5. The total construction cost for the tertiary treatment facilities were estimated assuming a construction start date of 2023. The total project cost estimate includes construction contingency, engineering, and inspection services. An interest rate of 0.5% was applied to the estimated operation and maintenance (O&M) cost to determine each alternative's present worth.

The conceptual design construction cost estimate of the two tertiary treatment alternatives are presented in Table 4 8. The costs include inflation to the expected midpoint of construction. It should be noted, if implementation of the tertiary treatment process is not selected at this time, the

presented total construction costs cannot be subtracted from the total project construction costs presented in Section 5. The cost presented below include several items that would be required regardless of whether a tertiary system was included in the comprehensive upgrade project.

TABLE 4-8

ESTIMATED CAPITAL COSTS – TERTIARY TREATMENT

Alternative	Total Construction Cost
1 Ballasted Clarification	$7,000,000
2 Cloth Media Filtration	$5,910,000

Annual O&M costs were estimated for each alternative. O&M costs include items such as labor, electrical demand, chemicals, and products needed in the secondary treatment system. Actual costs to operate the WWTP may vary from these values, but they are sufficient for comparing the different tertiary treatment alternatives. Summary of the O&M cost for each secondary treatment is presented in **Table 4 9.**

TABLE 4-9

ESTIMATED OPERATION AND MAINTENANCE COSTS

FOR TERTIARY TREATMENT

Parameter	Alternatives	
	1. Ballasted Clarification	2. Cloth Media Filtration
Labor[1]	$40,000	$40,000
Electric Demand[2]	$10,000[3]	$7,000[4]
Chemical and Products Use	$138,000[5]	$102,000[5]
Total Annual O&M Cost	$188,000	$149,000

Notes:

1. An operator labor cost of $55/hr. was used in the estimates.
2. Electrical demand was estimated for all process equipment associated with the secondary treatment processes based on expected online motor horsepower and expected run times. An average electrical cost of $0.12 per kWh was used for the comparative analysis.
3. Electrical demand cost for Alternative 1 include rapid mixing, clarification, sludge pumps and chemical

pumps.

4. Electrical demand cost for Alternative 2 include rapid mixing, filtration, sludge pumps and chemical pumps
5. Chemical costs include: Ferric chloride $0.34/lb., Polymer $2.5/lb., Sodium hydroxide $2.1/gal and sand media $0.125/lb.

Present worth costs were developed for each alternative, as shown in Table 4-10, and include the summation of total capital costs and twenty years of annual O&M costs. Process equipment generally has a 20-year life cycle, so no salvage value has been carried for equipment.

TABLE 4-10

ESTIMATED TOTAL PRESENT WORTH – TERTIARY TREATMENT

Alternative	Total Construction Cost	Net Present Value	Total Present Worth
1 Ballasted Clarification	Ballasted Clarification	$7,000,000	$3,600,000
2 Cloth Media Filtration	Cloth Media Filtration	$5,910,000	$2,800,000

4.4.4 Tertiary Treatment Alternative Recommendation

Although more expensive on a capital O&M, and present worth basis, it is recommended that the Town of Rockland budget for the installation of a Ballasted Clarification process to achieve an effluent total phosphorus (TP) limit of 0.1 mg/l. Budgeting for this process represents a conservative and technology appropriate solution to achieve a 0.1 mg/l TP limit. A limit of 0.1 mg/l TP is a strict limit and there are very few applicable technologies that could be considered. Ballasted clarification while expensive, does have extensive experience achieving this limit. That said, the Town of Rockland should consider conducting a pilot test of the cloth media filter system. If pilot testing proves successful, the Town could move ahead with this option that offers both capital and O&M cost savings.

4.5 DISINFECTION AND EFFLUENT PUMPING STATION

The existing chlorine contact tanks need structural rehabilitation, but otherwise they are in adequate working order. Thus, it is recommended to retain them for future treatment. To address the current disinfection issues; specifically failure of existing underground chemical piping, chemical travel time, inadequate existing sodium bisulfite storage area, it is recommended that a

new chemical storage building be constructed to the east of the existing disinfection and effluent pumping structure.

The chemical storage building would be a slab on grade structure containing new chemical storage tanks and associated pumping systems for both sodium hypochlorite and sodium bisulfite. Each of these systems would be in a separate area with secondary containment within the building. Final effluent sampling and disinfection monitoring equipment could be located within this space.

As discussed in Section 3; the lime silo, slurry tanks and associated pumping equipment is beyond its useful life. In lieu of replacing this system in kind, it is recommended that a new liquid magnesium hydroxide chemical system be installed at the Rockland plant. This system would consist of two bulk storage tanks and associated pumping equipment. This equipment would be located in the new chemical storage building. Supplemental alkalinity would be pumped to the adjacent secondary treatment structure for injection into the RAS piping system.

The effluent pumping system was upgraded in 2015 and thus no improvements are recommended at this time.

4.6 SOLIDS HANDLING PROCESS

4.6.1 Anaerobic Digesters

The facility has four anaerobic digesters, two small digesters constructed in 1964 and two large digesters installed in 1977. The four digesters are located at the four corners of the digester complex. There has been minor rehabilitation work conducted on the digester with a single mixing system replaced in 2013 and a new heat exchanger in 2016. However, there are significant upgrade needs related to the tank covers and the biogas handling system. Currently, only one digester is in operation with a second smaller unit used for sludge storage prior to dewatering.

Anaerobic digestion reduces the volatile solids content of the sludge generated at the WWTP thereby reducing the total mass of sludge that subsequently needs to be removed offsite for final disposal. On average, the digesters reduce the total mass for disposal by approximately 40%, or approximately 3.25 wet tons per day. Currently, the Town of Rockland pays $120 per wet ton of

dewatered cake that is hauled offsite for disposal. Thus, the anaerobic digestion process eliminates approximately $142,000 per year in sludge disposal costs.

In January of 2018 a feasibility report entitled "Evaluation of the Feasibility of Combined Heat and Power at the Rockland Wastewater Treatment Plant" was submitted to the Town and the Massachusetts Clean Energy Center. The feasibility study evaluated the anaerobic digesters and specifically the cost-benefit of bringing in merchant sludge. The hauled-in merchant sludge could potentially provide a revenue source for the Town through sludge tipping fees and power generation. That report concluded that the existing general state of repairs required for the anaerobic digestion complex was cost prohibitive. As such, expansion of the anaerobic digestion complex to include the acceptance of merchant sludge was not recommended. This report did not evaluate the financial impacts of the rehabilitation requirements in comparison to a non-anaerobic digested sludge disposal option. It also did not evaluate the impact of return flows.

The majority of equipment and systems associated with the existing anaerobic digestion process are well beyond their useful life and need repair and replacement. Prior to evaluating alternative approaches to upgrading the anaerobic digestion process, a cost-benefit analysis was conducted as part of the WWTP assessment. The cost-benefit analysis focused on the capital and operational costs of upgrading and operating the anaerobic digestion process in comparison to the reduction in sludge disposal costs and the potential revenue from electricity generation. The following assumptions were included in the cost-benefit analysis:

- Annual sludge quantities were as defined by the BioWIN® process model
- 55% reduction in volatile suspended solids through the AD's
- Annual anaerobic digestion maintenance costs of $50,000
- 0.5 dedicated full-time employee for anaerobic digestion operation
- Sludge Dewaterability
    - 24% dry solids with an anerobic digestion process
    - 28% dry cake without an anaerobic digestion process
- Revenue potential with a CHP system
    - Assumed $220,000 in power generation potential (as defined in the 2018 report)
    - $10,000 in natural gas offset

It is very difficult to predict what the future disposal costs could be given the current sludge disposal climate (i.e., limited disposal outlet options, ongoing regulatory changes, etc.) As such, the annual estimated cost savings associated with the anaerobic digestion process was estimated across a range of potential disposal costs ($100/wet ton to $260/wet ton). Cumulative annual cost savings with anaerobic digestion (with and without an internal combustion engine for power generation) are presented in **Figures 4-13** and **4-14**. A negative value indicates that operation of the anaerobic digestion process would be more expensive than abandoning the anerobic digestion facility and dewatering the pre-digestion sludge and disposing of that material. Positive cumulative cost savings indicate that the anaerobic digestion process would reduce the annual WWTPWWTP operational costs. However, those values cannot be achieved without rehabilitation of the anaerobic digestion process and thus incurring the significant capital upgrade costs and subsequent annual debt retirement costs.

FIGURE 4-13

CUMULATIVE COST SAVINGS WITH ANAEROBIC DIGESTION

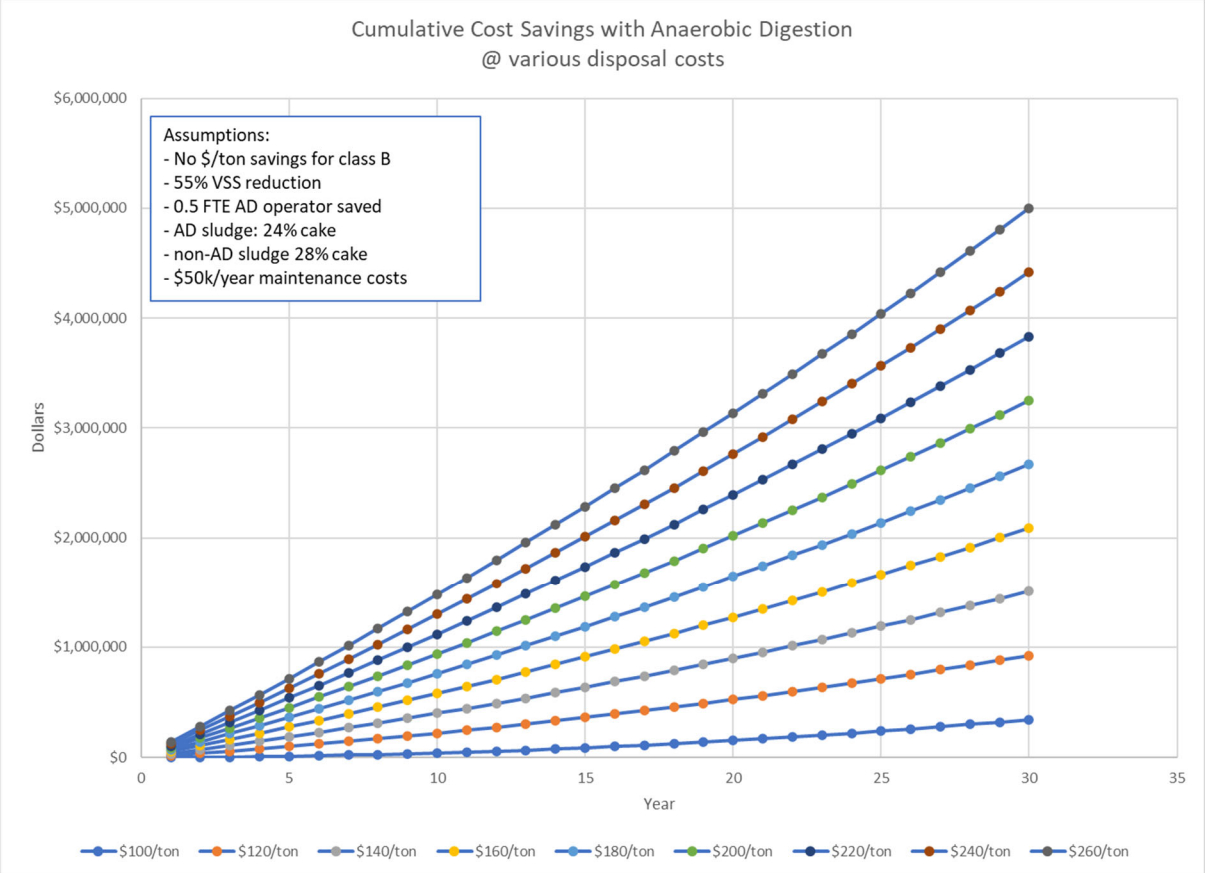
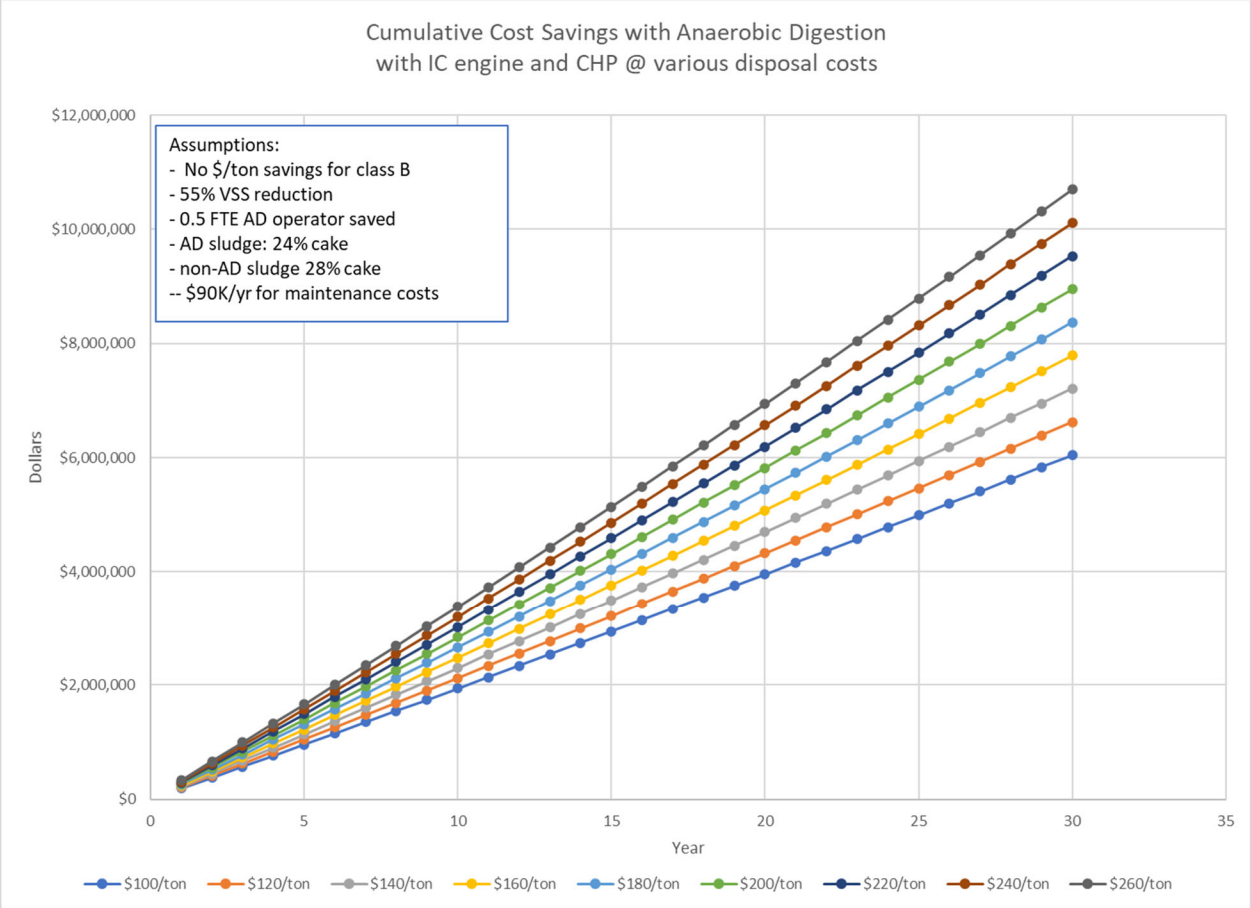


FIGURE 4-14
CUMULATIVE COST SAVINGS WITH
ANAEROBIC DIGESTION WITH IC ENGINE AND CHP



A detailed capital cost estimate to rehabilitate the anaerobic digestion complex was not conducted as part of the plant assessment. The 2018 feasibility study concluded that the capital cost to address the anaerobic digestion facility infrastructure was $6.7 M. The capital costs increase to $8.5 M if an internal combustion engine and combined heat and power system was included as part of the upgrade. Wright-Pierce concurs that these estimated capital costs are in the correct range of the required expenditure to address the condition of the existing anaerobic digestion complex.

Present worth costs were developed and include the summation of total capital costs and twenty years of annual O&M costs (net present value). The total project cost represents the difference in net capital cost of the anaerobic digestion process and a simplified solids handling scheme. A net

present value for operation and maintenance costs was determined based on a federal discount rate of 0.5% over 20 years. The present worth costs are as presented in **Table 4-11**.

TABLE 4-11

TOTAL PRESENT WORTH – ANAEROBIC DIGESTION

Alternative	Total Project Cost	Net Present Value	Total Present Worth
Anaerobic Digestion Process			
At a disposal cost of $120/cy	$4.4M	$0.9 M	-$3.5M
At a disposal cost of $260/cy	$4.4M	$5.0M	$0.6M
Anaerobic Digestion Process with a CHP system			
At a disposal cost of $120/cy	$6.2M	$6.6M	$0.4M
At a disposal cost of $260/cy	$6.2M	$10.7M	$4.5M

The anaerobic digestion process does reduce the total sludge required for offsite disposal and thus the annual sludge disposal fees incurred. However, the magnitude of those savings does not offset the cost to operate the anaerobic digestion process. If the sludge disposal costs increase in the future, as expected, the annual sludge disposal cost savings does offset annual operating costs. However, the existing anaerobic digestion system needs extensive rehabilitation to maintain satisfactory operation over the next 20 years. Ultimately, the annual debt retirement costs to address these issues results in a negative total present worth for each scenario analyzed, until costs for disposal reaches approximately $230/wet ton.

The anaerobic digestion process is an excellent process for the reduction of sludge and as a method to reduce operational costs. However, this process is rarely included at wastewater treatment plant the size of Rockland. Ultimately, the total amount of sludge produced at a 2.5MGD facility is not sufficient to warrant its inclusion. Given the magnitude of the capital costs to rehabilitate the anaerobic digestion costs and the negative total present worth of this alternative, rehabilitation of the anaerobic digestion complex is not recommended at this time.

It should be noted that due to ongoing regional market volatility regarding the location and availability of sludge outlets, it is possible that a rapid increase in the sludge disposal costs to materialize in the very near future. It is recommended that further investigation be conducted at the onset of the preliminary design phase (mid 2022) regarding the anaerobic digestion process. A final decision can be made at that time regarding future use and potential upgrades to the digestion process.

4.6.2 Alternative Solids Handling Configurations

Two alternative solids handling approaches were identified in lieu of retaining the anaerobic digestion process. The two alternatives are as follows:

- Alternative No.1: The existing Aeration Tank would be converted into two sludge storage tanks. A new wall would be constructed perpendicularly to create two independent sludge storage tanks. One for primary sludge and one for waste sludge. In this alternative tertiary sludge would be sent to the primary clarifiers for co-settling prior to being transferred to the primary sludge storage tank. Waste-activated sludge would be sent directly from the secondary treatment process to the waste sludge storage tank. Sludges from both tanks would be removed independently, mixed in a flocculation tank, and processed through a sludge dewatering device.

The primary sludge storage tank would include a supplemental mixing device, a cover, and an independent odor control device. The waste-activated sludge tank would remain uncovered. Sludge mixing would be accomplished via diffused aeration. The sludge pumps and blowers would be in the basement of the Administration Building.

- Alternative No. 2: This alternative would be almost identical to Alternative No.1, except waste activated sludge would be sent to a thickening device prior to being sent to the waste-activated sludge storage tank. Pre-thickening the waste-activated sludge has several benefits including reducing the size of the waste-activated sludge storage tanks and expanding the types of dewatering devices that could be considered as an alternative to the current belt filter press dewatering device. However, thickening the waste-activated sludge does increase the potential for odor generation in the sludge storage tank (due to dissolved oxygen transfer concerns) and

requires the installation of a mechanical thickening system, a thickened pumping system and an associated polymer system.

- Alternative No. 3: Convert small digester to gravity thickener for primary sludge thickening and storage. Convert the other small digester to waste activated sludge storage. Reuse the sludge dewatering feed pumps.

The existing activated sludge tanks are currently used to address periodic high flow events (they are used as peak flow equalization tanks). It is anticipated that through improvements to the plant hydraulics and secondary treatment process use of these tanks won't be necessary in the future for high flow management. However, the existing tanks are of sufficient size that only one of the existing tanks would be required for conversion for either Alternative No.1 or No.2. Thus, one tank would remain for high flow management, if desired. Alternative No. 3 would not impact the operation of the existing high flow management plant.

Alternative No.1 is recommended for implementation. Alternative No.1 will have a lower capital and lower annual operation and maintenance costs given the elimination of the waste-activated sludge thickening step. Alternative No. 3 is viable alternative, with similar cost implications, that should be considered during preliminary design.

4.6.3 Sludge Dewatering

The facility has two Belt Filter Presses (Ashbrook Klampress) that are used for sludge dewatering. Dewatered sludge is transferred from the Belt Filter Presses (BFP) via a belt conveyor system to disposal bins in the Sludge Removal Room. Once the bins are full, the dewatered sludge is hauled to the Synagro facility in Woonsocket, RI for final disposal. The BFPs were installed in 1994. The conveyor was installed in the last plant upgrade in 1977. The BFPs and sludge conveyor system are beyond their typical service life and need to be replaced.

The condition of the sludge impacts the performance and capabilities of the dewatering device. If anaerobic digestion is eliminated, there will be a few notable changes in the sludge characteristics including:

- An increase in the final dry solids content of the dewatered sludge

- An increase in the odor generation potential. This will be most evident in the disposal bins in the sludge removal room.

New Belt Filter Presses could be provided for sludge dewatering. The WWTP staff is very familiar with the belt filter press technology and the pros/cons of these types of systems. A new press can be designed as a two-belt or three-belt system to maximize dewatering performance. To address odor issues, belt filter press manufacturers have recently developed enclosures to minimize odors. However, there are many moving parts associated with belt filter presses and enclosures limit operator access, which makes equipment operation and maintenance difficult.

As the costs of sludge disposal have increased, the sludge dewatering market has moved toward equipment that can produce higher dewatered cake solids, thereby reducing transportation and tipping fee costs, as well as toward systems that do not require as much operator attention, thereby allowing for longer runtime hours. Dewatering operations at municipal wastewater treatment plants have increasingly upgraded to "enclosed-type" equipment due to the improved performance, health and safety, and odor control compared to the traditional belt filter press. Examples of “enclosed-type” dewatering options include centrifuges and rotary screw presses. Each of these types of dewatering technologies is described in the paragraphs below.

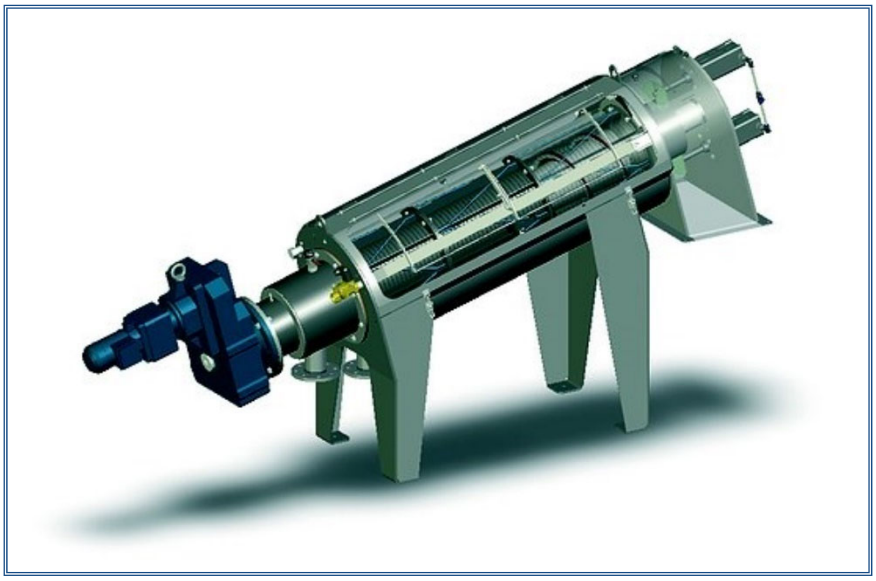
4.6.4 Rotary Screw Press

The rotary screw press (RSP) has been used extensively for dewatering municipal wastewater sludge. There are a number of manufacturers of the screw presses technology with considerable differences in their dewatering capabilities. As shown in Figure 4-15, this technology consists of feeding flocculated sludge into a horizontal or inclined screw (~20□) rotating inside a stainless steel, wedge wire or perforated screen. As the sludge is advanced up the screw, filtrate flows out through the screen. The frictional force at the sludge/screen interface coupled with increased pressure caused by an outlet restriction produces the dewatered sludge cake. The RSP technology was introduced into the European market approximately 20 years ago. Historically, this type of press has not been cost competitive in the municipal market due to the large sizes required to achieve the typical solids throughput. However, these units become more cost competitive when the dewatering is done over a longer period of time (10 to 16hr) or over a 24-hour per day continuous basis.

Screw presses typically achieve better sludge cake solids than belt filter presses and slightly lower than centrifuges. They typically have a larger footprint than centrifuges but smaller than BFPs.

The advantages of the screw press include fully enclosed, ease of operation with ability to fully automate, high solids content, low rotational speed, low energy requirements, moderate polymer requirements and low maintenance requirements. For high grit loadings, the low rotational speed is a significant advantage over centrifuges. The press is also completely enclosed minimizing odor control requirements. The unit is self-regulating to some extent and requires very little oversight during operation. The polymer feed rate is set proportional to the speed of the sludge feed to maintain the proper polymer ratio. The dewatering screw is designed to rotate very slowly gradually placing pressure on the sludge by decreasing the volume in the screw flight with water draining from the outside perforated cylinder.

FIGURE 4-15
HUBER INCLINED SCREW PRESS



4.6.5 Centrifuge

Centrifuges have had a long and strong presence in the municipal sludge dewatering market. In recent years, they have been the preferred dewatering technology for large facilities and have also

been used at a significant number of smaller facilities, particularly for secondary only applications without primary sludge.

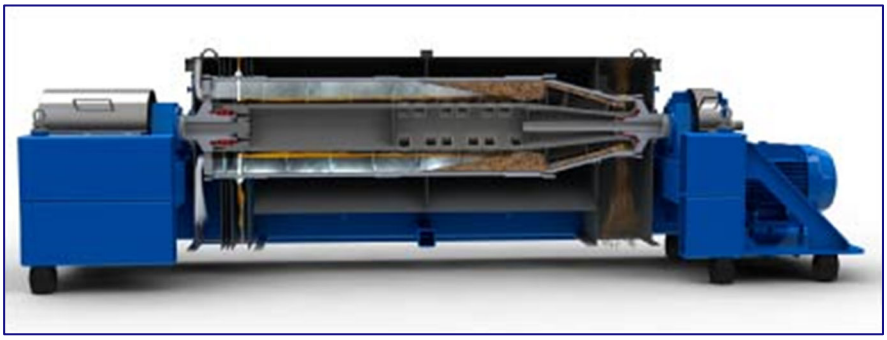
Centrifuge technology consists of feeding polymer flocculated sludge into a cylindrical bowl assembly rotating between 2,200 and 3,300 revolutions per minute (RPM). The solids are driven by centrifugal force to the bowl wall and then transported to the solids discharge chute via a screw feeder (scroll). Clarified liquid (centrate) flows backwards to the liquid discharge chute. Washdown can be automated and odor control is relatively easy on a centrifuge since it is enclosed. **Figure 4-16** shows a cutaway image of a typical dewatering centrifuge.

Modern centrifuges are self-regulating to some extent and thereby require less oversight during operation than previous equipment generations. Centrifuges are able to self-compensate for changes in feed solids by monitoring the torque and speed requirements of the inner scroll drive relative to the outer main bowl drive. In constant torque differential mode, the speed can be adjusted to remove or retain more solids as the weight of solids in the bowl changes. This reduces the need for oversight during operation of the centrifuge resulting in lower operating labor requirements. The constant torque mode provides more consistent cake solids.

A centrifuge is a highly sophisticated piece of equipment periodically requiring the replacement of the wear items and rebalancing. Factory servicing of the rotating assemblies (bowl, scroll and main bearings) is recommended. Thus, periodic extended down time needs to be planned for with one unit offline so that unexpected down time periods are minimized. Due to the high speed operation, centrifuge equipment problems are more likely to be severe enough to make the equipment unusable, whereas the other technologies being considered are prone to less acute problems that may diminish performance, but likely will still allow the equipment to be operated. For these reasons, equipment redundancy is a very important aspect to be considered in the design of a centrifuge system.

FIGURE 4-16

CENTRIFUGE CUTAWAY



4.6.6 Recommendation

It is recommended that the Town of Rockland replace the existing belt filter presses with an enclosed dewatering technology. Rotary screw presses and centrifuges are both applicable for use at the Rockland facility. However, Rotary Screw Presses do provide several advantages as noted below. Final selection of the dewatering technology can be delayed until the beginning of the preliminary design phase of the WWTP upgrades.

- The screw presses will have a lower energy cost per year. Furthermore, the motor size of the screw press will be significantly smaller than the centrifuge.
- The screw presses will have a lower polymer usage than the centrifuges.
- The screw presses will have lower annual maintenance costs
- The screw presses operate at a low rotational speed reducing internal wear and tear.
- Screw presses will perform better at the lower sludge feed concentration associated with solids handling Alternative No.1
- While screw presses will produce a significantly higher percent solids cake than belt filter presses, it will be slightly lower than the centrifuge technology.

It is recommended that the existing belt conveyor be replaced with a shaftless screw conveyor. The shaftless screw conveyor would be enclosed, minimizing odor release. A new odor control system is recommended. This system would pull odorous air directly from the screw press enclosure, screw conveyor enclosure and sludge garage.

4.7 ADMINISTRATION BUILDING

The Administration Building has been added to and modified several times since the original structure was constructed in 1966. This building provides space for administrative functions (i.e., conference room, office space, lunchroom, lockers, etc.) as well as process needs including a plant laboratory, dewatering area, chemical storage, and pumping systems. Space is also provided for maintenance and storage of equipment and spare parts in a first-floor garage space.

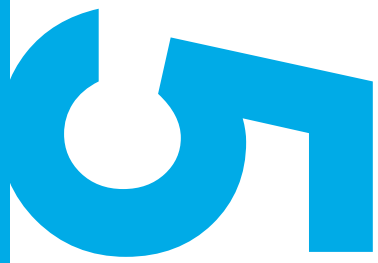
Recommended improvements to the building are in the building design memorandums which are in Appendix C. Improvements to the wastewater treatment processes located in this building have been summarized separately in the preceding sections of this report.

A new supervisory control and data acquisition (SCADA) is recommended. A SCADA system is a computerized system for gathering and analyzing real time data collected at various locations throughout the facility. A new fiber optic network (underground) would connect all the building and unit processes together. New local control panels with program logic controllers (PLC) would be provided at various locations to collect local data and control the various unit processes. A main control station would be provided in the Administration Building for real-time monitoring of the wastewater treatment plant.

4.8 ELECTRICAL BUILDING AND GARAGE

As summarized in the electrical assessment and recommendation memo (Appendix C), the Rockland WWTP should replace the entire existing electrical system. This includes replacement of all of the underground duct banks, individual building motor control centers, main switchgear, and generator.

The replacement of the plant-wide electrical systems is often one of the most difficult construction activities due to the need to construct the entire new electrical infrastructure prior to demolishing the existing one. To facilitate its replacement, a new electrical building is recommended. The new main switchgear and generator would be in this building. Given, the limited maintenance and garage space afforded in the Administration Building, it is also recommended that this building include new garage and maintenance space.



WRIGHT-PIERCE
Engineering a Better Environment

SECTION 5

RECOMMENDED PLAN AND PROJECT COSTS

5.1 INTRODUCTION

This section of the report presents the recommended facilities improvements/upgrades, estimated project costs, and proposed implementation schedule. As previously noted, the facility underwent its last major renovation in the early 1980s (construction drawings dated 1977). Therefore, virtually all of the recommended improvements not related to future nutrient limits, described herein, are necessary due to wear, age, and outdated/obsolete equipment systems.

5.2 RECOMMENDED IMPROVEMENTS

The Rockland WWTP needs an immediate upgrade to address aging infrastructure and provide capacity to meet growth needs and impending permit modifications. It is important to note that the majority of the equipment was installed as part of the 1977 upgrade and is now almost 40 years old and is well beyond the end of its useful life. As previously stated, most WWTPs undergo comprehensive upgrades every 25 years to address worn out equipment and systems. Furthermore, the existing WWTP infrastructure (tanks, buildings, electrical systems) have not been addressed since the 1977 upgrade and are also in desperate need of being addressed. This includes significant corrosion and concrete damage, inoperable mechanical HVAC systems, leaking roofs, water intrusion in the underground electrical duct banks, and various building and life safety code compliance issues. It should be noted that Suez has replaced various high priority pieces of equipment at the WWTP to maintain successful operation of the facility. While certainly beneficial and something that should be continued moving forward, these equipment replacements do not eliminate or delay the need for a comprehensive upgrade.

The consequence of failure varies from unit process to unit process. However, there are numerous very high priority items that could have severe ramifications if failure occurred prior to an upgrade. This includes the influent pump station electrical system, main electrical switchgear, mechanical aerators, RAS and sludge piping systems, nitrification settling tank sludge removal mechanisms, and various components within the anaerobic digestion complex.

It is recommended that the Town of Rockland undertake a comprehensive upgrade of the WWTP which should begin immediately. Based on the scope of needs at the WWTP, a comprehensive upgrade will be a multi-year process, resulting in further strain on the existing systems and equipment. Therefore, it is highly recommended that the Town immediately proceed with the development of a Comprehensive Wastewater Management Plan (CWMP) and the preliminary design of improvements. Typically, other communities have first proceeded with a CWMP followed by the design phase (as outlined herein). The completion of a CWMP and design phase services will take several years and require the existing WWTP equipment to continue to operate successfully for several more years. However, some communities have elected to proceed forward with a CWMP, and the design phase services concurrently as a method to reduce the total project schedule. A concurrent CWMP and design phase approach would reduce the overall schedule by approximately one year.

The recommended comprehensive upgrade would address the issues facing the WWTP and ensure successful treatment at the current and future estimated wastewater flows and loads. As previously identified, the annual average flow treated at the WWTP is just slightly below the facility's permitted flow capacity. An increase in the permitted flow capacity is not expected given the French Stream's water quality, flow volume, and impoundment locations. Therefore, aggressive removal of infiltration and inflow (I/I) should continue independent of the timing or scope of the WWTP improvements (enforce Town's 11:1 I/I removal program for new development municipal sewer connections). It is recommended that the Town of Rockland develop a Comprehensive Wastewater Management Plan (CWMP) prior to the WWTP upgrade design phase. The CWMP is one of several requirements that would position the Town for zero percent financing. The CWMP can include evaluation of remote treatment and/or effluent disposal options in addition to I/I reduction to manage WWTP permitted flows to achieve long term compliance with the WWTP's effluent permit.

The improvements summarized in Sections 3 and 4 of this report constitute a "comprehensive" upgrade. As identified in Section 4, it is recommended that the Town of Rockland abandon the existing anaerobic digestion process in favor of a simplified solids handling process. The estimated capital costs to upgrade this treatment component outweigh the annual cost savings achieved through reduced sludge disposal costs. There is significant volatility in the local sludge disposal

market. This is due to the changing landscape regarding PFAS chemicals and limited final sludge disposal locations. This volatility is likely to continue for the next few years. It is expected that sludge disposal costs will steadily increase from year to year. The current schedule includes initiating design related services in mid-2022. A detailed review of the anaerobic digestion cost-benefit analysis should be conducted at that time based on an updated understanding of the current sludge disposal market. This analysis should also reevaluate the financial implication of incorporating power generation independent of receiving merchant sludge. The current project cost estimate includes abandoning the anaerobic digestion process and upgrading the WWTP to a simplified solid handling scheme. Retaining and upgrading the anaerobic digestion process would add approximately $3.0M to $5.0M in capital project costs, depending on options chosen.

The Town of Rockland is also facing the prospect of a lower total phosphorus limit and a total nitrogen limit. Section 4 summarizes recommendations to achieve compliance with both parameters. As previously stated, an upgrade to the secondary treatment process is required due to capacity and equipment related issues. It is recommended that the Town move forward with a biological process that assists in the removal of these two parameters regardless of the timing of a future change to the current permit limit. It is almost certain that these parameters will be included in the facility permit within the 20-year planning window. A tertiary treatment process was identified as being a required wastewater component if the Town receives a 0.1 mg/l seasonal total phosphorus limit. A tertiary treatment process is not required to achieve compliance with the current NPDES permit. As such, this unit process could be installed later commensurate with the issuance of a 0.1 mg/l TP limit.

The presented tertiary project costs are based on the inclusion of a ballasted flocculation process to achieve permit compliance. This technology represents a conservative approach with respect to the estimated project costs. It is recommended that during the initial stages of the design phase of the WWTP upgrade, pilot testing be conducted to ascertain the actual site-specific phosphorus removal performance of cloth filtration technology. At this time, without actual site-specific pilot testing, it is unknown if cloth filtration can achieve consistent compliance with a 0.1 mg/l effluent total phosphorus limit. If proven successful, cloth filtration would represent a lower cost tertiary treatment solution.

The following summarizes the recommended improvements associated with a comprehensive WWTP upgrade:

- Screening and Grit Facility
  - Provide a new facility located upstream of the influent pump station
  - One new mechanical screen and associated wash press
  - One new vortex style grit removal system and associated grit washer
  - One new grit and screenings receiving roll off
- Influent Pump Station Modifications
  - Replace existing pumps and piping
  - Address structural issues in lower wetwell
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Primary Clarifier Modifications
  - Replace clarifier sludge removal mechanisms
  - Address tank structural issues
- Secondary System Modifications
  - Modify the secondary treatment process to an A2O process to achieve additional treatment capacity and biological nitrogen and phosphorus removal
  - Repurpose the existing secondary settling tanks to activated sludge tanks
  - Provide a new flow distribution structure
  - Provide new mixing system for anaerobic and anoxic zones
  - Provide new mechanical mixer/aerators for the oxic zones
  - Provide new blowers and associated blower building
  - Provide new internal recycle system
  - Provide new instrumentation and control system
  - Address secondary settling tank and nitrification tank structural issues
  - Provide new return and waste activated sludge pumps, piping and valves
  - Provide new mechanical/HVAC system for lower gallery
- Secondary Clarifier Modifications
  - Modify the effluent weirs to raise the tank water surface by three feet

  - Provide new sludge removal mechanisms
  - Address tank structural issues
- Tertiary Building
  - Provide a new tertiary treatment process for phosphorus removal
  - Tertiary treatment process will include two ballasted flocculation units complete with associated pumps, mixers, hydrocylcones, chemical feed and polymer system
  - Provide a new ferric chloride storage and feed system
- Chemical Building
  - Provide a new chemical building
  - New magnesium hydroxide storage and feed system for supplemental alkalinity.
  - New sodium hypochlorite storage and feed system
  - New sodium bisulfite storage and feed system
- Chlorine Contact Tanks and Effluent Pump Station
  - Address tank structural issues
  - Sludge Storage tanks
  - Repurpose the ex. aeration tank to two new sludge storage tanks
  - Provide aeration and mixing devices
  - Provide a tank cover and associated odor control unit
  - Address tank structural issues
- Administration Building
  - Provide new primary sludge piping and valves
  - Provide new dewatering and sludge transfer pumps
  - Provide new blower for sludge tank mixing
  - Demolish existing lime system
  - Demolish existing lower level chemical systems
  - Provide two new screw presses for sludge dewatering
  - Provide new polymer system
  - Provide new sludge transfer conveyor, truck loading system and odor control unit
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Garage and Electrical Building

- Provide a new electrical building with additional garage space
- Provide a new generator
- Provide a new main switch gear

- General
  - Provide a new electrical distribution system
  - Provide new site piping as required
  - Replace all existing motor control centers throughout the facility
  - Provide a new fiberoptic network and plant SCADA system
  - Address existing site lighting

5.3 ESTIMATED PROJECT COSTS

Planning level project costs have been estimated for the recommended facilities upgrades/improvements. Total project costs by major unit processes are presented in **Table 5-1**. The total project cost estimate for the comprehensive upgrade is presented in **Table 5-2**. The project cost estimate includes project costs related to the installation of a tertiary process. These planning-level costs were developed using standard cost estimating procedures consistent with industry standards utilizing concept layouts, unit cost information, and planning-level cost curves, as necessary. Total project capital costs include estimated construction costs to account for construction contingency, design, and construction engineering, permitting, as well as financing, administrative and legal expenses. The project cost information presented herein is in current dollars and is based on ENR Construction Cost Index 11625 (December 2020). The detailed construction cost estimate is provided in Appendix D.

Many factors arise during preliminary and final design phases (e.g., foundation conditions, owner selected features and amenities, code issues, etc.) that cannot be definitively identified and estimated at this time. These factors are typically covered by the allowances described above; however, this allowance may not be adequate for all circumstances.

For planning level cost estimate, the following assumptions and values were made:

- **Administrative and Legal Costs** – The administrative and legal costs are estimated to be approximately 1% of the total construction cost. This includes Town costs such as bond council and accounting services that are associated with the project.
- **Financing** – The Town will likely incur interim financing costs until the final loan is closed. 1.5% of the total project cost has been carried for interim financing costs.
- **Engineering Services** – The engineering services cost is estimated to be approximately 20% of the construction cost and is for all phases of engineering services associated with the project. The services include design, permitting, bidding, construction administration, onsite field observation (resident project representative), development of record drawings, development of the operation and maintenance manual, and commissioning phase services.
- **Contingency Costs** – There are two contingency costs – construction contingency (5%) to account for unexpected conditions in the field identified once construction starts, and design contingency (20%) to account for potential design changes necessary to address unforeseen or unaccounted for items. The contingency costs are a percentage of the total construction cost associated with the project.
- **Materials Testing Costs** – The materials testing costs are estimated to be approximately 0.5% of the total construction cost. This cost is for miscellaneous materials testing such as soils and concrete testing associated with the project.

TABLE 5-1

PROJECT COST ESTIMATE BY UNIT PROCESS

PROJECT COMPONENT	COST
Screening and Grit Facility (New)	$4,900,000
Influent Pump Station Modifications	$2,200,000
Primary Clarifier Modifications	$2,300,000
Secondary System Modifications	$13,400,000
Secondary Clarifier Modifications	$2,700,000
Tertiary Building (New)	$6,300,000
Chemical Building (New)	$1,900,000
Chlorine Contact Tanks and Effluent P.S.	$300,000
Sludge Storage Tanks	$2,300,000
Administration Building Modifications	$5,200,000
Garage and Electrical Building (New)	$3,200,000
General	$4,400,000

TABLE 5-2

TOTAL COST ESTIMATE – COMPREHENSIVE UPGRADE

PROJECT COMPONENT		COST
CONSTRUCTION		$38,240,000
CONSTRUCTION CONTINGENCY	5.0%	$1,910,000
ENGINEERING SERVICES	20.0%	$7,648,000
MATERIALS TESTING	0.5%	$191,000
ASBESTOS & LEAD PAINT ABATEMENT		$0
DIRECT EQUIPMENT PURCHASE		$0
LAND ACQUISITION/ EASEMENTS		$0
LEGAL/ ADMINISTRATIVE	1.0%	$382,000
SUBTOTAL		**$48,371,000**
FINANCING	1.5%	$726,000
ENGINEER'S ESTIMATE OF PROJECT COST[2]		$49,100,000

Notes:

1. Cost estimate is based on ENR INDEX 11625 12/2020
2. Cost estimate is based on eliminating the anaerobic digestion process in favor of an alternative solids handing scheme. Refurbishing the existing anaerobic digestion process would add an additional $3.0M to $5.0M to the total project cost.

5.4 IMPLEMENTATION SCHEDULE

The estimated project schedule for WWTP upgrades/improvements is shown in **Table 5-3**. The schedule is subject to change based on the Town's review and final selection of WWTP upgrades. It is assumed that the Town will take advantage of low interest financing through the Massachusetts Department of Environmental Protection (DEP) Clean Water State Revolving Fund (CWSRF) program. CWSRF loans have a standard term of twenty years and an interest rate of 2 percent. A CWSRF project can become eligible for a zero percent rate (for nutrient related portions of the upgrade, including Total Phosphorous reduction) if the community meets specific criteria. The five criteria are:

1) The project is primarily intended to remediate or prevent nutrient enrichment of a surface water body or a source of water supply.

2) The applicant is not currently subject, due a violation of a nutrient-related total maximum daily load standard or other nutrient based standard, to a department of environmental protection enforcement order, administrative consent order or unilateral administrative order, enforcement action by the United States Environmental Protection Agency or subject to a state or federal court order relative to the proposed project.

3) The applicant has a Comprehensive Wastewater Management Plan (CWMP) approved pursuant to regulations adopted by the Department of Environmental Protection.

4) The project has been deemed consistent with the regional water resources management plans if one exists.

5) The applicant has adopted land use controls, subject to the review and approval of the department of environmental protection in consultation with the department of housing and economic development and, where applicable any regional land use regulatory entity, intended to limit wastewater flows to the amount authorized under zoning and wastewater regulations as of the date of the approval of the CWMP.

It is recommended that the Town proceed with the development of a CWMP to position themselves for a loan through the CWSRF program (2 percent standard, 0 percent for the nutrient related portions of the project). The proposed schedule assumes the development of a CWMP in 2021, design phase engineering services in 2022, and construction beginning in early 2024. A two-year construction schedule has been assumed as part of this implementation schedule and completion of the upgrades in a single phase (vs. multiple project phases).

TABLE 5-3

PROPOSED SCHEDULE

MILESTONE	DATE
Completion of the WWTP Evaluation	Winter 2021
Town Appropriates CWMP Funding at Annual Town Meeting	May 2021
CWMP Development and Completion	July 2021 – June 2022
Town Appropriates Design Phase Funding at Annual Town Meeting	May 2022
Preliminary Design Phase Engineering Begins	July 2022
DEP SRF Loan Project Evaluation Form (PEF) Submitted	August 2022
Preliminary Design Report (30% design completion)	December 2022
Draft DEP SRF Loan Intended Use Plan (IUP) Notification	December, 2022
Final DEP SRF Loan IUP	January 2023
Final Design and Permitting Begins	January 2023
SRF Application Submission (90% Design completion)	By October 15, 2023
100% Design and Permitting Complete	December, 2023
DEP Issues Project Approval Certificate (PAC)	By December 31, 2023
Bidding	January 2024 - March 2024
Start Construction	April 2024
Substantial Completion of Construction	February - March 2026
Final Completion of Construction	April 2026
One-year Warranty Period	April 2027

WRIGHT-PIERCE
Engineering a Better Environment

A

MODIFICATION OF AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Town of Rockland
Board of Sewer Commissioners

is authorized to discharge from the facility located at

Rockland Wastewater Treatment Plant
South End of Concord Street
Rockland, MA 02370

to receiving water named

French Stream

in accordance with effluent limitations monitoring requirements and other conditions set forth in the permit issued on January 26, 2006, as modified by the conditions set forth herein in italics and summarized as follows:

Page 2, Flow Limit, and Page 4, Footnote Number 3., Flow Reporting Requirements

Pages 14, 15 and 16, Section F., COMPLIANCE SCHEDULES

This modification shall become effective April 1, 2007.

This permit modification and the authorization to discharge expires five years from the effective date of the permit, which was July 1, 2006.

Signed this 15th day of February, 2007

/S/ SIGNATURE ON FILE

_____
Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

_____
Director
Division of Watershed Management
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge from outfall serial number **001,** treated effluent to the French Stream. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS			MONITORING REQUIREMENTS	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE[2] TYPE**
FLOW LIMIT[3]	*2.5 MGD*	**********	**********	CONTINUOUS	RECORDER
FLOW REPORTING[3]	Report MGD	**********	Report MGD	CONTINUOUS	RECORDER
BOD_5[4] (October 1 - April 30)	20 mg/l 417 lbs/Day	20 mg/l 417 lbs/Day	30 mg/l[1] 626 lbs/Day	2/WEEK	24-HOUR COMPOSITE[5]
TSS[4] (October 1 - April 30)	20 mg/l 417 lbs/Day	20 mg/l 417 lbs/Day	30 mg/l[1] 626 lbs/Day	2/WEEK	24-HOUR COMPOSITE[5]
BOD_5[4] (May 1 - September 30)	6 mg/l 125 lbs/Day	6 mg/l 125 lbs/Day	10 mg/l[1] 209 lbs/Day	2/WEEK	24-HOUR COMPOSITE[5]
TSS[4] (May 1 - September 30)	10 mg/l 209 lbs/Day	10 mg/l 209 lbs/Day	15 mg/l[1] 313 lbs/Day	2/WEEK	24-HOUR COMPOSITE[5]
pH RANGE[1]	6.5 - 8.3 SU SEE PERMIT PAGE 7 OF 16, PARAGRAPH I.A.1.b.			1/DAY	GRAB
TOTAL CHLORINE RESIDUAL[6,7]	0.011 mg/l	**********	0.019 mg/l	1/DAY	GRAB
TOTAL CHLORINE RESIDUAL[6,7]	REPORT mg/l	**********	REPORT mg/l	CONTINUOUS	CONTINUOUS
FECAL COLIFORM[1,6]	200 CFU/100 ml	**********	400 CFU/100 ml	3/WEEK	GRAB
SETTLEABLE SOLIDS	**********	REPORT ml/l	REPORT ml/l	1/DAY	GRAB

CONTINUED FROM PREVIOUS PAGE

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge from outfall serial number **001,** treated effluent to the French Stream. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS			MONITORING REQUIREMENTS	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE[2] TYPE**
AMMONIA NITROGEN October 1 - March 31[8] April 1 - May 31[8] June 1 - September 30	 3.3 mg/l 2.5 mg/l 1.0 mg/l	 3.3 mg/l 2.5 mg/l 1.0 mg/l	 5.7 mg/l 5.7 mg/l 1.5 mg/l	2/WEEK	24-HOUR COMPOSITE[5]
PHOSPHORUS, TOTAL[8] April 1 - October 31 November 1-March 31[8]	 0.2 mg/l Report lbs/day 1.0 mg/l Report lbs/day	 ******** ******** ******** ********	 Report mg/l Report lbs/day Report mg/l Report lbs/day	 2/WEEK 1/WEEK	 24-HOUR COMPOSITE[5] 24-HOUR COMPOSITE[5]
ORTHOPHOSPHORUS November 1-March 31	 Report mg/l	 ********	 Report mg/l	 1/WEEK	 24-HOUR COMPOSITE[5]
COPPER, TOTAL	12 ug/l	*********	19 ug/l	1/MONTH	24-HOUR COMPOSITE[5]
ALUMINUM, TOTAL	88 ug/l	*********	REPORT ug/l	1/MONTH	24-HOUR COMPOSITE[5]
DISSOLVED OXYGEN (May 1 - September 30)	≥7.4 mg/l SEE PERMIT PAGE 7 OF 16, PARAGRAPH I.A.1.h			1/DAY	GRAB
WHOLE EFFLUENT TOXICITY SEE FOOTNOTES 9, 10, 11, and 12	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC ≥ 99%			4/YEAR	24-HOUR COMPOSITE[5]

The permittee shall follow the notification requirements found 40 CFR§ 122.41(m), see Permit Part II General Conditions, Section B.4.c., if a bypass of treatment occurs.

Footnotes:

1. Required for State Certification.

2. All required effluent samples shall be collected from the following locations:

Parameter	**Sampling Location**
Flow	(Influent) headworks building (ultrasonic probe) at Parshall flume
BOD, TSS	(Influent) headworks building just prior to Parshall flume. (Effluent) wetwell immediately following contact chamber
Ammonia, Total Copper, Total Phosphorus	(Effluent) wetwell immediately following contact chamber
TRC, pH, Dissolved Oxygen	(Effluent) cascade steps
Fecal Coliform	(Effluent) end of chlorine contact basin
Whole Effluent Toxicity (WET)	(Diluent) Summer Street bridge upstream from the receiving water. (Effluent) cascade steps

Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. All samples shall be 24 hour composites unless specified as a grab sample in 40 CFR §136.

All sampling shall be representative of the effluent that is discharged through outfall 001. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA.

3. ***The flow limit is expressed as a monthly average.***

*The permittee shall also report (**without limit**) the annual average flow, which shall be reported as a rolling average. The first annual average flow value will be calculated using the monthly average flow for the first full month ending after the effective date of the permit modification and the eleven previous monthly average flows. Each subsequent month's discharge monitoring report ("DMR") will report the annual average flow that is calculated from that month and the previous 11 months. The maximum daily flows for each month shall also be reported (**without limit**).*

4. Sampling required for influent and effluent.

5. A 24-hour composite sample will consist of at least twenty four (24) grab samples during a 24-hour consecutive period [e.g. 0700 MON- 0700 TUES].

6. Fecal coliform discharges shall not exceed a monthly geometric mean of 200 colony forming units per (cfu) 100 ml, nor shall they exceed 400 cfu per 100 ml as a daily maximum. This monitoring shall be conducted concurrently with the TRC sampling described below. Fecal coliform samples shall be taken 3 times per week and conducted concurrently with the TRC sampling described below.

   The permittee shall collect and analyze a minimum of one TRC grab sample per day for calibration purposes. The same daily grab sample can be used for both compliance and calibration. A comparison of the grab sample results to the continuous analyzer reading, including the time of the grab samples, shall be attached to the DMRs.

   The permittee shall also report the average monthly and maximum daily discharge of TRC using data collected by the continuous TRC analyzer. Four continuous recording graphs (1/week) showing weekly data or an equivalent alternative record that provides the same data, shall be submitted with the monthly DMRs.

   The permittee shall substitute three TRC grab sample per day, for any day that they are unable to comply with the continuous recording requirement.

7. The minimum level (ML) for total residual chlorine is defined as 20 ug/l. This value is the minimum level for chlorine using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G, or USEPA Manual of Methods of Analysis of Water and Wastes, Method 330.5. The permittee shall use one of these two methods or another approved method that has an equivalent or lower ML (see 40 CFR, part 136). For effluent limitations less than 20 ug/l, compliance/non-compliance will be determined based on the ML. Sample results of 20 ug/l or less shall be reported as zero on the discharge monitoring report.

8. **See Section F of this permit for a schedule of compliance.**

9. The permittee shall conduct chronic (and modified acute) toxicity tests four times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the daphnid, Ceriodaphnia dubia, only. Toxicity test samples shall be collected during the second week of the months of January, April, July and October. The test results shall be submitted by the last day of the month following the completion of the test. The results are due February 28th, May 31st, August 31st, and November 30th, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates Second week in	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**	**Chronic Limit C-NOEC**
January April July October	February 28th May 31st August 31st November 30th	Ceriodaphnia dubia (daphnid) See Attachment A	≥ 100%	≥ 99%

After submitting **one year** and a **minimum** of **four** consecutive sets of WET test results in one year, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

10. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

11. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "99% or greater" limit is defined as a sample which is composed of 99% (or greater) effluent, the remainder being dilution water. This is a maximum daily limit derived as a percentage of the inverse of the dilution factor of 1.01.

12. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment A Section IV., DILUTION WATER** in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required **in Attachment A**, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If this Guidance document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment A**.

The "Guidance Document" has been sent to all permittees with their annual set of DMRs and Revised Updated Instructions for Completing EPA's Pre-Printed NPDES Discharge Monitoring Report (DMR) Form 3320-1 and is not intended as a direct attachment to this permit. Any modification or revocation to this "Guidance Document" will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

Part I.A.1. (Continued)

a. The discharge shall not cause a violation of the water quality standards of the receiving waters.

b. The pH of the effluent shall not be less than 6.5 nor greater than 8.3 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.

g. The permittee shall submit the results to EPA of any additional testing done to that required herein if it is conducted in accordance with EPA approved methods, consistent with the provisions of 40 CFR §122.41(l)(4)(ii).

h. The dissolved oxygen level at the point of discharge must maintain a minimum of 7.4 mg/l.

2. All POTWs must provide adequate notice to the Director of the following:

a. Any new introduction of pollutants into that POTW from an indirect discharger in a primary industry category discharging process water; and

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For purposes of this paragraph, adequate notice shall include information on:

(1) the quantity and quality of effluent introduced into the POTW; and

(2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

B.1. Limitations for Industrial Users:

a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

b. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond.

Within (90 days of the effective date of this permit), the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (Attachment B) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval.

The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

B.2. Industrial Pretreatment Program

a. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR 403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

1. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

2. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

3. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

4. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

b. The permittee shall provide the EPA (and the MassDEP) with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 403.12(i). The annual report shall be consistent with the format described in Attachment C of this permit and shall be submitted no later than October 1 of each year.

c. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR 403.18(c).

d. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR 405 et. seq.

e. The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program.
The permittee must provide EPA, in writing, within 180 days of this permit's effective date proposed changes, **if applicable,** to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations.
At a minimum, the permittee must address in its written submission the following areas: (1) Enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The permittee will implement these proposed changes pending EPA Region I's approval under 40 CFR 403.18. This submission is separate and distinct from any local limits analysis submission described in the permit.

B.3. Toxics Control

a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

B.4. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

C. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from outfall 001. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and shall be reported in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting).

D. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

1. Maintenance Staff

   The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Preventative Maintenance Program

   The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges.

3. Infiltration/Inflow Control Plan:

   The permittee shall develop and implement a plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be submitted to EPA and MassDEP within six months of the effective date of this permit (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

   The plan shall include:

   - An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.

   - An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.

   - Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.

- An educational public outreach program for all aspects of I/I control, particularly private inflow.

- The permittee shall require, through appropriate agreements, that all member communities develop and implement infiltration and inflow control plans sufficient to ensure that high flows do not cause or contribute to a violation of the permittee's effluent limitations, or cause overflows from the permittee's collection system.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MassDEP annually, by the anniversary date of the effective date of this permit. The summary report shall, at a minimum, include:

- A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.

- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.

- A map with areas identified for I/I-related investigation/action in the coming year.

- A calculation of the annual average I/I, the maximum month I/I for the reporting year.

- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR §122.2).

E. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state or federal (40 CFR part 503), requirements.

3. The requirements and technical standards of 40 CFR part 503 apply to facilities which perform one or more of the following use or disposal practices:

   a. Land application - the use of sewage sludge to condition or fertilize the soil

   b. Surface disposal - the placement of sewage sludge in a sludge only landfill

   c. Sewage sludge incineration in a sludge only incinerator

4. The 40 CFR part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons- reed beds), or are otherwise excluded under 40 CFR 503.6.

5. The permittee shall comply with the 40 CFR, Part 503 regulations. A compliance guidance document is attached to help determine appropriate conditions. Appropriate conditions contain the following elements:

   - General requirements
   - Pollutant limitations
   - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   - Management practices
   - Record keeping
   - Monitoring
   - Reporting

   Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year:

less than 290	1/ year
290 to less than1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.

8. The permittee shall **submit an annual report containing the information specified in the regulations by February 19**. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not responsible for the ultimate sludge disposal.

   In such cases, the permittee is required only to **submit an annual report by February 19** containing the following information:

   - Name and address of contractor responsible for sludge disposal
   - Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

F. COMPLIANCE SCHEDULES

No later than April 1, 2010, *the permittee shall achieve compliance with the final cold weather limits for ammonia as nitrogen (October 1 through May 31) and the summer total phosphorus limit (April 1 -October 31). During the interim period, monitoring and reporting of total phosphorous and ammonia as nitrogen shall be performed in accordance with the requirements in Part A.1.*

During the interim period, the permittee shall achieve an average monthly total phosphorus limit of 1 mg/l during April 1-October 31, shall further optimize the removal of total phosphorus using existing equipment pursuant to requirements in item 1 below, and will be subject to earlier compliance dates for achieving the summer total phosphorous limit and the winter ammonia nitrogen limits if it is determined to be feasible pursuant to items 1 and 2 below.

During the interim period there is no cold weather interim limit for ammonia as nitrogen.

1. Phosphorus Removal Optimization Requirement

Upon the effective date of the permit, the permittee shall begin to develop a plan for determining the lowest effluent phosphorus concentration achievable by the existing facility. The plan shall include, at a minimum, the use of multiple dosing points for chemical addition, various dosage rates, increased monitoring of influent and effluent phosphorus concentrations, and a plan for minimizing influent phosphorus loading to the treatment facility. The permittee shall submit the plan within three (3) months of the effective date of the permit ***(note: the plan was submitted on September 28, 2006)*** *and implement the plan within three (3) months of its submittal, or upon approval by the agencies, whichever is sooner.*

The plan shall provide for a phosphorous removal study to be performed during one full phosphorus removal season (i.e. the study shall be performed during the months of April, May, June, July, August, September, and October) ***(note: the study must be completed by October 31, 2007)****.*

A final report documenting the results of the study shall be submitted by January 31, 2008. This final report shall include, at a minimum, the chemical dosage rates used, a summary of the influent and effluent phosphorus concentrations achieved, and an evaluation of whether the optimization of phosphorus removal at the existing facility is sufficient to consistently achieve the final monthly average phosphorus limit of 0.2 mg/l.

If the final report concludes that the final limit of 0.2 mg/l can be achieved by optimizing removal at the existing plant and minimizing influent loading, the final permit limit of 0.2 mg/l or less shall become effective on April 1, 2008.

If the final report concludes that the final limit cannot be achieved by the existing facilities, upgrades to the facility shall be completed according to the schedule in item 3 below.

2. Ammonia Removal Optimization Requirement

During the months of October 1, 2006 through May 31, 2007, the permittee shall operate the existing treatment plant in a manner consistent with optimizing removal of ammonia nitrogen. The permittee shall collect operational and effluent data during this period necessary to determine the treatment plant's ability to achieve the final winter permit limits for ammonia (i.e the final permit limits for the months of October through May). The permittee shall submit a report by August 31, 2007 which summarizes operational and effluent data collected during this period and concludes whether the existing facility is capable of achieving the final limits. If the permittee concludes that the facility can achieve the final limits , the limits must be achieved beginning on October 1, 2007.

If the final report concludes that the final limits cannot be achieved by the existing facilities, upgrades to the facility shall be completed according to the schedule in item 3 below.

3. Construction Schedule

a. By April 30, 2008, submit a plan for achieving the final limit(s) . The plan shall describe the treatment options evaluated, include preliminary cost estimates, and describe the selected treatment plant upgrades necessary to achieve the final effluent limits.

b. By March 31, 2009, complete plans and specifications for the necessary facility upgrades

c. By April 1, 2010 complete construction of necessary upgrades and attain

compliance with the final effluent limit(s).

4. Technology Scaling

Design of any facility improvements during the effective dates of this permit shall not preclude installation of technology compatible with achieving more stringent total phosphorus limits that may be set in the future.

G. MONITORING AND REPORTING

1. Reporting

Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the following month.

Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114

The State Agency is:

Massachusetts Department of Environmental Protection
Southeast Regional Office
Bureau of Resource Protection
20 Riverside Drive
Lakville, MA 02347

Signed and dated Discharge Monitoring Report Forms and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

Copies of all reports required to be submitted in Section B, "Limitations for Industrial Users and Industrial Pretreatment Program" shall be sent to:

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention - Industrial Wastewater Section
1 Winter Street
Boston, MA 02108

H. STATE PERMIT CONDITIONS

This discharge permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chap. 21, §43.

Each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event this permit or any portion of this permit is declared, invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit or any portion of this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

B

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Comprehensive WWTP Assessment and Evaluation

Workshop of the WWTP Preliminary Assessment and Solution Alternatives

December 11, 2020

W. Doug Hankins, PE
Edwin Castilla, PhD, PE

ROCKLAND, MA

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KO1

Agenda

- Evaluation of Existing Infrastructure
- Current and Design Flows and Loads
- Alternatives Analysis
  - Plant Hydraulics
  - Electrical Distribution
  - Solids Handling Process
  - Influent Pumping and Grit Removal
  - Clarification
  - Secondary Treatment System
  - Tertiary Treatment System
  - Chlorine Contact Tanks

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Evaluation of Existing Infrastructure

- Key Findings:
  - Other than some new rotating equipment (i.e., pumps), about 95% all of equipment at the plant should be considered past their life expectancy. This includes process, electrical, plumbing and mechanical HVAC systems.
    - Recommend equipment replacement
    - Recommend replacement of most above-grade piping and valves
    - Architectural review not completed yet
  - Mechanical Aerators – critical component, difficult to repair/replace – equipment failure would likely result in permit compliance issues
    - Develop plan for supplemental oxygen delivery to aeration tanks (AT) in event mechanical aerator fails prior to upgrade

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Evaluation of Existing Infrastructure

- Key Findings:
  - Influent Pump Station is a viable structure, no overt structural concerns
  - Significant structural cracking throughout the facility, in particular the nitrification tanks, secondary settling tanks and pumping galleries.
    - Cracks are all repairable – epoxy resin injection
    - Missing or not installed water stops – Elastomeric membrane applied to concrete
    - Some heightened structural concern with a location in nitrification pump gallery
  - National Electrical Code Issues
    - Lack of single disconnect for each Building
    - MCC locations within Buildings
  - National Fire Protection Assoc. Issues
    - Inadequate ventilation rates in critical areas

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Current Flows and Loads

- 2016 -2020 analyzed
- Current compound annual growth rates
  - Flow: 8.0% (significant seasonal variation)
  - TSS Load: - 0.7%
  - BOD Load: - 2.4%
- Annual Rate of Precipitation Increase: 14.2%
- Begin influent TKN sampling

TABLE 1-1
CURRENT INFLUENT FLOWS AND LOADS

Parameter	Flow		BOD_5			TSS		
	MGD	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day	1.13	0.46	98	926	0.25	129	1,216	0.24
Minimum Month	1.34	0.54	156	1,739	0.47	251	2,803	0.56
Annual Average	2.46	-	179	3,676	-	244	5,008	-
Maximum Month[1]	4.28	1.74	153	5,460	1.49	255	9,085	1.81
Maximum Month Loading[2]	3.39	1.38	193	5,460	1.49	321	9,064	1.81
Maximum Day[3] (98th %)	4.69	1.91	172	6,713	1.83	265	10,381	8.54
Maximum Day[4] (100th %)	6.09	2.47	260	13,211	3.59	504	25,560	5.10
Parameter	Temperature		NH3-N			Total Phosphorus		
	C	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day	8.89	0.56	30.08	283	0.60	1.63	15	0.21
Minimum Month	9.80	0.62			-			-
Annual Average	15.76	-	22.92	470	-	3.61	74	-
Maximum Month[1]	9.80	0.62	17.65	629	1.34	3.04	109	1.47
Maximum Month Loading[2]	9.80	0.62						
Maximum Day[3] (98th %)	22.22	1.41						
Maximum Day[4] (100th %)	23.33	1.48						

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Near Term Flows and Loads

- Can the WWTF handle the current approved and pending sewer connections?
- Yes
  - The existing WWTF can handle the additional load
  - Assumes no failure of critical equipment or systems (remember a lot of systems are beyond their current life expectancy)
  - Flow Compliance Issue

APPROVED, PENDING AND FUTURE SEWER BUILDOUT
FLOWS AND LOADS

Parameter	Flow		BOD_5			TSS		
	MGD	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day		0.00		0	0.00		0	0.00
Title 5 Unit Flows	0.23	1.67	200	392	1.67	200	392	1.67
Annual Average	0.14	-	200	235	-	200	235	-
Maximum Month	0.19	1.35	200	317	1.35	200	317	1.35
Maximum Month Loading	0.19	1.35	200	317	1.35	200	317	1.35
Maximum Day (98th %)	0.28	2.00	200	470	2.00	200	470	1.20
Maximum Day (100th %)	0.28	2.00						
Parameter	Temperature		NH3-N			Total Phosphorus		
	C	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day			0	0	0.00		0	0.00
Title 5 Unit Flows			26	52	1.67	7.00	14	1.67
Annual Average			26	31	-	7.00	8	-
Maximum Month			26	42	1.35	7.00	11	1.35
Maximum Month Loading								
Maximum Day (98th %)								
Maximum Day (100th %)								

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Design Flows and Loads

- The US Census Bureau population estimates would indicate a 0.39% annual population growth rate for the Town of Rockland.
- The Metropolitan Area Planning Council projected an 8% increase in the number of households in the Town of Rockland (from 2010 to 2030).
- Design Assumption:
  - 0.75% Annual Growth for a 30 year window
  - Increase of max hydraulic capacity from 6 mgd to 7 mgd
  - 25% Increase in total wastewater received

Rockland Wastewater Treatment Plant (Rockland, MA)
Design Year Flows and Loads

Parameter	Flow		BOD_5			TSS		
	MGD	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day	1.15	0.46	121	1,159	0.25	159	1,521	0.24
Minimum Month	1.36	0.54	192	2,176	0.47	310	3,507	0.56
Annual Average	2.50	-	221	4,600	-	301	6,266	-
Maximum Month[1]	4.35	1.74	188	6,832	1.49	314	11,368	1.81
Maximum Month Loading[2]	3.44	1.38	238	6,832	1.49	395	11,342	1.81
Maximum Day[3] (98th %)	4.76	1.91	211	8,400	1.83	1347	53,511	8.54
Maximum Day[4] (100th %)	7.00	2.80	283	16,530	3.59	548	31,982	5.10

Parameter	Temperature		NH3-N			Total Phosphorus		
	C	P.F.	mg/L	lbs/day	P.F.	mg/L	lbs/day	P.F.
Minimum Day	8.89	0.56	37.04	355	0.60	2.01	19	0.21
Minimum Month	9.80	0.62			-			-
Annual Average	15.76	-	28.23	589	-	4.44	93	-
Maximum Month[1]	9.80	0.62	21.73	788	1.34	3.75	136	1.47
Maximum Month Loading[2]	9.80	0.62						
Maximum Day[3] (98th %)	22.22	1.41						
Maximum Day[4] (100th %)	23.33	1.48						

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Expected Secondary and Tertiary Effluent Data

PARAMETER	Expected Secondary Effluent				Expected Tertiary Effluent	
	Annual Average	Max Month Winter	Max Month Summer	Peak Day	Nov 1–Mar 31	Apr 1–Oct 31
Flow, MGD	2.5	4.38	4.38	6.0	-	-
BOD_5, mg/L	< 15	< 20	< 10	-	< 10	< 5
TSS, mg/L	< 15	< 20	< 10	-	< 10	< 5
TN, mg/L	< 8.0	< 8.0	< 8.0	-	< 8.0	< 8.0
Ammonia, mg/L	< 1.0	< 1.0	< 1.0	-	< 1.0	< 1.0
TP, mg/L	< 1.0	< 1.0	< 1.0	-	< 1.0	< 0.1
pH	6.0-7.5	6.0-7.5	6.0-7.5	-	6.0-7.5	6.0-7.5
Temp, °C	16	9.8	17	-	9.8	17

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Big Picture

- Upgrade liquid process for biological phosphorus and nitrogen removal
  - Analyzed with and without anerobic digestion
- Tertiary phosphorus removal process required
  - Modify plant hydraulics or new effluent pump station required
- Electrical distribution
  - Recommend completely new infrastructure
- Anaerobic digestion cost-benefit analysis

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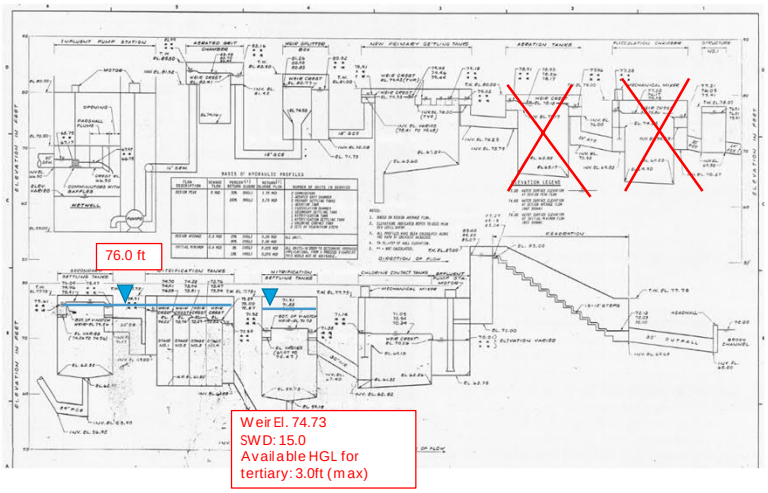
Plant Hydraulics – desired approach

- Keep primary clarifier at same elevation
- Raise water level in aeration tanks and secondary clarifiers
  - Increase from 12 ft. SWD to 15 ft. (A.T. and S.C.)
- 3.0 ft. available for Tertiary Process
- Eliminate piping bottlenecks
- Eliminate need for offline storage



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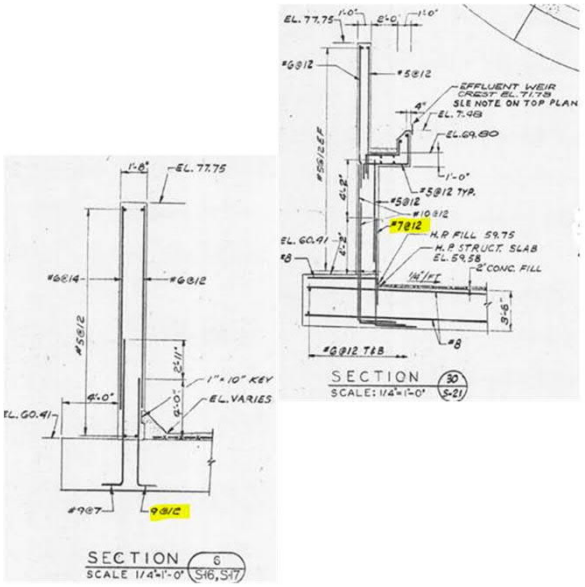
Plant Hydraulics – desired approach

- Aeration Tanks and Clarifiers
  - Still evaluating structural impacts of higher side water depth (SWD)
  - Fairly confident structures (with some minor improvements can handle higher SWD)
- If water level can't be raised, will need new effluent pump station
- For today's discussions, assume water level can be raised



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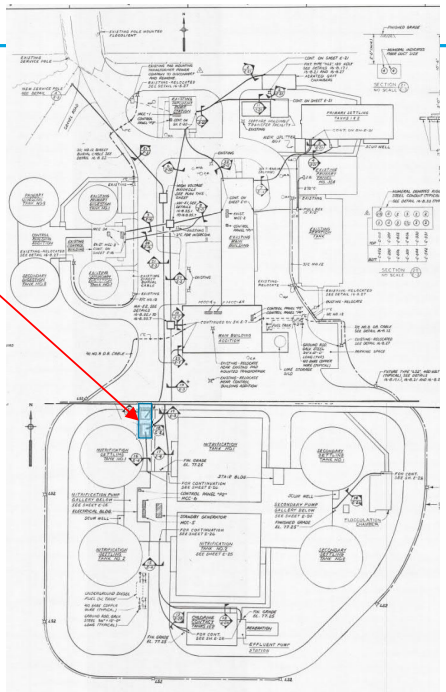
Electrical Distribution

- Main electrical feed to outdoor switchboard
  - Individual MCC's fed from this location
  - Needs to remain online while new electrical system is constructed
  - 1977 Vintage
- Need location for new switchboard
  - Indoor recommended
  - Close to new generator
  - Then install new conduits to existing electrical rooms and replace all MCC's
    - Addresses buildings with multi-feeds
    - Single disconnect



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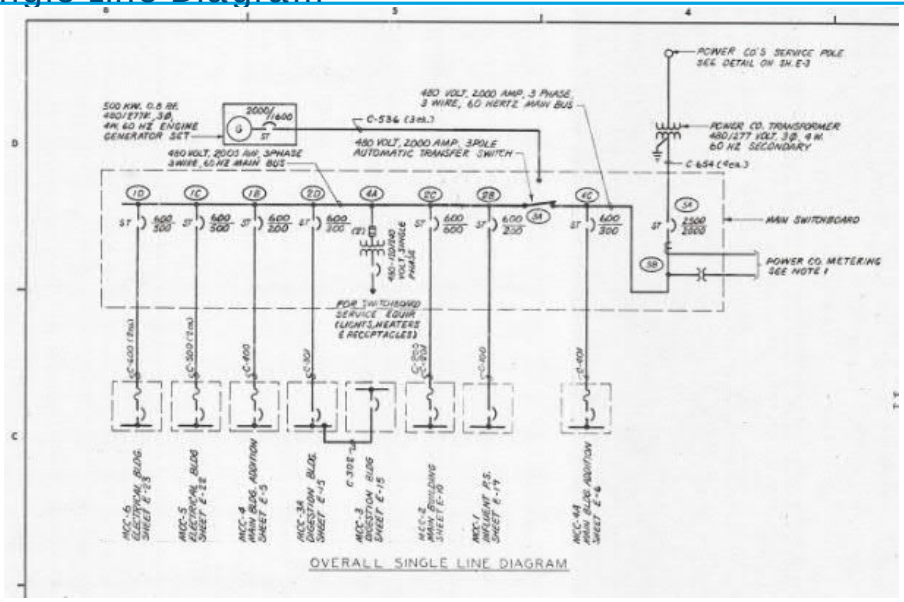
Overall Single Line Diagram



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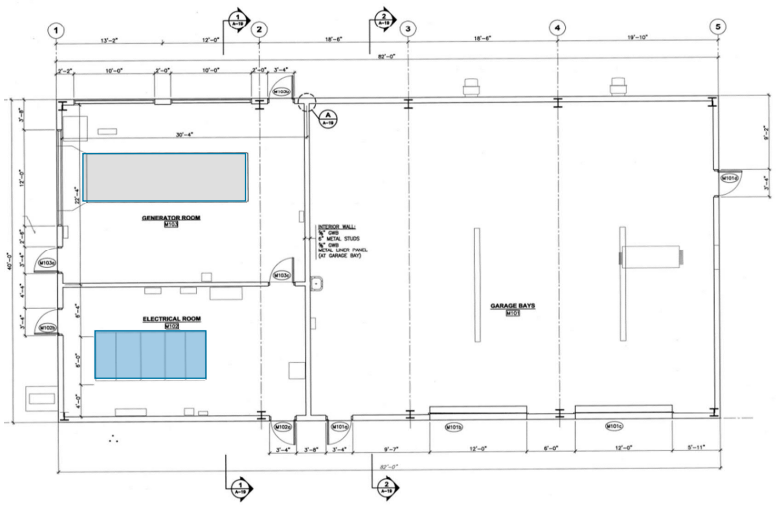
New Electrical/Garage Building

- Recommend new indoor location for switchboard
- Example from similar sized WWTP
  - New Indoor Generator
    - Exterior Fuel Tank
  - New Main Switchboard
  - Installed in metal pre-engineered building
  - Also include new garage space
- Generator can be located outside



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Electrical/Garage Building Example

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Electrical/Garage Building Example

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Electrical/Garage Building Location

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Anaerobic Digestion (AD) Facility

- Brown and Caldwell 2018 Report
  - Generally, agree with the improvements required
    - New covers, gas storage, pre-thickening step, piping, etc.
  - Cost estimates are in the right ballpark
- Issues
  - High capital cost to make viable for long term
  - High return of nitrogen loading
    - extra $ to reduce this TN loading
    - Post-AD treatment or expanded activated sludge process
  - High return of phosphorus loading (extra chemistry required)

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Anaerobic Digestion Facility

- Cost Implications
  - 2 Full-Time Employees
  - Natural Gas Use
  - Annual maintenance costs
  - Sludge Disposal Costs
    - Current: $100/ton
    - Future? $180 to $200/ton?
- Dewaterability
  - Current: 20% cake (excellent with digested sludge)
  - Without A.D's: 25% cake, or greater

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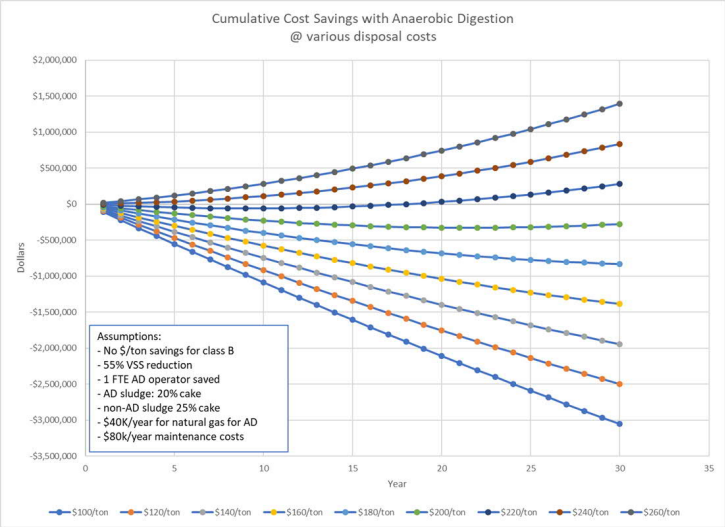
Anaerobic Digestion Cost Analysis

- Capital cost: $8.7M
- Net Present Value (NPV)
  - How much money Rockland would save with anaerobic digestion process
  - $100/ton: -$3 M
  - $260/ton: $1.4 M
- Present Value (Capital cost + NPV)
  - $100/ton: -$11.8 M
  - $260/ton: -$7.3 M



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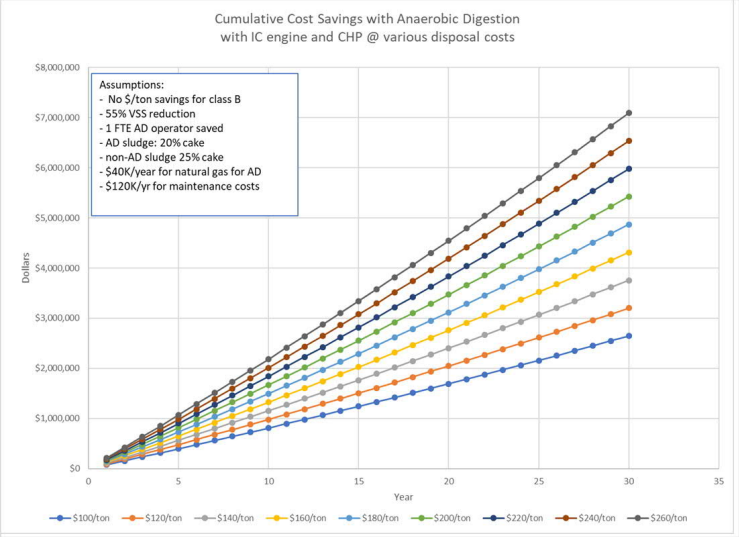
Anaerobic Digestion with Power Generation - Cost Analysis

- Capital cost: $9.8M
- Net Present Value (NPV)
  - How much money Rockland would save with anaerobic digestion process
  - $100/ton: $2.6 M
  - $260/ton: $7.1 M
- Present Value (Capital cost + NPV)
  - $100/ton: -$7.1 M
  - $260/ton: -$2.7 M



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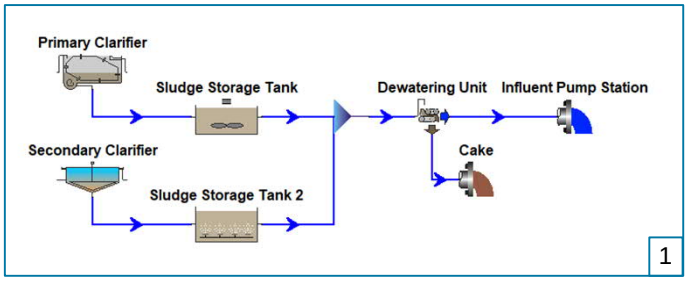
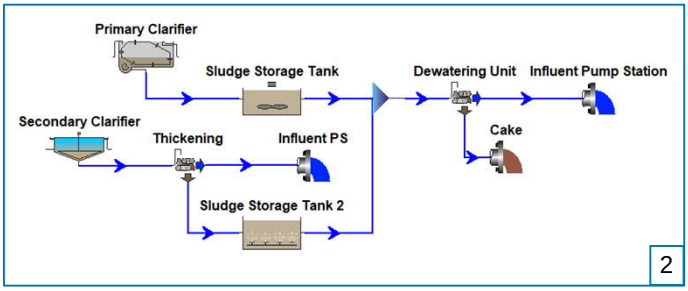
Alternative Solids Handling Configurations

- Option 1
  - Simplistic
  - Potentially large volume of waste activated sludge
  - Dewatering unit considerations
    - 1.5% feed sludge
    - Reduces types of units that can be used
- Option 2
  - Additional thickening and pumping step
  - Lower storage volume requirements
  - Thicker feed sludge to dewatering unit
- Tertiary sludge sent to primary clarifier
- Odor Considerations





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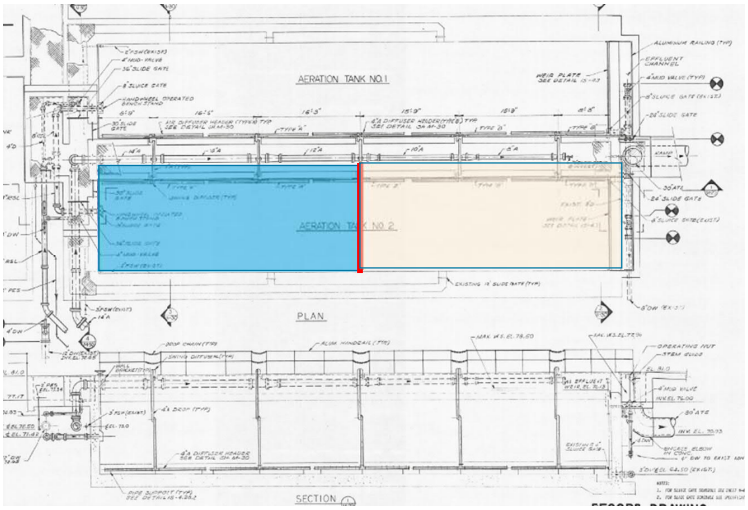
Sludge Storage Option 1

- 110,000 gal each
  - 14 ft. wide x 13 ft. deep x 81.5 ft.
- WAS - Design Max month:
  - 2,730 lbs./day at 0.9% = 30,000 gpd
- Primary Sludge - Design Max Month:
  - 5,000 lbs./day at 2.5% = 23,000 gpd
- 3 to 4 days of storage capacity recommended
  - Pumps located in basement of Admin. Building



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Sludge Storage Option 2

- Anerobic Digestion Building
  - Sludge Mixing and Storage Equipment
  - Sludge Thickening Device
- Sludge Digesters
  - Very Large for Sludge Storage

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Dewatering Options

- Screw Press
  - Slow speed
  - Enclosed vessel (covers removed in pics)
  - Typically operated unattended for 12-20 hrs./day
  - Can handle "dilute" sludge
  - Low connected horsepower

- Discussion Points
  - Desired run time, days/week and hours per day
  - Level of Redundancy

- Alternative Technologies
  - Centrifuge and Belt Filter Press

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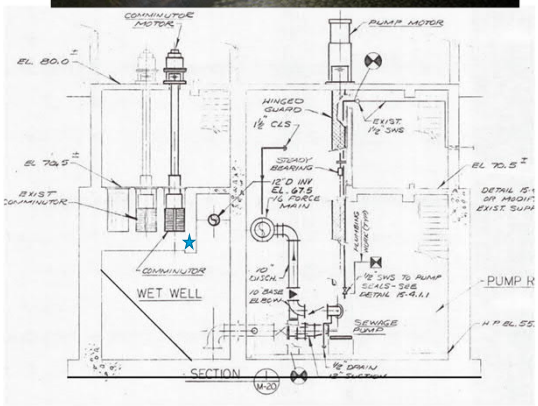
Influent Pump Station

- Wet Well Condition
  - Concrete fill protecting the exterior wall
  - No visible exposed rebar
  - Interior wall "doesn't look that bad"
  - Concern with the Beam (blue star)

- Recommendations
  - Bypass wet well, resurface concrete, place pump station back into service
  - New pump station would be very expensive due to structure depth
  - Provide mechanical screening in new upstream structure
  - Improved ventilation and isolated electrical area



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Influent Grit Removal

- Only 1 Existing unit (redundancy)
- Designed appropriately (tank geometry)
- Typically, decent at capturing large heavy grit, but less so lighter/fine grit
- Grit removal options
  - Replace clamshell grit bucket
  - Chain and flight
  - Screw conveyor

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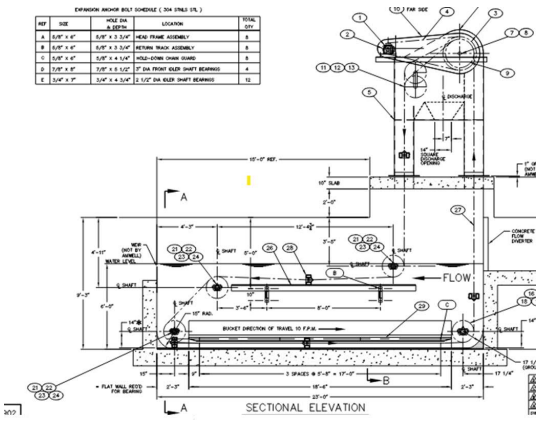
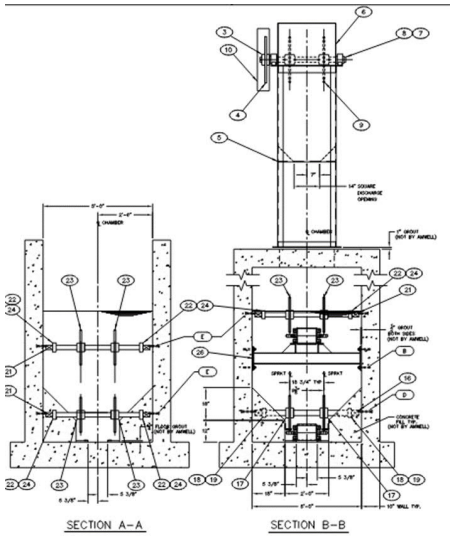
Influent Grit Removal

- Chain and Flight Option





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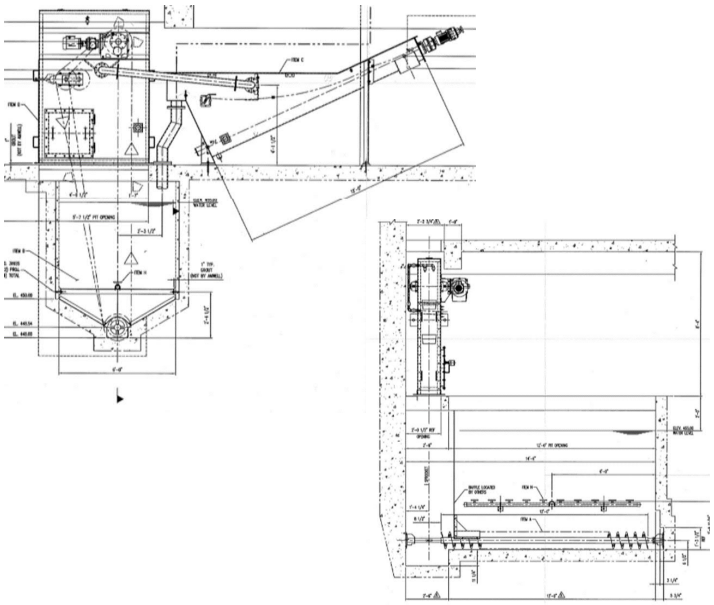
Influent Grit Removal

- Screw Conveyor Option
  - We have not had good luck with grit bucket elevators
  - Could provide submersible pump in lieu of elevator



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Influent Grit Removal

- Grit material transported to a grit classifier for washing and compaction
  - Reduces odors
  - Reduces volume
- Can be used with either the chain and flight or screw conveyor option
- Indoor installation required for New England

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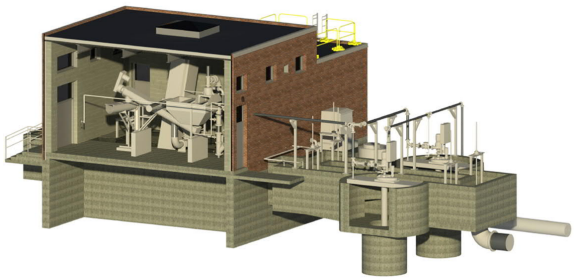
Influent Grit Removal

- Vortex Grit Removal Option
  - 1 or 2 units
  - Can be located indoor or outside
  - Better at capturing fine grit particles
  - Grit washer and compactor unit
- Located after the influent pump station
- Requires upstream screening
- More expensive than retrofitting existing aerated grit



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Primary Clarifiers

- Complete replacement of all internal equipment
  - Lower sludge hopper screw
- Concrete in decent shape
- Eliminate co-settling of waste sludge
  - Retain chemical addition prior to clarifiers
  - Tertiary sludge addition
  - Chemical in tertiary sludge will enhance phosphorus and TSS removal
- Adequately sized for current and future flows

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Secondary Clarifiers

- Complete replacement of all internal equipment
  - Drive mechanism, sludge scrapers, walkway
  - Increase size of EDI well
  - Increase side water depth by raising effluent weir
- Total Capacity (at 15ft SWD)
  - 6 mgd continuously for one day
  - 6 to 7 mgd (short duration only)
- Replace with rapid sludge withdrawal type mechanism
- Enhanced MLSS Settleability with BNR Process
  - Eliminate effluent polymer use

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Secondary Treatment – Big Picture

- Existing Activated Sludge Process
  - Tanks are too small for conventional BNR process
  - Clarifiers are shallow
  - Mechanical aerators are critical component
- Alternatives Considered
  - Expansion into unused settling tanks
  - Installing technology in existing tanks to increase biomass population
- Anaerobic Digestion Impacts
  - Nitrogen loading very high
- High Flow Considerations
  - Keep operating MLSS down
  - Enhance MLSS settleability

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Secondary Treatment Alternatives

- Conventional Process
  - Alternative 1 : Activated Sludge
    Anaerobic/Anoxic/Aerobic Configuration
- Technology Assisted Process
  - Alternative 2 : Integrated Fixed-film Activated Sludge (IFAS)
    Anaerobic/Anoxic/Aerobic Configuration
  - Alternative 3 : Membrane Aerated Biofilm Reactor (MABR)
    Anaerobic/Anoxic/Aerobic Configuration
  - Alternative 4 : Membrane Bio-Reactor (MBR)
    Anaerobic/Anoxic/Aerobic Configuration

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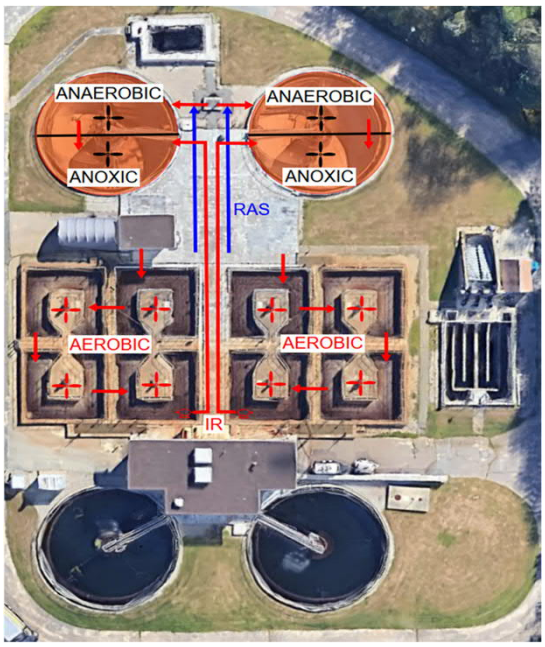
Secondary Treatment Alternative 1

Activated Sludge

- Anaerobic/Anoxic/Aerobic Configuration
- Secondary settling tanks converted into Anaerobic and Anoxic zones
  - Bio-P and TN removal
- Surface Aerators replaced by new aeration device
  - All zones aerated
- Internal recirculation for denitrification



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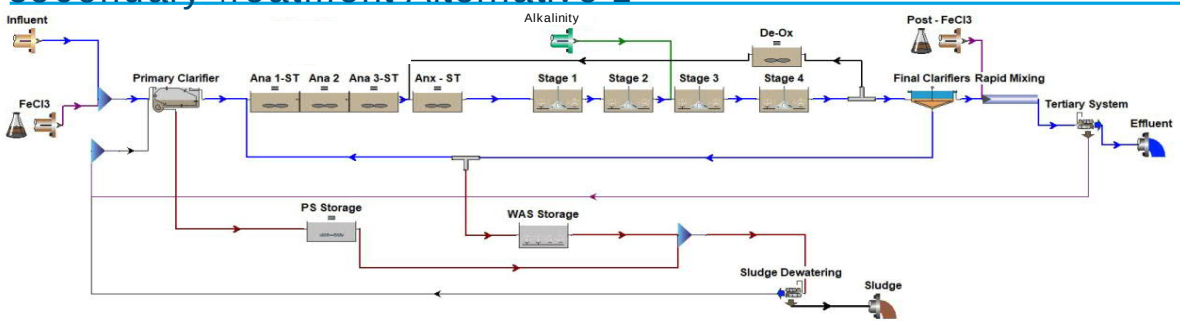
Secondary Treatment Alternative 1



Activated Sludge – Anaerobic/Anoxic/Aerobic Configuration

- Improved biological phosphorus and nitrogen removal
- Anaerobic zone that maximizes Bio-P
- Reduced ferric chloride addition
- Nitrification/Denitrification
- Additional carbon source for denitrification
- Better DO control to reduce aeration cost

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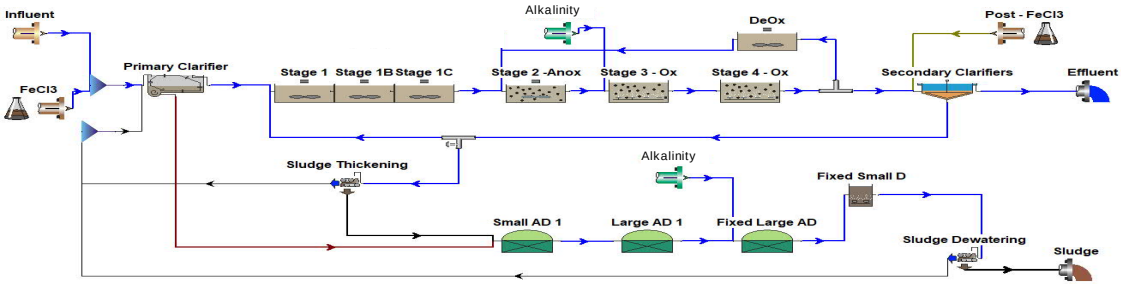
Secondary Treatment Alternative 2



Integrated Fixed-film Activated Sludge (IFAS) Anaerobic/Anoxic/Aerobic Configuration

- Can be implemented in the nitrification tanks
- Requires more ferric chloride addition than Alternative 1
- Requires more aeration capacity
- Operates at similar MLSS concentration as Alternative 1
- Requires internal screening
- Proven technology used in industrial/municipal WWTP

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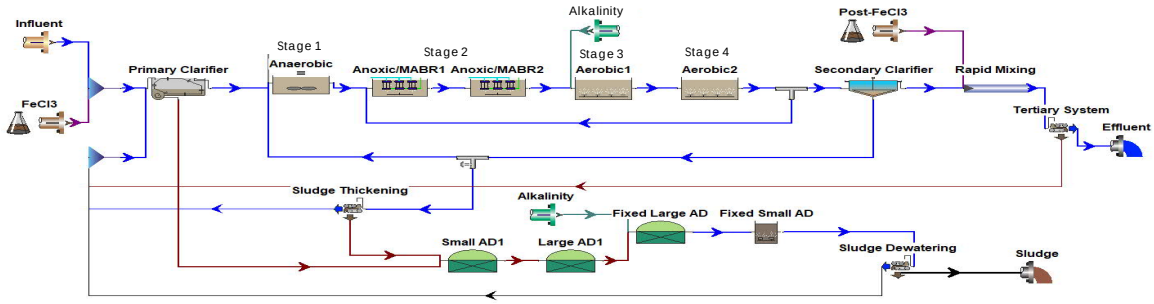
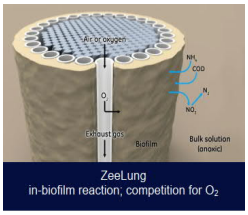
Secondary Treatment Alternative 3



Membrane Aerated Biofilm (MABR) Anaerobic/Anoxic/Aerobic Configuration



- Can be implemented in the nitrification tanks
- Requires more aeration capacity
- Efficient oxygen transfer
- Operates at much higher MLSS concentration than Alternative 1
- it requires additional secondary clarifier
- New technology with limited experience

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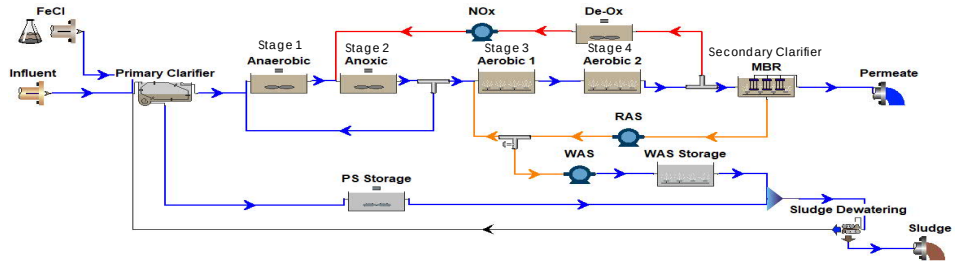
Secondary Treatment Alternative 4



Membrane Bio-Reactors (MBR) Anaerobic/Anoxic/Aerobic Configuration

- Can be implemented in the nitrification tanks
- Membranes can be installed in the secondary clarifiers
- Requires bigger aeration capacity
- Requires more mixed liquor recirculation
- Highest operational cost
- Proven technology used in industrial/municipal WWTP (FL, CA, GA, etc.)
- Mostly used in wastewater reuse applications

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Secondary Treatment Alterantives Summary

- Existing Unused Settling Tanks
  - Viable structures, minor rehab work req'd
  - Extra volume for conventional BNR
  - Sufficient capacity for future flows and loads
- Technology Assisted Processes
  - All can be retrofitted into existing Aeration Tanks
  - "Tight squeeze" – not a lot of extra capacity achieved
  - MBR – not recommended due to operational costs
  - MABR – viable but still in initial development stage
  - IFAS – viable, well developed process
- Future Considerations
  - IFAS could be implemented in combination with unused settling tanks to achieve additional capacity of nutrient removal beyond current project requirements.

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Secondary Treatment Alternative Comparison

Alternative 1: Activated Sludge

- Can achieve nutrient goals and capacity requirements
- Will develop a better settling MLSS than current process
- Requires additional volume (settling tanks) for anaerobic and anoxic zones
- Can be retrofitted with IFAS in the future for additional capacity of lower TN levels (if needed)

Alternative 2 : Integrated Fixed-film Activated Sludge (IFAS)

- Can achieve nutrient goals and capacity requirements
- Can be implemented in the nitrification tanks,
- More complicated process to operate
- Slightly higher operating costs than the conventional activated sludge process
- Higher capital cost – approx. $2.5 to $3.5M higher than conventional

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Aeration System Comparison

Mechanical Surface Aerators

- Less energy efficient
- Lower DO control for Bio-P process

Fine Bubble Diffusers

- Mixing and aeration cannot be separated
- Difficult low DO control for Bio-P process
- Reduced oxygen transfer in shallow tanks – not recommended if SWD less than 15 feet

Hyperboloid Aerators/Mixers

- Decouples mixing from aeration
- Provides an excellent DO control – Variable Frequency Drive (VFD)
- Similar oxygen transfer to fine bubble (at 15 ft. SWD)
- Easy to implement in existing platforms

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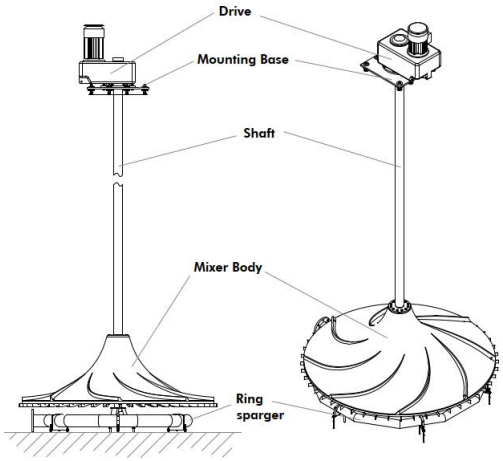
Aeration Upgrade

- Mixer/Aerators
- Blowers
- Aeration Piping

Mixer/Aerators – Technology Overview

- Non clogging Hyperboloid body
  - Integrated transport fins
  - Stainless steel shear ribs
- Vertical shaft with motor and mounting base
- Air sparge ring connected to air supply



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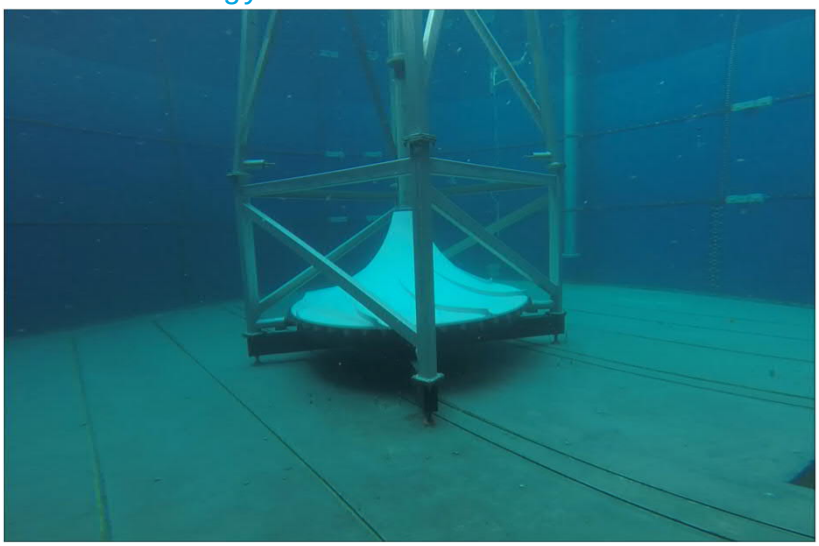
Aeration Upgrade

Mixer/Aerators – Technology Overview



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Tertiary Treatment Alternatives

Alternative 1 : Ballasted Flocculation/Clarification

Alternative 2 : Cloth Filtration

Alternative 3 : Reactive Media Filtration

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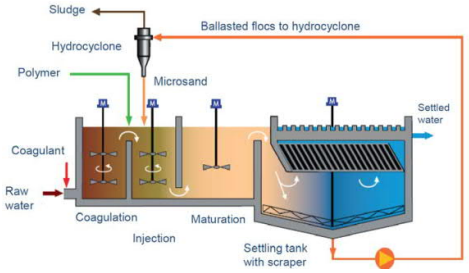
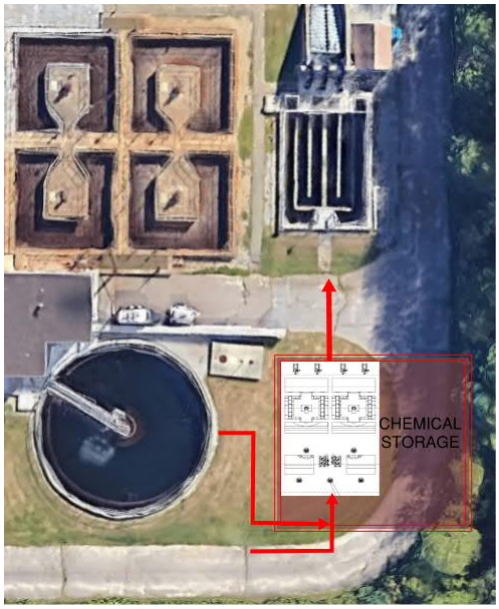
Tertiary Treatment Alternative 1

Ballasted Flocculation/Clarification

- High-rate clarification that uses micro-sand
- Requires coagulant (ferric chloride), polymer and micro-sand
- Low hydraulic losses – can fit within 3 ft. HGL
- Continuous discharge of chemical sludge





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Large Ballasted Flocculation Installation

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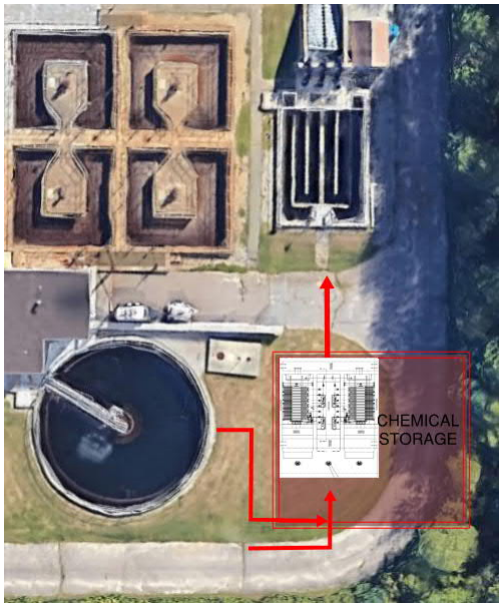
Tertiary Treatment Alternative 2

Cloth Filtration

- Requires rapid mixing and flocculation tank
- Requires coagulant (ferric chloride), but no polymer
- Moderate hydraulic losses – probably can fit within 3 ft. HGL
- Periodic backwashing of chemical sludge



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Disk Filter Installation

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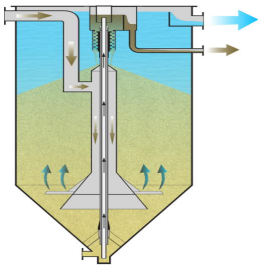
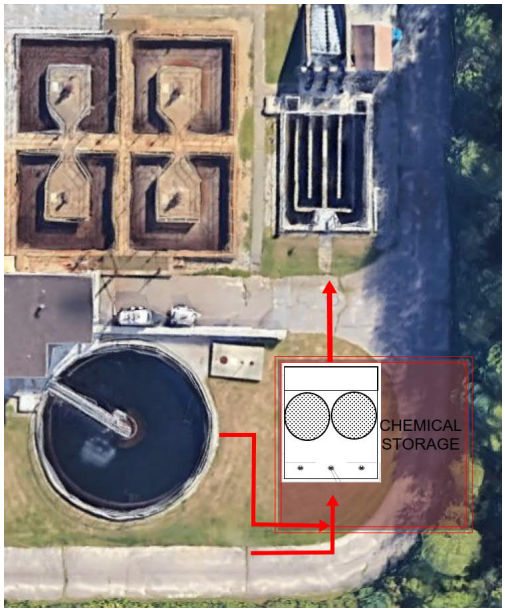
Tertiary Treatment Alternative 3

Reactive Media Filtration

- Requires rapid mixing and flocculation tank
- Requires coagulant (ferric chloride)
- High hydraulic losses – new pump station required
- Continuous backwashing of chemical sludge





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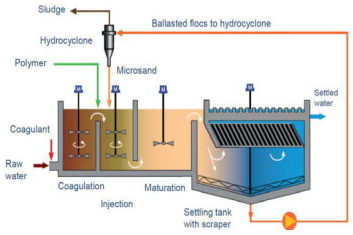
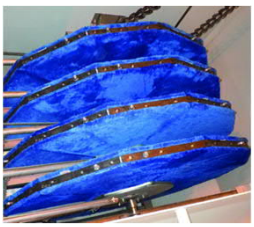
Tertiary System Comparison



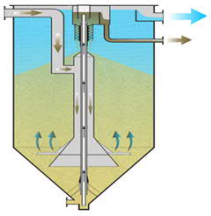
Ballasted Flocculation

- Can achieve 0.1 mg/l TP effluent
- Lowest head loss alternative
- Highest chemical demand
- Most complicated process
- Smallest footprint
- Doesn't mind solids carryover from activated sludge process



Cloth Filtration

- Has been shown to achieve 0.1 mg/l TP effluent
- Gravity flow-through possible without new pump station
- Minimum solids carryover desired
- Medium chemical demand
- Larger Footprint
- Simple process



Reactive Media Filter

- Can achieve 0.1 mg/l TP effluent
- Simple Process
- Doesn't like solids carryover
- High hydraulic requirements – will require new pump station
- Low chemical demand

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Chlorine Contact Tanks (CCT)

- Two Units, each approximately 32,000 gallons
  - HRT: 36 min @ 2.5 MGD
  - HRT: 30 min @ 3.1 mgd
  - HRT: 18 min @ 5.0 mgd
- State will require 30-minute Hydraulic Retention Time (HRT)

> When evaluating whether an expansion of contact tank volume is required, it is permissible to "grandfather" an existing chlorine contact chamber, providing less than 30 minutes of contact time at peak flow, if historical plant data justifies sufficient, reliable disinfection at lower contact times. If increased flow is anticipated, field testing should be performed to demonstrate how the existing chlorine contact tank will permit reliable disinfection at the expected peak flow.

- Structure is in decent shape

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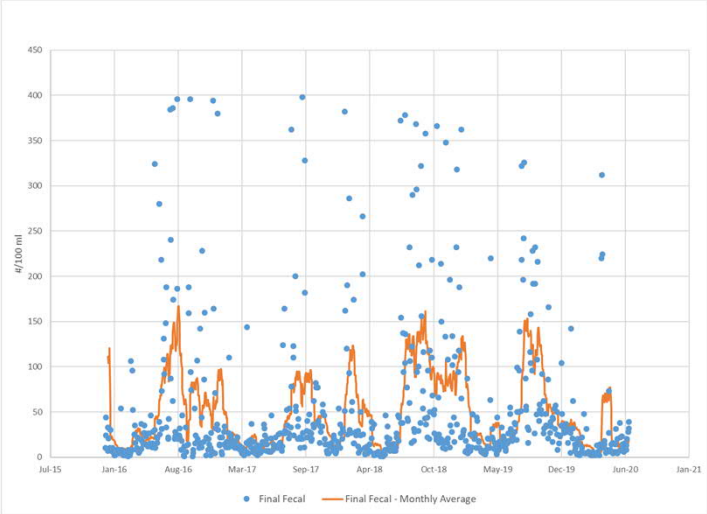
Current CCT Performance

- Chlorine Dose
  - Ave: 2.11 mg/l
  - Max: 5.7 mg/l
- Good Performance
- Low effluent TSS helps
- Effluent TSS will be lower in future with Tertiary system



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THANK YOU

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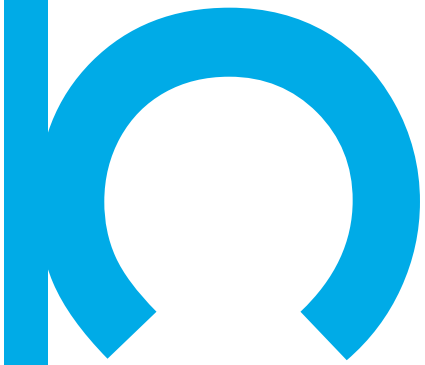

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MEMORANDUM

TO:	Doug Hankins, Project Manager	**DATE:**	11/30/2020
FROM:	Cathy Michaud, LEED AP, AIA	**PROJECT NO.:**	20395A
SUBJECT:	Rockland Wastewater Treatment Facility, Rockland, MA Architectural Assessment Recommended Upgrade Improvements		

General Description

The Rockland Wastewater Treatment Facility site consists of multiple buildings and structures required to treat wastewater for the community of Rockland, MA. The plant was originally constructed in the 1960's then added to in 1977. The administrative building was then again upgraded in 2000.

Potential new structures include Influent Pump Station, Screening and Grit Removal, Tertiary Treatment, Chemical Storage and Maintenance Garage. Additional upgrades and equipment replacement are also planned within the existing structures. Architectural upgrades will include replacement of failed architectural items such as roofs, windows, doors and finishes along with modifications and repairs necessary to complete the process upgrades.

The construction types of the buildings vary and are described in detail below.

General Comments

Maintenance at the site has mainly been limited to the major upgrade projects and because of that, condition of the buildings declines greatly with age. Generally, the buildings constructed in the 1964, 1977 projects are in fair condition. The 2000 addition to the administrative building is good condition with the exception of leaks in the roof and a few minor issues.

All of the caulking in the exterior walls has become brittle and failed. All caulking should be removed and reapplied. The roofs on the buildings around the administrative building are in fair condition. The windows, doors and hardware on the all buildings aside from the addition to the administrative building have reached their life expectancy and are in poor condition and should be removed and replaced.

Governing Codes

Currently the governing building code in Massachusetts is the 8th Edition Base Code. This code includes:

- 2015 International Building Code as Amended
- 2015 International Existing Building Code as Amended
- 2015 International Energy Conservation Code as Amended

Many of the buildings/spaces at the Rockland Wastewater Treatment Facility are normally unoccupied spaces and designed solely for housing equipment necessary for the treatment of wastewater. As unoccupied spaces, the principals of the Uniform State Plumbing Code as listed in 248 CMR 10.02 do not apply and plumbing fixtures are not required in these spaces. 521 CMR – MA accessibility regulations also do not apply. Daily workplace activities take place in the Operations Area of the Administrative Building. Any revisions to this area will meet the plumbing and accessibility regulations.

Existing Building Code Implications

Work in existing buildings is governed by the Existing Building Code. The existing building code classifies work in existing buildings in 6 categories; Repairs, Alteration – Level 1, Alteration – Level 2, Alteration – Level 3, Change of Occupancy and Additions. Following is a summary of how these classifications are defined and basic implications of each classification to the project:

Repairs: Fixing or replacing damaged materials. Replacement materials must comply with the building code.

Alteration – Level 1: Replacement of existing materials and equipment with new that serves the same purpose. New materials and equipment must comply with the building and energy codes.

Alteration – Level 2: Reconfiguration of space (where the Work Area is under 50%), addition/elimination of doors and windows, extension of existing systems or installing additional equipment. Modifications must comply with the building, energy and accessibility codes and cannot worsen means of egress. Other items required include:

- Providing automatic sprinkler systems where required by the building code for new buildings, including in windowless stories greater than 1500 sf.
- Providing guards at openings in work areas.

Alteration – Level 3: Where the Work Area is greater than 50%. Work Area is defined as the portion of the building where space is reconfigured. If other sections of the Existing Building Code requires reconfiguration of space, this reconfiguration does not count towards the Work Area. Modifications must comply with requirements for Level 2 Alterations plus additional items including:

- Enclosing stairs.
- Enclosing shafts and floor openings.
- Providing the number of exits required per current code.
- Providing doors that swing in the direction of travel for areas with an occupant load over 50.

Change of Use: Where the use or occupancy classification of a building is changed modifications must comply with requirements for Level 2 and 3 Alterations. If the new use is required to be accessible, the building must also be made accessible.

Generally, the energy code does not require updating existing buildings to current energy codes. New work and items must meet current energy codes if possible. If a building currently has a vestibule, the vestibule must remain or a new one provided. If any space changes from an unconditioned space to a conditioned space, the envelope of the space must be updated to meet the envelop requirements of the energy code.

ADMINISTRATIVE BUILDING

General Description

The original 1964 building was roughly 116” x 32” designed by Metcalf and Eddy Inc. Metcalf and Eddy added an 80” x 48” wing in 1977 on the south end of the existing building. R.AD. Jones Architect designed the 2000 addition which added a new lab, conference, room, archives room and men’s toilet/ locker space. Little was done to the existing building during this upgrade. The boiler room and the storage room were both locked and not inspected.

Existing Materials/Conditions/Modifications/Repairs

Exterior:

Foundation The foundation consists of concrete frost walls and a slab on grade.

Structure The structural system consists of load bearing CMU walls steel roof joists and metal roof deck.

Walls	The exterior walls are precast concrete with concrete panels on the 1964, 1977 portion of the building. The 2000's addition is Exterior insulation finish system and is in good shape
Doors	Doors on the 2000 addition are in good shape. Doors on the 1967, 1977 portion of the building are in fair condition. Some have staining and could be cleaned.
Hardware	The door hardware mostly is in fair condition. The lock should be replaced on the door that enters the shop area.
Windows	The windows on the addition are still in good condition. All windows from the existing 1964, 1977 building should be replaced.
Roofing	Parts on the existing EPDM have been patched as well as the new roof. Leaks continue despite patching. The ballasted roof should be removed and replaced. The EPDM roof is still under warranty and should continue to be maintaining to address leaks. Skylights should be removed and replaced.
Edge Trim	The edge trim is a metal fascia gravel stop. Trim on addition and existing are in fair shape.

Interior:

Floors	Vinyl tile in fair condition. Cracks where addition and existing meet. There is also cracking along the windows in the new break room. The vinyl base is hovering along floor in the corner of the new corridor near the men's bathroom. Office areas have carpeting that appears to be original and has reached its life expectancy and should be replaced.
Walls	The interior walls are a mixture of painted CMU, glazed face CMU, tile and painted GWB. Most is in fair condition with scuff marks along new corridor near reception. There is a crack in the CMU in the electrical room. Some areas of infill are unfinished and should be painted. Several offices/conference rooms have wood paneling. The wood paneling is in fair condition and could be replaced for aesthetic reasons.
Ceilings	Acoustical tile which is in fair condition. There is evidence of staining in new corridor near the archives room. There is a missing tile in the link to the lab next to the electrical room as well as the

	women's bathroom, storage space between the office and shop area and open space across from the electrical room.
Doors	The doors are hollow metal doors in hollow metal frames and are in fair condition. Doors in the lower level are corroded and should be replaced.
OH door	The rollup door to the shop area has corrosion on the tracks and should be replaced.
Hardware	The door hardware from 1964, 1977 is in mostly fair condition. The door closer to the shop area is corroded and should be replaced.
Lab	The lab is part of the 2000 upgrade and is good condition.
Bathrooms	Men's bathroom was upgraded in 2000 and is in good condition. Women's bathroom is part of the 1977 upgrade and is missing tile.
Kitchenette	The kitchenette has wood cabinets and plastic laminate countertops. Cabinets are noticeably dirty and worn in areas. All surfaces should be cleaned. The backsplash of the laminate counter has delaminated and should be replaced. The wood shelf nearest the door is overloaded and sags in the middle, additional supports should be added to adequately support the shelf.

EXISTING 1964 & 1977 BUILDINGS

General Description

Surrounding the administrative building are 4 structures built in 1964 and 1977. The structures are built from concrete with precast concrete tee beams. The exterior has precast concrete panels adhered to the concrete wall for an added decorative element. The following buildings are:

1964 Construction

- Digester Building
- Headworks/Influent Building

1977 Construction

- Electrical Building

- Stair Building

1977 Upgrades/ Additions

- Digester Building

Existing Materials/Conditions/Modifications/Repairs

Exterior:

Foundation	The foundation consists of concrete frost walls and a slab on grade. Painted coatings are failing and should be removed, cleaned or refinished as required. Refer to the structural memo for specifics on the condition of the concrete foundations.
Structure	The structural system consists of concrete columns and tees to support the roof with CMU walls.
Walls	The exterior walls *are built of* precast concrete with concrete panels. Concrete is fair but stucco panels are falling apart on parts of the buildings. Consider removing failed stucco. Sealant is failing and should be cleaned and reapplied. These buildings lack Insulation.
Windows	All windows are in fair/poor condition and should be replaced.
Louvers	All louvers should be replaced.
Roofing	All roofs are EPDM with ballasted gravel finish. Roofs are in fair condition. Roofs have exceeded their life expectancy and should be replaced.
Edge Trim	The edge trim is a metal fascia gravel stop. Trim is in fair shape.

Interior:

Floors	The floors are unfinished concrete and in fair condition. Areas have a lot of staining. All of the concrete floors should be pressure washed to provide a good clean surface as part of the upgrade.
Walls	The interior walls are painted CMU. Due to the moist atmosphere in the space and the apparent roof leak mentioned above, much of the paint finish has failed. The walls should be prepped and repainted.

Ceilings	The ceilings are concrete and are in fair condition. Surfaces cleaned and repainted.
Doors	Doors are in fair/poor condition and have reached their life expectancy. All doors should be replaced.
Hardware	The door hardware on all doors should be replaced.
Stairs	Stairs are made of steel and are in fair condition. Concrete stairs have missing stair nosing and degraded concrete and should be repaired.

Space Modifications/Additions

Note that the existing building is assumed to have been designed in accordance with the current codes at the time of the original construction. Any significant renovations or changes to the use or the spaces will trigger the need to meet the new code. The level of compliance and work required to meet the current code will need to be evaluated pending the level of proposed modifications to this building.

Code Concerns

- The basement chemical room was likely designed to be code complaint at the time of construction. Modifications to this area could trigger additional modification to comply with current codes.
- Additional life safety codes such as fire detection and alarm should be evaluated.

DECHLORINATION SHED

General Description

This small wooden shed houses chemicals on the south end of the WWTF. This shed was meant to be a temporary solution but ended up being long term. This shed is in rough shape and should be replaced with a permeant structure.

NEW STRUCTIRES

General Description

Potential new structures include Influent Pump Station, Screening and Grit Removal, Tertiary Treatment, Chemical Storage and Maintenance Garage. Proposed structures will

be located within the constraints of the existing site. Building separations shall meet code required separation distances proposed materials are as follow:

Exterior:

Walls	Insulated masonry bearing walls with masonry veneer
Roofing	Concrete roof deck with EPDM roofing
Windows	Fixed aluminum storefront windows
Louvers	Kynar finished aluminum louvers
Doors	Painted hollow metal insulated doors
	Prefinished Roll-up doors
Access	Aluminum grated stairs

Interior:

Walls	Painted masonry walls
Stairs	Aluminum grated stairs
Floors	Exposed concrete floors

WRIGHT-PIERCE
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MEMORANDUM

TO:	Doug Hankins, Project Manager	**DATE:**	12/17/2020
FROM:	Steve LaPrise P.E.	**PROJECT NO.:**	20365A
SUBJECT:	Rockland Wastewater Treatment Facility, Rockland, MA Electrical Assessment of the Existing Electrical Systems and Areas Recommended Upgrade Improvements		

This memo represents assessments of the existing Electrical Switchgear, Motor Control Centers, Automatic Transfer Switch, existing conditions, and the existing Generator at the Rockland WWTF. A site visit took place on November 10th, 2020 with other design disciplines.

EXISTING CONDITIONS:

1. **Service:**

   The existing service is provided by National Grid. The medium voltage primary service is located to the right side of the plant entrance and feeds power to a pad mounted transformer located in the front of the Electrical Building. Transformer size was not identified on the unit. The Transformer Secondary Service is rated 2000 amps at 480/277 VAC, 3 phase, 4 wire, and connects to the Main switchgear located in a NEMA 3R enclosure located not far from the transformer.

2. **Switchgear**

   The Main Switchgear is rated for 2000 amps with Main breaker set to trip at 2000 amps. The Main Switchgear is manufactured by General Electric and was installed at the plant during a 1980 upgrade. The Switchgear and internal components are nearing the end of its useful operational life and should be replaced as part of the upgrade. Replacement parts older than 30 years are hard to find. The Switchgear includes the main breaker, Automatic Transfer switch (ATS) and seven circuit breakers, which power MCC's serving the various areas of the plant. Six breakers are on the load side of the ATS. One breaker is dedicated to MCC-4A and connects on the normal bus ahead of the ATS. The switchgear internally and externally is showing signs of rust.

The distribution breakers feed power to the following MCC's and locations listed below.

- MCC-1 – Influent Pump Station
- MCC-2 – Administration Building
- MCC-3A/3 –Digester Building
- MCC-4 Administration Building Addition
- MCC-4A Adminstration Building Addition (Belt filter Press Electrical Room)
- MCC-5 Electrical Building
- MCC-6 Electrical Building

3. Generator System

The existing generator consists of a diesel driven 480/277VAC, 500KW unit that provides back-up power to most of the plant. The unit was installed as part of the 1980 upgrade and is located within the Electrical Building. The Automatic transfer switch (ATS) monitors the incoming 480Volt 3 phase power on a transformer and calls for the generator to start upon loss of power. Once the generator reaches operating voltage, the transfer switch transfers to the generator source providing back-up power to the plant. Upon reinstatement of the normal 480VAC power, the transfer switch cycles back to the normal source, and the generator cools down and stops. Presently, the existing generator does not provide power to MCC-4A as part of the building addition. Per operator personnel the generator is adequately sized to provide backup power to the plant. The generator is serviced by Highland Power Company (508)-941-6500.

4. Influent Pump Station:

Based on the site visit walk through, the following items were noted.

- The screening area conduit, lighting and associated local control stations is in poor condition and replacement is required.
- Gas detection was present as required per NFPA 820.
- The dry pit submersible pumps located on the lower level and are fed from the MCC-1 above. This area is considered Class 1 Division 2 per NFPA 820. As there are holes in the floor of the top level for the pump feeders, the lower level hazardous area makes the top floor area hazardous as well per NFPA 820. The existing electrical equipment located in on all levels are not rated for the hazardous classification. If the space is ventilated six air changes per hour or more, the space would be rated general purpose. Ventilation or isolation from the lower level should be considered for this space as part of the upgrade especially if VFDs, MCCs, and control panels, and other electrical equipment are planned for this space.
- The Existing MCC-1 is manufactured by Unitrol and is original to the plant and has been upgraded over the years with starters, and feeder breakers. Most items in these sections is locked out and out of service. Additional sections were added in the 1980s manufactured by Sylvania that have starters on each side in a condensed footprint. Due to its age parts for the MCC are hard to come by, replacement is recommended.
- Existing VFDs and Nema 4X control panels look to be in fair condition but should be relocated or replaced as part of the upgrade
- There is an existing control panel with a chart recorder that does not appear to be in use and should be removed with any upgrades.
- Pager system is not in operation, operator would like it replaced with any upgrades.

5. **Adminstration Building and Administration Building Addition:**

Based on the site visit walk through, the following items were noted.

- The Admin building addition looked in good condition with new lighting and devices throughout.
- The original portion of the Admin building looked to be in fair condition, however new lighting and wiring devices should be considered due to the age of the facility.
- The Fire Alarm system is fairly new and installed as part of the building addition upgrade and serves only the Admin Building and addition, with a local annunciator and Master Control pull station locate outside near the entrance.
- The main electrical room is fairly congested, with VFDs and other control panels mounted throughout.
- The control panel in flush mounted in the hallway with many chart recorders has a closet cabinet for termination wiring and console located within the electrical room. Consideration should be given to a dedicated space for this equipment as part of the upgrade.
- MCC-2 is the Main MCC in the building and is a Unitrol MCC with two section added by Sylvania. It is powered by the Main Switchgear.
- The lower level electrical room that houses MCC-2 is very crowded and is not air conditioned.
- There is a VFD located atop MCC-2 and is not accessible without a ladder. This installation is a code violation of article 110 and 430 of the NEC.
- There are also MCC-4A and 4 located in an electrical room on the dewatering level. These MCCs are a back to back installation and manufacturer by Sylvania. MCC-4A and 4 are also powered from the Main Switchgear. MCC-4A however is not connected to the standby

power source. Thus, there are 3 feeders to this building. As each building should have one Main disconnect and feeder by code, this installation is a code violation unless it is considered an exception and approved by the authority having jurisdiction per article 225 of the National Electrical Code.

- The control panels located on the upper dewatering level were in poor condition, corroded, and covered with sludge and dirt. These panels should be replaced and located into a clean environment.
- The electrical room that houses MCC-4 and 4A was in good condition. No air conditioning was present within the space.
- The Lime chemical system conduits and devices were covered with Lime and appeared in poor condition with signs of corrosion on motorized equipment and Unistrut. Two large control panels on this level appear to be unused and could be removed with any upgrades.
- The compressor located in the Lime chemical area was also severely corroded and should be replaced.
- Compressors and other motor operated equipment located throughout the facility appeared to be in fair condition, though it was not clear if these pumps handled dewatering systems. If so, these areas could be rated Class 1 Division 2 per NFPA 820. Consideration should be given to ventilation in these spaces.
- Lighting in the lower levels were spotty in areas, and lighting should be replaced with any upgrades.
- The Sodium Hypo-chloride Chemical area conduits and equipment appeared in fair condition.

6. **Electrical Building:**

Based on the site visit walk through, the following items were noted.

- The lower pump gallery level of the Electrical Building is considered a hazardous area. This level and extending gallery contains return and waster sludge piping and should be rated as a Class 1, Division 2, classified space per NFPA 820. The VFDs and other existing electrical equipment located in the basement level are not rated for the hazardous classification. If the space is ventilated six air changes per hour or more, the space would be rated general purpose. Ventilation should be considered for this space as part of the upgrade especially if VFD's, pumps, control panels, and other electrical equipment are planned for this space. VFDs are recommended to be installed in a clean environment with air conditioning and or exhaust fans to maintain operational temperature.
- There is a Foxboro control panel that appears to be in use on the lower level.
- MCC-5 and MCC-6 are back to back type MCCs. These MCCs have reduced footprint due to Manufacture Sylvania design. Other MCCs would not fit within the same footprint. Many buckets were identified as being out of service.
- MCC-5 and 6 are fed from two separate feeders. This installation is a code violation unless it is considered an exception and approved by the authority having jurisdiction per article 225 of the National Electrical Code.
- The existing electrical room was overcrowded and all wall space was taken up with control panels and VFDs. Presently the room is not air conditioned.
- There is an old Foxboro panel located in the electrical room that does not appear to be in use.
- The existing lighting on lower levels was inadequate and some lights did not operate within the pipe gallery on lower level. Replacement is recommended.
- Conduits appear to be in fair condition; however, water stains were present on exterior walls, likely caused from water in existing conduits.
- Presently there is no fire alarm devices within the facility.

- Generator room lighting and conduits were in fair condition. Generator is over 30 years old and replacement is recommended.

7. **Digester Building:**

Based on the site visit walk through, the following items were noted.

- Conduit and lighting were in fair condition.
- The equipment located on the roof near the flare appear in poor condition and should be replaced.
- Sump pump control panel and pumps were very corroded and should be replaced.
- Gas detection was not readily apparent in process gas areas and required per NFPA 820.
- The lower level electrical/boiler area near the back entrance was very congested with the MCC-3 back against a wall and MCC-3A located on the stairway. MCC-3A manufactured by Sylvania and MCC-3 by Unitrol. A disconnect mounted on the side of MCC-3A does not appear to have working clearance per NEC article 110.
- The boilers burn off the digester produced gas and are used to as a heat source for digestion, Excess Gas is burnt off at the flare.
- Fire alarms devices were not present in any areas.

8. **Aeration tank and other field conditions:**

Based on the site visit walk through, the following items were noted.

- Conduit and lighting were in fair to poor condition in the Aeration tank.
- Site lighting operation in spotty and not all site lights operate. Some poles are crooked in the clarifier tank areas.
- PVC conduit along the sides of tank walls and within other field areas do not have any expansion fittings and will buckle and crack over time.
- Several junction boxes were corroded and taped shut with black electrical tape.

- Control stations near clarifiers were in fair to poor condition and should be replaced with future upgrades.
- Conduits run along the pavement in the Effluent Pump Area pose a hazard and should be relocated.
- Primary Clarifier covers over chain pulleys were in fair condition, conduits for theses pulleys were corroded and should be replaced with any upgrades.
- Nema 3R enclosure housing the switchgear is showing signs of rust on outside.
- The Grit handling tank, and septage receiving tank have not been used or operational for some time. Existing conduit and wire and any unused equipment should be removed, and below grade conduits capped in place.

9. **Existing Code Violation**

As mentioned, we observed code violations in the following buildings:

- Influent Pump Station
- Electrical Building
- Digester Building
- Main Building and addition.

The plant currently has a fire alarm system at the Main Building but does not have a fire alarm system at the other remote buildings. A facility wide fire alarm system should be installed as part of this upgrade, with an alarm beacon at each building, plus an annunciator and alarm beacon installed at the Admin Building.

Location of the Effluent pump disconnects were not apparent near the effluent structure. This could be a code violation, unless an exception is allowed per the local authority having jurisdiction.

Corroded conduit and exposed wire pose hazards to operator staff. These corroded conduits should be repaired and or replaced in the near term.

10. Single point of Failure

It is recommended in TR-16, that Wastewater Treatment Facilities avoid having a single point of electrical failure. Currently as the existing switchgear is older, one failure of this equipment could cause issues with electrical power for the plant. For instance, if the distribution buss or the automatic transfer switch were to fail, the WWTF would be offline, and part replacements may be difficult. Other issues such as older aerator starters at MCC-5 and 6, could cause issues with maintaining aeration in the near term if a starter were to fail.

The age of the Influent Pump Station MCC is concerning, as a failure of this MCC could cause issues with powering the influent pumps. Though the VFDs are newer, an upgrade should make replacement of this MCC a priority for power distribution at the pump station.

There were also a lot of duct banks and conduits that may be compromised due to water in the conduits, over time these ducts will short circuit as the wire installation breaks down, thus causing issues with the feeders from the switchgear to the remote building MCC's.

For the upgrade we recommend replacement of the main switchgear and the respective MCCs so that all new installations are backed by a warranty, and replacement parts are readily available. We also recommend that the new Automatic Transfer switch (ATS) has a manual bypass option, so that the ATS can be replaced or repaired while still maintaining plant electrical operation. It is also recommended that separate MCC sections power separate aeration tank trains and respective blowers so that there is some built in diversity for maintenance and operation. Any new upgrades should include new duct banks and new feeders to the MCC's with manholes with drainage so that water does not collect over time.

IMPROVEMENT OPTIONS

New Service and Transformer:

A new service 480/277 VAC 3 phase, 4 wire service and switchgear should be installed in a new building or structure on the facility campus. Getting the new switchgear out of the elements and into a clean environment would be ideal. The existing service could be rerouted with a new service transformer located just outside the new building. A new Emergency Standby generator could also be located near the new building. Possible locations for the new electrical gear could be the Blower Building, or an auxiliary garage.

Having the new equipment in a new location would allow the old equipment to remain operational until new systems are in place. We are expecting the new loads to be approximately 10% more that the existing loads. Thus a 2000 amp secondary service with a 1500KVA transformer would likely be required.

Switchgear/MCC's

The New Switchgear would consist of 5 sections, that would house a new 2000 main breaker, automatic transfer switch, generator breaker, and up to 7 distribution breakers for plant power distribution. The Switchboard would be installed at grade level within a new building nearest the point of the incoming below grade service conduits. The new switchgear would have 5 dedicated distribution breakers plus 2 spares, to feed the following new Motor Control Centers and Power Panels as part of the Upgrade.

- MCC-1 – Influent Pump Station
- MBDP-2 (MCC-2,4,4A) – Admin Building Distribution Panel
- MCC-3A/3 –Digester Building
- MCC-5/6 Electrical Building

- Blower Building, Garage or Auxiliary Structure MDP

Each new MCC or distribution panel would contain surge arresters, power metering, and the respective motor starters as well as VFD's needed for the plant processes and HVAC equipment in the area. Each MCC shall also have a feeder breaker to power a step down transformer and lighting panels for any low voltage power circuits needed as part of the upgrade.

Generator Options:

As the existing standby generator is rated 500 KW and provides adequate back-up, a new generator shall be close in size and voltage rating. An accurate analysis would have to be conducted during preliminary design based on the proposed new process equipment. The generator could be a diesel driven unit and will be located just outside a new building in a level 2 sound attenuated enclosure with a diesel belly tank or day tank.

Influent Pump Station Improvements

New conduit and wire, lighting, and MCC should be installed in the space to accommodate the upgrade in the existing building or a proposed building. Necessary OEM panels, and VFDs would also be installed to power the new equipment.

Admin Building improvements

New conduit and wire, lighting, and MCC should be installed in the in areas deemed necessary per code as part of the upgrade. A new distribution panel and location shall be determined during the preliminary engineering phase so there is one designated feeder and main disconnect. New Gallery pumps and respective VFDs should be installed in environmentally friendly areas rather than in the lower gallery areas.

Electrical Building Improvements

New conduit and wire, lighting, and MCCs should be installed in the in areas where the former generator resided for construction sequencing. An MCC5/6 location shall be determined during the preliminary engineering phase. New pumps, aeration OEM equipment, and respective VFDs should be installed in environmentally friendly areas or in the existing or new electrical room.

Digester Building Improvements

New conduit and wire, lighting, should be installed in the in areas deemed necessary per code or per client request as part of the upgrade. Roof top electrical devices should be replaced due to corrosion as part of this upgrade. For areas that are Class 1 Division 1 or 2, any installation shall adhere to the NEC requirements.

Site Electrical Improvements

As part of the upgrade, new site lighting should be installed throughout the facility on the roadways and main entrance. New site lighting conduits can be installed in the new duct bank planned for distribution. New site lighting should also be installed in the aeration tanks and the Primary Clarifiers. New technologies such as LED shall be examined to minimize maintenance and energy costs.

Power and lighting -General

Each existing building can be retrofitted with new energy efficient lighting for each space. New technologies such as LED shall be examined to minimize maintenance and energy costs. Available power company energy rebates could also be reviewed during design. New process area maintenance receptacles shall also be installed for each building and near process equipment. Each device shall meet the area classifications as required per the NFPA 820.

New Fire Alarm System

A new Fire Alarm system should be installed throughout the entire plant. The new system shall be an addressable system with main control panel located within the Main Building with a main annunciator at the building front entrance. Other buildings shall be connected to the main panel with use of a fiber optic network as approved by the local authority having jurisdiction. All fire alarm system designs and installations must meet NFPA72 and all local code requirements. New devices shall also be rated for the area classification as established by the latest NFPA-820.

Routing of new Duct Banks

New Duct Banks shall be installed with the respective feeder circuits for each of the remote buildings from a new designated building that houses the new switchgear. These new duct banks will be routed on the outside roadway around the plant to avoid conflicts with existing duct banks for construction sequencing. Site lighting conduits shall also be installed as necessary. Once the old service and feeder systems are no longer powered, the existing wire will be pulled out of the existing ducts and they shall be abandoned in place or listed as spare. New manholes and hand holes will be installed as needed for the new duct banks for power, signal or control wiring.

WRIGHT-PIERCE
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MEMORANDUM

TO:	Doug Hankins, Project Manager	**DATE:**	12/18/2020
FROM:	Ted Carlman	**PROJECT NO.:**	20395A
SUBJECT:	Rockland Wastewater Treatment Facility, Rockland, MA Mechanical Assessment Recommended Upgrade Improvements		

EXECUTIVE SUMMARY

A site visits was conducted at the Rockland, MA Wastewater Treatment Facility on November 10, 2020 in order to perform a facility walk-through and an evaluation of the facility's existing conditions. This report addresses current issues, deficiencies and recommendations regarding HVAC and Plumbing systems.

Documentation:

HVAC, Plumbing, and Fire Protection plans for the WWTP are available.

Governing Codes

- NFPA 820
- 2018 International Mechanical Code
- 2018 International Plumbing Code
- ASHRAE 62.1, Ventilation for Acceptable Indoor Air Quality

EXISTING CONDITIONS

General

The majority of the existing HVAC, Plumbing, and Fire Protection systems in WWTP are original to the facility expansion constructed in 1977 except for a portion of the Administrative building that was renovated in 2000. The original 1977 construction documents and 2000 Administrative building construction documents appeared to accurately reflect the building systems. A majority of the systems connected to the main heating system were not operational at the time of the visit. The cause of this may have been due to the shutdown of hot water boiler plant.

ADMINISTRATION BUILDING

HVAC

Laboratory: The laboratory was part of the 2000 renovation of the administrative building. The current HVAC system serving the laboratory consists of a packaged roof top air handling unit

(HVAC-1) providing space conditioning with a gas furnace and direct expansion (DX) cooling coil which uses refrigerant R-22. Two (2) gas fired makeup air handling units (MUA-1&2) and three (3) exhaust air fans (EF-1,2,3) serve the lab hoods. **The equipment is approximately twenty years old, in relatively good condition, but they are relatively inefficient, use refrigerant which is no longer available and at the end of its typical operating life.**

Administrative Areas: The administrative area was part of the 2000 renovation of the administrative building. The current HVAC system serving the administrative offices, conference rooms, and corridors consists of two (2) packaged roof top air handling units (HVAC-2&3) providing space conditioning with a gas furnace and direct expansion (DX) cooling coil which uses refrigerant R-22. There is additional fin tube perimeter heating in each of the spaces with an exterior wall. **The units are approximately twenty years old, in relatively good condition, but they are relatively inefficient, use refrigerant which is no longer available and at the end of its typical operating life. The fin tube appeared to be original to the 1977 building, in poor condition and well beyond the end of its useful operating life.**

Shower/Locker/Toilet Room: The Shower/Locker/Toilet Rooms were part of the 2000 renovation of the administrative building. The current HVAC system serving the Shower/Locker/Toilet Room also serves the western part of the administrative area, HVAC-2. In addition to the rooftop unit, there is a dedicated exhaust fan serving the Men's Toilet room. The exhaust for the shower/locker room is tied directly to HVAC-2. **The exhaust fan is approximately twenty years old, in fair condition, and is at the end of its typical operating life.**

Chlorinator/Chlorine Storage Room: The Chlorinator/Chlorine Storage Room is part of the original 1977 construction of the administrative building. The current HVAC system serving the space consists of two (2) roof mounted exhaust air fans (REF-13&16), two (2) intake air louvers, and two (2) hot water unit heaters (UH-8&9) connected to the central hot water heating system. **The equipment is approximately 43 years old, in poor/not operational condition and well beyond the end of its useful operating life.**

Truckway Room: The Truckway is part of the original 1977 construction of the administrative building. The current HVAC system serving the space consists of one (1) hot water unit heaters (UH-10) connected to the central hot water heating system. **The unit is approximately 43 years old, in poor/not operational condition and well beyond the end of its useful operating life.**

Maintenance Shop: The current HVAC system serving the space consists of two (2) hot water unit heaters (UH-11&12) connected to the central hot water heating system. **The units are approximately 43 years old, in poor/not operational condition and well beyond the end of their useful operating life. In addition to the unit heaters there are two (2) abandoned air handling units hung from the ceiling.**

Boiler Room: The boiler room for the most part is part of the original 1977 construction of the administrative building; however the original boiler was replaced in 2017 as part of an energy upgrade. The boilers and distribution system provide the means of heating for a majority of the WWTP. The two (2) boilers are gas fired Lochinvar FTX500N that inject heat into the primary heating loop via new Bell & Gossett EcoCirc boiler pumps. Each boiler has a 500,000 BTU per hour (BTUh) gross heating capacity and has a 10/1 turndown capability. The boilers, boiler pumps and accessories are in like new condition, but were not operable at the time of the visit due to a leak. The main distribution system is original to the 1977 building that consists of 4 heating zones, each with its own distribution pump and redundant pump. The pumps, piping and accessories are all in poor condition and are well beyond the end of their useful operating life.

Basement Equipment/Chemical Storage Room: The Equipment/Chemical Storage Room is part of the original 1977 construction of the administrative building. The current HVAC system serving the space consists of one (1) hot water air handling unit (AHU-8). **The unit is approximately 43 years old, in poor condition and well beyond the end of its useful operating life. The AHU was not operational at the time of the visit, and the system appeared to be covered in the chemical dust being stored in the area.**

Dewatering Room: The Dewatering Room is part of the original 1977 construction of the administrative building. The current HVAC system serving the space consists of one (1) hot water air handling unit (AHU-7), two (2) roof mounted exhaust air fans (REF-19&20), and five (5) hot water unit heaters (UH-1,2,3,4&5) connected to the central hot water heating system. **The equipment is approximately 43 years old, in poor condition and well beyond the end of its useful operating life. During the visit the AHU did not appear to be operational.**

Basement Machine Shop and Blower Rooms: The Basement Machine Shop and Blower Rooms are part of the original 1977 construction of the administrative building. The current HVAC system serving the space consists of one (1) hot water air handling unit (AHU-6), and one (1) supply air fan (SAF-1). **The equipment is approximately 43 years old, in poor condition and well beyond the end of its useful operating life. During the visit the equipment did not appear to be operational.**

<u>Plumbing</u>

Laboratory: Overall the laboratory is in good condition. Laboratory plumbing is old but in good condition. The eyewash stations are cold water only with no flow switch. The fume hoods operate as intended.

Shower/Locker/Toilet Room: The lavatory, water closets, and showers are in acceptable condition. The floor drains appeared to be in fair condition. The hot water heater serving the toilet room, locker room, break room, and laboratory is located the janitors closet adjacent to the toilet

room. The hot water heater is gas fired with a 75 gallon capacity, 76 MBH heating input and was recently installed in 2019.

1977 Southern Main Building: The southern portion of the administrative building is part of the original 1977 construction. The domestic cold and hot water piping, service water piping, sanitary waste piping, and rain leaders are in fair to poor condition. The hot water heater is electric with a 50 gallon capacity, 7875W heating input and is in fair condition. The emergency shower/eyewash stations are cold water only with no flow switch. The toilet room lavatory, water closet, and shower are in fair/poor condition. Two 3" diameter double check valve backflow preventors are located in the basement at the north end of the building; both backflow preventers appear to be in poor/fair condition.

Fire Protection

General: Fire protection system appeared to be in fair/good condition depending on the location. The entire system appeared to be installed during the 2000 renovation. **The system is approximately twenty years old, in relatively good condition, but is at the end of its typical operating life.**

DIGESTION TANKS BUILDING

General: The Digestion Tanks Building is part of the 1977 upgrade of the wastewater treatment plant. The current HVAC system consists of two (2) air handling units with steam heating coils (AHU-1&10), and one (1) roof mounted exhaust fan (REF-27) serving each of the building towers. The steam heating for the air handling units is provided by the original Weil-McLain 40 series cast iron steam boiler with 1200 MBH capacity and distribution system. The boiler has duel fuel system with the primary fuel being fuel oil and the secondary fuel being methane. **The air handling units, boiler and distribution system are 43+ years old, in poor/not operational condition and well beyond the end of their operational life.** The building is provided service water via a 2" pipe from the operations building that supply service water hose bibbs. The service water piping, sanitary waste piping, floor drains, sump pumps and rain leaders are in poor condition. The service water hose bibbs do not have integral vacuum breakers.

NITRIFICATION AND SECONDARY GALLERIES

General: The Nitrification and secondary galleries were part of the 1977 upgrade of the wastewater treatment plant. The current HVAC system consists of one (1) air handling unit with

a hot water heating coil (AHU-11), one (1) roof/grade mounted exhaust fan (REF-25), two (2) wall hung dehumidifiers, four (5) hot water unit heaters (UH-13,14,15,16,&17), and two (2) hot water cabinet unit heaters (C-17&18). The hot water heating equipment is connected into the main building hot water heating plant. **The air handling equipment and space heating equipment are approximately 43 years old, in poor/not operational condition and well beyond the end of their operational life.** The building is provided service water via a 2" pipe from the operations building that supply service water hose bibbs. The service water piping, sanitary waste piping, floor drains, sump pumps and rain leaders are in poor condition. The service water hose bibbs do not have integral vacuum breakers.

ELECTRICAL BUILDING

General: The electrical building was part of the 1977 upgrade of the wastewater treatment plant. It serves as the plants electrical service and generator backup. The current HVAC system serving the electrical room consists of one (1) roof mounted exhaust fan (REF-25), one (1) inlet air louver & damper, one (1) hot water unit heater (UH-19), and one hot water cabinet unit heater (C-16). The current HVAC system serving the generator room consists of two (2) roof mounted exhaust fans (REF-22&23), two (2) inlet air louvers & dampers, and one (1) hot water unit heater (UH-18). The hot water heating equipment is connected into the main building hot water heating plant. **The equipment is approximately 43 years old, in poor/not operational condition and well beyond the end of their operational life.** The sanitary waste piping, floor drains and rain leaders are in fair condition.

INFLUENT PUMP STATION

General: The Influent Pump Station was part of the 1977 upgrade of the wastewater treatment plant. The current HVAC system serving the building consists of one (1) utility supply fan serving the lower screenings room, one (1) roof mounted exhaust fan (REF-28), and one (1) inlet air louver & damper. **The equipment is approximately 43 years old, in poor/not operational condition and well beyond the end of their operational life.** The building is provided service water via a 1" pipe from the operations building that supply service water hose bibbs. The service water piping, sanitary waste piping, floor drains, and sump pump and in poor/not operable condition. The service water hose bibbs do not have integral vacuum breakers.

RECOMMENDATIONS

General: Wright-Pierce recommends updating a majority of the HVAC, Plumbing and Fire Protection systems serving the Rockland WWTP. A majority of systems are over 20 years old and at the end of the operating life. It is acceptable to reuse existing systems that were described as being in new or like new condition, including the hot water heating boilers, boiler pumps, and the gas fired hot water heater.

The HVAC updates would include providing code-compliant ventilation systems as required by NFPA 820, IMC, and ASHRAE 62.1, providing a new heating hot water distribution system, and replacing all heating and cooling equipment, ductwork, and piping.

The Plumbing updates would include replacing all of the major systems including: Domestic cold water, domestic hot water, and service water piping systems, sanitary waste drain systems, and rain leaders systems. The major pieces of plumbing equipment shall be replace as required including water heaters, sump pumps, emergency showers and eye wash stations. In to replacing existing systems, a new tepid water system with mixing valves would be required for the new emergency shower/eyewash stations.

CODE DISCUSSION

General: The mechanical work scope for this project focuses on providing code-compliant ventilation systems in each of the areas listed above, as follows:

Room	Ventilation	Code Reference (NFPA 820 unless noted otherwise)
Truckway	6 ACH/3 ACH	Table 6.2.2(a), Row 13, Line a (Unclassified rating)
	1 cfm/sf, continuous	International Mechanical Code, Section 502.8
Dewatering	6 ACH	Table 6.2.2(a), Row 12, Line a (Unclassified rating)
Chemical Rooms	6 ACH/3 ACH	Table 6.2.2(a), Row 12, Line a (Unclassified rating)
	1 cfm/sf, continuous	International Mechanical Code, Section 502.8
Office/Administrative	5-10 cfm/person, 0.06-0.18 cfm/sf	International Mechanical Code, Table 403.3

Laboratory	10 cfm/person, 0.18 cfm/sf	International Mechanical Code, Table 403.3
Lavatory/Locker Rooms	.75 cfm/sf exhaust	International Mechanical Code, Table 403.3
Blower Room	0.3 cfm/sf (occupied)	International Mechanical Code, Table 403.3
Digestion Tank Building	6 ACH	Table 6.2.2(a), Row 18, Line c (Unclassified rating)
Nitrification/ Secondary Galleries	<6 ACH, intermittent	Table 6.2.2(a), Row 22, Line b (Class 1/Division 2)
	1 cfm/sf, continuous	International Mechanical Code, Section 502.8
Influent Pump Station	<6 ACH, intermittent	Table 6.2.2(a), (Class 1/Division 2)
	1 cfm/sf, continuous	International Mechanical Code, Section 502.8

Building-by-Building Recommendations

ADMINISTRATION BUILDING

- The existing HVAC systems shall be removed and new systems shall be installed to accommodate general office renovations and renovation of the basement area. This work will include replacing the existing air handling unit and air-cooled condensing unit with new equipment, reconfiguring the air distribution system to accommodate the proposed spaces, and revising the automatic temperature controls system. Systems shall conform with the requirements noted in NFPA 820 and IMC.
- HVAC and plumbing systems serving the laboratory will be reconfigured and/or replaced to accommodate the space.
- Existing plumbing systems in the building will be reconfigured and/or replaced to accommodate the architectural renovations, and new plumbing will be provided in the new toilet rooms in accordance with the American With Disabilities Act.
- The existing hot water boilers shall remain, but the plant distribution system and piping shall be removed and replaced in its entirety.
- Chemical rooms shall be upgraded to Unclassified Rating per NFPA 820 and Conform to IMC- The chemical rooms need to conform with requirements needed to establish an Unclassified rating in accordance with NFPA 820 and it also must conform to exhaust

requirements listed in the International Mechanical Code (IMC), section. Modify/replace the existing makeup air system serving chemical rooms to provide 6 ACH when the chemical rooms are occupied or the outside air temperature is greater than 50°F, and /3ACH or 1 cfm/sf (whichever is greater) when the chemical room is unoccupied and when the outside air temperature is 50°F or less. Provide a proof-of-flow sensor. Provide an exhaust air system which draws exhaust directly from the Chemical Room; fan speed shall be adjustable using variable speed motors. Provide a proof-of-flow sensor. Consider providing a heat recovery runaround loop to preheat outside air using heat reclaimed from exhaust air.

- Heating and ventilation in the Dewatering area and truckway will be replaced to provide airflows in accordance with NFPA 820 (continuous ventilation at 6 air changes per hour when occupied, 3 ACH when unoccupied and outside air temperatures are 50^{o} F or lower). Equipment in this area will be NEMA 4X rated. This will be coordinated with odor control air exchange flow rates.
- Ductless split air conditioning will be provided in electrical rooms.
- Energy efficiency measures will be implemented, such as installing and/or restoring pipe insulation, sealing existing ductwork and adjusting controls.
- Provide an emergency shower/eyewash unit in the sludge garage, supplied with tepid water.
- Existing fire protection equipment will be replaced, and new equipment provided as appropriate.

DIGESTION TANKS BUILDING

- Heating and ventilation in the will be replaced to provide airflows in accordance with NFPA 820 (continuous ventilation at 6 air changes per hour when occupied, 3 ACH when unoccupied and outside air temperatures are 50^{o} F or lower). Equipment in this area will be NEMA 4X rated.
- Provide an emergency shower/eyewash unit in the sludge garage, supplied with tepid water.
- Existing plumbing systems in the building will be replaced to meet the current plumbing code.
- Energy efficiency measures will be implemented, such as installing and/or restoring pipe insulation, sealing existing ductwork and adjusting controls.
- New fire protection shall be provided as appropriate.

NITRIFICATION AND SECONDARY GALLERIES

- Heating and ventilation in the will be replaced to provide airflows in accordance with NFPA 820 and IMC (continuous ventilation at 6 air changes per hour when occupied, 3 ACH when unoccupied and outside air temperatures are 50^{o} F or lower). Equipment in this area will be NEMA 4X rated.
- Existing plumbing systems in the building will be replaced to meet the current plumbing code.
- Provide an emergency shower/eyewash unit in the sludge garage, supplied with tepid water.
- Energy efficiency measures will be implemented, such as installing and/or restoring pipe insulation, sealing existing ductwork and adjusting controls.
- New fire protection shall be provided as appropriate.

ELECTRICAL BUILDING

- The electrical building will contain electrical equipment, which will include numerous variable frequency drives. These will reject heat to the space. Provide a ductless split air conditioning system to keep the room from overheating.
- The generator room heating and ventilation in the will be replaced to provide adequate supply and exhaust airflows for the new generator.

INFLUENT PUMP STATION

- Heating and ventilation in the will be replaced to provide airflows in accordance with NFPA 820 and IMC (continuous ventilation at 6 air changes per hour when occupied, 3 ACH when unoccupied and outside air temperatures are 50o F or lower). Equipment in this area will be NEMA 4X rated.
- Existing plumbing systems in the building will be replaced to meet the current plumbing code.
- Provide an emergency shower/eyewash unit in the sludge garage, supplied with tepid water.
- Energy efficiency measures will be implemented, such as installing and/or restoring pipe insulation, sealing existing ductwork and adjusting controls.
- New fire protection shall be provided as appropriate.

WRIGHT-PIERCE
Engineering a Better Environment

MEMORANDUM

TO:	Doug Hankins, Project Manager	**DATE:**	12/18/2020
FROM:	Christine Sexton, PE	**PROJECT NO.:**	20395A
SUBJECT:	Rockland Wastewater Treatment Facility, Rockland, MA Structural Assessment Recommended Upgrade Improvements		

INTRODUCTION

A site visit was conducted at the Rockland, MA Wastewater Treatment Facility on November 10, 2020 in order to perform a facility walk-through and an evaluation of the facility's existing structures (buildings and tankage). Wright-Pierce was also on site on July 22, 2020 to observe and take photos of one of the Primary Settling Tanks drained and one of the Nitrification Settling Tanks drained. This memorandum summarizes observations made during the site visits and made through review of existing documentation provided by the facility. Based on these observations, findings and recommendations regarding the existing buildings and tankage have been made including recommendations for upgrades, maintenance, and other restorative measures.

DESCRIPTION OF EXISTING FACILITIES AND RECOMMENDATIONS

GENERAL

It appears the guard height varies at the Facility. Need to confirm the guard height is OSHA compliant.

INFLUENT PUMP STATION

The influent pump station was originally constructed in 1964.

Observations

- Painted steel monorail beam has peeling paint and signs of corrosion.
- The monorail capacity is not labeled. The hoist may or not be okay depending on capacity.
- There is failing paint on the slabs, walls, stairs and handrail.

- An existing floor slab opening was cut to account for newer equipment extending between levels. The cut was rough and the concrete exhibits minor exposed aggregate and exposes the ends of a couple reinforcing bars.
- There are concrete cracks and spalls.
- There are lifting eyes with no labeled capacities, which also appear to be corroded.
- The floor plating is warped and embedments have detached.
- Pipe supports are showing signs of corrosion.

Recommendations

- Powerwash the entire pump station to remove paint and loose and degraded concrete.
- Remove all failed paint and corrosion from steel monorail beam and steel guard surfaces by sand blasting and recoat with epoxy. Label monorail with capacity.
- Repair all cracks in the concrete by pressure injection of an epoxy resin as required.
- Remove degraded concrete and resurface with cementitious repair material, including areas where rebar is exposed.
- Remove lifting eyes. Cut lifting eyes flush with concrete and coat with epoxy.
- Replace warped floor plates. Drill holes and use concrete screws to hold down detached embedments.
- Remove all failed paint and corrosion from steel pipe support surfaces and recoat with epoxy. Consider replacing painted steel with aluminum or stainless. Add a stanchion pipe support to replace the wood support.

AERATED GRIT CHAMBERS

The aerated chamber was originally constructed in 1977. The grit removal clam hoist has been out of service since 2015. The grit collected at the bottom of the chamber is currently removed via vactor trucks. This removal is a manual operation that requires bypassing the grit chamber.

Observations

- The tank was filled with liquid so the concrete below the waterline could not be observed.
- The concrete above the waterline appeared to be in fair condition.
- Several cracks exhibiting efflorescence were observed in the portion of the exterior North wall visible above grade.
- At two valve locations, chains are being used instead of Aluminum guard.
- The painted monorail steel frame above the chambers has peeling paint and is showing signs of corrosion. The monorail beams are severely corroded.

Recommendations

- Clean and fully inspect the concrete grit chambers.
- Repair all cracks in the concrete by pressure injection of an epoxy resin as required.
- Replace the chains on guard with new guard.
- Remove all failed paint and corrosion from the monorail steel frame by sand blasting and recoat with epoxy.
- Replace the monorail beams.

SEPTAGE HOLDING AND TRANSFER TANK

The septage holding chamber and pump station were originally constructed in 1964. Treating septage at the WWTF was stopped in the early 1980s.

Observations

- The concrete appeared to be in good condition with mild exposed aggregate on the lower portion of the walls.
- Chains are being used instead of Aluminum guard in a few locations.

Recommendations

- Resurface approximately the lower 4'-0" +/- of the tank walls.
- Replace the chains on guard with new guard.

WEIR SPLITTER BOX

Wastewater flows from the Aerated Grit Chamber to the primary splitter box, where it is diverted to either Primary Settling Tank No. 1 or No. 2.

Observations

- Cracks and pin holes exhibiting efflorescence were observed in the concrete walls.
- Toe plates are missing from guard.

Recommendations

- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Install toeplate on the guard.

PRIMARY SETTLING TANKS NO. 1 AND 2

The facility has four primary settling tanks. The two large primary settling tanks were constructed in 1977 and are in service.

Observations

- Primary Settling Tank No. 1 was filled with liquid so the concrete surfaces below the waterline could not be observed. Primary Settling Tank No. 2 had been drained and inspected in July of 2020.
- The concrete walls especially at the waterline in the effluent drop channel area exhibited exposed aggregate.
- Concrete cracks and spalls were observed.

- Guard is missing around the scum well.
- Toe plates are missing from guard.

Recommendations

- Resurface the concrete walls and launders.
- Repair all cracks in the concrete by pressure injection of an epoxy resin as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Remove degraded concrete and resurface with cementitious repair material.
- Install guard around the concrete scum well.
- Install toeplate on the guard around the tanks.

PRIMARY SETTLING TANKS NO. 3 AND 4

The two small primary settling tanks were constructed in 1964. Currently, they are offline and are used to store influent during peak flow events.

Observations

- Some major cracks and significant concrete spalling were observed.

Recommendations

- If this tank is not demolished, then some concrete repairs will be required for safety.

AERATION TANKS

The aeration tanks were originally constructed in 1964. The aeration tanks were taken offline in 1984 after determining that treatment could be achieved by operating only the second stage of the facility and are currently only used for bypass storage during peak flow events.

Observations

- Some of the vertical expansion joints sealant are failing.

- Spalls and vertical/diagonal cracks are observed in the concrete wall surfaces.
- Toe plates are missing from guard.
- Chains are being used instead of Aluminum guard in a few locations.
- A 30" diameter effluent opening in the concrete may be a safety concern.

Recommendations

- Remove and replace expansion joint backer rod and sealant.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Remove the degraded concrete and resurface the exposed aggregate with a cementitious overlay.
- Install toeplate on the guard around the tanks.
- Replace the chains on guard with new guard.
- Install a safety grate over the large effluent opening in the slab.

NITRIFICATION TANKS NO. 1 AND 2

The nitrification tanks were constructed in 1977.

Observations

- Nitrification Tanks No. 1 and 2 were filled with liquid so the concrete surfaces below the waterline could not be observed.
- Many cracks were observed on the slab between Tank No. 1 and No. 2, which it the top slab of the hallway between the Secondary Pump Gallery and Nitrification Pump Gallery.
- Toe plates are missing from guard.
- Chains are being used instead of Aluminum guard in a few locations.
- Many of the hanging threaded rod pipe supports and U-bolt pipe support straps have failed.

Recommendations

- Drain and clean the tanks for structural inspection and evaluation.
- Repair all cracks in the concrete by pressure injection of an epoxy resin as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Install toeplate on the guard around the tanks.
- Replace the chains on guard with new guard.
- Replace existing or install new pipe supports.

NITRIFICATION SETTLING TANKS NO. 1 AND 2

The circular nitrification settling tanks were constructed in 1977 and show some concrete degradation. The tank collector drive units were replaced in 2018. The other steel components are original to the tanks and are severely corroded and beyond their useful life.

Observations

- Nitrification Settling Tank No. 2 was filled with liquid so the concrete surfaces below the waterline could not be observed. Nitrification Settling Tank No. 1 had been drained and inspected on July 22, 2020.
- The launders have a slight accumulation of algae. The concrete surfaces exhibit mild exposed aggregate.
- Vertical cracks are observed in the tank walls.
- Spalls and cracks are observed in the concrete slab.
- Toe plates are missing from tank guard and a portion of the walkway bridge.
- The top slab of the Nitrification Pump Gallery had an elastomeric waterproofing that has failed.
- The expansion joint between the Nitrification Settling Tanks and the top slab of the Nitrification Pump Gallery appears to have failed in places. The elastomeric waterstop has been completely removed.

Recommendations

- Resurface concrete launders.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Remove the degraded concrete and resurface with a cementitious overlay.
- Install toeplate on the guard around the tanks and the missing piece on the bridge.
- Replace the expansion joint sealant.

NITRIFICATION PUMP GALLERY

Observations

- There is a horizontal joint along the Nitrification Settling Tanks that is exhibiting efflorescence. From the record drawings, this is the joint at the launder slab (approx. 9'-4" high). At this height the tank wall changes thickness and the wall reinforcing transitions from #10 @ 12" to #5 @ 12". It appears that the waterstop in this joint has failed or was never installed. Dwgs do not show a waterstop at this location. A general note on the drawings states to provide waterstops at all horizontal and vertical joints below water surface in tanks.
- There is concrete crazing and spalling in a narrow section of wall between the Nitrification Settling Tank and an expansion joint. It appears the crazing may be an alkali-silica reaction (ASR). This is a concern because in ASR, aggregates with certain forms of silica react with alkali hydroxide in concrete to form a gel that can produce destructive swelling.
- The expansion joints are failing in many places.
- Cracks exhibiting efflorescence were observed in the corners of the top slab edges.
- Cracks and pin holes exhibiting efflorescence were observed in the concrete walls.
- The walls have many locations where there is liquid brown staining from expansion joints, cracks and pipe openings. There is an active leak in the concrete at the corner of the hallway between the Nitrification Tanks, which is leaking directly on an electrical junction box.

- The concrete slab is spalling in several locations and one has an exposed reinforcing bar.
- A pump equipment pad has a significant crack in it and the skid is corroded.
- Pipe supports are showing signs of corrosion. One pipe is being supported by wood.
- The concrete walls and slabs have peeling paint.

Recommendations

- Coat a 1-foot strip of wall along the inside face of the tanks along the launder slab joint to seal the joint with an elastomeric membrane.
- Spray the crazed concrete wall with a lithium compound that reduces ASR. Reevaluate the existing wall. If the damage to the existing wall is extensive, use the existing wall as a form to cast-in place a new wall designed to support the loading.
- Remove and replace the expansion joints backer rods and sealants.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Seal the leaks at the concrete pipe openings.
- Remove degraded concrete by sandblasting and resurface with cementitious repair material. Epoxy paint exposed rebar.
- Demolish and install a new concrete pump equipment pad.
- Remove all failed paint and corrosion from steel pipe support surfaces and recoat with epoxy. Consider replacing painted steel with aluminum or stainless. Replace stanchion supports that are severely corroded. Install a more permanent pipe support to replace the wood.
- Remove the failing coating from the wall and slab surfaces.

FLOCCULATION CHAMBER

The flocculation chamber connected to the two secondary settling tanks has been abandoned.

Observations

- The Flocculation chamber was filled with liquid so the concrete surfaces below the waterline could not be observed.
- Floor plate section is missing above one of the slide gate locations.
- The two concrete stairs have moved away from the tank.
- Chains are being used instead of Aluminum guard in a few locations.
- Toe plates are missing from tank guard.

Recommendations

- Drain and clean the tanks for structural inspection and evaluation.
- Install the missing plate section.
- Replace the two stairs.
- Replace the chains on guard with new guard.
- Install toeplate on the guard around the tanks.

SECONDARY SETTLING TANKS NO. 1 AND 2

The circular secondary settling tanks were originally constructed in 1977 as part of the first stage of the two-stage aeration plant configuration. These tanks were taken offline in 1984 and are currently not used. The steel components show advanced corrosion and are not functional.

Observations

- Secondary Settling Tanks No. 1 and 2 have a considerable amount of vegetation growing in the troughs and some on the base slab.
- There are many vertical cracks in the tank walls and cracks in the base slab.
- Toe plates are missing from the walkway bridge guard.
- The grating sections on the bridge do not appear to be lined up. Some sections may be loose.
- The top slab of the Secondary Pump Gallery had an elastomeric waterproofing that has failed.

- The expansion joint between the Secondary Settling Tanks and the top slab of the Secondary Pump Gallery appears to have failed in places. The elastomeric waterstop has been completely removed.

Recommendations

- Remove the vegetation and clean the tanks for structural inspection.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Install toeplate on the guard of the walkway bridge.
- Securely fasten any sections of grating on the bridge that may be loose.
- Replace the expansion joint sealant.

SECONDARY PUMP GALLERY

Observations

- There is a horizontal joint along the Secondary Settling Tanks that is exhibiting efflorescence. The concrete appears to have been previously injected with repair material. From the record drawings, this joint is at the height of the Secondary Settling Tank base slab (approx. 2'-11" high). It appears that the waterstop in this joint has failed or was never installed.
- The expansion joints are failing in many places.
- Cracks and pin holes exhibiting efflorescence were observed in the concrete walls.
- The walls have many locations where there is liquid brown staining from expansion joints, cracks and pipe openings. There is an active leak in the concrete at a pipe opening, which is leaking directly on an electrical junction box.
- The concrete is spalling in several wall and slab locations and one area on the Secondary Settling Tank wall has an exposed reinforcing bar.
- Pipe supports are showing signs of corrosion.

Recommendations

- Coat a 1-foot strip of wall along the inside face of the tanks along the launder slab joint to seal the joint with an elastomeric membrane.
- Remove and replace the expansion joints backer rods and sealants.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Replace pipe sealants.
- Remove degraded concrete and resurface with cementitious repair material, including areas where rebar is exposed.
- Demolish and install a new concrete pump equipment pad.
- Remove all failed paint and corrosion from steel pipe support surfaces and recoat with epoxy. Consider replacing painted steel with aluminum or stainless. Replace stanchion supports that are severely corroded.

ADMIN BUILDING, PRIMARY DIGESTER NO. 1 AND SECONDARY DIGESTER NO. 1

These structures were originally constructed in 1964.

Observations

- Painted steel guard, stair handrail, stair clip angles, and stair stringers are exhibiting signs of corrosion.
- Cracks and spalls were observed in the concrete surfaces.
- Pipe supports are showing signs of corrosion.
- The concrete and CMU walls and concrete slabs have peeling paint.

Recommendations

- Remove all failed paint and corrosion from steel surfaces by sandblasting and recoat with epoxy. Consider replacing painted steel pipe supports with aluminum or stainless. Replace stanchion pipe supports and stair clip angles that are severely corroded.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required.
- Remove degraded concrete and resurface with cementitious repair material.
- Remove the failing paint from the wall and slab surfaces.

ADMIN BUILDING ADDITION, PRIMARY DIGESTER NO. 2 AND SECONDARY DIGESTER NO. 2

These tanks were constructed in 1977.

Observations

- The concrete and CMU walls, concrete beams and concrete slabs have peeling paint.
- The expansion joint filler between the slabs and Digesters have failed in many places.
- The Digester covers are exhibiting signs of corrosion.
- The methane gas support base on the roof is showing signs of corrosion.
- There is a broken steel drain cover on the lower level.
- In one location the exterior metal siding of the Digester has been damaged. It appears to have been impacted by equipment.

Recommendations

- Remove the failing paint from the wall, beam and slab surfaces.
- Remove and replace the failed expansion joint filler.
- Remove all failed paint and corrosion from steel surfaces by sandblasting and recoat with epoxy.
- Replace the broken steel drain cover.
- Repair the damaged exterior metal siding.

CHLORINE CONTACT CHAMBERS AND EFFLUENT PUMP STATION

Observations

- Tanks were filled with liquid so the concrete below the waterline could not be observed.
- There are several vertical cracks on the walls exhibiting efflorescence.
- The concrete at the waterline exhibited exposed aggregate.
- Chains are being used instead of Aluminum guard in a few locations.
- Toe plates are missing from guard.

Recommendations

- Drain and clean the tank for structural inspection and evaluation.
- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Resurface the exposed aggregate on the tank walls with a cementitious overlay.
- Replace the chains on guard with new guard.
- Install toeplate on the guard.

ELECTRICAL BUILDING

Observations

- The exterior painted steel monorail support frame and beam has peeling paint and signs of corrosion.
- The monorail capacity is not labeled.
- The exterior concrete pedestal supporting the monorail support frame column is severely cracked.
- There are concrete spalls in the slab in several locations.

Recommendations

- Remove all failed paint and corrosion from steel monorail support frame and beam surfaces by sand blasting and recoat with epoxy. Label monorail with capacity.
- Replace the exterior concrete support pedestal.
- Remove degraded concrete and resurface with cementitious repair material, including areas where rebar is exposed.

ADMIN BUILDING

Observations

Exterior

- The exterior concrete east stairs have significant cracks and spalls with some exposed rebar on the underside of the concrete landing.
- There is minor concrete spalling on the south concrete loading platform.

Filter Press Room

- In the stairways, paint on the concrete beams was peeling and concrete spalling was observed.
- The monorail load capacity was not visibly indicated.
- The floor around the filter presses has standing liquid.
- There are some rough concrete areas on the slab where equipment pads had been removed.
- There is a broken floor drain cover near the hopper slab opening.
- The ladder up to the roof has smooth rungs, which are more vulnerable to slippage than non-slip surfaced rungs.

Lime and Ferric Chloride Room

- One of the Ferric Chloride FRP tanks is not sitting completely on the concrete equipment pad. The concrete anchors to restrain the tank are missing.
- There are a few significant cracks on the underside of the ceiling slab with brown staining.
- Concrete coating is failing on some of the containment area, wall, slab and column surfaces.

- The aluminum stair column base plate in the Lime area is corroded.
- Several steel unistrut and pipe supports are showing signs of corrosion.
- There is a crack at the double doors all around in the expansion joint.

Maintenance Garage

- The monorail load capacity was not visibly indicated.

Sludge Truck Container Area

- There is a lifting hook with no labeled capacity, which appears in good condition.
- There are no roll-off plates beneath the sludge truck container wheels.

Sodium Hypochlorite Room

- The chemical containment area wall has a concrete crack and spall.
- The concrete containment area coating is failing in areas, especially near the sump.

Recommendations

Exterior

- Remove degraded concrete and resurface with cementitious repair material, including areas where rebar is exposed.

Filter Press Room

- Remove peeling paint from concrete surfaces by high pressure water or abrasive blast.
- Remove degraded concrete and resurface the exposed aggregate with a cementitious overlay.
- Label monorail with capacity.
- Replace the broken floor drain cover.
- Consider replacing ladder with a ladder with non-slip surfaced rungs, if slippage is a concern.

Lime and Ferric Chloride Room

- Shift the Ferric Chloride tank to be fully supported on the concrete equipment pad. Install the concrete anchors to restrain the chemical FRP tanks.

- Repair all cracks in the concrete by pressure injection of an epoxy adhesive as required. Cracks that are damp will require a polyurethane expanding foam resin that will react with the water.
- Remove the peeling paint from the concrete walls, slabs and columns. Remove the failing coating from the concrete containment surfaces and recoat.
- Replace the corroded aluminum stair column base plate in the Lime area.
- Remove all failed paint and corrosion from steel Unistrut and pipe support surfaces and recoat with epoxy. Consider replacing painted steel with aluminum or stainless.
- Replace the cracked joint sealant.

Maintenance Garage

- Label monorail with capacity.

Sludge Truck Container Area

- Label the lifting hook capacity.
- Install roll-off plates for the sludge truck container.

Sodium Hypochlorite Room

- Repair all cracks in the concrete by pressure injection of an epoxy resin as required.
- Remove the degraded concrete. Resurface exposed aggregate with concrete repair material.
- Remove failing coating from concrete surfaces and recoat the containment area.

Please note depending on the scope of work, there may be modifications (i.e. roof and/or insulation replacement) included that may trigger an assessment as to whether the structural capacity of the existing buildings or components of buildings and structures must conform to the current Building Code.

STRUCTURAL DESIGN

The following standards and criteria will be used in the structural design of the WWTF:

Governing Codes and Standards

- Commonwealth of Massachusetts State Building Code - 9th Edition
- International Building Code 2015
- ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
- ACI 318-14 - Building Code Requirements for Reinforced Concrete
- ACI 350-06 - Code Requirements for Environmental Engineering Concrete Structures
- ACI 350.3/350.3R-06 - Seismic Design of Liquid-Containing Concrete Structures and Commentary
- AISC Manual of Steel Construction - 13th Edition
- Aluminum Association - Specifications for Aluminum Structures
- ACI 530/530.1-13 - Building Code Requirements and Specification for Masonry Structures and Related Commentaries
- Occupational Safety and Health Administration

Design Criteria

Material Properties

- Concrete
  - f'_c - 4,500 psi
  - f_y - 60,000 psi (Reinforcing steel)
  - Max W/C ratio - 0.42
  - Air Content - 6 +/- 1.5%
- Structural Steel
  - Structural Shapes and Lintels
    - ASTM A992 Grade 50 (wide flange and “S” type beams)
    - ASTM A36 Grade 36 (channels and angles)
    - ASTM A572 Grade 50 (plates)
  - Anchor Rods - ASTM F1554
  - Bolts - ASTM A325
  - Finish - Hot-dipped galvanized or painted
  - Welding - E70XX electrodes
- Structural Aluminum
  - Shapes/Plates - ASTM B308 Alloy 6061-T6
  - Bolts - Stainless Steel Type 316
  - Finish - Mill or clear anodized
- Masonry
  - f'_m - 1,500 psi

- CMU Block - ASTM C90 Type N-1 - 2,000 psi
- Mortar - ASTM C270 Type S - 1,800 psi
- Grout - ASTM C476 - 2,000 psi

Live Loads

In accordance with Massachusetts Building Code, ACSE 7 and the Risk Category III/IV:

Building:

- Floor Live Load - Uniformly distributed load based on equipment weights and expected usage
- Ground Snow Load - 35 psf
- Wind Speed - Ultimate: 143 mph, Nominal: 111 mph
- Seismic Design Factors:
  - S_s (0.2 second Spectral Response Acceleration coefficient) = 0.198
  - S_1 (1.0 second Spectral Response Acceleration coefficient) = 0.065

Tanks and Foundations:

- Freezing Index = 750 +/-
- Frost Depth = 43” +/-, Use 4’-0”
- Lateral earth pressures:
  - Above groundwater table - 65 psf / ft
  - Below groundwater table - 95 psf / ft
- Lateral surcharge pressures:
  - Lateral surcharge resulting from a 300 psf surcharge loading
- Hydrostatic pressures: leak test and uplift - 65 psf / ft
- Flotation resistance - Dead weight of concrete structure and soil over slab extension

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ROCKLAND, MA
WWTF ASSESSMENT
W-P PROJECT NO. 20395A

ENR INDEX 11580, 11/2020
CONSTRUCTION COST ESTIMATE

DESCRIPTION	ESTIMATED COST
CIVIL	
WWTF SITE WORK	$200,000
WWTF SITE DRAINAGE	$50,000
WWTF ELECTRICAL DUCTBANKS AND PADS	$150,000
WWTF SITE PIPING (INCL. IN PROCESS)	
WWTF SITE RESTORATION AND REPAVING	$400,000
SCREENING AND GRIT FACILITY (NEW)	$117,600
INFLUENT PUMP STATION MODIFICATIONS	$57,750
PRIMARY CLARIFIER MODIFICATIONS	$68,250
SECONDARY SYSTEM MODIFICATIONS	$77,725
SECONDARY CLARIFIER MODIFICATIONS	$10,878
TERTIARY BUILDING (NEW)	$90,739
CHEMICAL BUILDING (NEW)	$44,617
CHLORINE CONTACT TANKS AND EFFLUENT P.S.	$0
SLUDGE STORAGE TANKS	$47,250
ADMINSTRATION BUILDING MODIFICATIONS	$5,250
GARAGE AND ELECTRICAL BUILDING (NEW)	$58,800
ARCHITECTURAL	
SCREENING AND GRIT FACILITY (NEW)	$315,000
INFLUENT PUMP STATION MODIFICATIONS	$241,500
PRIMARY CLARIFIER MODIFICATIONS	$0
SECONDARY SYSTEM MODIFICATIONS	$609,000
SECONDARY CLARIFIER MODIFICATIONS	$0
TERTIARY BUILDING (NEW)	$275,625
CHEMICAL BUILDING (NEW)	$496,125
CHLORINE CONTACT TANKS AND EFFLUENT P.S.	$0
SLUDGE STORAGE TANKS	$0
ADMINSTRATION BUILDING MODIFICATIONS	$693,000
GARAGE AND ELECTRICAL BUILDING (NEW)	$213,150
PROCESS EQUIPMENT AND PIPING FINISHES	$150,000
STRUCTURAL	
SCREENING AND GRIT FACILITY (NEW)	$787,500
INFLUENT PUMP STATION MODIFICATIONS	$116,550
PRIMARY CLARIFIER MODIFICATIONS	$68,250
SECONDARY SYSTEM MODIFICATIONS	$756,000
SECONDARY CLARIFIER MODIFICATIONS	$147,000
TERTIARY BUILDING (NEW)	$414,078
CHEMICAL BUILDING (NEW)	$99,671
CHLORINE CONTACT TANKS AND EFFLUENT P.S.	$36,750
SLUDGE STORAGE TANKS	$131,250
ADMINSTRATION BUILDING MODIFICATIONS	$105,000

ROCKLAND, MA
WWTF ASSESSMENT
W-P PROJECT NO. 20395A

ENR INDEX 11580, 11/2020
CONSTRUCTION COST ESTIMATE

DESCRIPTION	ESTIMATED COST
GARAGE AND ELECTRICAL BUILDING (NEW)	$105,000
PROCESS	
SCREENING AND GRIT FACILITY (NEW)	$922,845
INFLUENT PUMP STATION MODIFICATIONS	$405,090
PRIMARY CLARIFIER MODIFICATIONS	$743,400
SECONDARY SYSTEM MODIFICATIONS	$3,614,804
SECONDARY CLARIFIER MODIFICATIONS	$950,661
TERTIARY BUILDING (NEW)	$2,223,805
CHEMICAL BUILDING (NEW)	$228,900
CHLORINE CONTACT TANKS AND EFFLUENT P.S.	$65,100
SLUDGE STORAGE TANKS	$739,200
ADMINSTRATION BUILDING MODIFICATIONS	$1,164,240
GARAGE AND ELECTRICAL BUILDING (NEW)	$5,250
HVAC/ PLUMBING	
SCREENING AND GRIT FACILITY (NEW)	$0
INFLUENT PUMP STATION MODIFICATIONS	$100,800
PRIMARY CLARIFIER MODIFICATIONS	$0
SECONDARY SYSTEM MODIFICATIONS	$367,500
SECONDARY CLARIFIER MODIFICATIONS	$0
TERTIARY BUILDING (NEW)	-
CHEMICAL BUILDING (NEW)	-
CHLORINE CONTACT TANKS AND EFFLUENT P.S.	-
SLUDGE STORAGE TANKS	-
ADMINSTRATION BUILDING MODIFICATIONS	$369,600
GARAGE AND ELECTRICAL BUILDING (NEW)	$122,850
INSTRUMENTATION	
NETWORK/FIBER OPTIC	$150,000
SCREENING AND GRIT FACILITY (NEW)	$97,335
INFLUENT PUMP STATION MODIFICATIONS	$30,500
PRIMARY CLARIFIER MODIFICATIONS	$58,477
SECONDARY SYSTEM MODIFICATIONS	$333,900
SECONDARY CLARIFIER MODIFICATIONS	$76,328
TERTIARY BUILDING (NEW)	$28,875
CHEMICAL BUILDING (NEW)	$81,375
CHLORINE CONTACT TANKS AND EFFLUENT P.S.	$21,000
SLUDGE STORAGE TANKS	$92,270
ADMINSTRATION BUILDING MODIFICATIONS	$94,709
GARAGE AND ELECTRICAL BUILDING (NEW)	$20,475
ELECTRICAL	

ROCKLAND, MA
WWTF ASSESSMENT
W-P PROJECT NO. 20395A

ENR INDEX 11580, 11/2020
CONSTRUCTION COST ESTIMATE

DESCRIPTION		ESTIMATED COST
WWTF ELECTRICAL DISTRIBUTION		$750,000
WWTF ELECTRICAL SITE LIGHTING/MANHOLES		$50,000
WWTF FIRE SYSTEM		$25,000
WWTF ELECTRICAL DEMOLITION		$150,000
SCREENING AND GRIT FACILITY (NEW)		$292,182
INFLUENT PUMP STATION MODIFICATIONS		$181,249
PRIMARY CLARIFIER MODIFICATIONS		$251,192
SECONDARY SYSTEM MODIFICATIONS		$1,204,046
SECONDARY CLARIFIER MODIFICATIONS		$190,819
TERTIARY BUILDING (NEW)		$157,500
CHEMICAL BUILDING (NEW)		$45,864
CHLORINE CONTACT TANKS AND EFFLUENT P.S.		$21,000
SLUDGE STORAGE TANKS		$151,925
ADMINSTRATION BUILDING MODIFICATIONS		$236,773
GARAGE AND ELECTRICAL BUILDING (NEW)		$1,216,215
SPECIALS		
MOBILIZATION		$200,000
DEMOBILIZATION		$150,000
PILES		$0
GROUNDWATER DEWATERING (OPEN)		$20,000
SUBTOTAL, CONSTRUCTION		$17,193,744
GENERAL CONTRACTOR OH&P AND GENERAL CONDITIONS	17.5%	$3,009,000
SUBTOTAL, SUBCONTRACTORS (C/M/P/I/E)		$8,348,616
GENERAL CONTRACTOR MARKUP	5.0%	$417,000
ELECTRICAL/ TELEPHONE ALLOWANCE		$10,000
BONDS & INSURANCES	1.5%	$435,000
UNIT PRICE ITEMS	1.0%	$172,000
SUBTOTAL, CONSTRUCTION COSTS		$29,585,360
PROJECT MULTIPLIER, DESIGN CONTINGENCY	1.20	
PROJECT MULTIPLIER, INFLATION TO MIDPT CONST.	1.08	
ENGINEERS ESTIMATE OF CONSTRUCTION COST		**$38,236,000**

WRIGHT-PIERCE
Engineering a Better Environment

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ROCKLAND, MASSACHUSETTS

Comprehensive Wastewater Management Plan

APRIL 2023

Phase 2 – Alternatives Identification & Screening

WRIGHT-PIERCE
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Comprehensive Wastewater Management Plan

Phase 2 – Alternatives Identification &Screening

Rockland, MA

APRIL 2023

Prepared By:

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Section 1 Introduction

1.1 Background Information

The Town of Rockland continues to evaluate its current wastewater collection, treatment and disposal needs through its Comprehensive Wastewater Management Plan (CWMP). Approximately 95 percent of the residents of Rockland rely upon the Town's existing wastewater system to collect, transport, treat, and dispose of their wastewater at the Wastewater Treatment Plant (WWTP). The remaining residents, which reside outside of the sewered service area, rely on individual onsite wastewater disposal systems. The intent of the CWMP is to provide a wastewater management planning tool to guide the Town for the next 20 years.

The Phase 1 - Existing Conditions, Problem Identification and Needs Assessment Draft Report was completed and submitted to the Massachusetts Department of Environmental Protection (MassDEP) and Environmental Protection Agency (EPA) on August 9, 2022.

This report, entitled 'Phase 2 Alternatives Identification and Screening' presents the results of the second phase of the three-phase CWMP undertaken by the Town of Rockland to determine the viability of current wastewater disposal practices in non-sewered areas. In general, the intent of this phase of the CWMP is to identify and evaluate alternative wastewater solutions to address the Phase 1 "needs areas'" use of individual onsite wastewater disposal systems. In addition, based on the EPA Order received in July 2022, an additional item evaluated and summarized in this section is the potential of adding groundwater discharge within town to "shed" flow away from the WWTP and review if groundwater discharge at the WWTP site is viable in whole or part.

1.2 Purpose and Scope of Services

In January 2022, Wright-Pierce was retained by the Town to develop a CWMP. This document satisfies the Phase 2 requirements of the three-phase CWMP process and is prepared in accordance with DEP's Guide to Comprehensive Wastewater Management Planning as outlined below:

- Phase 1: Assessed existing conditions, problem identification and needs assessment for the City. The completed needs assessment determined areas with a "need for further study" in Phase 2
- **Phase 2: Alternatives Identification and Screening. Identify and short-list appropriate means of wastewater management alternatives to address any "needs areas" identified in Phase 1. The analysis includes a review of technical, environmental, institutional, and economic factors and**
- Phase 3: Provide a detailed evaluation of alternatives short-listed in Phase 2 and development of recommended wastewater management plan

1.3 Summary of Phase 1 Study Areas

Study areas were delineated and evaluated in Phase 1. Six of the seven areas were estimated to be well suited for the continued use of onsite individual septic systems. Those six study areas were categorized as having Average, Low or Very Low wastewater disposal needs and were removed from further analysis.

The Phase 1 analysis also concluded that the Town has one "high needs areas" (Study Area 1) as shown in Table 1-1 and in Figure 1-1. This area is the focus of the CWMP Phase 2 Alternatives Identification and Screening. Wastewater management alternatives for each area that were investigated include Innovative and Alternative (I/A) systems; local shared systems; sewer system extensions to Rockland's existing collection system; decentralized small wastewater treatment facilities; and continued use of individual septic systems.

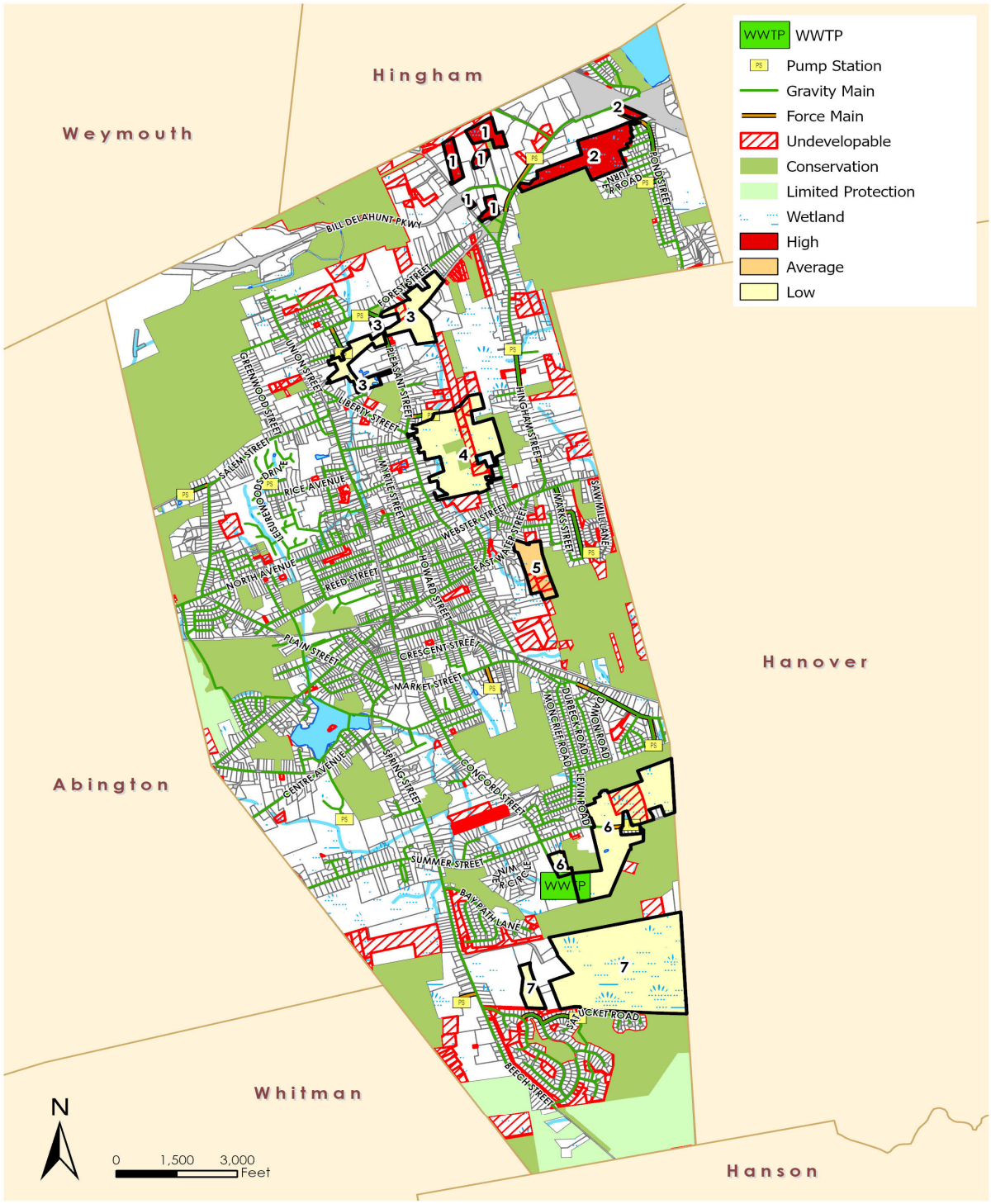
Table 1-1 Areas with Need for Further Study

Needs Area	Location Name
1	Weymouth Street

1.4 Public Review

The report for each phase of the CWMP will be available for review and comment by all interested stakeholders. There will be further opportunity for the public and interested stakeholders to provide input for the CWMP during the public hearing, which will be held towards the completion of the Phase 3 CWMP.

Figure 1-1 Areas with Need for Further Study



2

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Section 2 Wastewater Management Alternatives

The Phase 1 CWMP identified one Needs Area (Study Area 1) with need for further evaluation. The evaluation will determine if this study area needs a wastewater management solution different than the existing onsite individual septic systems. Wastewater alternatives evaluated for treatment, collection, and disposal for the need's areas include the following:

- Optimizing onsite individual septic treatment systems
- Onsite individual Innovative and Alternative (I/A) treatment systems
- Decentralized treatment systems including shared septic and I/A systems and small WWTFs
- Town of Rockland sewer collection system extension

The above listed wastewater alternatives are generally described below, and the evaluation completed and summarized in detail in Section 3. Section 4 presents potential locations for groundwater discharge and impacts to flow management at the WWTP.

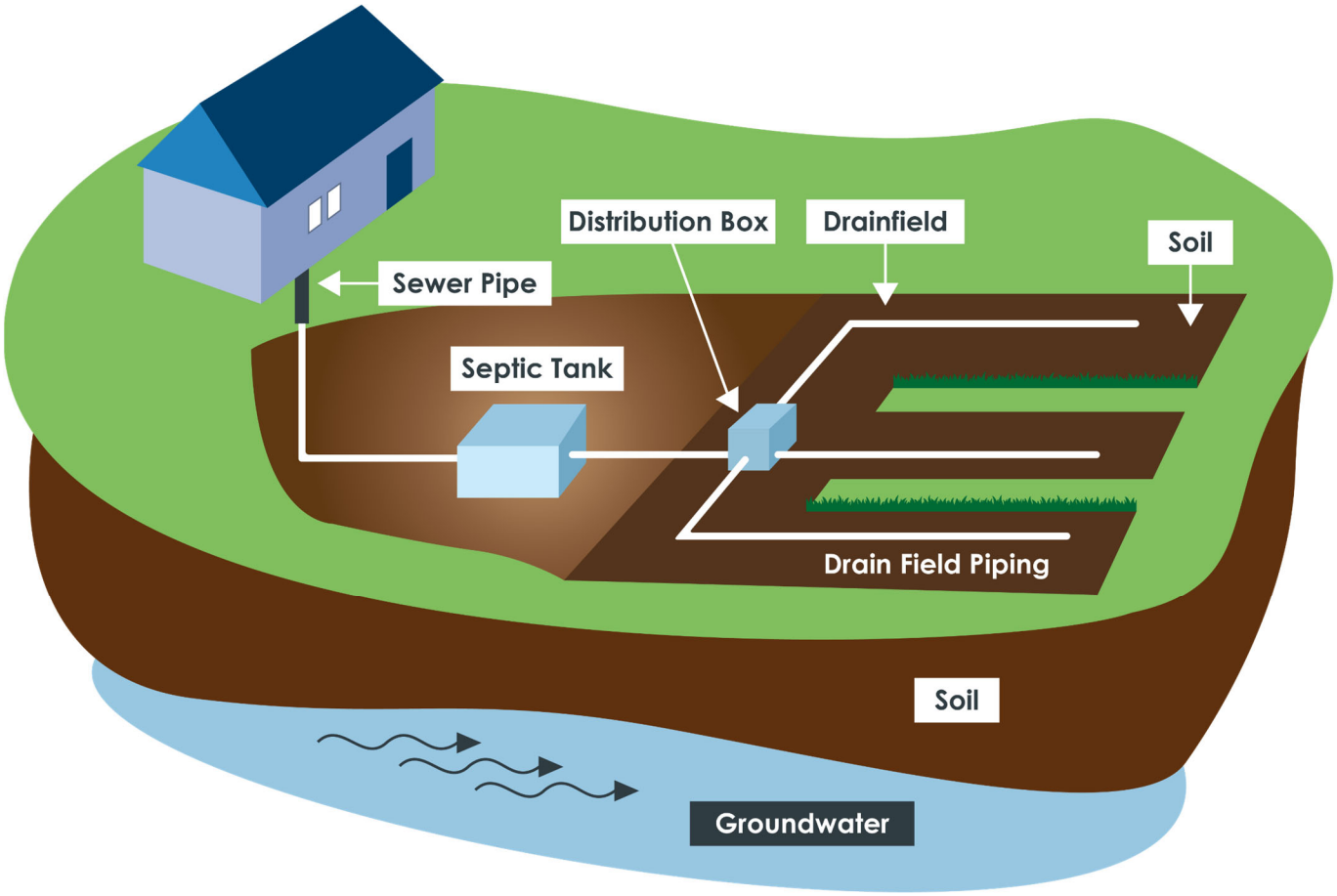
2.1 Onsite Wastewater Treatment Systems

Onsite wastewater treatment systems are defined as wastewater from a property that is collected, treated, and disposed of via subsurface groundwater recharge, typically within the boundaries of that property. There are two types of onsite systems typically used, a septic system or Innovative/Alternative (I/A) systems. Examples are shown in Figures 2-1 and 2-2.

2.1.1 Individual Onsite Septic Systems

As shown in Figure 2-1, the standard components of an onsite septic system are a sewer pipe from a building to the system, a septic tank, a distribution box, a leach field, and a reserve area. Wastewater exits the building through the pipe and enters a septic tank where solids, scum and sludge are separated from the liquid and retained within the tank. To improve scum and solids capture, septic tanks are typically designed with baffle walls or multi-compartments to increase wastewater detention time. Anaerobic bacteria contained within the constituents in the tank will digest organic materials in the waste. A properly operating septic tank can typically produce an effluent with a Biochemical Oxygen Demand (BOD_5) concentration from 140 to 200 mg/L and Total Suspended Solids (TSS) concentration from 50 to 90 mg/L, or approximately 50 to 55 percent removal. Individual septic systems only remove a small percentage of nutrients (nitrogen and phosphorus).

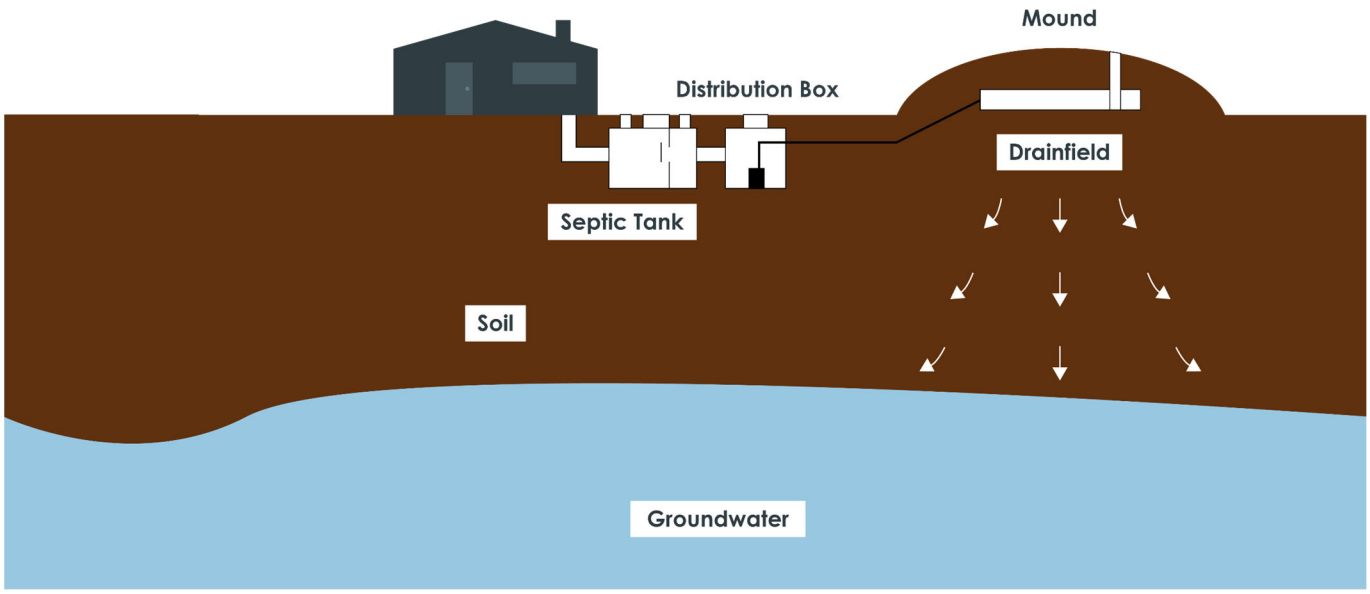
Figure 2-1 Typical Septic System Schematic



Following the septic tank, the partially treated wastewater flows through the distribution box and to the leach field where it is evenly distributed into the subsurface soils. To maximize its effectiveness, a leach field must be constructed in soils capable of accepting, dispersing, and properly treating the wastewater. Advantages of septic systems include systems being self-sufficient and a relatively inexpensive method for treating and disposing of wastewater.

Disadvantages of septic systems include not providing for nutrients (i.e., nitrogen or phosphorous), bacteria, or virus removal. In addition, the siting of onsite systems can be difficult depending on the location. Areas with a shallow depth to groundwater or poorly draining soils can result in the need for a mounded system as shown in Figure 2-2, which may be considered aesthetically unattractive and add to construction cost.

Figure 2-2 Mounded Title 5 Septic System



2.1.1.1 Technical Considerations for Individual Septic Systems

Title 5 of the Massachusetts Environmental Code, 310 CMR 15.000, effective March 31, 1995 (last updated in September 2016), governs the subsurface disposal of sanitary wastewater through onsite septic tanks and leach fields. Title 5 provides standard design requirements for basic treatment and subsurface disposal of sanitary wastewater as necessary for the minimum state requirements for the protection of public health, safety, welfare, and the environment.

The regulations include standards for the design, siting, construction, upgrade, and maintenance of onsite wastewater disposal systems and require appropriate means for the disposal of septage. A sample of the design requirements and standards are summarized below:

- Minimum horizontal separation distance between the components of the onsite system and specified points of potential concern such as property lines, surface waters, wetlands, tributaries to surface water supplies, public wells, and private wells
- Flow and lot size limitations in nitrogen sensitive areas
- Minimal vertical separation from the bottom of the leach field to the top of the seasonally high groundwater table, typically 4 or 5 feet
- Depth of naturally occurring pervious soil below the leach field and reserve area, typically 4 feet
- Minimum depth to bedrock
- Allowable soil percolation rates, typically less than 60 minutes per inch is acceptable
- Additional local Health Department regulations

2.1.1.2 Optimum Operation of Existing Individual Septic Systems

As required per MassDEP guidelines, optimizing the performance of existing onsite treatment systems must be considered as part of the evaluation. This includes optimizing septage management, maintenance, and repair and upgrade of onsite systems as necessary. If this alternative were to be selected, all presently developed lots in that study area would remain dependent on individual septic systems.

Septic systems can often be an efficient and effective means for wastewater treatment. A successful septic system installation is typically constructed in the proper site conditions and routinely maintained. Improper operation of septic systems can lead to system damage and failures, resulting in public health hazards. In order to optimize septic systems, it is required to perform periodic pumping to remove the excess buildup of solids, scum, and grease within the septic tank. Regular pumping should generally occur every 2 years. If solids accumulate to the level of the septic tank outlet, solids can pass into the leach field and clog the piping and leach field. This clogging of the leach field will cause the system to fail. For households with a garbage disposal, it is typically recommended to have pumping occur on an annual basis as the system will incur additional solids loading.

Public education concerning the importance of proper maintenance of onsite wastewater disposal systems is essential for prolonging the life of individual septic systems. The Town should consider the implementation of a Septage Management Plan to help residents improve and maintain the operation of their septic systems. As a start, the Septage Management Plan should include such items as mandated septage pump-out frequencies and proper maintenance practices for septic systems.

2.1.1.3 Title 5 Betterments

The Town of Rockland participates in the Commonwealth's Title 5 Betterments Help for Homeowners with Failed Septic Systems: The Community Septic Management Program. The program targets homeowners with failed septic systems for upgrade/repair to Title 5 systems or connection to an existing municipal sewer line. Funding for the program is through the State Revolving Fund (SRF) loan and Water Pollution Abatement Trust (WPAT). The homeowners pay their betterment quarterly with their property's real estate tax payment. Rockland currently has a zero percent interest loan for the septic loan program.

2.1.2 Innovative/Alternative (I/A) Systems

Innovative/Alternative (I/A) wastewater treatment systems are recognized by MassDEP as providing at least the same level of treatment, and typically achieving better treatment, than a septic system. In general, most of these I/A systems rely upon proven methods of treatment that have been used at WWTFs for several years. The new I/A systems are generally using the same concepts, except that they are now being applied to smaller-scale onsite systems to achieve an enhanced level of treatment.

There are several different types of I/A systems, which will be discussed in detail in the following sections. Most of the MassDEP approved I/A systems utilize many basic components of a septic system, including the septic tank and leach field. I/A systems are sometimes recommended for use in areas where the site is small and/or the ground water table is high. According to Title 5, "alternative systems, when properly designed, constructed, operated and maintained, may provide enhanced protection of public health, safety, welfare and the environment." I/A systems most often utilize the well-established "suspended growth" or "fixed-film" processes for the biological treatment of wastewater. In a suspended growth system, also known as "activated sludge system", the wastewater is mixed and aerated to provide constant contact between the bacteria and wastewater in the presence of oxygen. Fixed film treatment provides a surface in contact with the wastewater for the bacteria to grow on. The main drawbacks to I/A systems are typically the capital cost and level of operation and maintenance of the systems.

2.1.2.1 DEP I/A Approval Process

The MassDEP has a detailed approval process for prospective I/A technologies, including the following four categories that must be approved:

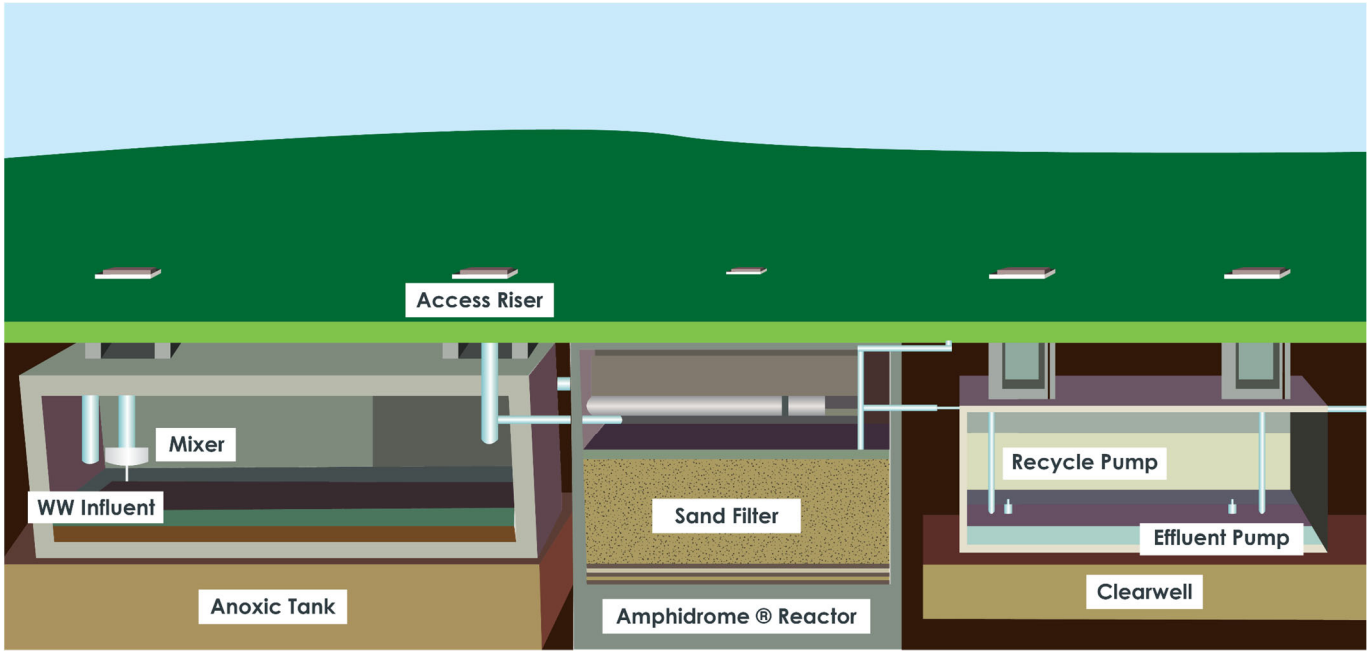
1. Approval for Piloting – I/A effluent must be connected to WWTF or a Title 5 septic system.
2. Provisional Approval – I/A system passed the piloting approval and is now tested in actual field conditions.
3. Certification for General Use – I/A system proven to provide same level of treatment as septic systems.
4. Approval for Remedial Use – for rapid approval of an I/A technology that is needed to upgrade facilities currently served by a failed system.

A current list of the MassDEP approved I/A technologies is provided in Appendix A. The MassDEP approved onsite I/A technologies, which will be evaluated for use in each needs area in Rockland include Amphidrome™, Bioclere™, FAST®, RUCK®, Enviro-Septic®, and FujiClean™ systems. These are the most common I/A systems in current use.

2.1.2.2 Amphidrome™ System

As shown in Figure 2-3, the Amphidrome™ system is a submerged, attached-growth, bioreactor approved for general, provisional, and remedial use. The treatment process consists of an anoxic equalization tank, the Amphidrome™ reactor/sand filter, and clear well. Effluent from the anoxic tank flows downward through the sand filter, providing contact with the bacterial population adhering to the sand particles, and then flows into a clear well. From the clear well, the wastewater can be mixed with a supplemental carbon source and pumped through a second sand filter (included in the Amphidrome™ Plus process) for increased nitrogen removal. Liquid from the clear well is pumped back through the Amphidrome™ reactor/sand filter to backwash the filter and return liquid to the anoxic tank. This is a complicated system, typically designed for small WWTFs but can be used for individual buildings.

Figure 2-3 Amphidrome™ Schematic

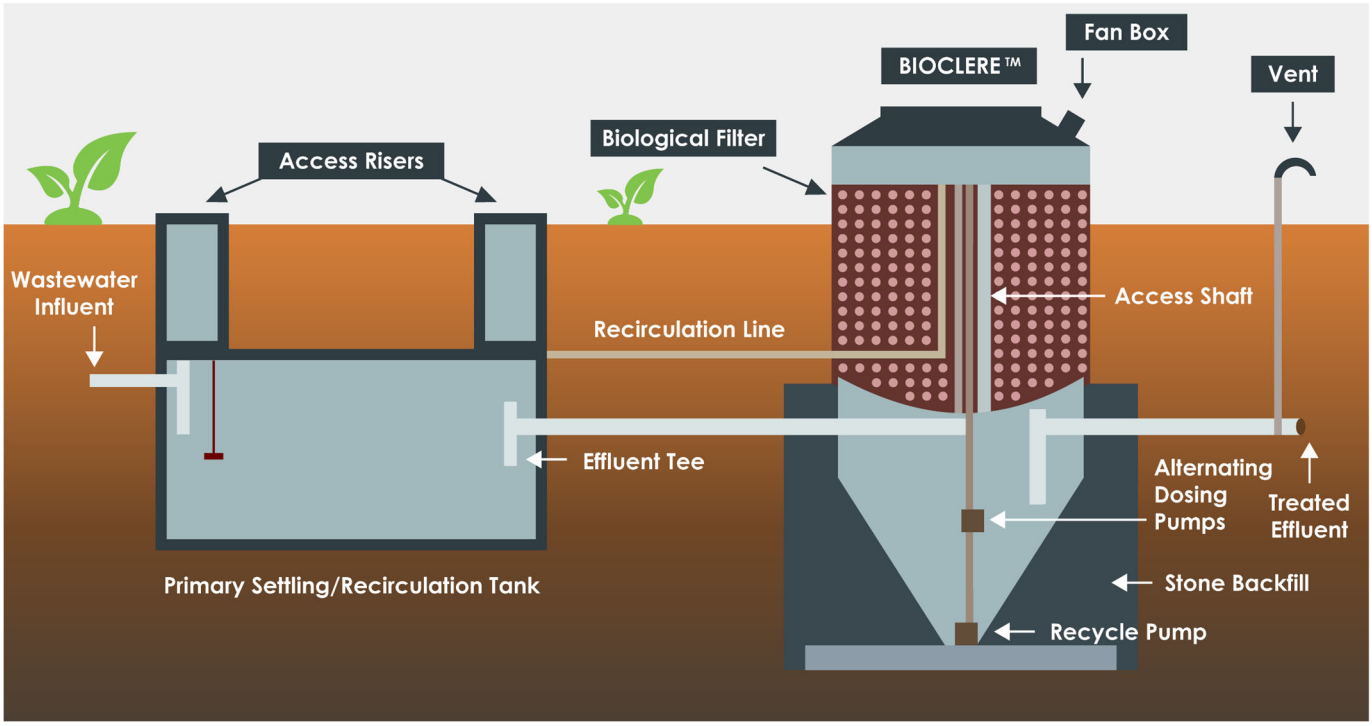


Regulated by the MassDEP, the Amphidrome™ process must meet effluent standard concentrations of 30 mg/L BOD_5 and 30 mg/L TSS. Effluent pH must be within the standard of 6 to 9. Similarly, effluent nitrogen concentrations shall not exceed 19 mg/L or 25 mg/L depending on the selected size and model of the system.

2.1.2.3 Bioclere™ System

The Bioclere™ system is a fixed film, modified trickling filter over a clarifier approved for general, provisional, and remedial use as shown in Figure 2-4. The treatment process consists of a traditional septic tank and the Bioclere™ unit. Effluent from the septic tank flows by gravity into a baffled chamber in the clarifier portion of the Bioclere™ unit. The wastewater is distributed by dosing pumps over the trickling filter media, where a biological film develops and provides the treatment.

Figure 2-4 Bioclere™ Schematic



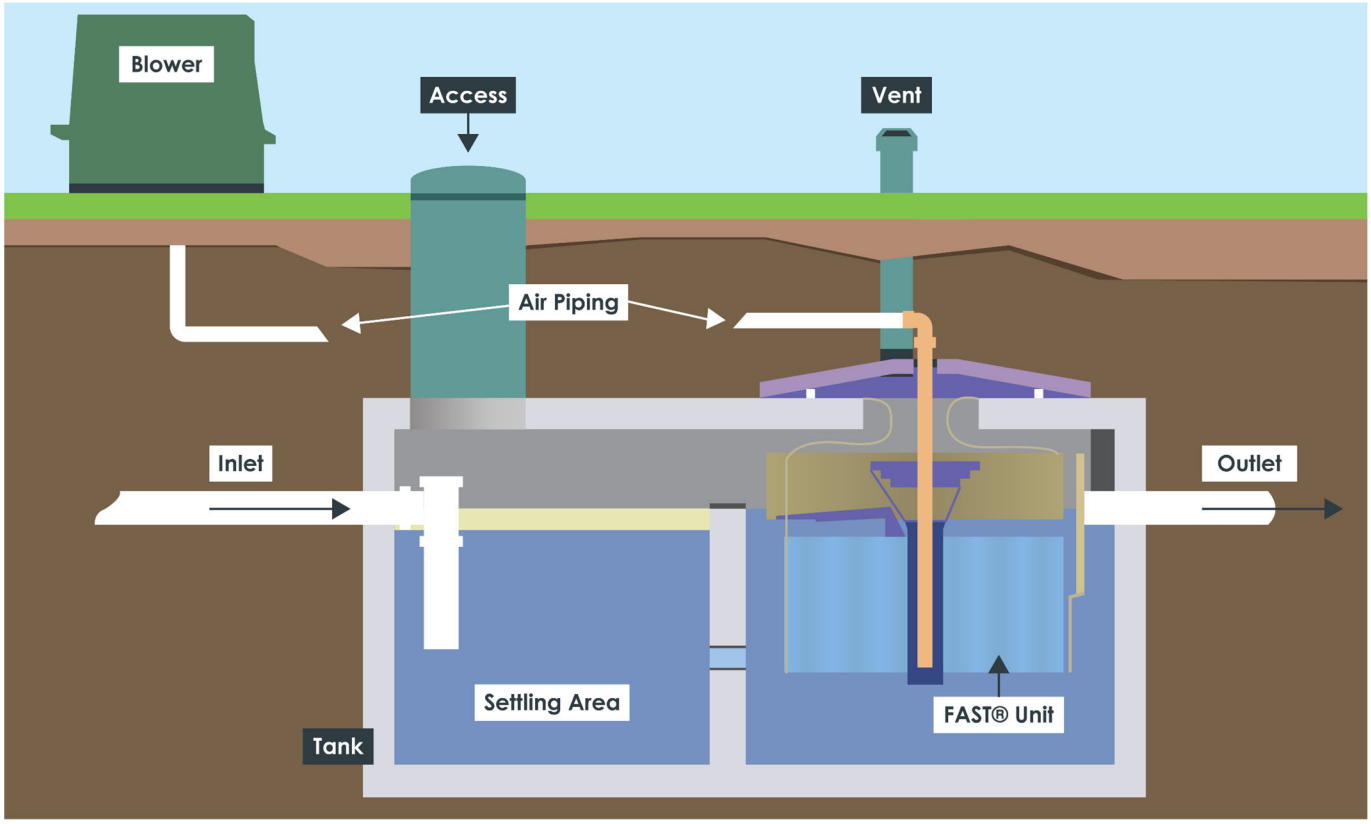
Regulated by the MassDEP, the Bioclere™ system must meet effluent standard concentrations of 30 mg/L BOD_5 and 30 mg/L TSS. Effluent pH must be within the standard of 6 to 9. Similarly, effluent nitrogen concentrations shall not exceed 19 mg/L or 25 mg/L depending on the selected size and model of the system.

The Bioclere™ unit typically has a five-foot diameter footprint and is installed partially above-grade. Potential problems with the Bioclere™ system relate to the biology of the wastewater and the habits of the property owner. For example, excessive oil and grease may impact the system performance.

2.1.2.4 FAST® System

As shown in Figure 2-5, the single home, Fixed Activated Sludge Treatment (FAST) system is a fixed film, aerated system utilizing a combination of attached and suspended growth that is approved for general, provisional, and remedial use. The FAST® treatment process consists of the FAST® unit installed within a two-compartment septic tank. The first compartment is a primary settling zone, and the second is an aerobic biological zone.

Figure 2-5 FAST® System



Regulated by the MassDEP, the FAST® system must meet effluent standard concentrations of 30 mg/L BOD_5 and 30 mg/L TSS. Similarly, effluent nitrogen concentrations shall not exceed 19 mg/L or 25 mg/L depending on the selected size and model of the system.

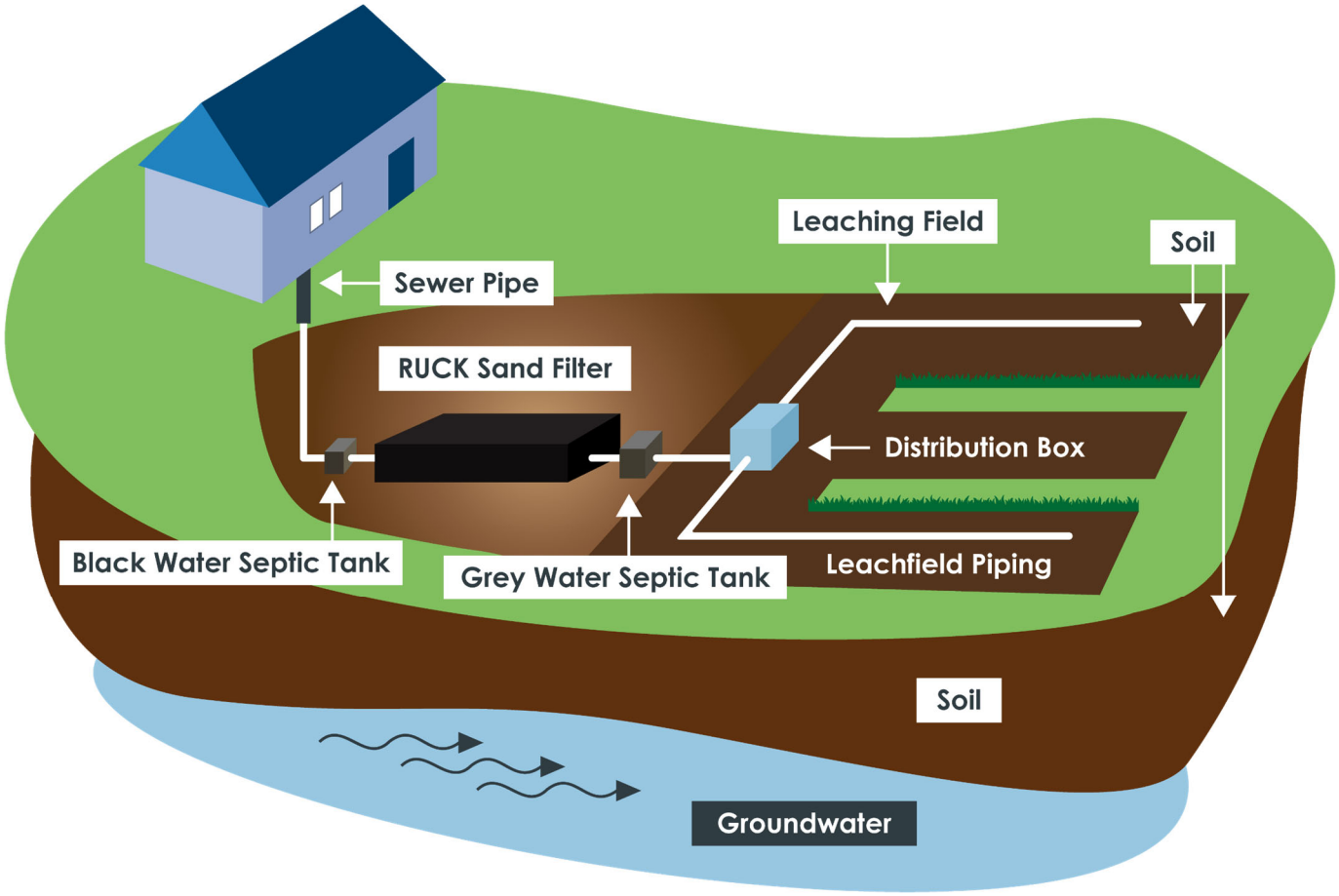
The FAST® system has low maintenance requirements following installation with the exception of recommended tank pumping and blower maintenance. The system can have minimal odors as it is typically located entirely below-grade with the exception of a blower that can be housed up to 100 feet away from the system. This blower must operate continuously, increasing electricity usage and generating a noise source that may need to be mitigated.

2.1.2.5 RUCK® System

The RUCK® system is a passive nitrogen removal system approved for general use as shown in Figure 2-6. The RUCK® treatment process consists of two parallel septic tanks and the RUCK® filter. Influent wastewater is separated into blackwater and graywater by dual plumbing systems within the building unit. Blackwater consists of wastewater generated from toilets and kitchen sink drains equipped with garbage grinders. Graywater, also referred to as wash water, consists of the wastewater from showers, washing machines, dishwashers, and other sinks. The blackwater flows into the blackwater septic tank where primary settling occurs. Effluent from the blackwater septic tank flows through the RUCK® sand filter and into the graywater septic tank where it is mixed with the graywater. The effluent from the graywater tank flows to a leach field.

Regulated by MassDEP, the RUCK® system has the same effluent discharge limits as septic systems.

Figure 2-6 RUCK® Schematic

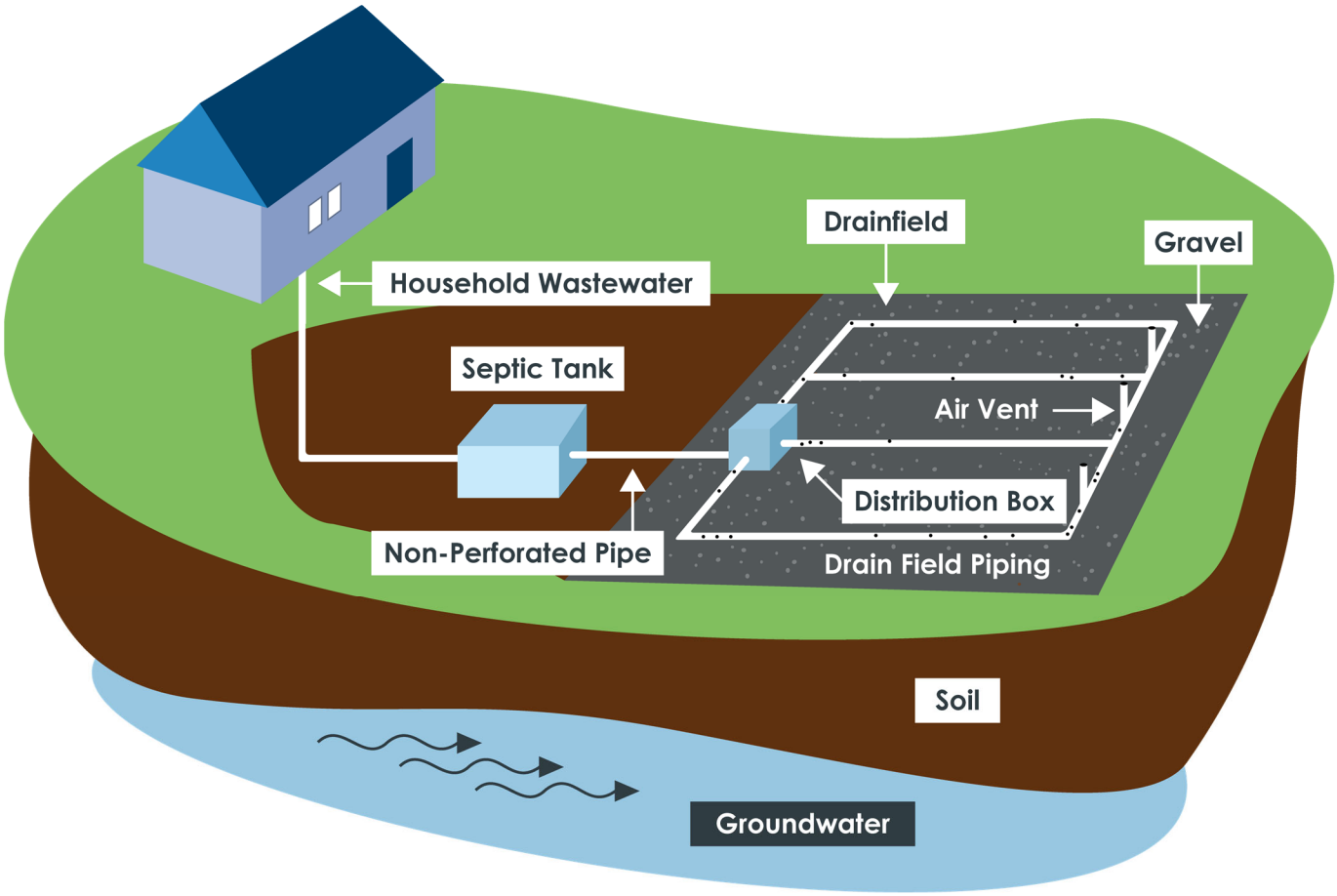


2.1.2.6 Enviro-Septic® System

The Enviro-Septic® system consists of a septic tank followed by the Enviro-Septic® leaching system approved for general and remedial use as shown in Figure 2-7. The septic tank effluent flows into the specially designed Enviro-Septic® pipes. The pipes are corrugated and perforated with a series of ridges at the peak of each corrugation and skimmers protruding on the interior, designed to further capture grease and suspended solids from the effluent. The pipe is surrounded by a mat of randomly oriented, course plastic fibers providing additional treatment. Covering the mat is a geo-textile fabric which is surrounded by coarse sand.

The Enviro-Septic® system uses only natural processes for standard installations, eliminating the need for any pumps, filters, electricity, chemicals, or special maintenance. While this system is not approved to be used with a pressure distribution system, pumps and electricity may be necessary to lift the wastewater up to a mounded disposal field. A reduction in the leaching area required for this system is allowed by Title 5. This system has the same effluent discharge limits as septic systems. However, a study completed in 2004 indicates that the Enviro-Septic® leaching system can remove significant amounts of BOD and TSS as well as a significant amount of nitrogen and phosphorous when compared to an onsite septic system.

Figure 2-7 Enviro-Septic® System



2.1.2.7 FujiClean™ System

The FujiClean™ system is a combined wastewater treatment process approved for provisional use. The FujiClean™ system consists of a single tank with a sedimentation chamber (Chamber 1), an anaerobic contact filtration chamber (Chamber 2) and an aerobic contact filtration chamber (Chamber 3). Chamber 1 uses gravity to separate the solids and grease from the influent wastewater. In Chamber 2, suspended growth anaerobic micro-organisms and spherical filter media aid fixed film decomposition of organic matter. Lastly, in Chamber 3, filtration of the wastewater occurs along with digestion of organic matter, and sludge settling before discharge. The effluent is collected in the Clarification Chamber located in the center of Chamber 3, which uses gravity separation to clarify the treated wastewater. In Suffolk County, New York, single-family homes using this system have produced an average total nitrogen discharge of 11.4 mg/L in 83 samples taken from 20 systems.

2.1.3 Advantages/Disadvantages of Onsite Systems

A summary of the advantages and disadvantages of onsite (individual septic and I/A) systems are summarized in Table 2-1 and highlighted in the following sections.

Table 2-1 Advantages/Disadvantages of Onsite Wastewater Treatment Systems

Method of Treatment	Advantages	Disadvantages
Individual Septic Systems	Cost-effective for low flows Local groundwater recharge Basic treatment of wastewater Minimal owner requirements to operate and maintain	Acceptable level of treatment and protection of public health and welfare of the environment only when properly sited May not be adequate method for protection of public/private water supplies and surface waters from nutrients (nitrogen and phosphorous) Difficult to site on small properties with poor soils and/or shallow depth to ledge and/or groundwater Not capable of providing reliable removal of bacteria or viruses
I/A Systems	Provides local groundwater recharge Advanced treatment and bacteria, virus, and nutrient reduction Less stringent disposal setbacks, easier to site Reduction in the size of leach field depth to high groundwater and required depth of pervious soils	More expensive than individual septic systems Higher operation and maintenance costs and owner involvement Less effective when serving a seasonal property

2.2 Decentralized Systems

Decentralized wastewater treatment systems are larger scale versions of onsite treatment systems and are usually divided into three categories:

1. Shared septic systems
2. Shared I/A systems
3. Small public or private treatment facilities designed to serve larger individual sites or small areas of a community (i.e., specific neighborhoods, apartment communities, large nursing homes).

These systems require a collection system to collect and transfer the wastewater from a specific area (a "needs area" for example) to the treatment and disposal site. Decentralized facilities that treat flows less than 10,000 gpd are designed, permitted, and constructed under Title 5 regulations. Facilities that treat flow between 10,000 and 150,000 gpd require a Groundwater Discharge Permit and are regulated under the MassDEP "Guidelines for the Design, Construction, Operation, and Maintenance of Small Wastewater Treatment Facilities with Land Disposal" (also known as the Small Treatment Facility Guidelines). Facilities over 150,000 gpd also require a discharge permit but have more stringent regulations than a Small WWTF. The regulations that govern small WWTFs are primarily the Massachusetts Groundwater Discharge Permit Program (314 CMR 5.00) and the Massachusetts Groundwater Quality Standards (314 CMR 6.00).

Decentralized wastewater treatment systems can provide solutions to areas where systems are unsuitable, individual I/A systems are unfeasible, and connection to an existing wastewater collection system is not practical or economical. Benefits of these types of systems include local groundwater recharge and reduced infrastructure costs by keeping collection and treatment systems small compared to "centralized" systems. These systems will be investigated further in Section 4 for potential groundwater discharge locations and “shedding” wastewater flow from the existing Rockland collection and treatment system.

2.2.1 Decentralized Treatment Technologies

2.2.1.1 Shared Septic Systems

Shared or cluster onsite treatment systems utilize similar septic tanks and leaching fields as compared to individual onsite systems, but on a larger scale. A shared system typically combines the wastewater from two or more properties into one single treatment system located within these properties or on a neutral site. Shared systems are allowable by Title 5 regulations for upgrades of existing systems, new construction, and for increased flow to an existing system.

2.2.1.2 Shared Innovative/Alternative Systems

Any of the previously discussed I/A technologies, with the exception of the RUCK® system, are suitable for use with shared systems. The RUCK® system is not recommended for use as a shared system for Rockland due to its requirement for separate plumbing (separate black water and gray water) within each residence (system is considered cost prohibitive to the individual property/building owners due to plumbing separation needs).

Shared I/A systems can provide a more cost-effective treatment solution for properties or neighborhoods which cannot support Title 5 systems by dividing the increased cost of an I/A system among several users.

2.2.1.3 Small Wastewater Treatment Facilities

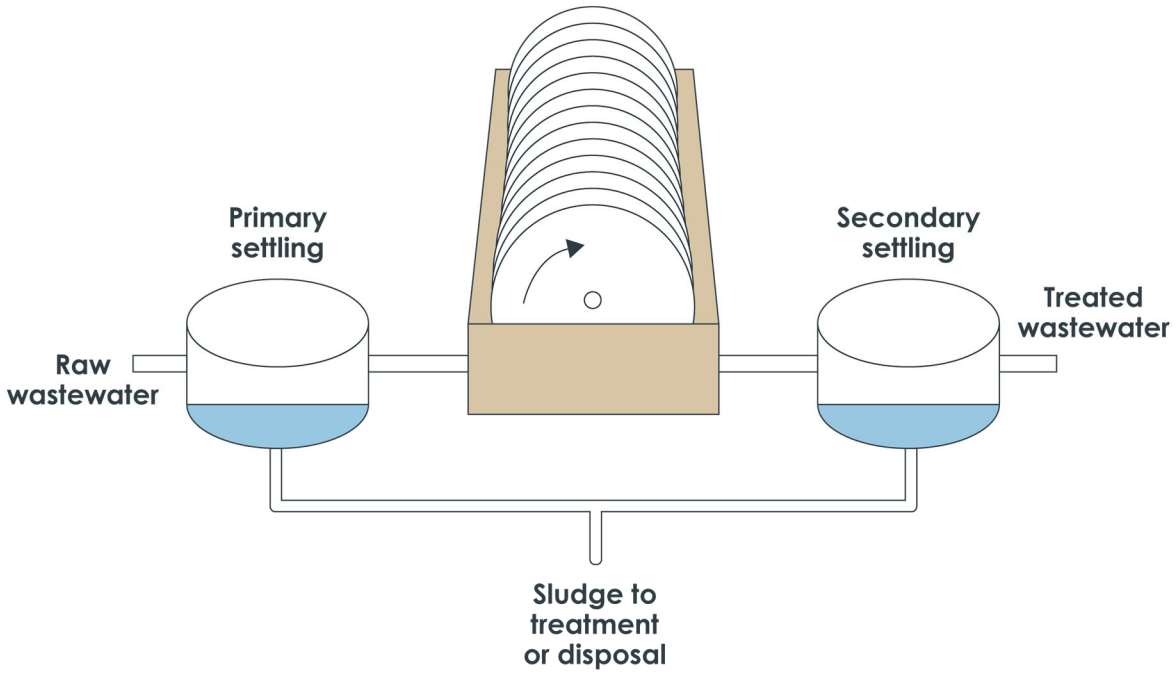
For the purposes of this CWMP, small wastewater treatment facilities (WWTFs) are facilities acceptable for use with a MassDEP Groundwater Discharge Permit (GWDP). This applies to facilities with flow between 10,000 gpd and 150,000 gpd. The Amphidrome™ system discussed previously is a common alternative for small wastewater treatment facilities. The layout and operation of these I/A systems is essentially the same, except on a larger scale. In addition, there are three technologies that are prevalent for use in small WWTFs including rotating biological contactors (RBCs), sequencing batch reactors (SBRs), and membrane bioreactors (MBRs). Each of these types of WWTFs are discussed in the following sections.

2.2.1.4 Rotating Biological Contactors

Rotating biological contactor (RBC) wastewater treatment systems have historically been the preferred biological treatment process for small WWTFs. RBCs are able to operate more efficiently than many other treatment processes and are capable of producing a high-quality effluent. The systems, as shown in Figure 2-8, are quite reliable primarily due to the development of a large biological population during operation over a wide range of hydraulic and organic loading scenarios. The system is also able to adjust quickly to increases and decreases in the strength and volume of the influent wastewater flow.

RBCs consist of a series of circular polyethylene discs, mounted close together on a steel shaft within a tank. The tanks can either be installed within a building or outside with fiberglass covers. Typically, 40 percent of the disc media is submerged in the wastewater. In operation, the steel shafts are rotated to ensure a peripheral velocity of approximately 60 feet per minute creating an environment in which the disks alternately contact the biomass with the organic material in the wastewater and then with the atmosphere for absorption of oxygen. RBC systems also require pretreatment and secondary clarification to complete the treatment process, which can increase the size and cost of the facility.

Figure 2-8 RBC System



The RBC units themselves do not require any regular use of chemicals to operate the facility. However, the other processes complimenting the RBC may require chemicals depending on the degree of treatment required.

2.2.1.5 Sequencing Batch Reactors

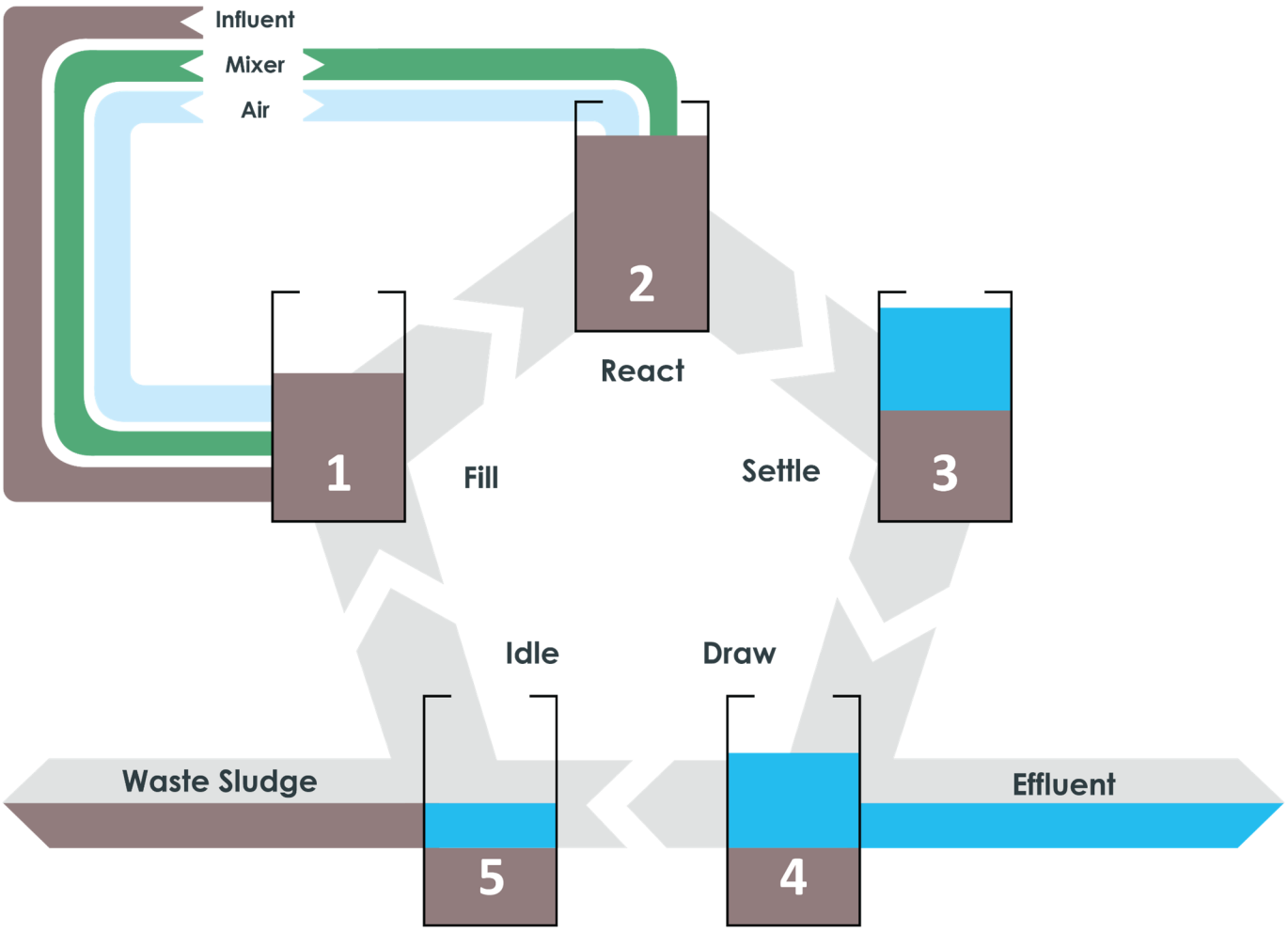
Sequencing batch reactor (SBR) wastewater treatment systems are a modified activated sludge treatment process that utilize a batch treatment cycle to perform the necessary steps for wastewater treatment. SBRs minimize the facility footprint by combining multiple treatment processes into one tank, thereby reducing the capital cost. The process introduces wastewater to a reactor, provides time for the necessary reactions to occur, and sequentially discharges a volume of treated effluent that is essentially equal to the original volume of influent. An SBR is a well-established treatment process that is capable of producing a high-quality effluent while operating over a wide range of hydraulic and organic loadings.

The SBR process typically operates as a five step "fill and draw" system, which is carried out in sequential order within a specific time period as shown in Figure 2-9. The steps are as follows:

1. Mix/Fill - to add preliminary treated wastewater to the reactor (under mixing, no aeration)
2. React - to complete reactions initiated during Fill (under aeration)
3. Settle - to allow solids separation to occur (no mixing or aeration)
4. Decant - to remove treated and clarified wastewater from the reactor tank (no mixing or aeration)
5. Sludge Wasting/Idle - to remove excess sludge from the reactor tank (no mixing or aeration)

In a two-tank system, the general principal is to have one reactor continue to receive the influent flow while the other reactor proceeds through the React, Settle, Decant, and Sludge Wasting stages. SBRs have recently become highly automated, with the prevalent use of reliable Programmable Logic Controllers (PLCs), making the systems much more practical for use in small systems.

Figure 2-9 Typical SBR Sequence



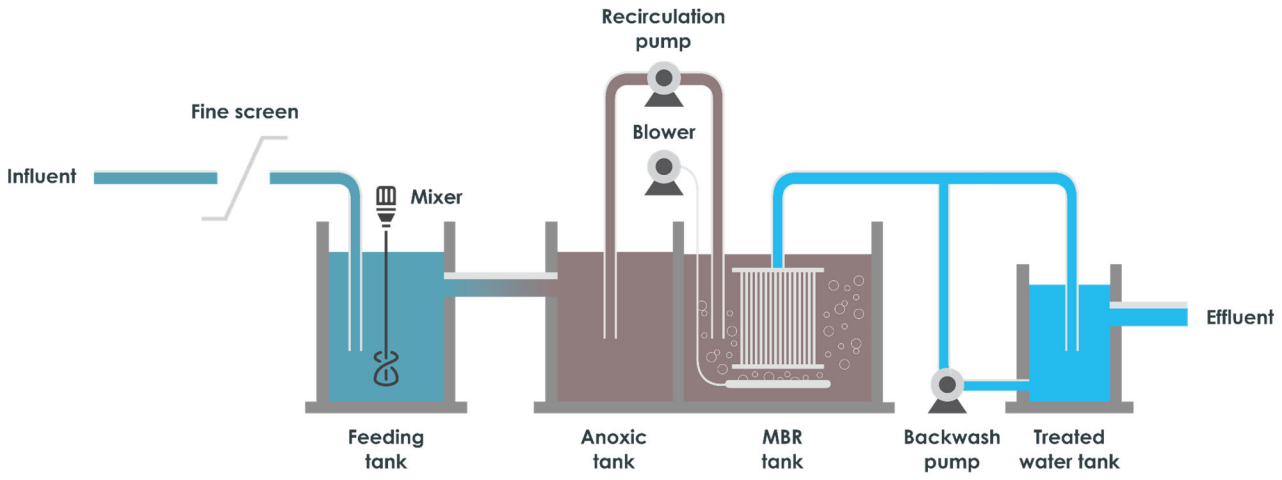
2.2.1.6 Membrane Bioreactors

Membrane bioreactor (MBR) wastewater treatment systems utilize a combination of the activated sludge treatment process and advanced filtration of the membrane units. MBRs are being used with more frequency for small wastewater treatment facilities. When operated correctly, MBRs can produce a very high-quality effluent that can be used for reuse applications, such as irrigation.

MBR systems utilize a bioreactor and a membrane unit as shown in Figure 2-10. MBRs are typically preceded by pretreatment, screening, and flow equalization and may be supplemented with disinfection. The bioreactor consists of several baffled zones or even separate tanks that make up the activated sludge process, which typically uses aerobic suspended growth to separate treated wastewater from the suspended solids (active biomass). The treated effluent is drawn through the membrane by a vacuum, filtering out the suspended solids. The membranes are essentially microfilters that come in two main designs, flat-plate, and hollow-fiber. The membrane microfiltration units can be immersed within the bioreactor or located in a separate unit. When they are located in a separate unit, the separated suspended solids are recirculated into the bioreactor. The membrane units are continuously scoured with air bubbles to prevent membrane clogging and fouling.

MBR systems have the advantage of producing a very high-quality effluent without the need for several additional processes. This allows them to have a relatively small facility footprint that can be a combination of above and below grade components. MBRs can also be installed as a phased process where additional membrane modules can be added to the process as flows and loads dictate. However, MBRs typically include higher capital costs, potential high cost of membrane replacement, and high chemical costs.

Figure 2-10 MBR System



2.2.1.7 Operation and Maintenance Requirements

In accordance with "Operation and Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Discharges" (314 CMR 12.00), the permittee bears the ultimate responsibility of providing for the proper operation and maintenance of the permitted WWTF. The permittee, whether public or private, must have a WWTF Operator who is certified in accordance with the "Rules and Regulations for Certification of Operators of Wastewater Treatment Facilities." (275 CMR 2.00) The licensed operator may be part-time or full-time depending on the size of the system and its chosen technology.

The treatment facility operator is typically present at the facility approximately two hours per day, five days per week for small facilities. In addition to routine system maintenance, the operator is required to record the daily influent and effluent flow as well as several other parameters. Once a month, the operator is required to collect samples to determine if the facility is in compliance with its GWDP. A monthly inspection report, including the results of the sampling and daily flow analysis, must be submitted to the MassDEP and local Health Department.

Small WWTFs are required to include an automatic transfer switch and standby generator that is adequate to power the entire facility in the event of a power failure. The operator is also “on call” and must respond to alarms at the facility, typically through a remote telemetry system.

2.2.1.8 Permitting and Regulatory Requirements

As mentioned above, small WWTFs are considered to be decentralized facilities with flows between 10,000 and 150,000 gpd. These facilities are regulated by the MassDEP Small Treatment Facility Guidelines.

The prevalent permit issued by MassDEP for these systems is the Groundwater Discharge Permit (GWDP). MassDEP has an initiative to retain local groundwater recharge, and the GWDP process allows for the effluent to recharge the local aquifer.

An engineering report detailing the proposed new or upgraded facilities must be submitted along with plans for the collection, treatment, and effluent disposal components of the facility; a hydrogeologic investigations and evaluation of the disposal and surrounding area; a groundwater monitoring plan; and a certification by a Registered Professional Engineer that the plans and specifications have been prepared in accordance with 314 CMR 5.00.

2.2.2 Decentralized Systems Advantages/Disadvantages

There are several advantages and disadvantages to a decentralized wastewater treatment system as listed in Table 2-2. In general, decentralized systems can provide relief for areas with urgent wastewater needs, as well as provide for local groundwater recharge. In particular, I/A systems and small WWTFs can be designed to provide an enhanced level of treatment. The negative aspects of decentralized systems include the potential difficulty in siting the systems or facilities due to the need for a localized site with adequate conditions (emphasis on effluent disposal). These systems may also have high capital and operation and maintenance costs. In constructing decentralized facilities, they often are not large enough to develop an "economy of scale" for the equipment. Therefore, the cost per gallon is higher than for a larger centralized facility.

Table 2-2 Advantages/Disadvantages of Decentralized Wastewater Treatment Systems

Method of Treatment	Advantages	Disadvantages
Shared Septic Systems	Cost-effective for low flows Local groundwater recharge Basic treatment of wastewater Minimal operation and maintenance	Acceptable level of treatment and protection of public health and welfare of the environment only when properly sited May not be adequate method for protection of public/private water supplies and surface waters from nutrients Can be difficult to site on properties with poor soils and/or shallow depth to ledge and/or groundwater Not capable of providing reliable removal of bacteria or viruses
Shared I/A Systems	Provides local groundwater recharge Advanced treatment and bacteria, virus, and nutrient removal Less stringent disposal setbacks, easier to site	More expensive than shared Septic systems High operation and maintenance demands/costs Less effective when serving seasonal properties
Small Wastewater Treatment Facilities	Provides local groundwater recharge Advanced treatment and bacteria, virus, and nutrient removal Less stringent disposal setbacks, easier to site	Significantly more expensive than cluster Septic systems Higher operation and maintenance demands/costs Less effective when serving seasonal properties, although better than shared I/A systems

2.2.3 Existing Small Wastewater Treatment Facilities

The Town of Rockland does not have any existing small wastewater treatment facilities and/or groundwater discharge locations. Due to the recent EPA Order, potential groundwater discharge locations are evaluated in Section 4.

2.3 Wastewater Collection System Extension

Extending the Town of Rockland's municipal collection system is a possible solution that was evaluated for each of the two high needs areas. Connection to the Town's municipal collection system could prove beneficial where individual septic, I/A systems, or decentralized facilities are not feasible. The benefits of connecting to the Town's existing municipal collection system are described in the following sections. The Town WWTF currently meets or exceeds the design and permitted flow, and the Sewer Commission has a moratorium in place against new sewer connections. However, the Town continues to identify and plan to reduce infiltration and inflow (I/I) sources and Section 4 discusses potential groundwater discharge locations within the Town and potential opportunities to "shed" existing flow away from the system, which could allow for new connections. Therefore, existing collection system extension to the high needs areas 1 and 2 will be evaluated fully.

2.3.1 Connecting to Town of Rockland Municipal Wastewater System

The Town of Rockland WWTF treats wastewater from approximately 95 percent of the Town's residents. The Town's NPDES Permit has an annual average flow limit of 2.5 MGD with a peak flow rate of 6.0 MGD. Depending on the depth of the existing collection system and the local topography, sewer collection system expansion could include gravity sewers, force mains, low-pressure systems, or a combination of these types of systems. However, connection to the existing collection system may not be feasible for certain needs areas due to estimated costs due to distance, necessity for pump stations, or other factors.

2.3.2 Permitting and Regulatory Requirements

The Town may need to obtain permits associated with extension of the existing collection system. The Town may also need to obtain easements and purchase property depending on where the proposed sewer system extension is located. Other potential permits include those required by the Massachusetts Historical Commission, the U.S. Army Corps of Engineers, local Conservation Commission, and MassDEP.

The Massachusetts Environmental Policy Act (MEPA) 301 CMR 11.00 provides the opportunity for public review of the potential environmental impacts of a project. The MEPA review process has established specific thresholds, which identify categories of potential impacts. Review is required when one or more review thresholds are triggered. A review threshold that is triggered specifies whether MEPA review shall consist of an Environmental Notification Form (ENF) and potentially an Environmental Impact Report (EIR). One of the thresholds includes new collection system piping.

2.3.3 Advantages/Disadvantages

There are several advantages and disadvantages of connecting a needs area to the Town's existing wastewater collection system as listed in Table 2-3. Connection to the Town's existing collection system would provide a high level of treatment of wastewater for the needs areas at the existing WWTF. However, the economics and overall feasibility must be evaluated for each area as it would include the cost to construct new piping and pumping stations.

Table 2-3 Advantages/Disadvantages of Collection System Extensions

Collection System Alternative	Advantages	Disadvantages
Extending Town of Rockland's Collection System	New users add revenue for the WWTF Removal of wastewater from high needs areas Control of wastewater disposal and level of treatment by the Town	Could shift the water balance between watershed sub-basins Additional sewers and possibly pump stations for the Town to maintain Land purchase and permitting

2.4 Collection System Alternatives

A collection system is a network of pipes, pump stations, and appurtenances that convey wastewater from its point of origin to a point of treatment and disposal. The collection system includes the pipe from the building to the public system in the street or easement, which is called the "service connection" or "service lateral". The service connection is usually owned by and the responsibility of the property owner.

The Town of Rockland's collection system currently consists of 57 miles of gravity sewer. Ninety-five percent of the current population in the Town is sewered. The collection system alternatives available to Rockland include all components from the wastewater source to the treatment facility. Some of the publicly owned collection system alternatives include components that may be privately maintained. Collection system alternatives include low pressure (septic tank effluent pump or grinder pump), vacuum, and small diameter gravity systems. These types of systems are detailed in the following sections.

2.4.1 Collection and Pumping Systems

In traditional gravity systems, wastewater flows by gravity from the building through the service connection and through a piping network to a common collection point (typically a topographic low point). At this location, a central pump station may be used to pump the wastewater to another downstream stretch of gravity pipe or to transport the wastewater to its final destination, typically a WWTF, for treatment and disposal.

Gravity sewers are normally constructed of polyvinyl chloride (PVC), ductile iron, or concrete pipe materials. Extremely flat or hilly terrain and areas with high groundwater and/or ledge may pose problems to gravity sewer installation. These conditions often result in increasingly deep excavations, increased cost, or the need for intermediate pump stations.

Wastewater pump stations are typically located at low elevations in the collection system to collect and pump the wastewater to the next high point in the collection system or to a WWTF. Pump stations can be expensive to construct and represent a considerable O&M expense for the community.

In general, collection systems are relatively simple to maintain, reliable, and can be sized to provide for future capacity.

2.4.2 Low-Pressure Sewers

A low-pressure sewer system includes an individual pumping system, which conveys wastewater generated from a building into the low-pressure piping network where it is transported to a central location for re-pumping or treatment. Specifically, each building uses either an effluent pump in a septic tank (STEP) or a grinder pump to discharge to the sewer main. The piping network is comprised of small-diameter pipe, typically buried just below the frost line (generally 4-6 feet deep). Typical pipe diameters are 1.5 to 6 inches for the mains and 1.25 to 1.5 inches for individual building services. The pressure main and service pipe are generally manufactured from PVC or high-density polyethylene (HDPE).

Low-pressure systems have proven to be viable alternatives especially in low-lying areas with high groundwater, or shallow depth to bedrock. Low-pressure sewer systems have also proven reliable in extremely hilly areas or waterfront areas where deep excavations and extensive dewatering could be problematic.

Some problematic issues for this type of system are ownership of the components located on private property, the potential need for easements, limitations on future expansion, pumping system compatibility, operation during power outages, and delineation of O&M responsibilities. Typically, each user would own and operate the pumping system.

There is currently no low-pressure sewer or individual STEP systems within Rockland.

2.4.2.1 Septic Tank and Effluent Pump (STEP) Type

STEP systems are a variation of the low-pressure collection system that includes septic tank pretreatment. On each property, there is a septic tank and septic tank effluent pump. Depending on the site layout, the construction of a new STEP system can incorporate the existing structure, or it may be entirely new. The septic tank of a STEP system captures the solids, grit, grease, and stringy material that could cause problems in pumping and conveyance through the small diameter piping. STEP systems can be used to convey wastewater to a treatment facility or to a common subsurface leaching system. Periodic removal of the sludge and grease collected within the septic tank by a licensed septage hauler is essential to the long-term performance of this type of system.

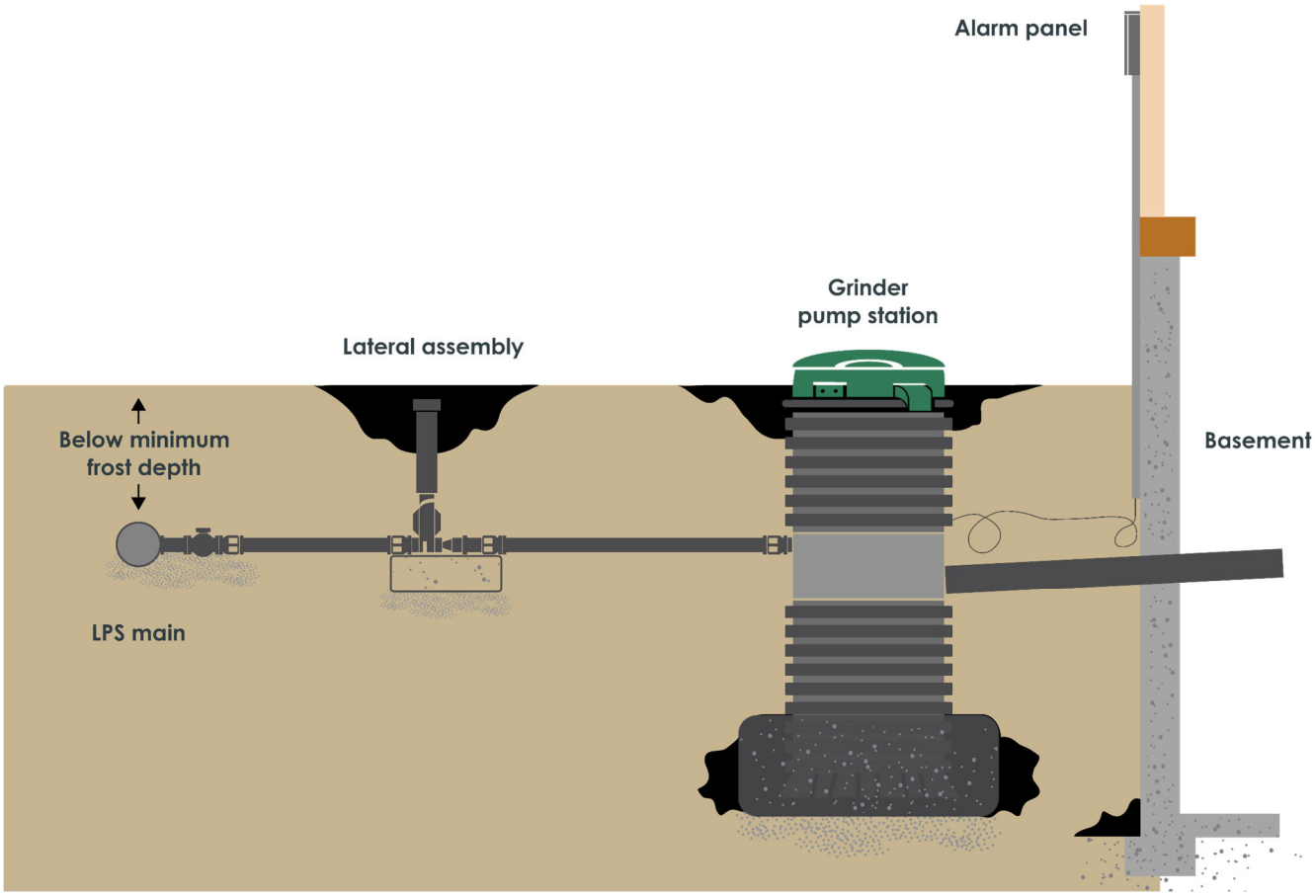
STEP systems require backup power during an outage, or the system will not run. Some communities provide a portable generator and service during an outage to assist homeowners.

2.4.2.2 Grinder Pump Type

A grinder pump system, as shown in Figure 2-11, is another variation of the low-pressure collection system which utilizes a grinder pump. The grinder pump macerates the solids present in the raw wastewater and discharges the wastewater to a low-pressure piping system. Although the grinder pumps can be installed indoors, they are generally located outside so that the service connection can be easily made with minimal alterations to the indoor plumbing. An advantage of these systems is that there is no need for pumping of a separate tank for maintenance, like the STEP system requires.

Grinder pumps which serve individual buildings are usually operated by 1 horsepower motors. Grinder systems have the same issues during power outages as a STEP system.

Figure 2-11 Typical Low-Pressure Grinder Pump System (E-One Design)



2.4.3 Vacuum Systems

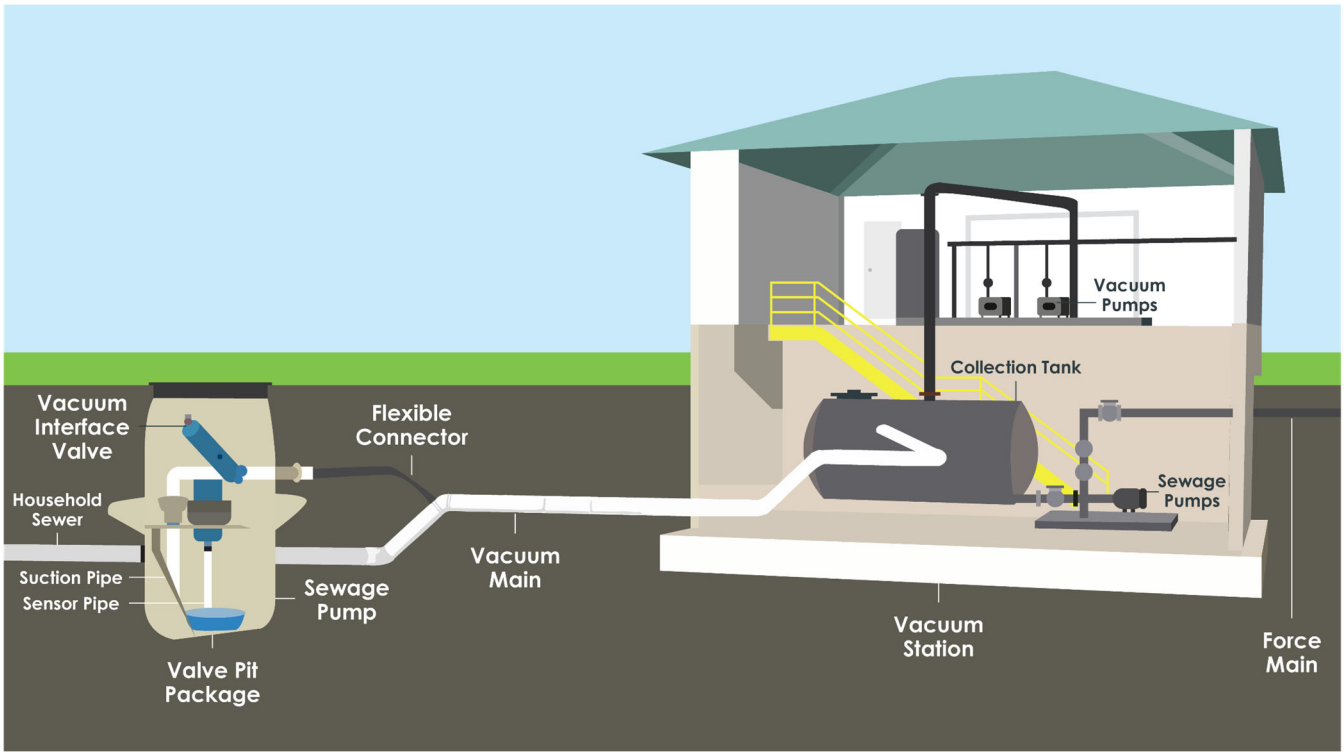
Like the low-pressure system, a vacuum system can be used where gravity sewer systems are impractical and not economically feasible. Vacuum sewers are limited by available lift and are better suited to flat terrain. This technology is not as widely used as the other low-pressure type systems noted. Vacuum sewers have repeatedly been subject to increased operations and maintenance issues as compared to low pressure type systems and are not as well-suited to cold climate applications. Although not prevalent in New England due to cold climate challenges, vacuum systems are currently being used in Provincetown, areas of Barnstable and on Plum Island in Newbury/Newburyport.

Vacuum sewers employ a central vacuum source. The collection mains are typically constructed of PVC or HDPE ranging in size from 4 to 10 inches in diameter. Vacuum systems can be buried at shallow depths (2-4 feet) as the high velocities (15 to 18 feet per second) attained by the system typically keep the lines from freezing. The collection mains can follow the profile of the ground, provided that modest elevation changes are maintained.

The vacuum collection system as shown in Figure 2-12 consists of three main components: (1) services, (2) wastewater collection mains, and (3) the vacuum station. After a preset time interval, the vacuum valve located on each property closes and a slug of wastewater is propelled into the collection main. Numerous cycles eventually propel the wastewater to a collection tank located at a central vacuum station. Buffer tanks are also used as

holding tanks to collect and regulate large flows such as those flows from apartment buildings, schools, and other large users.

Figure 2-12 Typical Vacuum System Schematic



2.4.4 Small Diameter Gravity Sewers

Small diameter gravity collection systems include a septic tank after the building service connection prior to discharge to the sewer main. The septic tank reduces grit, grease and other troublesome solids which might cause obstructions, allowing the collection system to be constructed with smaller pipe sizes. Other than pipe size, these systems are configured similar to gravity systems requiring straight runs between manholes to convey wastewater directly to a WWTF to a low point where a pump station is typically sited. Solids settlement is less of a concern as compared to a gravity system, but periodic pumping of the individual septic tanks is required to remove sludge, scum, and grease.

Small diameter gravity collection systems rely on gravity to transport the effluent, but they are often designed to be laid at variable grades throughout the system. The variable grade of the pipe creates low points in the system. The effluent backs up at these low points until pressure is created and the effluent is then forced through the pipe. This can be beneficial in extremely flat areas where the excavation would need to be particularly deep if the pipe was laid at a continuous downward slope. Therefore, construction costs are often reduced, because excavation can be minimized since the sewer may be laid to follow the topography more closely than with gravity sewers. Designers must still be cognizant of infiltration and inflow and future growth when sizing these systems.

2.4.5 Collection System Advantages/Disadvantages

A summary of the advantages and disadvantages of the collection system alternatives including conventional low pressure (STEP and grinder pump), vacuum, and small diameter gravity systems are presented in Table 2-4. These collection system alternatives will be evaluated as part of the alternatives analysis.

Table 2-4 Advantages/Disadvantages of Collection System Alternatives

Technology	Advantage	Disadvantage
Gravity Collection System	Ease of long-term maintenance Power outages handled with centralized backup power at pump station Provides excess capacity for future connections Centralized solids management Lowest energy use Limited need for service connection easements	Deep excavations disrupt traffic and private property Not all properties can easily be served by gravity connections (pumps needed for low-lying buildings) Stream, road, and railroad crossings more expensive Less amenable to narrow streets Flat areas require pump stations Higher capital costs
Low Pressure Sewer System (Grinder and STEP)	Potential for lower capital cost Easier construction due to shallower excavation Environmental disruption reduced Suitable for challenging terrain Reduces stream, road, and railroad crossing effort More amenable to narrow streets	Increased service call effort Pumps located on each property Electrical costs paid by property owner Ownership and O&M responsibility are shared by many entities Easements/Access agreements may be required Need to pump tank for STEP system Power outage challenges
Vacuum Sewer System	Lower O&M costs Easier construction due to shallow excavation Environmental disruption reduced Duration of construction reduced	Limited number of vendors and service providers Limited to flat terrain Maintenance concerns with valves and pipe plugging Construction and design costs higher than low pressure systems Modifications to interior plumbing is required
Small Diameter Gravity Sewers	Lower O&M costs Lower construction costs	Septic tanks still need to be pumped out routinely Not amendable to future growth Pipe plugging concerns

2.5 Effluent Disposal Alternatives

There are two general options when disposing of effluent from wastewater treatment facilities: groundwater or surface water (river or ocean). Each of these options are discussed in more detail below.

2.5.1 Surface Water Effluent Disposal

The Town of Rockland has an approved NPDES permit (#MA0101923) to discharge the effluent from its WWTF to the French Stream. In addition to the NPDES permit, a new EPA program based on the size of the WWTF has issued a new permit in 2022 called the Medium General Permit (#MAG590038). This permit is included in Appendix A. The levels of treatment for surface water disposal depend on the size of the water body, how negatively impacted it is, and the general use and class of the water body. Typically, once the wastewater has been treated to appropriate levels it is discharged into the surface water through a directly piped outfall. Based on the EPA's Order (discussed in Phase 1 of the CWMP) issued to the Town, a review of potential other surface water discharge locations will be conducted in Phase 3.

2.5.2 Groundwater Effluent Disposal

Groundwater effluent disposal systems discharge treated wastewater either at the ground surface or below the surface. The goal of both disposal systems is to get the effluent to percolate down through the soil to the groundwater below, eventually being carried away by the regional groundwater flow. Surface disposal systems include spray irrigation and rapid infiltration basins. Subsurface disposal systems include leaching facilities (trenches, beds, or chambers), wicks, and drip irrigation. Descriptions of each of these types of effluent disposal systems are presented in the following sections.

The relative weighting of advantages and disadvantages for a given disposal technology is best determined by considering the features of the specific site. Once potential effluent disposal sites are identified through a hydrogeologic investigation and evaluation, the best-suited disposal type can be further evaluated.

The physical characteristics of a site, which need to be evaluated to determine its suitability, include size, topography, permeability of the soils, and depth to groundwater and bedrock. All effluent disposal sites require proper separation distance (setbacks) from buildings, property boundaries, water supplies and other sensitive environmental receptors.

2.5.2.1 Subsurface Leaching

A soil adsorption system typically includes a networking of rigid solid and perforated piping buried below grade, which distributes treated effluent into surrounding gravel trenches or beds that provide dispersal of effluent over an area at a specific dosing rate. If well operated and maintained, the leaching system can last for 20 years or longer. Land must be available for the active or "primary" disposal area as well as an equivalent area of land earmarked as "reserve", which can be developed as an effluent disposal leach field in the event of a failure to the primary disposal area.

These systems are designed to operate year-round and work best with regular dosing of treated effluent. The entire disposal system is buried, which eliminates the chance of human contact, and can be located under public parks, sports fields, or under parking lots with proper design and site conditions.

2.5.2.2 Drip Irrigation

Drip irrigation is a subsurface installation of flexible small-diameter plastic piping that provides pressure dosing of effluent to the soil. Loading rates are comparable to subsurface leaching fields because the concepts are similar. This technology has been tested at the Massachusetts Alternative Septic System Test Center on Cape Cod and has received "general use" approval. Drip irrigation systems are designed to drain in between doses to allow for year-round operation. These systems require a pressurized application; usually a pump station is located near the disposal system and requires filtration of the effluent prior to disposal to avoid plugging.

These systems can be sited under parks, sports fields, or parking lots. The flexible hosing can follow surface contours and avoid horizontal obstructions like trees and landscaping and can be installed in some wooded settings. The drip tubing can be installed in the soil through narrow trenching or a single blade plow. It is possible to install a system in a matter of days and avoid tearing up turf. The low-cost materials and easy installation translate into a relatively low capital cost.

2.5.2.3 Rapid Infiltration

Rapid infiltration, also referred to as open sand beds or rapid infiltration basins (RIBs), can operate at high loading rates on sites with good permeability and significant depth to groundwater. Year-round application is routine. The reduced footprint compared with other technologies often outweighs the drawback that the site can only be used for RIBs. A smaller disposal footprint also broadens the number of parcels that could be used as effluent disposal sites. The reduced footprint sometimes allows a single site to provide both treatment and disposal, which is less likely for other systems. Locating the treatment and disposal processes on the same site minimizes the transport costs.

Rapid infiltration systems require fencing around the perimeter to keep out wildlife and humans. The maintenance of the system includes periodic solids removal from the application surface (scarifying) and infrequent weeding. Rapid infiltration beds are considered less aesthetically pleasing than other alternatives and may not be recommended in densely populated areas.

2.5.2.4 Spray Irrigation

Landscape spray irrigation is another example of technology that can be used on a site with another use. Effluent can be applied to parks, sports fields, golf courses, or landscaping. All these activities are associated with human interaction and require meeting the effluent reuse guidelines (US EPA Reclaimed Water Guidelines), which usually adds to the cost of wastewater treatment. Irrigation is certainly restricted to seasonal operation which requires either winter storage or a complementary effluent disposal system. This technique uses moderate application rates.

2.5.2.5 Wicks

A wick is a vertical cylinder of highly permeable material that provides an efficient path for effluent to travel from the surface point of discharge to the groundwater. This allows for very high loading rates on a very small footprint. Wicks are the most space-efficient method of disposal because they disperse effluent both horizontally and vertically. Another advantage to wicks is the ability to bypass less permeable soil at the surface to more pervious soil below.

The type of soil and the depth to groundwater affect how fast surface applied effluent takes to reach the groundwater table, as well as the depth of the mound of the wick.

This technology currently has a relatively limited track record. There are only four wicks with groundwater permits in Massachusetts. Initially, MassDEP took a very conservative approach to permitting wick disposal systems by requiring a standby wick and reserve area, but recently MassDEP has been less stringent with their permitting requirements. Extensive hydrogeologic evaluations are required to determine the suitability of the soil for wicks.

While other technologies need 3 to 5 acres to distribute 100,000 gpd of effluent for example, the same volume could perhaps be handled by wicks on a site as small as one tenth of an acre. Typically, the only above-grade components include an access vault and cover. This technology is best considered after an unsuccessful search for sites large enough for more traditional technologies. There have been varied results in the pilot testing for wick disposal; and there are some operations and maintenance concerns.

2.5.2.6 Combining Technologies

It is possible to combine technologies, such as year-round subsurface application below golf course fairways and seasonal spray irrigation on the course. It is also possible to install wicks within rapid infiltration basins to maximize the application area.

2.5.3 Effluent Disposal as part of the Treatment Process

Utilizing the disposal system as part of the treatment process is worth consideration. Specific rapid infiltration bed loading cycles can provide additional nutrient removal. Spray irrigation of effluent removes additional phosphorus, nitrogen, and most other parameters, providing effective effluent "polishing". While such polishing is well documented, MassDEP may not give credit for the additional pollutant removal because it is difficult to monitor and quantify.

2.5.4 Effluent Reuse

Effluent reuse is defined as reclaimed water that has been treated at a WWTF to an advanced degree and used again for various applications. Reuse of treated wastewater effluent typically is associated with the application and reuse of water for irrigation. Reuse also applies to discharging treated wastewater into the ground to recharge the aquifer used for supplying drinking water.

The MassDEP issued Interim Guidelines on Reclaimed Water (Reuse) on January 3, 2000, and revised the guidelines and combined such with the Groundwater Discharge Permit process in 2009. Also in 2009, 314 CMR 20 - Reclaimed Water Permit Program and Standards was issued. The MassDEP has initially limited the use of reclaimed water to spray irrigating golf courses, landscaping, artificially recharging aquifers, and gray water toilet flushing. The artificial recharging of aquifers is only permitted in watershed basins and sub-basins which are stressed water resource areas where it is necessary to replenish stream flow, enhance the productivity and capacity of an aquifer, and/or improve upon or mitigate water quality problems. The water quality criteria for the treated wastewater are extremely rigorous, requiring that reclaimed water be virtually pathogen and contaminant free. Effluent reuse is often not a viable alternative due to financial constraints associated with the enhanced treatment requirements.

2.5.5 Groundwater Effluent Disposal Advantages/Disadvantages

The alternatives for groundwater disposal are dependent on the conditions of the proposed discharge site. The recommended alternative should be based on the proposed wastewater effluent flows and the required site conditions of the effluent disposal technology. Table 2-5 includes a summary of advantages and disadvantages of groundwater effluent disposal alternatives.

Table 2-5 Advantages/Disadvantages of Groundwater Effluent Disposal Systems

Technology	Advantage	Disadvantage
Subsurface Leaching	Minimal operation and maintenance when operated properly Suitable for decentralized alternatives when small quantities of wastewater must be disposed	Lowest application rates Poorly draining soils not suitable
Drip Irrigation	Suitable for installation under parks, sports fields, or parking lots Relatively low capital cost Can be routed around existing features (trees, etc.)	Requires pumping system Lower discharge rates Freeze protection/measures necessary
Rapid Infiltration	Good for large systems Moderate application rates	Well-drained soils required Significant separation from groundwater required for mounding Aesthetics and other “neighbor” concerns
Spray Irrigation	Additional nutrient removal Moderate application rates Possibility of dual use	Seasonal operation only Dual-use applications often require meeting reuse standards
Wicks	Most space efficient disposal technology Bypass impervious soils to reach well drained soils	Well-drained soils in disposal layer required Loading test for permitting required More redundancy required than other technologies Regular monitoring of system operation Varying results in pilot testing Operations and maintenance concerns

2.6 Watershed-Based Management Techniques

Wastewater based management techniques such as water conservation initiatives are available to the Town of Rockland. These techniques provide mechanisms for optimizing Rockland's current water system, wastewater collection and treatment system, and onsite systems. These alternatives may also provide effective management in the study areas that are determined to be well suited for onsite systems. These techniques are not always applicable in areas where the site conditions do not allow for proper onsite treatment.

2.6.1 Conservation Initiatives

Identifying techniques for wastewater flow and load reduction is an important part of a CWMP. The reduction in wastewater volume allows for minimized collection, pumping, treatment, and effluent disposal processes and infrastructure. Wastewater reduction starts at the source. Changing water use habits typically results in a decrease in actual wastewater flows. Water conservation may increase the strength of the wastewater and hence the amount of treatment required.

One of the ways to reduce wastewater generation is to implement water conservation measures to reduce water use. Water conservation for Rockland starts with comprehensive planning. A variety of water conservation alternatives have been presented by the Executive of Energy and Environmental Affairs (EOEEA) in its 2018 "Water Conservation Standards." This manual covers key areas of water supply planning and management, and indoor and outdoor water use, including the following ten topics:

1. Comprehensive Water Resource Planning and Drought Management Planning
2. Water Loss Control
3. Metering
4. Pricing
5. Residential Use
6. Public Sector Use
7. Industrial, Commercial and Institutional Use
8. Agricultural Use
9. Outdoor Use
10. Public Education and Outreach

The goals of the standards and recommendations are to:

- Preserve water resources as the Commonwealth's public trust
- Sustain water supplies for current and future needs, including in times of drought
- Protect aquatic ecosystems
- Reduce utility costs by:
  - reducing water waste and associated energy and treatment costs
  - prolonging the natural life of system components and equipment
  - postponing or eliminating the need to develop additional water supply sources
- Spur economic development by helping ensure reliable and sustainable access to water

Several of the standards will directly reduce wastewater flows, such as pricing, replacement fixtures and public education. While others, such as outdoor water use, would impact water use only. Table 2-6 summarizes the ten topics outlined by the EOEEA for water conservation. For public outreach, the Town of Rockland and Abington-Rockland Water District have water conservation tips for the public on their respective websites.

Table 2-6 Summary of Water Conservation Standards

Category	Standard	Recommendation
Comprehensive Planning and Drought Management Planning	Create Drought Management Plan. Create Emergency Management Plan. Develop a written program to comply with these Standards.	For Integrated Infrastructure Planning focus on stormwater, wastewater, I/I, and water supply. Improve communication with other local officials so that they are aware of the water consumption and supply availability. Establish a water bank to reduce the existing demand on the water resources.
Water Loss Control	Develop and implement a Water Loss Program. Meet or demonstrate progress towards meeting the state standard of less than 10 % unaccounted-for-water (UAW). Conduct complete system-wide leak detection every three years. Repair all leaks quickly.	Use MassDEP Guidance manuals on leak repair. There should be consideration given to assuring the penalty for water theft. Conduct a desktop or paper top-down water audit every year.
Metering	Each public water supplier should develop a program to implement 100% metering of all public sector and private users with meters. The metering program should include regular meter maintenance. Meter reading and billing for domestic accounts should be done quarterly. Master meters should be calibrated annually.	Meter reading and billing for the largest users should be done more frequently than domestic accounts. Water and sewer rates, where applicable, should be billed so as to inform customers of their actual use and cost of each. Seek Commonwealth funding for meter replacement and automatic meter reading equipment. Consider purchasing remote reading equipment.
Pricing	Water pricing structure should include the full cost of operating the water supply system. Water supply system operations should be fully funded by water supply system revenues. Prohibit decreasing block rates which are illegal in MA.	Each water supplier should establish an enterprise account for water. Water suppliers should consider adopting rate structures that promote revenue stability, affordability, and equity.

Category	Standard	Recommendation
Residential Water Use	(1) Install water efficient plumbing fixtures. Use residential water efficiently - meet or demonstrate progress towards meeting residential use of 65 gpcd as soon as possible. Implement a comprehensive residential water conservation program.	Promote water efficient household appliances. Free or low-cost water audits should be made available to residential customers. Promote efficient non-landscape outdoor water use - pools, car washing, sweeping driveways. Promote waterless plumbing fixtures. Facilitate Leak Repair - provide a list of plumbers who will fix leaks for a reasonable rate.
Public Sector Water Use	Government facilities, including school departments and hospitals should account their full use of water, based on full metering of public buildings, parks and other facilities. Public building should be built or retrofitted with equipment that reduces water use. Water used by contractor using fire hydrants for pipe flushing and construction should be metered, and they should be charged, including service fees. Strictly apply plumbing codes and incorporate other conservation measure in new and renovated buildings.	Adopt outdoor water use strategies (See Lawn and Landscape below). Create Demonstration Sites for Innovative water conservation techniques.
Industrial, Commercial, and Institutional Water Use	All industrial, commercial, and institutional water users should develop and implement a written water policy. All industrial, commercial, and institutional water users should carry out a water audit. Practice good lawn and landscape water use techniques.	All industrial, commercial, and institutional users should install/ retrofit water saving sanitary devices. Industrial and commercial users should work with code officials, standards committees, state programs, manufacturers, and legislators to promote water conservation.
Agricultural Water Use	Adopt a water conservation approach. Create a soil health management plan, when applicable.	Develop and promote industry specific best management practices. Irrigation system efficiency should be evaluated on a regular basis. Develop and implement a conservation plan based on Natural Resources Conservation Service Guidance.

Category	Standard	Recommendation
Outdoor Water Use	Minimize water lawns and landscapes. Adopt and implement a water use restriction bylaw, ordinance, or regulation for municipal and private wells.	Restrict diverting water directly from a water source without approval from the local Conservation Commission or MassDEP Implement water-use efficiency policies or regulations. Increase public awareness of water-smart landscaping and efficient irrigation practices. Maximize water conservation of automatic irrigation systems.
Public Education & Outreach	Develop and implement an education plan.	Municipalities should hire a water conservation coordinator. Use social marketing to build public support for water conservation. Include other Town boards in water conservation.

3

WRIGHT-PIERCE
Engineering a Better Environment

Section 3 Alternatives Analysis

3.1 Introduction

The Phase 1 CWMP identified one study area with need for further evaluation. Study Area 1 was found to have high priority needs. This area was further evaluated and summarized in this section to determine if additional wastewater management, beyond individual onsite septic systems, is recommended. The potential wastewater management alternatives for treatment, collection, and disposal include Innovative and Alternative (I/A) systems, shared/decentralized systems, municipal sewer system extensions, and continued use of onsite septic systems.

3.2 Treatment Technology Assessment

As part of this phase of the CWMP, a similar ranking and scoring system approach as utilized in Phase 1 was used to evaluate the alternative wastewater treatment systems. Each of the treatment systems was scored based on primary and secondary criteria for each high needs area. The primary criteria were based on technical components, including the system's ability to provide a certain level of treatment and nutrient removal (i.e., nitrogen and phosphorus) and cost to construct the system. The secondary criteria conditions were less technical in nature and included more evaluative components, such as public and regulatory acceptance of the treatment systems, and other environmental factors. Local criteria, specific to Rockland, were considered for this CWMP, such as phosphorus and flow requirements at the WWTP.

Each type of treatment system received a score based on the evaluation criteria for both primary and secondary criteria. The lowest scores for each of the identified treatment systems were then short-listed, which will be further evaluated in Phase 3 - Detailed Evaluation of Alternatives and Recommended Plan for the CWMP.

The specific evaluative criteria established for this ranking system for the primary and secondary criteria are summarized below in Table 3-1.

Table 3-1 Ranking Criteria

Primary Criteria (Ranking 0 to 10)	Secondary Criteria (Ranking 0 to 5)
Level of Treatment	Public Acceptance
Nutrient Removal	Regulatory Acceptance
Land / Size Requirements	Legal Consequences and Costs
Capital / Construction Costs	Operation and Maintenance Costs
Ease of Operation	Environmental Impact

Each of the above listed primary criteria was ranked from 0 to 10. A score of "0" is associated with a well-suited and better treatment technology, while a score of "10" means that the treatment technology is not well-suited or worse for that Needs Area. To differentiate the importance of primary criteria from secondary criteria, the scoring for the secondary criteria ranged from 0 to 5 points. The lower the total score, the better the treatment technology is suited for that Needs Area. If the treatment technology scored less than or equal to 35 points it became a short-

listed alternative for the specific Needs Area. The maximum number that a treatment technology could receive is 75 points.

The following sections provide a detailed discussion for each of the primary and secondary evaluative criteria and its scoring system.

3.2.1 Primary Criteria

There are five primary criteria that were considered to determine if a given treatment technology will be a viable option for wastewater treatment over the 20-year planning period. A brief discussion of each of the evaluative criteria is presented below.

3.2.1.1 Level of Treatment

This criterion evaluated the ability of the alternative treatment technology to produce a high-quality effluent. A high-quality effluent is considered to have low concentrations of biochemical oxygen demand (BOD), total suspended solids (TSS), and pathogens. Nutrients are not considered as there is a separate criterion for nutrient removal, discussed below. Under this ranking system, when flows are less than 10,000 gpd, Title 5 regulations apply and when flows are over 10,000 gpd, MassDEP/EPA regulate through a discharge permit. Depending on if the discharge is to groundwater or surface water, regulations may differ for level of treatment.

The existing municipal wastewater treatment system currently provides preliminary treatment, primary treatment, secondary treatment, and disinfection. The WWTF has stringent effluent limits based on the National Pollutant Discharge Elimination System (NPDES). Therefore, the WWTF scored the lowest points as it has the highest level of treatment of all the alternatives.

3.2.1.2 Nutrient Treatment

Each of the treatment technologies was analyzed based on its ability to remove nitrogen and phosphorus (nutrients) in wastewater. For this analysis, Title 5 systems do not provide nutrient removal and score the highest. Some I/A systems provide nitrogen removal, but not all. Small, decentralized WWTFs also typically provide nitrogen removal as they discharge to groundwater, and they can also be designed and operated to remove phosphorus. The existing WWTF currently provides secondary treatment but based on the new NPDES permit and the new Medium General Permit, a strict total phosphorus effluent limit of 0.1 mg/L will go into effect in February 2025. The facility will need to be upgraded with tertiary treatment for phosphorus removal to meet this limit. Nitrogen is currently not a focus or permit requirement for removal at the facility. Therefore, the existing WWTF and decentralized WWTF scored the lowest under this ranking system.

3.2.1.3 Land/Site Requirements

This primary criterion evaluates the amount of land that may be impacted by construction of the system. A municipal wastewater collection system extension would disturb a lot of land, whereas an individual onsite septic system would disturb minimal land area and be contained to the parcel.

I/A systems have less stringent disposal setbacks and can be easier to site than individual onsite septic systems. If an individual onsite septic system needs to be mounded due to the subsurface conditions, the disposal area may require even more land. In general, the parcel size and subsurface conditions have a significant impact on whether the treatment system can be sited and function properly. Each of these potential site condition issues was analyzed and scored appropriately for this evaluation.

3.2.1.4 Capital and Construction Costs

The capital and construction cost of a particular technology were evaluated. Onsite systems received a low score as these systems are paid for by the individual property owner and are generally affordable unless conditions require a more complex system (i.e., mounded system). Depending on their complexity, shared septic and I/A systems are more expensive than individual onsite systems. Sewer system extensions are more expensive than onsite systems based on the length of new pipe required for properties to connect and pump stations to reach the existing municipal collection system. Land purchasing for pump stations and decentralized WWTFs was also considered in this criterion. Capital costs for decentralized systems tend to be the highest due to land requirements, a new WWTF requiring construction, and a collection system to be constructed to transport wastewater to the new facility.

3.2.1.5 Ease of Operation

In general, a treatment technology that requires a minimal amount of operation and maintenance received a lower score as part of this evaluation. An individual onsite septic system scores low as it typically requires a minimal amount of maintenance if it is properly sited and installed correctly. The homeowner typically needs to pump out the septic tank every 2 years to remove accumulated solids. I/A systems require additional attention because these systems typically have pumps and/or blowers that need to be routinely maintained. Depending on its complexity, shared septic and/ or I/A systems may have to be operated and maintained through a subcontract with an outside vendor.

A WWTF received the highest overall score in this evaluation as it is composed of unit processes which require daily operation and maintenance from a licensed operator(s) and is the most difficult out of the options. The collection system extension received slightly higher scores due to the additional pump stations that would be required to convey wastewater to the existing WWTF.

3.2.2 Secondary Criteria

The secondary criteria conditions are less technical in nature and include more institutional and economic components as described below.

3.2.2.1 Public Acceptance

Communities tend to support technologies that have a proven track record, are aesthetically appealing, do not produce odors, and offer a cost-effective solution to solving their wastewater management needs. The implementation of any wastewater solution will be made easier with public support. Individual onsite septic systems and I/A systems are publicly accepted practices, so these ranked lower in the scoring system. Depending on the area within Town, the construction of a decentralized WWTF could be welcome, especially if it allows for the reduction of flow from the existing WWTF, which has existing capacity issues.

3.2.2.2 Regulatory Compliance

Title 5 of the State Environmental Code, 310 CMR 15.000, is the regulation that provides detailed guidelines for onsite wastewater septic systems. These regulations are easily met by parcels that have conditions well-suited for onsite Title 5 septic systems. Nearby water bodies, wetlands, or protected drinking water zones make siting systems more difficult. Title 5 does not take into account potential nutrient loading issues from areas proximate to surface waters. There are stringent requirements for decentralized treatment facilities including the groundwater or surface water discharge permitting requirements. However, for Rockland, regulators are likely to be interested in solutions that alleviate capacity issues at the existing WWTF, which may be favorable for new decentralized

WWTFs. Construction of collection systems can also trigger environmental reviews and permitting requirements, which lead to a higher score for decentralized WWTFs and extension to the Rockland WWTF. Regulators currently would not favor solutions that recommend extension to the Town's existing WWTF as there are existing flow capacity issues at the facility.

3.2.2.3 Legal Requirements

Depending on the treatment and effluent disposal system, there are a number of potential legal issues that could come into play for the needs areas. In general, the property owner is responsible for all issues pertaining to an onsite wastewater treatment system. Individual onsite septic and individual I/A systems typically have minimal legal issues; hence, they scored low in the ranking system. Shared systems and decentralized WWTFs ranked higher as these types of systems tend to have additional legal issues that may need to be resolved. This may include agreements to purchase land and maintain and operate the shared system. Based on the current EPA Order, there are significant legal barriers to existing collection system extensions for Rockland.

3.2.2.4 Operation and Maintenance Costs

It is preferable for a viable technical solution to have low operation and maintenance (O&M) costs. A well sited onsite septic system typically has minimal O&M requirements; therefore, it achieved a low score in the ranking system. A municipal wastewater collection system extension has associated O&M costs with the piping system, pump stations, and for the WWTF itself.

Decentralized WWTFs would require operators to run the facility daily to ensure that it is operating properly. The collection system and any potential pump stations (typically not required due to size of service area) would also require additional O&M costs. The required energy to operate a decentralized WWTF would be substantially greater than the other alternative treatment solutions; so, it scored higher in the evaluation.

3.2.2.5 Environmental Impact

The various treatment options were examined for their potential impact to the environment including groundwater, surface water, and habitats for rare and endangered species. In general, if the wastewater treatment system is properly operated and sited in the right conditions, it should not result in significant environmental issues. Most of the identified treatment technologies will recharge the local watershed sub-basin; however, a malfunctioning system could contaminate the groundwater and/or the nearby surface waters.

3.3 Treatment Technology Analysis by Needs Area

This section evaluates and scores the high needs area using the criteria described above. The evaluation will be used to short-list the alternatives for the needs area that will move on to Phase 3 for further analysis.

3.3.1 Needs Area 1 – Weymouth Street

3.3.1.1 Area Description

Needs Area 1 is located in the north central part of Rockland. This needs area encompasses approximately 20.5 acres and is comprised of 5 parcels, as seen in Figure 3-1.

3.3.1.2 Needs Description

The area has very poorly drained soils, high groundwater around the wetlands, and has a mixture of somewhat poorly drained to well drained soils in the areas away from wetlands. Parcel sizes were typically greater than one acre. The study area is within Zone A and Zone B surface water protection areas in the north. Area 1 does not contain any historical districts. Based on our evaluation in Phase 1, Study Area 1 received a total score of 27 points and was categorized as a high needs category area.

3.3.1.3 Short-Listed Alternatives

As previously discussed, all of the treatment technologies were ranked based on the primary and secondary criteria as shown in Table 3-2 below. Based on the results of this ranking system, the following wastewater treatment alternatives have been short-listed for this study area:

- Individual Onsite Septic Systems
- I/A Systems
- Decentralized WWTF
- Extension of the Rockland Collection System

Individual onsite septic systems ranked lowest on the evaluation and may continue to be an appropriate technology for Study Area 1. I/A systems could improve the level of treatment and could also provide for nutrient removal as compared to an existing septic system. Due to the existing flow capacity issues at the existing Rockland WWTF, a decentralized WWTF could be a good fit for this area. The existing collection system is in close proximity, as well as several large parcels of land that could be purchased/developed for wastewater treatment and disposal. Due to the proximity to the existing collection system, it is possible that flow could be removed from the existing system and sent to a new decentralized WWTF in this area. This is discussed further in the next section. In addition, due to the proximity to the existing collection system, and the flat nature of the area (pump stations not likely required), extension to the existing collection system is also a good fit for this needs area. This would be predicated on alleviating the existing EPA Order and flow issues at the WWTF, as there are currently no new connections allowed, both through the Town's self-imposed moratorium, and EPA's Order.

Figure 3-1 Study Area 1 – Weymouth Street

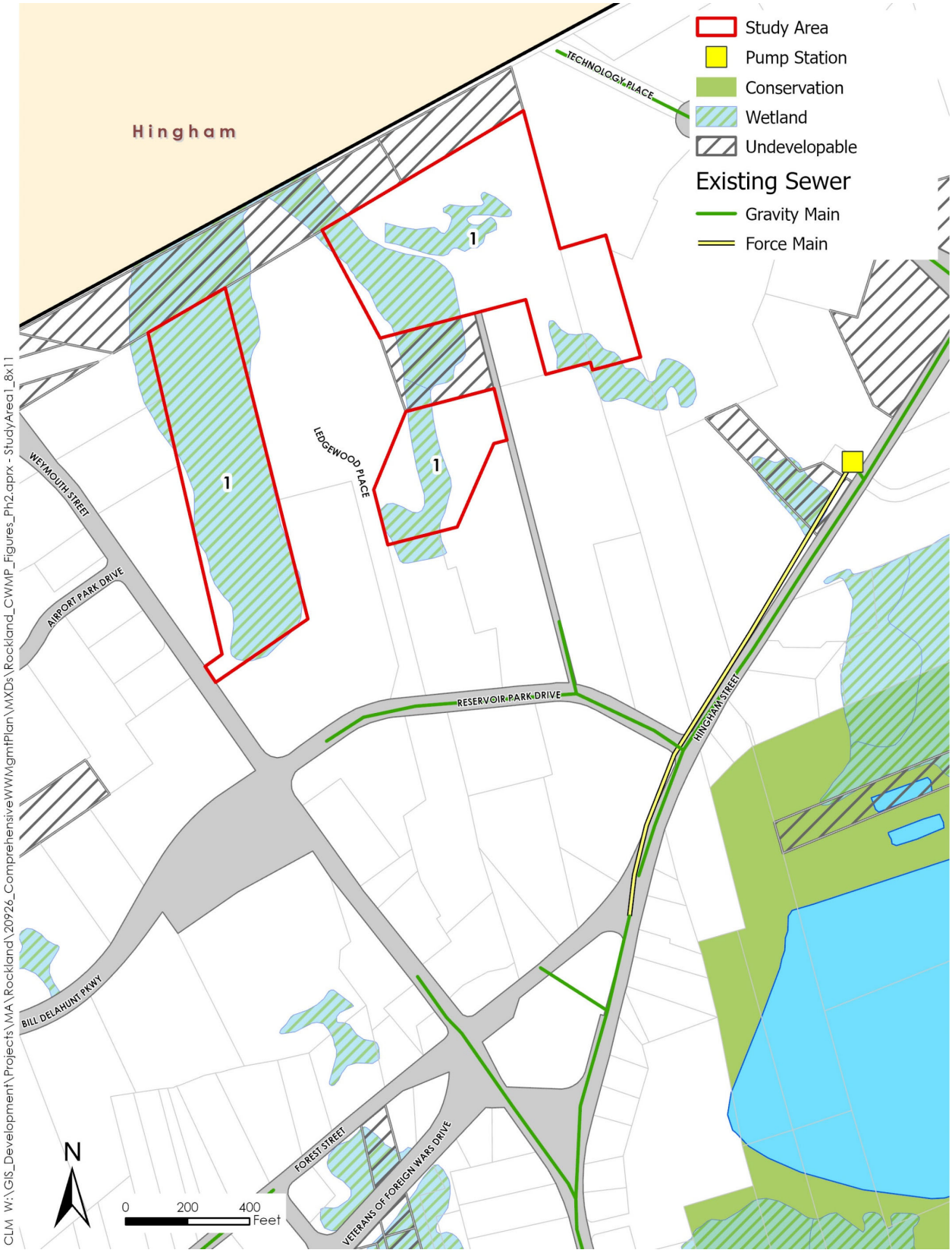


Table 3-2 Treatment Technologies Ranking Results for Study Area 1 – Weymouth Street

Primary Criteria (Scoring from 0 to 10)							Secondary Criteria (Scoring from 0 to 5)						
Treatment Alternative	**Level of Treatment**	**Nutrient Treatment**	**Land/Site Requirements**	**Capital/ Construction Costs**	**Ease of Operation**	**Primary Criteria Total**	**Public Acceptance**	**Regulatory**	**Legal**	**O&M Costs (incl. energy costs)**	**Environmental**	**Secondary Criteria Total**	**Total Score**
Onsite													
Individual Septic Systems	8	9	5	1	2	**25**	0	1	0	1	4	**6**	**31***
I/A Systems	6	6	4	3	4	**23**	1	2	1	2	3	**9**	**32***
Decentralized													
Shared Title 5 Systems	8	9	6	4	3	**30**	3	1	2	2	4	**12**	**42**
Shared I/A Systems	6	6	7	5	5	**29**	3	2	2	3	3	**13**	**42**
Decentralized WWTF	1	2	8	7	6	**24**	1	0	3	4	1	**9**	**33***
Collection System Extensions													
Town of Rockland WWTF	0	2	2	3	1	**8**	1	5	5	2	2	**15**	**23***

Notes:

1. 0 = most well suited for both primary and secondary criteria
2. 5 = least well suited for secondary criteria
3. 10 = least well suited for primary criteria
4. * = short listed alternative

3.3.2 Summary of Short-Listed Wastewater Treatment Alternatives

Phase 3 will further evaluate the short-listed alternatives for the needs area as summarized below in Table 3-4. As part of the conceptual design, each viable short-listed treatment alternative will be analyzed for its environmental impacts, treatment efficiency, and present worth cost analysis comparing the capital and O&M costs for each type of system.

Table 3-3 Short List of Treatment Alternatives for Needs Areas

Treatment Technology	Needs Area 1 Weymouth Street
Individual Onsite Septic Systems	X
I/A Systems	X
Decentralized Systems (Shared System or Small WWTF)	X
Collection System Extension	X

3.4 Wastewater Flow Estimates

For the needs area short-listed for collection system extension and for groundwater disposal planning purposes, an estimate of wastewater flows was calculated. Table 3-5 below summarizes the flows. The flows were estimated based on MassDEP Title 5 design values. Existing flows are calculated based on existing buildings that are potentially on septic systems. Build-out flows were calculated based on the number of undeveloped parcels, taking the parcel area, percent wetlands, and the Town's zoning restrictions to calculate the approximate number of homes/buildings that could be developed. Flows were estimated as residential and commercial to provide a range of potential buildouts.

The total estimated flow also includes an estimate of the amount of infiltration and inflow (I/I) which would be collected by the potential new sewer system. The quantity of I/I was estimated from TR-16 Guidelines based on 375 gpd/inch-diameter/mile (middle of recommended range of 250-500) of new sewer piping. It was assumed that 8-inch diameter piping would be required based on the estimated flow, larger pipe would likely not be required. The pipe length was estimated based on street lengths.

The flows will be used for planning purposes as Phase 3 further evaluates the short-listed alternative solutions for wastewater management.

Study Area 1 – Weymouth Street consists of a total of 4 parcels, all undeveloped. One of the parcels is not developable due to wetlands and streams and their respective setback requirements. The undeveloped parcels in this area are zoned Industrial Park – Hotel. However, based on the layout of the parcels, access limitations, and wet land and stream coverage in two, only one of the parcels appears to actually be able to site a hotel. The other two were assumed to be able to construct offices. All three parcels were also divided based on half-acre lots for 3 bedroom homes to provide a value for residential flow. The flow from the homes was estimated at 110 gpd/bedroom. Offices were estimated at 75 gpd/1,000 square feet. The hotel was estimated at 110 gpd/bedroom and assumed that 300 rooms would be constructed. The needs area is in close proximity to the existing collection

system and would require minimal pipe construction, other than the service from the property to the main sewer system. There is an existing access road off Reservoir Park Drive that is sewered, and that would likely be extended to pick up the parcels north of the road.

Table 3-4 Flow Estimate for Needs Area 1 – Weymouth Street

Flow from Existing Buildings	Potential Residential Buildout Flow	Potential Commercial Buildout Flow	Flow Attributed to I/I	Total Flow Residential/Commercial
0	1,450	34,800	1,100	2,550/35,900

3.5 Collection System Alternatives

The collection system alternatives were described in detail in Chapter 2 of this report. These alternatives were evaluated based on a number of conditions, including technical, operation, maintenance, and economic factors. The result of this analysis is a short-list of viable alternatives to be further evaluated in Phase 3 including the following:

- Conventional gravity collection system
- Increasing pipe size if necessary to accept additional flow
- Increasing pump station capacity if necessary to accept additional flow

Conventional systems typically have lower energy cost as compared to low pressure systems (LPS) and can handle power outages with backup power generators at the pump stations. They are also typically sized with excess working capacity to allow for future connections.

Vacuum and small diameter gravity sewer systems have been discontinued from further study due to several factors including appropriateness for Town's topography, cold weather challenges and higher level of operation and maintenance.

3.6 Effluent Disposal Alternatives

Effluent disposal evaluation is summarized in Section 4 and in Phase 3.

4

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Section 4 Groundwater Discharge Screening

4.1 Introduction

This section of the Phase 2 report discusses potential groundwater discharge sites within the Town of Rockland. The evaluation was conducted for Rockland due to the EPA Order and general need for alternative solutions to connecting new sewer to the existing collection system due to flow and capacity issues at the existing WWTP. Groundwater disposal is investigated for discharge of wastewater from Needs Areas, potentially shedding flow from the existing collection system, and potentially to add an option for WWTP effluent discharge other than the existing surface water discharge.

This analysis will be a "desktop" style evaluation to identify potential locations within Rockland that could be used to site groundwater disposal areas. The potential locations will be shortlisted for further analysis in Phase 3 of the CWMP. However, a great deal of effort and expense is needed to confirm the suitability of a site, including mapping, subsurface investigations and computer modeling of groundwater flow. The additional analysis is not included in the scope of this CWMP. The basis for each location and shortlisting of options is discussed in detail below. Figure 4-1 shows the disposal areas identified.

4.2 Location Identification

Initial site screening considers many different factors to help determine if a parcel or group of parcels is suitable for groundwater disposal. These factors include parcel location, proximity to existing wastewater collection system, parcel size, parcel ownership, land use, status of development (undeveloped or largely undeveloped), water protection areas such as Zone I and Zone II areas, anticipated soil and groundwater conditions, soil type, proximity and setbacks to wetlands, flood zones, and habitats for endangered species. Ideally, as many sites as possible would be publicly owned sites to minimize cost.

Based on these factors, 6 locations were chosen for potential groundwater discharge locations within Rockland. In the northern part of town, there is a large portion of land identified as "Union Point" as discussed in Phase 1. In the central part of town, there are two golf courses, the Rockland Golf Course and Harmon Golf and Fitness Club. The EPA Order requires that the existing WWTP parcel be investigated, and WP included the nearby parcel that is currently owned by the R. Stewart Esten School with the WWTP analysis. In the southern part of town, two parcels were selected, the McCarthy Farm and several parcels of land between the farm and the Beech Street Conservation Area. These locations were all suitable based on an initial screening.

4.3 Analysis

The initial parcels identified for groundwater disposal were further analyzed to understand how much space might actually be available for disposal area. The entire parcel is reduced in size based on some of the factors discussed above. For example, if all or some of the identified area is within a flood zone, wetland, setback area, or has a designated soil type that would indicate groundwater disposal is not possible, the area was eliminated or reduced in size. Factors such as Zone I, Zone II, or habitat protection are considered as difficulties for citing groundwater disposal areas, but do not eliminate an area from consideration. Each area is discussed in further detail below.

4.3.1 Union Point

The entire area designated for Union Point is shown in Figure 4-1. Much of the parcel has been protected as Open Space by the Town. However, this area presents a very good location for groundwater disposal that the Town could utilize for new sources and/or to shed flow from the northern parts of the existing collection system. Much of the commercial property and high flow contributors are located in the north along Hingham Street.

This area consists of several surface water bodies and much of it contains wetlands. The entire area is an estimated habitat area. The habitat area makes things more difficult but not impossible for siting effluent disposal. Much of the existing developed land from the old base could be re-purposed for groundwater disposal. There is also a large portion of suitable area that extends from Bill Delahunt Parkway to Oregon Avenue as shown in Figure 4-1. The final reduced area identified as a potential disposal location consists of 6.3 million square feet (145 acres). Potential disposal volumes are discussed in Section 4.4 below.

4.3.2 Rockland Golf Course

The Rockland Golf Course was identified as a potential disposal location based on the amount of land available. Golf courses tend to be good locations and willing participants in effluent disposal/re-use. The areas of the course that are near surface water and surrounding wetlands were removed from the parcel area. The resulting parcel area identified for disposal area is 1.9 million square feet (43 acres).

4.3.3 Harmon Golf and Fitness Club

The Harmon Golf Club was identified as a potential disposal location based on similar reasoning to the Rockland Golf Course. The areas of the course that are near surface water and surrounding wetlands were removed from the parcel area. The resulting parcel area identified for disposal area is separated by the stream that dissects the parcel and is 1.8 million square feet (42 acres).

4.3.4 WWTP/School Land

Due to the EPA Order, the WWTP parcel was considered for groundwater disposal. After review, the entire parcel is unsuitable. However, the Town-owned school land is in very close proximity to the WWTP. The school land (including ball fields) appears to be well-suited for groundwater disposal. The area was reduced based on unsuitable soils and wetlands. The resulting area is 835,000 square feet (19 acres).

4.3.5 Southern Lands

The collective area identified as the Southern Lands on Figure 4-1 were selected based on the amount of open space available in the area. There are several parcels identified as Undevelopable, a large portion that falls in the Beech Street Conservation Area, and some that falls under a parcel identified as being owned by the Town of Whitman. This area was chosen due to the proximity to an existing pump station (shed much of flow from the southern part of the collection system) and open space nature. The area was reduced based on unsuitable soils. The final area is 3.7 million square feet (84 acres).

4.3.6 McCarthy Farm

The McCarthy Farm Open Space was recently purchased by the Town. This parcel had very similar considerations as the Southern Lands for inclusion in this analysis. The space was reduced by proximity to surface water and unsuitable soils and wetlands. The final area is 1.4 million square feet (31 acres).

4.4 Disposal Volume

Each of the 6 locations identified above for potential groundwater discharge locations was evaluated for potential disposal volumes available. For the volume calculations, it is assumed that 50% of the area identified would be available for disposal. Based on the Small WWTP guidelines issued by MassDEP, a disposal rate of 2 gpd/sq. ft. and 5 gpd/sq. ft. was chosen to calculate potential disposal volumes available per area. Table 4-1 below summarizes the disposal volumes by area.

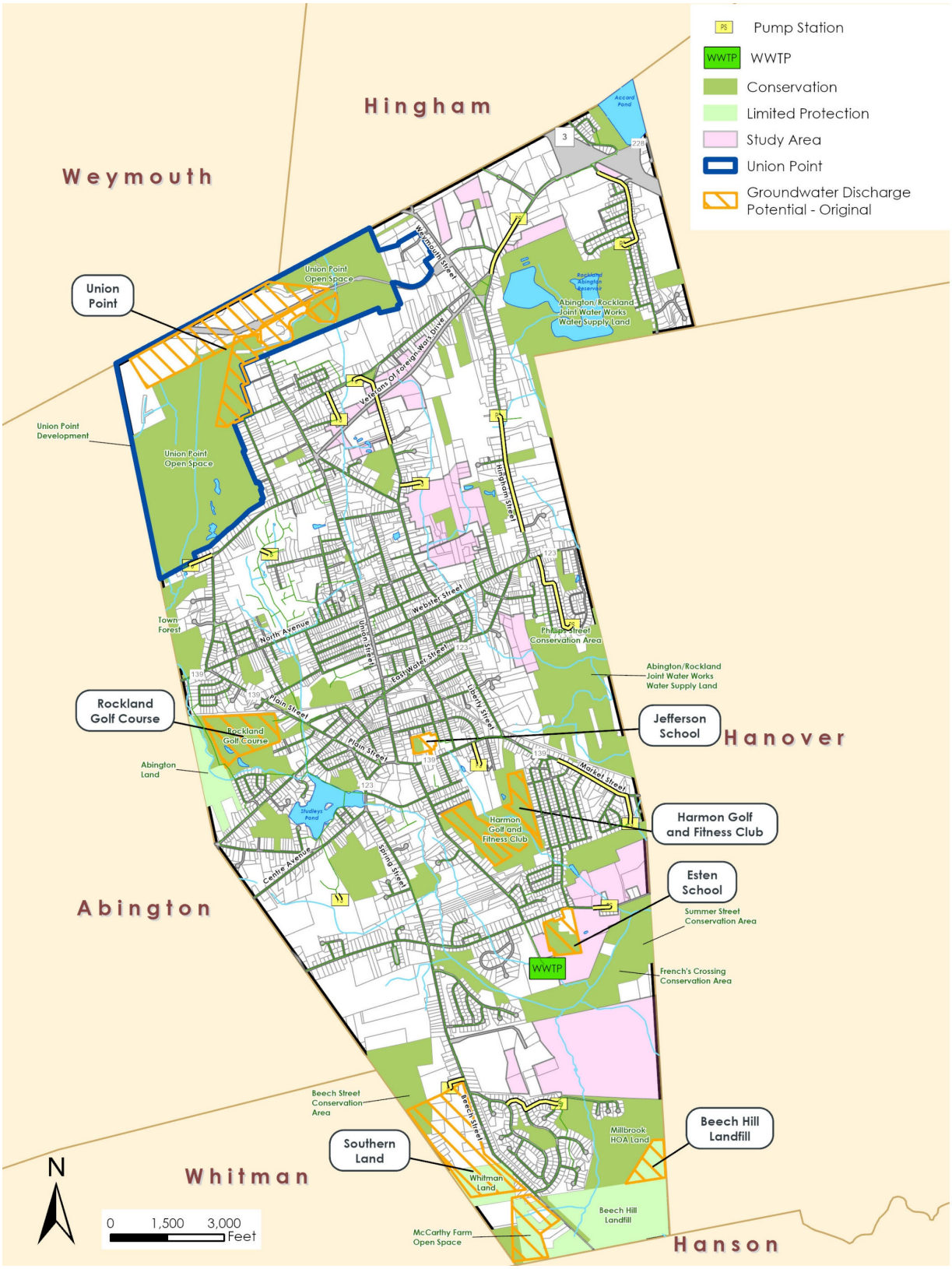
Table 4-1 Disposal Volume Summary

Area Name	Area Size (square feet)	Usable Area (square feet) 50% usage	Disposal Volume	
			2 gpd/sq. ft. rate	5 gpd/sq. ft. rate
Union Point	6,300,000	3,150,000	6,300,000	15,750,000
Rockland Golf Course	1,900,000	950,000	1,900,000	4,750,000
Harmon Golf Club	1,800,000	900,000	1,800,000	4,500,000
School	835,000	417,500	835,000	2,087,500
Southern Lands	3,700,000	1,850,000	3,700,000	9,250,000
McCarthy Farm	1,400,000	700,000	1,400,000	3,500,000

The volumes identified in the table above are much more than the flow estimates from Needs Area 1 (126,400 gpd). Each disposal area identified could also significantly alleviate flow capacity issues at the existing WWTP if flow was shed from the existing collection system. If the school land was utilized, a possible 0.8 to 2.1 MGD could be disposed from the existing WWTP discharge.

However, this analysis is based on many assumptions and is “desktop” level only. Further analysis of each area is required, including significant site hydro-geological investigation and evaluation work. These areas will continue into Phase 3 of the CWMP for further analysis.

Figure 4-1 Potential Groundwater Disposal Locations



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APPENDIX

Appendix A
Summary of Innovative/Alternative Technologies Approved for Use in Massachusetts and Under Review

Appendix A:

Summary of Innovative/Alternative Technologies Approved for Use in Massachusetts and Under Review

As of December 9, 2021, the inclusion in this table of URLs for I/A technology companies does not in any way constitute a recommendation or endorsement by MassDEP. For schematics of any technology, contact the manufacturer.

Certified for General Use				
Technology	Model(s)	Company	Technology Description	Approved Use & Approval Date
Composting Toilets	Compliant with Title 5	Generic	Composting Toilet	Composting toilets as described in Title 5 (310 CMR 15.289(3)
Recirculating Sand Filter	Compliant with Title 5	Generic	Nitrogen Reduction Sand Filter	Nitrogen Reduction For 550 gallons per day per acre: Effluent: TN = 25 mg/L, BOD5 = 30mg/L TSS=30 mg/L, pH: 6-9 For residential <2000 GPD: 50% SAS size reduction Approval: September 9, 2008
Advantex Treatment System	AdvanTex AX20 AX100 AX20-RT AX25-RT	Orenco Systems, Inc. 814 Airway Avenue Sutherlin, OR 97479	Secondary Treatment Unit: for BOD5 and TSS Removal Textile Filter with Aerobic Treatment Process	Secondary Treatment Unit: Effluent: BOD5 = 30m/L, TSS=30 mg/L, pH: 6-9 For resident <2000 GPD: 50% SAS size reduction Approval: April 19, 2013
Advantex Treatment System, Nitrogen reduction by Orenco System, Inc.	Advantex AX20, AX20-RT, AX25-RT, AX100 <2000 GPD	Orenco Systems, Inc. 814 Airway Avenue Sutherlin, OR 97479	Nitrogen reduction Two compartments UV protected fiberglass reinforced plastic treatment tank and aerobic textile filter module with recirculation	Nitrogen reduction Subject to Nitrogen Loading: 660 GPD/acre w/ TN <19 mg/l 550 GPD/acre w/ TN <25 mg/l For systems <2,000 GPD: TN <25 mg/L Approval: October 25, 2018

Certified for General Use				
Amphidrome Treatment System*	Amphidrome Process	F.R. Mahony & Associates, Inc. 273 Weymouth Street Rockland, MA 02370	Secondary Treatment Unit: for BOD5 and TSS Removal. Submerged Attached-Growth Sequencing Bioreactor	Secondary Treatment Unit: Effluent: BOD5 = 30m/L, TSS=30 mg/L pH: 6-9 For resident <2000 GPD: 50% SAS reduction Approval: February 19, 2013
Bioclere*	16, 22, 24, and 30 series	Aquapoint.3 LLC 39 Tarkiln Place New Bedford, MA 02745	Secondary Treatment Unit: for BOD5 and TSS Removal. Trickling Filter	Secondary Treatment Unit: Effluent: BOD5 = 30m/L, TSS=30 mg/L pH: 6-9 For resident <2000 GPD: 50% SAS size reduction Approval: April 2, 2015
BioDiffuser and ARC Chambers	BioDiffuser 11" Standard, BioDiffuser 14" High Capacity, BioDiffuser 16" High Capacity, BioDiffuser 15" Narrow (Bio 2), BioDiffuser 22" Narrow (Bio 3), ARC 36, ARC 36HC, ARC 50, ARC 18, ARC 24, ARC 36 LP (3.8 inch- invert), and ARC 36 LP (8 inch-invert)	Infiltrator Water Technologies, LLC P.O. Box 768 4 Business Park Road Old Saybrook, CT 06475	Alternative SAS (Disposal Only) Open-Bottom Leaching Unit	Alternate SAS (Disposal Only) Trench, bed, field, or gallery configurations: 40% reduction in size Effluent loading rates specified in Title 5 (310 CMR 15.242) Approval: June 12, 2015
Bio-Microbics MicroFAST*	FAST Treatment Systems with Nitrogen Reduction MicroFAST® 0.5, 0.75, 0.9, 1.5, 3.0, 4.5, 9.0 ; HighStrengthFAST® 1.0, 1.5, 3.0, 4.5, 9.0; NitriFAST® 0.5, 0.75, 1.0, 1.5, 3.0, 4.5, 9.0	Bio-Microbics, Inc. 16002 West 110th Street Lenexa, KS 66219* * Note new address	Secondary Treatment Unit: for BOD5 and TSS Removal. Aerobic Treatment Unit	Secondary Treatment Unit Effluent: BOD5 = 30m/L, TSS=30 mg/L pH: 6-9 For resident <2000 GPD: 50% SAS size reduction Approval: February 19, 2013

Certified for General Use				
Bio-Microbics MicroFAST*	FAST Treatment Systems with Nitrogen Reduction MicroFAST® 0.5, 0.75, 0.9, 1.5, 3.0, 4.5, 9.0 ; HighStrengthFAST® 1.0, 1.5, 3.0, 4.5, 9.0; NitriFAST® 0.5, 0.75, 1.0, 1.5, 3.0, 4.5, 9.0	Bio-Microbics, Inc. 16002 West 110th Street Lenexa, KS 66219* * Note new address	Nitrogen Reducing Aerobic Treatment system	Nitrogen reducing- 25 mg/l for 550 gpda; 19 mg/l for 660 gpda Residential <2000 gpd Approval: 12/29/10, revised 3/20/15
BUSSE-MF System	Models B-220, 440, 660, 880, 1000, 1500, 2000	Busse Green Technologies Inc. 1101 South Euclid Ave. Oak Park, IL 60304	Secondary Treatment Unit: for BOD5 and TSS Removal: Activated sludge process and a membrane process (biological-filtration)	Secondary Treatment Unit Effluent: BOD5 = 30m/L, TSS=30 mg/L pH: 6-9 For resident <2000 GPD: 50% SAS size reduction Approval: February 19, 2013
Clean Solution Treatment System*	250, 250 Integral, 250PT, 250ST3, 250ST4, 600, 1000, 1750, 2500, 3100 and 10000	Wastewater Alternatives, Inc. 2 Whitney Road, Suite 10 Concord, NH 03301	Secondary Treatment Unit: for BOD5 and TSS Removal: Biological Treatment Unit	Secondary Treatment Unit Effluent: BOD5 = 30mg/L, TSS=30 mg/L pH:6-9 For residential <2,000 GPD: 50% SAS size reduction Approval: April 30, 2013
Cultec Chambers	EZ-24; Contactor C4; Recharger 180, 280 and 330XL	Cultec, Inc. PO Box 280, 878 Federal Road Brookfield, CT 06804	Alternative SAS (Disposal Only) Open-Bottom Leaching Unit with Non-Woven Geosynthetic Filter	Alternate SAS (Disposal Only) Trench, Bed, Field, or Gallery configurations: 40% reduction in size Effluent loading rates specified in Title 5 (310 CMR 15.242) Approval: March 31, 2016
Cur-Tech CTL	CTL-12 and CTL-18	Cur-Tech LLC 23 Ryan Street Stamford, CT 06907	Alternative SAS (Disposal Only) Open-Bottom Leaching Unit with Plastic Fin	Alternative SAS (Disposal Only) Trench, Bed, Field, or Gallery configurations: 40% reduction in size Effluent loading rates specified in Title 5 (310 CMR 15.242) Approval: March 31, 2017

Certified for General Use				
Eljen Geotextile Sand Filter Systems	Type B43 and A42	Eljen Corporation 125 McKee Street East Hartford, CT 06108	Alternative SAS (Treatment with Disposal) Modular Absorption System	Alternate SAS (Treatment with Disposal) Trench, Bed, Field, or Gallery configurations: 40% reduction in size Effluent loading rates specified in Title 5 (310 CMR 15.242) Approval: March 19, 2013, Modified September 19, 2018
Eljen Mantis M5 System	Mantis 5.1, Mantis 5.1 LowPro (LP), Mantis 5.2, Mantis 5.2 LowPro (LP)	Eljen Corporation 125 McKee Street East Hartford, CT 06108	Alternative SAS (Disposal Only) Passive Graveless Wastewater Disposal System	Alternate SAS (Disposal Only) Trench, Bed, Field, or Gallery configurations: 40% reduction in size Effluent loading rates specified in Title 5 Approval: August 21, 2014
EZ Flow Polystyrene Aggregate System	EZ1202V, EZ1203T, EZ1203H, EZ1402V, EZ1203 Bed, EZ1203 Mound	Infiltrator Water Technologies, LLC P.O. Box 768 4 Business Park Road Old Saybrook, CT 06475	Alternative Aggregate	Alternate Aggregate Trench, Bed, Field or Gallery configurations. No SAS size reduction. Effluent loading rates specified in Title 5 Approval: June 12, 2015
Geoflow Subsurface Drip Wastewater Disposal System	Classic WF 16 and WF Special Order and WFPC 16 and WFPC Special Order series	Geoflow Inc. 506 Tamal Plaza Corte Madera, CA 94250	Pressure Distribution System (Subsurface)	Dispersal Unit Equivalent to pressure distribution. Can be placed in A, B, or C horizon a minimum of six inches below grade. The System does not require a five foot over dig as indicated at 310 CMR 15.255(5). For residential systems <2,000 GPD, can reduce the size of the SAS by up to 50% Approval: March 20, 2015
GeoMat™ Leaching System	GeoMat Leaching System Models 200, 400, 600, 1200 and 3900	GeoMatrix Systems, LLC 114 Mill Rock Road East, Old Saybrook, CT 06475	Alternative SAS (Disposal Only) Leaching Unit with 1-in thick core fused entangled plastic filaments fully wrapped in a	Alternate SAS Trench, Bed configurations: Department authorizes reductions in effective leaching area (310 CMR 15.242), subject to the Standard Conditions that

Certified for General Use				
			hygroscopic membrane.	apply to all SAS with General Use Certifications and subject to the Special Conditions applicable to this Technology. Effluent loading rates specified in Title 5 Approval: July 14, 2017
Hoots Aerobic Systems	Hoots Aerobic H-Series H-500A, H-600A, H- 750A and H-1000A	Hoots Aerobic Systems Inc. 2885 Highway 14 East Lake Charles, LA 70607	Secondary Treatment Unit: BOD5 and TSS Removal: Aeration device with indigenous bacteria	Secondary Treatment Unit Effluent: BOD5 = 30mg/L; TSS=30 mg/L; pH: 6-9 50% reduction in size of SAS Approval: February 19, 2013
Infiltrator ATL	Infiltrator Advance Treatment Leachfield (ATL)	Infiltrator Water Technologies, LLC P.O. Box 768 4 Business Park Road Old Saybrook, CT 06475	Alternative SAS, disposal with treatment 12 inch diameter conduit and c33 sand	40% size reduction with the effluent loading rates specified in Title 5 (310 CMR 15.242). Approval: 2/28/18
Infiltrator Chambers	Quick4; Infiltrator 3050 (Storm Tech SC-740); Equalizer 24; Equalizer 36	Infiltrator Water Technologies, LLC P.O. Box 768 4 Business Park Road Old Saybrook, CT 06475	Alternative SAS (Disposal Only) Open bottom leaching unit molded from polyolefin resin. It can be installed without aggregate or distribution pipe as an absorption trench/bed/field	Alternate SAS (Disposal Only) Trench, Bed, Field, or Gallery configurations: 40% reduction in size Effluent loading rates specified in Title 5 (310 CMR 15.242). Approval: June 12, 2015
Infiltrator TW and IM Series Septic Tanks	TW-1050 (1,050 gallon), TW-1250 (1,250 gallon), TW-1500 (1,500 gallon), IM-1060 (1,094 gallon), and IM-1530 (1,509 gallon)	Infiltrator Water Technologies, LLC P.O. Box 768 6 Business Park Road Old Saybrook, CT 06475	Polyolefin septic tanks TW-series septic tanks are rotational molded multi- layered corrugated polyethylene or polypropylene. IM- series tanks are injection molded single layer corrugated	Equivalent to conventional septic tank. Exempt from requirements for 3 manholes, and four- foot liquid depth. Two-compartment tank exempt from requirement for U- shaped pipe inter- connection. Approval: June 12, 2015

Certified for General Use				
			polyethylene or polypropylene	
JET Inc. 1500 Series BAT Media Wastewater Treatment*	J-500, J-750, J-1000, J-1250, and J-1500 J-500-PLT & J-800- PLT	Clearwater Recovery 175 Spring Street Rockland, MA 02370	Secondary Treatment Unit: BOD5 and TSS Removal: Aerobic treatment process with primary settling zone, aerobic zone with fixed media, and a secondary clarifying zone to treat wastewater	Secondary Treatment Unit Effluent: BOD5 = 30mg/L TSS=30 mg/L; pH:6- 9 For residential <2,000 GPD: 50% SAS reduction for system Approval: August 31, 2017
Mantis M5 System	Mantis 5.1, Mantis 5.1 LowPro (LP), Mantis 5.2, and Mantis 5.2 LowPro (LP) Residential only <2,000 GPD	Eljen Corporation 125 McKee Street East Hartford, CT 06108	Alternative SAS (Disposal Only) Passive gravel-less wastewater disposal system. Filter support modules wrapped in Bio-Mat, geotextile fabric and surrounded by C-33 sand	Alternative SAS (Disposal-Only) Alternative SAS in trench, bed, or gallery configurations with 40% reduction in size with effluent loading rates specified in Title 5 Approval: August 21, 2014
Perc-Rite Drip System	QM (WD), ASD-15, ASD-25, and ASD-40	American Manufacturing Co, Inc. PO Box 549 Manassas, VA 20108	Alternative SAS Subsurface drip dispersal)	Dispersal Unit Equivalent to pressure distribution. Can be placed in A, B, or C horizon a minimum of six inches below grade. The System does not require a five foot over dig as indicated at 310 CMR 15.255(5). For residential systems <2,000 GPD, can reduce the size of the SAS by up to 50% Approval: November 23, 2016
Polyethylene Septic Tanks	1,000 gallons; 1,250 gallons; 1,500 gallons low profile one/two compartment with gasket and tee	Norwesco, Inc./Snyder Industries PO Box 439 St Bonifacius, MN 55375-0439	Low profile polyethylene septic tanks with gasket and tee	Equivalent to conventional septic tank. Exempt from requirements for 3 manholes, four-foot liquid depth, and pumping on an annual basis. Two-compartment tank exempt

Certified for General Use				
				from requirement for U- shaped pipe inter- connection. Approval: March 19, 2013
Presby Enviro-Septic Wastewater Treatment System	Enviro-Septic	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed * Bed installations only	Alternative SAS - Patented Sand Filter 40% reduction in size of SAS with effluent loading rates specified in Title 5 (310 CMR 15.242). Approval: Revised March 19, 2013, Modified October 30, 2019.
Presby Advanced Enviro-Septic (Alternative SAS) Wastewater Treatment System	Advanced Enviro-Septic	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter - Treatment with Disposal Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed * Bed installations only	Alternative SAS with Secondary Treatment for 40% size reduction with the effluent loading rates specified in Title 5 (310 CMR 15.242). Approval: Revised August 12, 2013, Modified October 30, 2019
Presby Advanced Enviro-Septic (Alternative SAS with Treatment) Wastewater Treatment System	Advanced Enviro-Septic (with 12 inches C-33 sand) <880 GPD, residential only	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter - Treatment with Disposal Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed, with 12 inches of C-33 sand below pipe units. *Bed installations only	Alternative SAS with Secondary Treatment 50% reduction in size of SAS with the effluent loading rates specified in Title 5 (310 CMR 15.242) Effluent limits: BOD: 30 mg/L; TSS: 30 mg/L; pH: 6 to 9 Turbidity: <40 NTU; DO: >2 mg/L Approval: Revised December 17, 2013, Modified October 30, 2019
ProStep Effluent Pumping System	ProStep PSA-X and PSB-X,	Orenco Systems, Inc. 814 Airway Ave. Sutherlin, OR 97479	Effluent filtering and pumping with pump vault, placed in	Equivalent to conventional pumping system Approval: March 20, 2015

Certified for General Use				
	and Biotube® Pump Vault PVU-X and PV- X		outlet end of septic tank	
Roth Global SEPTECH** ** this replaces FRALO SEPTEC poly tanks	Roth Multi-Tank Model RMT 1060, 1250, and 1500	Roth Global Plastics, Inc. PO Box 2451 One General Motors Drive Syracuse, NY 13206	Single or Two Compartment Polyethylene Septic Tanks Installed between building sewer and distribution box and SAS or between building sewer and DEP approved I/A treatment unit.	Equivalent to conventional septic tank Approval: March 20, 2015
RUCK	Systems less than 2000 gpd	Innovative RUCK Systems, Inc. 362 Gifford Street Falmouth, MA 02540	Nitrogen Reducing Filter	Nitrogen reducing: 19 mg/l for 660 gpda and 25 mg/l for 550 gpda Exempt from three manholes, four-foot liquid depth, and annual pumping requirements. The two compartment are exempt from U-shaped pipe inter- connection requirement. Shall not be installed in a vehicle traffic area Approval: March 20, 2015
SepTech/Pirana By Pirana	SepTech/Pirana	Pirana http://www.pirana.biz/ 1875 Joy Road. Occidental, CA 95465	SAS Aeration with Bacterial Augmentation	To enhance and maintain performance of properly functioning SAS where conventional system with reserve area exists or can be built on-site in full compliance with T5. No SAS size reduction. Flow <2,000 GPD Renewal: Oct. 10, 2018
SeptiTech Treatment Systems by	SeptiTech Models 400, 550, 750, 1200, 1500, 3000 and SeptiTech	SeptiTech, Inc. 69 Holland Street, Lewiston, ME 04240	Secondary Treatment Unit Recirculating Trickling Filter.	Secondary Treatment Unit Effluent: BOD5 = 30mg/L TSS=30 mg/L; pH:6-

Certified for General Use				
Bio-Microbics of Maine, Inc.	Engineered Systems		Installed after a T5 septic tank with effluent tee filter and prior to T5 SAS	9 For residential <2,000 GPD: 50% SAS size reduction Approval: July 8, 2013
SeptiTech Treatment Systems by SeptiTech/Bio-Microbics of Maine, Inc.	M400N, M550N, M1200N,M1500N, M2500N, and M3000N and SeptiTech Engineered Systems	SeptiTech, Inc. 69 Holland Street Lewiston, ME 04240	Secondary Treatment Unit and Nitrogen reduction Enhanced recirculating trickling filter with anoxic phase. Two compartment tank – 1st anoxic compartment and 2nd contains trickling filter media with recirculation within trickling and to anoxic tank. System installed between building sewer and SAS	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For flow <2,000 GPD. Subject to Nitrogen Loading 660 GPD/acre w/TN <19mg/l. 550 GPD/acre w/ TN <25 mg/l Approval: September 4, 2018
Simple-Septic Wastewater Treatment System	Simple-Septic	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter - Treatment with Disposal Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed	Alternative SAS - Patented Sand Filter Treatment with Disposal 40% reduction in size of SAS with the effluent loading rates specified in Title 5 Approval: September 11, 2014
Singulair Bio-Kinetic Wastewater Treatment System	Singulair 960 -500, 600, 750, 1000, 1250 and 1500. Singulair TNT-500, 600, 750, 1000, 1250 and 1500. Singulair Green (plastic tank):	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Secondary Treatment Unit (STU) Three compartment tank with a pretreatment chamber, aerobic	Secondary Treatment Unit Effluent: BOD5 = 30mg/L TSS=30 mg/L; pH:6- 9 For residential <2,000 GPD: 50% SAS size reduction

Certified for General Use				
	Green 960-500, 600; Green TNT-500, 600		chamber, and settling/filtration chamber with Bio- Kinetic filter unit. TNT models remove nitrogen using timed aerobic and anaerobic periods in the second chamber. Installed between building sewer and SAS	Approval: February 26, 2013
Singulair Bio-Kinetic Wastewater Treatment System	Singulair 960 DN, model 600, 750, 1000, and 1500. Singulair 960 DN Green, model 600	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Secondary Treatment Unit (STU) and Nitrogen reduction Enhanced Three compartment tank with a pretreatment chamber, aerobic chamber, and settling/filtration chamber with Bio- Kinetic filter unit. TNT models remove nitrogen using timed aerobic and anaerobic periods in the second chamber. Installed between building sewer and SAS	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For flow <2,000 GPD. Subject to Nitrogen Loading 660 GPD/acre w/TN <19mg/l. 550 GPD/acre w/ TN <25 mg/l Approval: January 3, 2019
Sludgehammer	Sludgehammer ABG, models S-46 and S- 86	Sludgehammer Group Ltd 336 Division Road Petoskey, MI 49770	SAS Aeration with Bacterial Augmentation	To enhance and maintain performance of properly functioning SAS where conventional system with reserve area exists or can be built on-site in

Certified for General Use				
				full compliance with T5. No SAS size reduction. Flow <2,000 GPD Approval: April 2, 2015
Smith & Loveless FAST System	Modular FAST	Smith & Loveless, Inc. 14040 Santa Fe Trail Drive Lenexa, KS 66215	Secondary Treatment Unit: Aerobic treatment unit with submerged fixed film media.	Effluent: BOD5 = 30mg/L TSS=30 mg/L; pH:6- 9 50% reduction in size of SAS Flow:2,000 to <10,000 GPD Approval: November 5, 2015
SoilAir	SoilAir RF-3952TB, RFG-3952MP, RF-5264MP, RF- 5295MP, RF-9858MP, RF-15652MP, RF- 21650MP, RF-29450MP	Geomatrix, LLC 114 Mill Rock Road East Old Saybrook, CT 06475	SAS Aeration	To enhance and maintain performance of properly functioning SAS where conventional system with reserve area exists or can be built on-site in full compliance with T5. No SAS size reduction. Flow <2,000 GPD Approval: October 24, 2018.
Waterloo Biofilter	Biofilter <10,000 GPD	Waterloo Biofilter System, Inc. 143 Dennis Street Rockwood, NT, N0B 2K0	Secondary Treatment Unit: Absorbent Trickling Filter with optional recirculation. Installed following a T5 septic tank with a screened pump vault or a T5 septic tank and separate pump tank, discharges to SAS	Effluent: BOD5 = 30mg/L TSS=30 mg/L; pH:6- 9 For residential <2,000 GPD: 50% SAS size reduction Approval: November 1, 2012

Certified Provisional Use				
Technology	Model(s)	Company	Technology Description	Approved Use & Approval Date
Advantex with Nitrogen Reduction by Orenco System, Inc..	Advantex AX20, AX20-RT, AX25-RT, AX100 <10,000 GPD	Orenco Systems, Inc. 814 Airway Avenue Sutherlin, OR 97479	STU and Nitrogen reduction Two compartments UV protected fiberglass reinforced plastic treatment tank and aerobic textile filter module with recirculation	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For systems >2,000 to <10,000 GPD: TN <25 mg/L Approval: August 31, 2015
Amphidrome	Amphidrome Process <10,000 GPD	F.R. Mahony & Associates, Inc. 273 Weymouth Street Rockland, MA 02370	STU and Nitrogen reduction Submerged Attached-Growth Sequencing Bioreactor consisting of anoxic/equalization tank, reactor tank with granular biological filter, alternating aerobic/anaerobic cycles, and a clear well	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For new construction <2,000 GPD subject to Nitrogen Loading: 660 GPD/acre w/ TN <19 mg/l 550 GPD/acre w/ TN <25 mg/l For systems >2,000 to <10,000 GPD: TN <25 mg/L Approval renewed: October 15, 2015
Bioclere .	16/12, 16/15, 16/19, 16/22, 16/25 and 24 Series <2,000 GPD	Aquapoint.3 LLC 39 Tarkiln Place New Bedford, MA 02745	STU and Nitrogen reduction: Trickling filter in fiberglass tank with clarifier and recycle of settled solids to septic tank. Chemical addition if required for carbon source, alkalinity and pH control, and/or phosphorus precipitation. Installed in series between T5 septic tank and SAS	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For new construction <2,000 GPD subject to Nitrogen Loading: 660 GPD/acre w/ TN <19 mg/l 550 GPD/acre w/ TN <25 mg/l Approval: September 17, 2015.

Certified Provisional Use				
Bioclere	24, 30, and 36 Series 2,000 GPD to <10,000 GPD	Aquapoint.3 LLC 39 Tarkiln Place New Bedford, MA 02745	STU and Nitrogen reduction: Trickling filter in fiberglass tank with clarifier and recycle of settled solids to septic tank. Chemical addition if required for carbon source, alkalinity and pH control, and/or phosphorus precipitation. Installed in series between T5 septic tank and SAS	Nitrogen reduction BOD5, TSS, Nitrogen, and Phosphorus reduction For systems >2,000 to <10,000 GPD: Effluent limit: TN <25 mg/L Effluent limits in a NSA: BOD <30 mg/L; TSS <30 mg/L; pH 6-9 Approval: October 29, 2015
FAST with Nitrogen Reduction by Bio-Microbics, Inc.	MicroFAST with Nitrogen Reduction: MicroFAST 0.5, 0.75, 0.9, 1.5, 3.0, 4.5, and 9.0; HighStrengthFAST 1.0, 1.5, 3.0, 4.5, and 9.0; and NitriFAST 0.5, 0.75, 1.0, 1.5, 3.0, 4.5, and 9.0. Residential >2,000 to <10,000 GPD Non-residential <10,000 GPD	Bio-Microbics, Inc. 16002 West 110th Street Lenexa, KS 66219* * Note new address	STU and Nitrogen reduction: Aerobic submerged fixed film media unit with passive recycle to anoxic zone for denitrification. Chemical feed for alkalinity control and carbon source if required. Installed between building sewer and T5 SAS, inside second compartment of a T5 septic tank. Models for larger flows installed in a secondary tank after a T5 septic tank (with recycle to septic tank for denitrification)	BOD5, TSS, and Nitrogen reduction For new construction <2,000 GPD subject to Nitrogen Loading: Non-residential- can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l Effluent limits in a NSA: BOD <30 mg/L TSS <30 mg/L pH 6-9 Increase in Nitrogen Loading limit to 550 GPD/acre allowed w/ TN <25 mg/L May be substituted for RSF Approval: July 28, 2015
Fuji Clean USA	CEN5, CEN7, CEN10 <900 GPD	Fuji Clean USA, LLC 41-2 Greenwood Road	Secondary Treatment Unit: Sedimentation, aerobic and anaerobic	BOD5, TSS, and Nitrogen Reduction Effluent Limits: BOD5 <30 mg/l;

Certified Provisional Use				
		Brunswick, Maine 04011	chambers with recirculation and attached growth media	TSS <30 mg/l Turbidity <40 NTU For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Non-residential - can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l; Exempt from requirements for T5 compliant septic tank Approval: February 20, 2020
Nitrex	Nitrex Filters <10,000 GPD	Lombardo Associates, Inc 49 Edge Hill Road Newton, MA 02467	STU and Nitrogen reduction Filter with nitrate reactive media. Includes effluent recycle over media and alkalinity feed if required. Installed in series after approved I/A technology providing nitrifying pretreatment and	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For new construction <2,000 GPD subject to Nitrogen Loading: 660 GPD/acre w/ TN <19 mg/l 550 GPD/acre w/ TN <25 mg/l For systems >2,000 to <10,000 GPD: TN <25 mg/L Approval: May 22, 2014
SeptiTech Treatment Systems by Bio-Microbics of Maine, Inc.	400N, 550N, 750N, 1200N, 1500N, 2500N, 3000N, and SeptiTech Engineered Systems	SeptiTech, Inc 69 Holland Street Lewiston , ME 04240	Secondary Treatment Unit: Enhanced recirculating trickling filter with anoxic phase. Two compartment tank- 1st anoxic compartment and	Nitrogen reduction BOD <30 mg/L; TSS <30 mg/L; pH 6-9 For new construction <2,000 GPD subject to Nitrogen Loading: 660 GPD/acre w/ TN <19 mg/l 550 GPD/acre w/ TN <25 mg/l

Certified Provisional Use				
			2nd contains trickling filter media with recirculation within trickling filter and to anoxic tank. System installed between building sewer and SAS	For systems >2,000 to <10,000 GPD: TN <25 mg/L Approval: November 20, 2017
Singulair	Singulair 960 -500, 960-600, 960-750, 960-1000, 960-1250 and 960-1500. Singulair TNT-500, TNT-600, TNT-750, TNT-1000, TNT-1250 and TNT-1500. Singulair Green (plastic tank): Green 960-500, 960 -600, Green TNT-500 and Green TNT-600	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Secondary Treatment Unit: Extended aeration, activated sludge, and filtration in three compartment tank. 1st - anaerobic pretreatment chamber; 2nd - aerobic chamber; 3rd – settling and clarification chamber with activated sludge recycle to aerobic chamber; followed by recirculation chamber with 12- 18% recycle to 1st chamber. System installed between building sewer and SAS. Systems >1,000 GPD require T5 septic tank for pretreatment	BOD, TSS, and Nitrogen Reduction For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Any facility- can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l Approval: October 11, 2017
Smith & Loveless Modular FAST	Modular FAST 2,000 to 10,000 gpd	Smith & Loveless, Inc 14040 Santa Fe Trail Drive Lenexa, KS 66215	Aerobic treatment unit with fixed film submerged media and optional denitrification components (recycle to septic tank or anoxic tank). Installed between T5 septic tank and SAS	BOD, TSS, and Nitrogen Reduction Effluent limits in a NSA: BOD <30 mg/L; TSS <30 mg/L; pH 6-9 Effluent limit for all systems: TN <25 mg/L Increase in Nitrogen Loading limit to 550 GPD/acre allowed w/ TN <25 mg/L May be substituted

Certified Provisional Use				
				for RSF Approval: May 22, 2014
Waterloo Biofilter	Biofilter < 2,000 gpd	Waterloo Biofilter System, Inc 143 Dennis Street Rockwood, ON N0B 2K0	Absorbent Trickling Filter with min. 50% recycle to septic tank for denitrification. Installed following a T5 septic tank with a screened pump vault or a T5 septic tank and separate pump tank, discharges to SAS	BOD, TSS, and Nitrogen Reduction For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l; Any facility- can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l Renewal: November 15, 2018
Waterloo Biofilter	Biofilter 2,000 to <10,000 gpd	Waterloo Biofilter System, Inc 143 Dennis Street Rockwood, ON N0B 2K0	Absorbent Trickling Filter with min. 50% recycle to septic tank for denitrification. Installed following a T5 septic tank with a screened pump vault or a T5 septic tank and separate pump tank, discharges to SAS	BOD, TSS, and Nitrogen Reduction Effluent limits in a NSA: BOD <30 mg/L; TSS <30 mg/L; pH 6-9 Effluent limit for all systems: TN <25 mg/L Increase in Nitrogen Loading limit to 550 GPD/acre allowed w/ TN <25 mg/L May be substituted for RSF Renewal November 29, 2018

Approved for Piloting				
Technology	Model(s)	Company	Technology Description	Approved Use
BioBarrier MBR and HSMBR	BioBarrier MBR models 0.5-N, 1.0-N, 1.5-N, 2.0-N, and BioBarrier HSMBR 1.5-SN, 1.5-DN, 3.0- SN, 3.0-DN, 4.5-SN, 4.5-DN, 6.0-SN, 6.0- DN, 9.0-SN, 9.0-DN <10,000 GPD	Biomicrobics Inc. 16002 West 110th Street Lenexa, KS 66219* * Note new address	Secondary Treatment Unit: Primary sedimentation, anaerobic, and aerobic compartments with a membrane bioreactor (MBR) and recirculation	BOD¬5, TSS, fecal coliform, and Nitrogen Reduction Effluent Limits: BOD5 <30 mg/l; TSS <30 mg/l Turbidity <40 NTU For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Non-residential - can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l Exempt from requirements for T5 compliant septic tank. Approval: July 11, 2016
Biorock Monoblock	Biorock Monoblock 1000-3	Vinicius Ranucci Ramos Acuantia Inc	System including a primary tank for solids separation and a treatment tank containing biorock media for biological purification. The system discharges to SAS	BOD5, TSS, and below 30 mg/L Approval: December 16, 2020
ECOPOD - N	E50-N, E60-N, E75- N, E100-N, E150-N <1,500 GPD	Delta Environmental - Pentair Water	Aerobic and anaerobic chambers with recirculation	BOD5, TSS, and Nitrogen Reduction Effluent Limits: BOD5 <30 mg/l

Approved for Piloting				
		8274 Florida Blvd Denham Springs, LA 70726	and attached growth media	TSS <30 mg/l Turbidity <40 NTU For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Non-residential- can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l; Exempt from requirements for T5 compliant septic tank . Approval: August 21, 2014
GPC Filter	GPC Filter <10,000 GPD	Ground Penetrating Carbon, Inc. 205 Worcester Court Falmouth, MA 02540	Stratified bottom drained sand filter treatment system with carbon addition	BOD, TSS, and Nitrogen Reduction Approval: December 8, 2014
Hydro-Kinetic Wastewater Treatment System	Model 600 FEU <600 GPD	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Extended aeration and attached growth processes with anoxic tank	BOD5, TSS, and Nitrogen Reduction Effluent Limits: BOD5 <30 mg/l; TSS <30 mg/l Turbidity <40 NTU For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Non-residential - can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l

Approved for Piloting				
				Exempt from requirements for T5 compliant septic tank Approval: August 23, 2013
Jet J-1500 CF	J-1500CF, J-1000CF, J-750CF, J-500CF	Clearwater Recovery	System is installed after primary septic tank. Consisting of primary, aerobic, and anoxic zones for settlement of solids and nitrogen removal by aerobic bacteria on plastic media through recirculation in anoxic zone	BOD5, TSS, and Nitrogen Removal For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Non-residential - can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l Approval: December 18, 2020
Phos-4-Fade	Phos-4-Fade Phosphorus Removal System <10,000 GPD	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Phosphorus removal by non-mechanical process through primary and secondary filtration media.	Phosphorus removal Approval: January 21, 2021
PhosRID	PhosRID Phosphorus Removal System <10,000 GPD	Lombardo Associates, Inc. 49 Edge Hill Road Newton, MA 02467-1170	Reductive Iron Dissolution (RID) media anaerobic upflow filter followed by oxygenation filter To reduce total phosphorus	Phosphorus removal Approval: February 24, 2014
RetroFAST System	Models 0.15, 0.25, 0.375 <2,000 GPD Residential strength	Bio-Microbics, Inc. 16002 West 110th Street Lenexa, KS 66219* * Note new address	SAS remediation by enhanced aerobic attached growth treatment in existing septic tank	SAS remediation BOD5 and TSS removal - Separation to GW shall not be less than 2/3 ft -Size of SAS shall not be <50% of T5 requirements

Approved for Piloting				
				Approval: June 5, 2014
RUCK	CFT System <10,000 GPD	North Coast Technologies, LLC 200 Main Street, Suite 201 Falmouth, MA 02540	Aerobic RUCK filter followed by anaerobic mixing chamber (with carbon addition) for denitrification	BOD5, TSS, and Nitrogen Removal For new construction <2,000 GPD subject to Nitrogen Loading: Residential- can increase N loading limit to 660 GPD/acre w/ TN <19 mg/l Non-residential - can increase N loading limit to 550 GPD/acre w/ TN <25 mg/l Approval: December 11, 2012
Subsurface Disposal System	Drip > 10,000 GPD	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Subsurface drip dispersal system	Subsurface drip approval for new construction, upgrade and remedial. Approval: December 9. 2021
Waterloo EC-P	Waterloo EC-P <10,000 GPD	Waterloo Biofilter System, Inc 143 Dennis Street, P.O. Box 400 Rockwood, ON N0B 2K0	Precipitation of Phosphorus with Iron	Phosphorus reduction Approval: April 30, 2019

Approved for Remedial Use				
Technology	Model(s)	Company	Technology Description	Approved Use
Bottomless Sand Filters	Compliant with Title 5 <880 GPD Residential only	Generic	Sand Filter	BOD5 and TSS removal Reduction in size of SAS; up to two foot reduction in depth of naturally occurring pervious material Secondary treatment prior to BSF required Approval: June 26, 2012
Recirculating Sand Filters	Recirculating Sand Filter (RSF) <10,000 GPD	Generic	Sand Filter	BOD5, TSS, and Nitrogen removal Up to 50% reduction in size of SAS; up to two foot reduction in separation to groundwater; up to two foot reduction in depth of naturally occurring pervious material Pressure distribution required Approval: March 10, 2008
AdvanTex Treatment Systems	AX20-RT, AX25-RT, AX20 and AX100 <10,000 GPD	Orenco Systems, Inc. 814 Airway Avenue Sutherlin, OR 97479	Secondary Treatment Unit Textile media aerobic treatment	BOD5 and TSS removal For 6 bedrooms or less, AX20 exempt from Title 5 Septic System requirements Approval: April 19, 2013

Approved for Remedial Use				
Aerobic Recovery System (TM) Septic Restoration Process (formerly Aero-Stream)	Models 101, 102, 103 and 104 <2,000 GPD	Aero-Stream LLC On-Site Treatment Systems (TM) W300 N7706 Christine Lane Hartland, WI 53029	SAS Aeration with Bacterial Augmentation	Restoration of failed SAS Approval: February 2, 2016
Amphidrome	Amphidrome Process <10,000 GPD	F.R. Mahony & Associates, Inc. 273 Weymouth Street Rockland, MA 02370	Secondary Treatment Unit: Submerged Attached-Growth Sequencing Bioreactor	BOD5, TSS, and Nitrogen removal Exempt from the requirements for a standard Title 5 septic tank designed in accordance with 310 CMR 15.223(1) and 15.224 Approval: November 5, 2012
Bioclere	16, 22, 24, and 30 series	Aquapoint.3 LLC 39 Tarkiln Place New Bedford, MA 02745	Secondary Treatment Unit: Trickling Filter	BOD5 and TSS removal Approval: November 5, 2012
BUSSE-MF System	Models B-220, 440, 660, 880, 1000, 1500, 2000 <2,000 GPD	Busse Green Technologies Inc. 1101 South Euclid Ave. Oak Park, IL 60304	Secondary Treatment Unit: Activated sludge process and a membrane process (biological-filtration)	BOD5 and TSS removal The requirements in 310 CMR 15.223(1) 'Septic Tanks' and 310 CMR 15.224 'Multiple Compartment Tanks' do not apply to the System, unless the system design incorporates a separate existing or new septic tank Approval: November 5, 2012
The Clean Solution Treatment System	250ST-R3, 250ST- R4, 250-RX, 250PT- RX, C-SAN600, C- SAN100, C- SAN2500, C-SAN3000, C-SAN400 and C- SAN8000	Wastewater Alternatives of New England, LLC 2 Whitney Road, Suite 10	Secondary Treatment Unit: Submerged media attached-growth biological treatment unit	BOD5 and TSS removal Models 250ST-R3 and 250ST-R4 are exempt from Title 5 septic tank requirements

Approved for Remedial Use				
		Concord, NH 03301		Approval: November 5, 2012
Presby Enviro- Septic Wastewater Treatment System	Enviro-Septic System <10,000 GPD	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter - Treatment with Disposal Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed * Bed installations only	Alternative SAS with BOD/TSS reduction and 40% reduction in size with the effluent loading rates specified in Title 5. Depth to groundwater may be reduced by two feet. Depth of naturally occurring pervious material may be reduced by two feet. Has to meet siting requirements for upgrades (310 CMR 15.242) Approval: Revised September 26, 2014, Modified October 30, 2019
Fuji Clean USA	CEN5 (<450 GPD), CEN7 (>450 – 630 GPD), CEN10 (>630 – 900 GPD)	Fuji Clean USA, LLC 41-2 Greenwood Road Brunswick, Maine 04011	Secondary Treatment Unit: Primary sedimentation chamber, anaerobic treatment chamber (with submerged media), and aerobic contact / filtration chamber (with submerged media)	BOD, TSS, and Nitrogen Reduction Exempt from Title 5 septic tank requirements Approval: November 3, 2015
Presby Advanced Enviro-Septic (Alternative SAS) Wastewater Treatment System	Advanced Enviro-Septic System <10,000 GPD	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter - Treatment with Disposal Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed	Approved for facilities where a conventional T5 system with reserve area exists or can be built on-site in full compliance with T5. Alternative SAS with Secondary Treatment for 40% size reduction with

			* Bed installations only	the effluent loading rates specified in Title 5 (310 CMR 15.242). Approval: Revised December 29, 2016, Modified October 30, 2019
Presby Advanced Enviro-Septic (Alternative SAS with 12" C-33 Sand Treatment) Wastewater Treatment System	Advanced Enviro-Septic System Approved for residential installations <880 GPD	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter - Secondary Treatment with Disposal Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed * Bed installations only	Alternative SAS with Secondary Treatment for 50% size reduction with the effluent loading rates specified in Title 5 (310 CMR 15.242) 400 sq. ft. min. leaching area not applicable Has to meet siting requirements for upgrades Approval: Revised December 17, 2013, Modified October 30, 2019
Eljen Geotextile Sand Filter Systems	Type B43 and A42 <10,000 GPD	Eljen Corporation 125 McKee Street East Hartford, CT 06108	Alternative SAS, Patented Sand Filter: Geotextile Sand Filter	Alternate SAS (Treatment with Disposal) in Trench, Bed, Field or Gallery Configurations with 40% reduction in size. Effluent loading rates specified in Title 5 (310 CMR 15.242). Depth to groundwater may be reduced by two feet. Depth of naturally occurring pervious material may be reduced by two feet.

				Approval: March 19, 2013, Modified September 19, 2018
GeoMat™ Leaching System	GeoMat Leaching System Models 200, 400, 600, 1200 and 3900	GeoMatrix Systems, LLC 114 Mill Rock Road East, Old Saybrook, CT 06475	Alternative SAS Leaching Unit with 1-inch thick core fused entangled plastic filaments fully wrapped in a hygroscopic membrane.	Alternate SAS Trench, Bed configurations: Department authorizes reductions in effective leaching area (310 CMR 15.242), subject to the Standard Conditions that apply to all SAS with General Use Certifications and subject to the Special Conditions applicable to this Technology. Approval: June 26, 2019
Hoot Aerobic Systems	Hoot Aerobic H- Series H-500A, H-600A, H-750A and H-1000A <1,000 GPD residential strength wastewater	Hoot Aerobic Systems Inc. 2885 Highway 14 East Lake Charles, LA 70607	Secondary Treatment Unit: Pretreatment tank, aeration chamber and clarifier	BOD5 and TSS removal Exempt from septic tank requirements of 310 CMR 15.223 and 15.228 Approval: November 5, 2012
Jet BAT Media Wastewater Treatment Plants	J-500, J-500-PLT, J-750, J-800-PLT, J-1000, J-1250 and J-1500 Approved for residential facilities only	JET Inc. 750 Alpha Drive Cleveland, OH 44143	Secondary Treatment Unit: Primary settling zone, aerobic treatment with fixed media, and a secondary clarifying zone	BOD5 and TSS removal Models J-500 and J-750 exempt from septic tank requirements of 310 CMR 15.223 and 15.224 Flow<10,000 GPD

Approved for Remedial Use				
				Approval: August 31, 2017
Low-Rate Intermittent Sand Filter	Low Rate Intermittent Sand Filter <10,000 GPD	Saneco, Inc. Box 9B 65 Eastern Avenue Essex, MA 01929	Secondary Treatment Unit: Screened pump vault (in existing septic tank), Intermittent Sand Filter and pump chamber	BOD5 and TSS removal flow<10,000 GPD Approval: November 5, 2012
MicroFAST	MicroFAST, High Treatment System Models MicroFAST® 0.5, 0.75, 0.9, 1.5, 3.0, 4.5 and 9.0; HighStrengthFAST® Treatment System Models HighStrength FAST® 1.0, 1.5, 3.0, 4.5 and 9.0 and NitriFAST® Treatment System Models NitriFAST® 0.5, 0.75, 1.0, 1.5, 3.0, 4.5 and 9.0 <10,000 GPD	Bio-Microbics, Inc. 16002 West 110th Street Lenexa, KS 66219* * Note new address	Secondary Treatment Unit: Primary settling zone, aerobic treatment with fixed media, and a secondary clarifying zone	BOD5 and TSS removal Approval: November 5, 2012
Modular FAST	Modular FAST	Smith & Loveless, Inc. 14040 Santa Fe Trail Drive Lenexa, KS 66215	Secondary Treatment Unit: Aerobic Treatment Unit with fixed media	BOD5 and TSS removal <10,000 GPD Approval: November 5, 2012
Perc-Rite Drip Dispersal System	Models: QM(WD) ASD-15, ASD-25, & ASD-40	American Manufacturing Co. Inc. 22011 Greenhouse Rd Elkwood, VA 22718	Alternative SAS: Subsurface drip dispersal	Equivalent to pressure distribution Can be placed in A, B, or C horizon a minimum of six inches below grade The System does not require a five foot over dig as indicated at 310 CMR 15.255(5). <10,000 GPD

Approved for Remedial Use				
				Approval: March 20, 2015
Puraflo	Puraflo Peat Fiber Biofilter <10,000 GPD	Bord na Mona Environmental Products U.S. Inc. 4106 Bernau Avenue Greensboro, NC 27407	Secondary Treatment Unit: Peat Fiber Biofilter (following septic tank), discharges via pressure distribution to SAS	BOD5 and TSS removal Approval: November 5, 2012
SepTech/Pirana By Pirana	SepTech/Pirana	Pirana http://www.pirana.biz/ 1875 Joy Road. Occidental, CA 95465	SAS Aeration with Bacterial Augmentation	Restoration of failed SAS. <2,000 GPD Flow <2,000 GPD Renewal: Oct. 10, 2018
SeptiTech Treatment Systems by Bio-Microbics of Maine, Inc.	SeptiTech 400, 550, 750, 1200, 1500, 3000, and SeptiTech Engineered Systems <10,000 GPD	SeptiTech, Inc. 220 Lewiston Road Gray, ME 04039	Secondary Treatment Unit: Recirculating Trickling Filter	BOD5 and TSS removal Approval: July 8, 2013
Simple-Septic Wastewater Treatment System	Simple-Septic <10,000 GPD	Presby Environmental Inc. 143 Airport Road Whitefield, NH 03598	Alternative SAS: Patented Sand Filter Perforated corrugated pipe wrapped with geotextile fabric, placed in a sand bed	Alternative SAS - Patented Sand Filter for Treatment with Disposal -40% reduction in effective leaching area of SAS ; -Two foot reduction of separation to groundwater; -Two foot reduction of naturally occurring pervious material Approval: September 11, 2014
Singulair Bio-Kinetic Wastewater Treatment System	Singulair and Singulair Green models <1,500 GPD	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Secondary Treatment Unit: Aerobic Treatment and Bio-Kinetic System	BOD5 and TSS removal TN removal with TNT models

Approved for Remedial Use				
				Approval: November 7, 2012
Sludgehammer Alternative Treatment System	Models: 5-46 & 5-86 <2,000 GPD	Sludgehammer Group Ltd 336 Division Road Petoskey, MI 49770	Septic Tank Aeration with Bacterial Augmentation	Restoration of failed SAS (BOD5 and TSS removal) <2,000 GPD Approval: April 2, 2015
Soilair	RF-3952TB, 3952MP, 5264MP, 5295MP, 9858MP, 15652MP, 21650MP, 29450MP <10,000 GPD	Geomatrix, LLC 114 Mill Rock Road East Old Saybrook, CT 06475	SAS Aeration	Restoration of failed SAS Approval: June 20, 2016
Subsurface Drip Wastewater Disposal System	Drip Disposal System MODELS: Geoflow WASTEFLOW Classic WF16-4-24, WF16-4-12, WF – Special Order and Geoflow WASTEFLOW PC WFPC16-4-24, WFPC16- 4-12.WFPC16-4-6, WFPC16-2-24, WFPC16-2-12, WFPC16-2-6 and WFPC-Special Order	Geoflow Inc. 500 Tamal Plaza, Suite 506 Corte Madera, CA 94925	Alternative SAS: Drip Irrigation	Equivalent to pressure distribution <10,000 GPD Approval: March 20, 2015
Waterloo Biofilter	Biofilter <10,000 GPD	Waterloo Biofilter System, Inc. 143 Dennis Street Rockwood, ONT, N0B 2K0	Secondary Treatment Unit: Trickling Filter	BOD5 and TSS removal Approval: November 5, 2012
White Knight Inoculator / Generator	White Knight System	Knight Treatment Systems 281 County Route 51A Oswego, NY 13126	Septic Tank Aeration with Bacterial Augmentation	Restoration of failed SAS BOD5 and TSS removal <10,000 GPD

Approved for Remedial Use	
Alternative Treatment System	Approval: June 9, 2015

I/A Technologies with Nitrogen Reduction Credit

A number of the technologies listed above have received nitrogen reduction credit as part of their technology approvals:

General Use Certification

Recirculating Sand Filters - Generic (25 mg/L TN) up to 10,000 GPD Ruck (19 mg/L TN) up to 2,000 GPD
MicroFAST (19 or 25 mg/L TN) up to 2,000 GPD - residential flows only Advantex <2,000 gpd
SeptiTech < 2,000 gpd
Singulair <2,000 gpd

Provisional Use Approvals

Advantex
Amphidrome
Bioclere for flows less than 2,000 gpd* FAST
Fuji Clean (900 gpd max)
Mod FAST
SeptiTech
Singulair
Waterloo Biofilter
Nitrex
* Bioclere has reached limit for installed systems less than 2,000 gpd.

Piloting Use Approvals

Bio Barrier MBR WWT System
Jet JC-1500 CF WWT System
Nitrex Plus
OMNI-Cycle System
OMNI Recirculating Sand Filter System RID Phosphorus Removal System RUCK CFT

Using a Technology Not Currently Approved for Use in Massachusetts

- You have several options if you are interested in using a technology not approved for use by MassDEP:
- For new construction, the technology manufacturer can apply to MassDEP for Piloting Approval, Provisional Use Approval, or for General Use Certification. Once the technology use approval has been issued, you can apply for approval to install it on your property. See MassDEP's Technology Approval Process for I/A
- Systems.
- • You can apply to MassDEP for a site-specific approval to pilot a technology on your property. To pilot an I/A
- technology for new construction, including an increase in design flow, you must show that the property could support a conventional system; this provision provides for a back-up in case the piloted system fails.
- • You can apply for a site-specific approval to pilot a technology on your property when it is used to replace an existing failed, failing or a nonconforming system, so long as there is no increase in design flow to the system.
- For site-specific piloting, you must apply to both your local Board of Health and to MassDEP.

ROCKLAND, MASSACHUSETTS

Comprehensive Wastewater Management Plan

APRIL 2023

Phase 3 – Detailed Evaluation of Alternatives and Recommended Wastewater Management Plan

WRIGHT-PIERCE
Engineering a Better Environment

Comprehensive Wastewater Management Plan

Phase 3 – Detailed Evaluation of Alternatives and Recommended Wastewater Management Plan

Rockland, MA

April 2023

Prepared By:

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Section 1 Introduction

1.1 Background Information

The Town of Rockland continues to evaluate its current wastewater collection, pumping, treatment, and disposal needs through its Comprehensive Wastewater Management Plan (CWMP). Approximately 95 percent of the residents of Rockland rely upon the Town's existing wastewater system to collect, transport, treat, and dispose of their wastewater at the Wastewater Treatment Plant (WWTP). The remaining residents, which reside outside of the sewer service area, rely on individual onsite wastewater disposal systems (traditional septic systems). The purpose of the CWMP is to provide a wastewater management planning tool to guide the Town's sewer planning process for the next 20 years.

The Phase 1 - Existing Conditions, Problem Identification and Needs Assessment Draft Report and the Phase 2 – Alternatives Identification and Screening Draft Report were completed and submitted to the Massachusetts Department of Environmental Protection (MassDEP) and the Environmental Protection Agency (EPA) in August 2022 and December 2022, respectively. Both documents were revised during Phase 3 and are updated with the submission of this report.

This report, entitled 'Phase 3 - Detailed Evaluation of Alternatives and Recommended Wastewater Management Plan' presents the results of the three-phase study undertaken by the Town of Rockland to determine the viability of current wastewater disposal practices in non-sewered areas and the needs within the existing sewer system. In general, the intent of this phase of the CWMP is to evaluate shortlisted wastewater management alternatives previously identified in Phase 2 and recommend a wastewater management plan for the 20-year planning period.

1.2 Purpose and Scope of Services

This document satisfies the Phase 3 requirements of the three-phase CWMP process and is prepared in accordance with DEP's Guide to Comprehensive Wastewater Management Planning as outlined below:

- Phase 1: Assessed existing conditions, problem identification and needs assessment for the City. The completed needs assessment determined areas with a "need for further study" in Phase 2.
- Phase 2: Alternatives Identification and Screening. Identify and short-list appropriate means of wastewater management alternatives to address any "needs areas" identified in Phase 1. The analysis includes a review of technical, environmental, institutional, and economic factors.
- **Phase 3: Provide a detailed evaluation of alternatives short-listed in Phase 2 and development of recommended wastewater management plan**

1.3 Summary of Phase 1 Report

Study areas were delineated and evaluated in Phase 1. A total of 6 of the 7 areas were estimated to be well suited for the continued use of onsite individual septic systems. Those 6 study areas were categorized as having Average, Low, or Very Low wastewater disposal needs and were removed from further analysis.

The Phase 1 analysis also concluded that the Town has one "high needs area" (Study Area 1) as shown in Table 1-1 and in Figure 1-1. This area was the focus of the CWMP Phase 2 Alternatives Identification and Screening. Wastewater management alternatives for the area that were investigated include Innovative and Alternative (I/A) systems; local shared systems; sewer system extensions to Rockland's existing collection system; decentralized wastewater treatment facilities; and continued use of individual septic systems.

Table 1-1 Areas with Need for Further Study

Needs Areas	Location Name
1	Weymouth Street

1.4 Summary of Phase 2 Report

The intent of the Phase 2 analysis was to determine if an identified "high needs area" requires additional wastewater management beyond conventional septic systems. The potential wastewater management alternatives include an evaluation of Innovative/Alternative (I/A), shared/decentralized systems, sewer extensions, treatment, and disposal of facilities, management techniques, and the continued use of septic systems.

1.4.1 Treatment Alternatives

Wastewater treatment, collection, and disposal techniques were evaluated for the needs area. A similar ranking and scoring system approach that was utilized in Phase 1 was used to evaluate the alternative wastewater treatment systems. Each of the treatment systems were scored based on primary (i.e., technical components) and secondary (i.e., evaluative and environmental components) criteria for the individual needs area.

Based on the analysis, a shortlist of wastewater treatment alternatives was provided for the study area as shown in Table 1-2 and is the focus of Phase 3.

Table 1-2 Short List of Treatment Alternatives for Needs Areas

Treatment Technology	Needs Area 1 Weymouth Street
Individual Onsite Septic Systems	X
I/A Systems	X
Decentralized Systems (Shared System or WWTP)	X
Collection System Extension	X

1.4.2 Groundwater Discharge Alternatives

Groundwater discharge sites were evaluated in Phase 2 for discharge of wastewater from the needs area, potentially shedding flow from the existing collection system, and potentially to add an option for WWTP effluent discharge other than the existing surface water discharge. Six discharge sites were identified as possible effluent disposal sites. All six locations were able to accommodate the flow estimates from Needs Area 1 based on a "desktop" level analysis. Further hydrogeological investigations and evaluation would be required to determine the actual loading rates of each site. After the issuance of the Phase 2 draft, members of the Town, local golf courses, a representative for Union Point, and Wright-Pierce met to discuss groundwater disposal. Two new sites were added, and four sites were removed, as will be discussed later in this report.

1.5 Public Review

The report for Phases 1 and 2 of the CWMP are currently available online and at the Town Hall for review and comment by all interested stakeholders. The draft of Phase 3 will also be available online and at the Town Hall. Public and interested stakeholders will be given the opportunity to provide input for the CWMP during the public information hearing. The public information hearing was held on Wednesday September 6, 2023 at 7:00 pm via Zoom. The public notice for this hearing has been published in the Tuesday July 25, 2023 issue of the *Quincy Patriot Ledger*. The presentation and discussion will include the final recommended wastewater management and implementation plan. A copy of the presentation and meeting minutes, including questions and answers, will be included in Appendix A.

2

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Section 2 Evaluation of Shortlisted Alternatives for Needs Area 1 – Weymouth Street

2.1 Summary of Shortlisted Alternatives

Needs Area 1 had four wastewater treatment alternatives that were shortlisted in Phase 2 of the CWMP, including the following:

- Individual Onsite Septic Systems
- Innovative/Alternative (I/A) Treatment Systems
- Extension of the Rockland Wastewater Collection System
- Decentralized WWTF

The following sections estimate the preliminary costs for the alternatives, and the impacts each alternative has on environmental issues, institutional issues, public health, water supply protection, surface water protection, and managed growth. The Decentralized WWTF (and groundwater discharge) option is summarized in Section 3, as part of the capacity analysis of the existing collection system/WWTF.

2.2 Preliminary Cost Analysis

The preliminary cost analysis was performed for each of the Phase 2 shortlisted wastewater treatment alternatives. The cost analysis was based on accepted engineering economic principles as stated in MassDEP Guidelines and was performed using a 20-year present worth analysis. The present worth analysis was primarily based on the capital and O&M costs for each of the treatment alternatives.

The capital cost estimates included construction, engineering design and construction administration, legal, land acquisition, easements, and contingencies. The O&M costs consisted of typical items such as labor, energy, chemicals, and sludge disposal. The present worth O&M cost is the total estimated cost to maintain each alternative over the 20-year planning period. In general, the costs are not intended to be used as specific construction cost estimates but are intended to be used to compare viable alternatives.

2.2.1 Individual Onsite Septic Systems

For this alternative, septic systems would be the method of treating and disposing of the property owner's wastewater. For the cost analysis, the worst-case scenario was used, where every septic system in the needs area would have to be replaced during the 20-year planning period.

There are three parcels in Needs Area 1. None of the parcels have existing buildings. “Build-out homes” were calculated based on the parcel size, zoning, and developable area and access for future planning purposes. The number of build-out homes for Needs Area 1 is estimated to be four. If the parcels were developed as commercial properties, which is the predominant use type in this area, septic systems may be too small for the design flow. As such, it is assumed that single family homes will be constructed in the undeveloped areas.

The capital costs for each type of onsite wastewater disposal system were estimated using cost information from various onsite disposal system manufacturers and construction contractors. A new septic system was estimated to cost an average of $50,000. This alternative’s total present worth capital cost includes the present worth cost for

the four new septic systems as well as other fees such as engineering, construction administration, legal fees, and contingencies. The costs were distributed evenly over the 20-year period.

A septic system is recommended to be pumped out once every two years and currently costs approximately $500 per "pump out" of a 1,500-gallon tank. This would be an annual cost of $250. There are generally no other associated O&M costs for a septic system.

The total present worth cost for adding septic systems for treating and disposing of wastewater from undeveloped parcels for this needs area was estimated at approximately $329,000 as shown in Table 2-1. The present worth value accounts for inflation and interest of future costs for the project. For the future capital costs and total present worth, 5% inflation and 5% interest were used to calculate the costs. The present worth O&M costs assumed 5% inflation and 5% interest. A summary comparing all the different alternatives' capital costs, O&M costs, and total present worth costs is presented later in Table 2-4.

Table 2-1 Present Worth Cost of Septic Systems

Cost Estimate	Septic System
Initial Capital Cost	$0
Present Worth of Future Capital Costs	$309,000
Present Worth O&M Costs	$20,000
Total Present Worth	**$329,000**

2.2.2 I/A Systems

For the I/A system wastewater treatment alternative, it was assumed that four build-out homes would be installed with a new I/A system.

There is a wide variety of MassDEP approved I/A systems available (as was described in the Phase 2 Report). Construction and O&M costs for the I/A systems were obtained based on the recent needs of I/A technologies. The average construction cost for a new I/A system is approximately $75,000. This alternative's total present worth capital cost includes the present worth cost for the four build-out systems along with other fees such as engineering, construction administration, legal fees, and contingencies. It was assumed that the construction of four new I/A systems would be equally distributed over the 20 years.

In order to obtain a higher level of treatment, most of the I/A systems require pumps and/or blowers to operate. The O&M costs were calculated based on estimates for sludge removal and disposal, testing, and electrical usage. The cost to pump out an I/A system currently averages $500, which should be performed once every two years (same as a traditional septic system). Regarding the DEP sampling requirements, the average annual cost for a certified laboratory to perform sampling and testing of an I/A system varies between $100 and $500, with some requiring higher first-year testing costs. The average electrical cost per unit is estimated to be $400 per year. It was assumed that an average total annual O&M cost is approximately $2,400, which accounts for electricity, septage

pumping, routine inspections, routine laboratory analysis, non-compliance inspections/lab analysis, chemicals, repairs, and program costs.

The total present worth cost using I/A systems for treating and disposing of wastewater for this needs area is estimated at approximately $669,000 as shown in Table 2-2. For the future capital costs and total present worth, 5% inflation and 5% interest were used to calculate the costs. The present worth O&M costs assume 5% inflation and 5% interest.

Table 2-2 Present Worth Cost of I/A Systems

Cost Estimate	Septic System
Initial Capital Cost	$0
Present Worth of Future Capital Costs	$477,000
Present Worth O&M Costs	$192,000
Total Present Worth	**$669,000**

2.2.3 Extension of the Rockland Wastewater Collection System

Another treatment alternative evaluated for this area is extending the existing wastewater collection system. The wastewater would be treated at the Town of Rockland 's Wastewater Treatment Plant (WWTP). The Town's existing collection system extends near many of the parcels in the needs area, including on Weymouth and Hingham Streets and Reservoir Park Drive. Additional sewer is needed along the access drive off Reservoir Drive to connect three of the parcels to the existing collection system and a service connection would be required for the parcel off Weymouth Street.

The proposed sewer extension route to reach the existing wastewater collection system is near Reservoir Park Drive, on a driveway entrance between Ledgewood Place and Hingham Street. The proposed wastewater collection system would consist of 8-inch diameter gravity sewer pipes, 6-inch diameter service laterals, and manholes approximately 300 feet apart. No additional pump stations are assumed to be needed. The proposed sewer route is shown in Figure 2-1.

The total present worth cost for installing the proposed sewer, including trenching and paving, was estimated at approximately $1,560,000 as shown below in Table 2-3. The cost assumed 20 feet of 6-inch PVC from the road to property line for the sewer service connections. Costs for sewer laterals beyond the right-of-way to the building will be the responsibility of the property owner. The 8-inch gravity pipe was estimated based on the proposed sewer route from the needs area to the existing collection system connection point, manholes every 300 feet and/or at intersections, and the costs for the trench and pavement, assuming road widths of 20 feet.

The unit costs were estimated using information from previous collection system projects. The estimate does not include the cost of any household interior plumbing rearrangements or septic system abandonment, as all of the parcels are undeveloped. As there are no proposed pump stations required, O&M costs were assumed to be zero. The revenue that the Town would receive from charging a user connection fee was not included in the analysis.

For the wastewater collection system extension, the present worth value was calculated assuming 5% inflation and 5% interest. A summary comparing all the different alternatives' capital costs, O&M costs, and total present worth costs is presented in Table 2-4.

Table 2-3 Present Worth Cost of Wastewater Collection System Extension

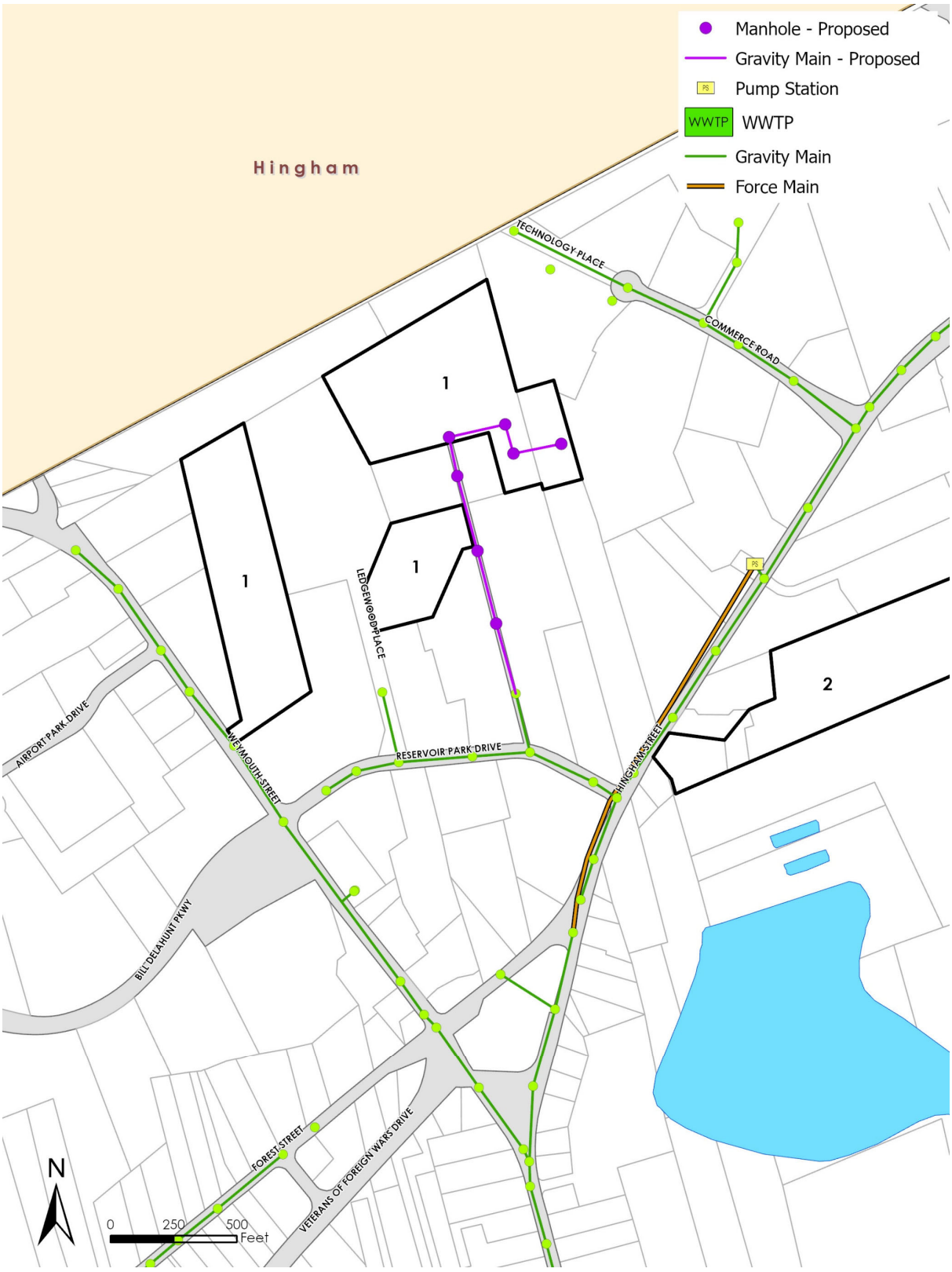
Cost Estimate	Wastewater Collection System Extension
Initial Capital Cost	$1,560,000
Present Worth O&M Costs	$0
Total Present Worth	**$1,560,000**

2.2.3.1 Estimated Betterment Fee

The betterment fee for the wastewater collection system extension for Needs Area 1 is estimated to be approximately $260,000. The betterment fee includes the developable parcels. The betterment fee is the cost the homeowners would pay the Town for the installation of the sewer extension. It can be treated like a loan and can be paid through the homeowner's real estate tax bill or paid all at once separate from the tax bill.

The betterment fee was calculated by taking the estimated capital costs for the proposed sewer route and dividing by the parcels in Needs Areas 1 that are developable as commercial buildings. Due to the proximity of existing sewer, it is likely that the betterment would be less than presented, depending on how much 8-inch sewer main and new paving would be required to tie-in the parcels.

Figure 2-1 Needs Area 1 – Collection System Extension



2.2.4 Decentralized WWTF

For the decentralized WWTF alternative, a new decentralized WWTF with groundwater effluent disposal would be used to dispose of wastewater from the needs area. This is discussed in a later section of this report as the area is in close proximity to the existing collection system and proposed effluent disposal and WWTF areas at Union Point.

2.2.5 Summary of Cost Estimates

As shown in Table 2-4 below, septic systems appear to be the most cost-effective wastewater treatment alternative for Needs Area 1. I/A Systems are often used in locations with strict nutrient limits, which is not currently applicable in Rockland. In the future, if strict nutrient limits were implemented in this area, then I/A Systems should be reinvestigated. At this time, with flow capacity being an issue for the existing WWTP, the sewer moratorium being in place, and the cost prohibitive estimated betterment fee, it is not recommended to extend sewer to this Needs Area. However, should capacity become available, sewer extension is a viable option.

Table 2-4 Summary of Cost Estimates for Needs Area 1

Cost Estimate	Treatment Alternatives		
	Septic System	Innovative/Alternative System	Extension of the Collection System
Initial Capital Cost	$0	$0	$1,560,000
Present Worth of Future Capital Costs	$309,000	$380,000	-
Present Worth of O&M Costs	$20,000	$190,000	$0
Total Present Worth	$329,000	$570,000	**$1,560,000**

2.3 Environmental Analysis

The alternatives for Needs Area 1 were screened for potential direct and indirect environmental impacts in accordance with DEP's 1996 CWMP Guidelines. A brief discussion of how each one of the environmental factors may be impacted by each treatment alternative is presented in the following sections. A summary of the impacts is shown in Table 2-5.

2.3.1 Direct Impacts

The following discusses the direct impacts that may arise from septic systems, I/A systems, and extension of the Rockland Wastewater Collection System.

2.3.1.1 Historical, Archaeological, Cultural, Conservation, and Recreation

The construction of any of the proposed treatment methods would have no impact on the historical, archaeological, or cultural aspects of the Town. As described in detail in Phase 1, there are no known historical places within Needs Area 1.

2.3.1.2 Wetlands, Flood Plains, Agricultural Lands, and Environmentally Sensitive Areas

Each of the proposed wastewater treatment alternatives, if constructed, would have a temporary impact on wetlands, which takes up a large portion of each parcel. There is no impact to flood plains, agricultural lands,

and/or environmentally sensitive areas. During the construction of the wastewater extension option, best management practices would be used to help minimize any disturbances to wetlands and potential priority habitats for rare species.

Also, there would be one stream crossing associated with the sewer extension option, which could be accomplished by directional drilling. Prior to construction, a Notice-of-Intent would be developed and submitted to the Town's Conservation Commission for approval.

Septic and I/A systems in this area would be sited such that buffer zones to wetlands would be followed. However, collection system extension would provide better protection to these wetland areas than a typical septic system.

2.3.1.3 Zones of Contribution of Existing and Proposed Water Supply Sources

The entire needs area is located inside Surface Water Protection Zones for the Hingham Street Reservoir. Therefore, extension of the existing collection system provides better treatment but would remove potential recharge for groundwater in the area. As the parcels in this area are currently undeveloped, the recharge of groundwater is a nonfactor.

2.3.1.4 Surface and Groundwater Resources

Properly functioning septic and I/A systems would provide some level of wastewater treatment if selected for future use in this needs area. A septage management plan where property owners are required to pump out their septic tank once every two years would help to maintain proper operation. Septic and I/A systems would keep effluent disposal systems onsite, which would help to recharge the local groundwater. The wastewater collection system extension would send flow to the Rockland WWTP, which discharges to the French Stream, which is an impaired water body. Due to the local surface water supply for the Abington Rockland Joint Water Works, sewer extension provides a better solution to protect the supply.

2.3.1.5 Displacement of Households, Businesses, and Services

Each of the wastewater treatment alternatives would result in only a minimal and temporary impact on residents or businesses during construction activities. None of the construction activity should result in the complete displacement of households, businesses, or other services. In addition, one lane of traffic would remain open during sewer construction to help minimize any inconvenience.

2.3.1.6 Noise Pollution, Air Pollution, Odor, and Public Health Issues

The I/A system option has pumps and/or blowers, and these may cause minimal noise pollution. Brief odor emission can occur during septic tank pump outs for the septic system or I/A option. A typical septic system does not contain any mechanical equipment; therefore, it should not cause any form of noise or air pollution. Any of the wastewater options would provide for proper handling of sewage, minimizing the potential public health issues associated with any failing septic systems.

2.3.1.7 Violation of Federal, State, or Local Environmental and Land Use Statutes

All the alternatives would be designed, constructed, and operated in accordance with all federal, state, and local environmental and land-use statutes, regulations, and plans.

2.3.2 Indirect Impacts

For this analysis, it has been determined that the wastewater alternatives will result in minimal indirect impacts. Based on the surrounding area, which is primarily commercial property, there are no impacts or changes to the land use patterns in the needs area. For the sewer extension option, there may be minimal population growth on parcels that meet the Town's residential zoning requirements.

Table 2-5 Environmental Impacts for Shortlisted Alternatives for Needs Area 1 – Weymouth Street

Treatment Alternatives	Environmental Impacts							
	Direct							Indirect
	Historical & Archeological	Wetlands, Floodplains & Habitats	Water Supply Protection	Surface & Groundwater Resources	Displacement of Households	Noise & Air Pollution	Violation of Statutes	Population Growth and Land Use Changes
Septic Systems	N	T	N	M	N	N	N	N
I/A Systems	N	T	N	M	N	M	N	N
Collection System Extension	N	T	N	M	N	N	N	M

Legend:

M= Minimal

N= None

T= Temporary

2.4 Institutional Arrangements

The use of new septic systems would require the approval of the Town's Board of Health. If I/A systems are selected, it may require the Board of Health to review DEP mandated annual inspection reports for these types of systems. The wastewater collection system extension option would require additional labor from the Town's WWTP personnel to maintain the collection system.

2.5 Flow and Waste Reduction

Several types of flow and waste reduction methods were discussed in Phase 2 of the CWMP. Some specific examples of flow and waste reduction measures include the following:

- Reducing I/I into the collection system
- Water Conservation
- Land use and development regulations
- Industrial reuse, recycling, and pretreatment programs
- Use of onsite facilities (Septic and I/A Systems)
- Pollution Prevention Initiatives

The reduction in wastewater volume allows for minimized collection, treatment, and effluent disposal processes. Water and thereby wastewater use habits start at the source with each individual property owner. In order to realize significant water use reductions, it is the responsibility of the community and should be taken on as a Town-wide initiative. Infiltration can be reduced through collection system rehabilitation and replacement, which are significant projects that must be undertaken by the Town. Private sources of inflow can be reduced and removed by a concerted effort of everyone in the Town by investigating any illicit connections such as roof leaders and sump pumps and disconnecting them from the sanitary sewer system.

Regarding the pollution prevention initiatives, the Town of Rockland should consider the implementation of a Septage Management Plan (SMP) for the management of onsite septic systems. The general intent of the SMP is to implement appropriate regulations, controls, and/or guidelines to ensure the proper operation of systems in areas where onsite treatment and disposal methods are recommended as a long-term solution. In addition, a program to investigate private illicit connections can be implemented. If needed, the Town and Sewer Department can implement programs to assist homeowners with removing these connections by conducting the investigations and assisting in part or whole of the costs to remove the connections.

2.6 Residuals Disposal

For onsite systems (Septic and I/A), the residuals are typically pumped out of the septic tanks or equalization tanks on a bi-annual basis. The septage is then transported and disposed of at a DEP-approved septage treatment facility or area WWTF.

2.7 Location of Facilities

The Town's WWTP would treat the wastewater from the proposed sewer extension. No new pump stations are needed for the sewer extension.

2.8 Revision of Waste Load Allocation

A waste load allocation (WLA) is the portion of a receiving water's assimilative capacity that is allocated to one of its existing or future point sources of pollution. Water quality based effluent limits (WQBEL) for discharge permits are

determined by the WLA. Individually, not including other needs areas or expansion within already sewered areas, the addition of wastewater flows from Needs Area 1, estimated at 1,450 to 34,800 gpd during Phase 2, would require the Town to increase their permitted average daily flow of 2.5 MGD. The Town continues to work on I/I removal as part of the existing capacity issues at the plant. This is discussed later in the report. It is unlikely that a permit increase would occur as the French Stream is already impaired.

2.9 Phased Construction

If septic systems or I/A systems are selected for future wastewater treatment, then individual systems should be replaced as existing septic systems fail over the 20-year planning period. Prior to property owners being able to connect to the proposed wastewater collection system extension option, it would be necessary for the sewer transmission pipes to be constructed, tested, and approved to accept wastewater.

2.10 Flexibility and Reliability

The wastewater management alternatives would be designed to be flexible and reliable so that any unforeseen circumstances could be accommodated in a timely manner. All infrastructure and wastewater treatment would be designed in accordance with the New England Interstate Water Pollution Control Commission's (TR-16) Guide for the Design of Wastewater Treatment Works.

3

WRIGHT-PIERCE
Engineering a Better Environment

Section 3 Groundwater Discharge Evaluation

3.1 Introduction

This section of the Phase 3 report continues the discussion and analysis for potential groundwater discharge sites within the Town of Rockland. The evaluation was conducted for Rockland due to the EPA Order and general need for alternative solutions for connecting new sewer users to the existing collection system due to flow and capacity issues at the existing WWTP. Groundwater disposal was investigated for discharge of wastewater from Needs Area 1, potentially shedding flow from the existing collection system, and potentially to add an option for WWTP effluent discharge other than the existing surface water discharge.

The analysis in this Phase of the CWMP further develops the desktop evaluation in Phase 2 and shortlists the potential groundwater locations based on feedback from key stakeholders and members of the Town. The shortlisted sites were be evaluated for effluent disposal from the existing WWTP and a combination of a new decentralized WWTF plus effluent disposal. Cost estimates are provided for each option as well as preliminary flow estimates for effluent disposal. To confirm the suitability of an effluent disposal site, mapping and subsurface investigations and modeling of groundwater flow are required. These additional investigations and analyses are not included in the scope of this CWMP. The basis for each location and shortlisting of options is discussed in detail below.

3.2 Summary of Shortlisted Alternatives

The evaluated locations for alternative groundwater discharge sites in Phase 2 of the CWMP included the following seven locations:

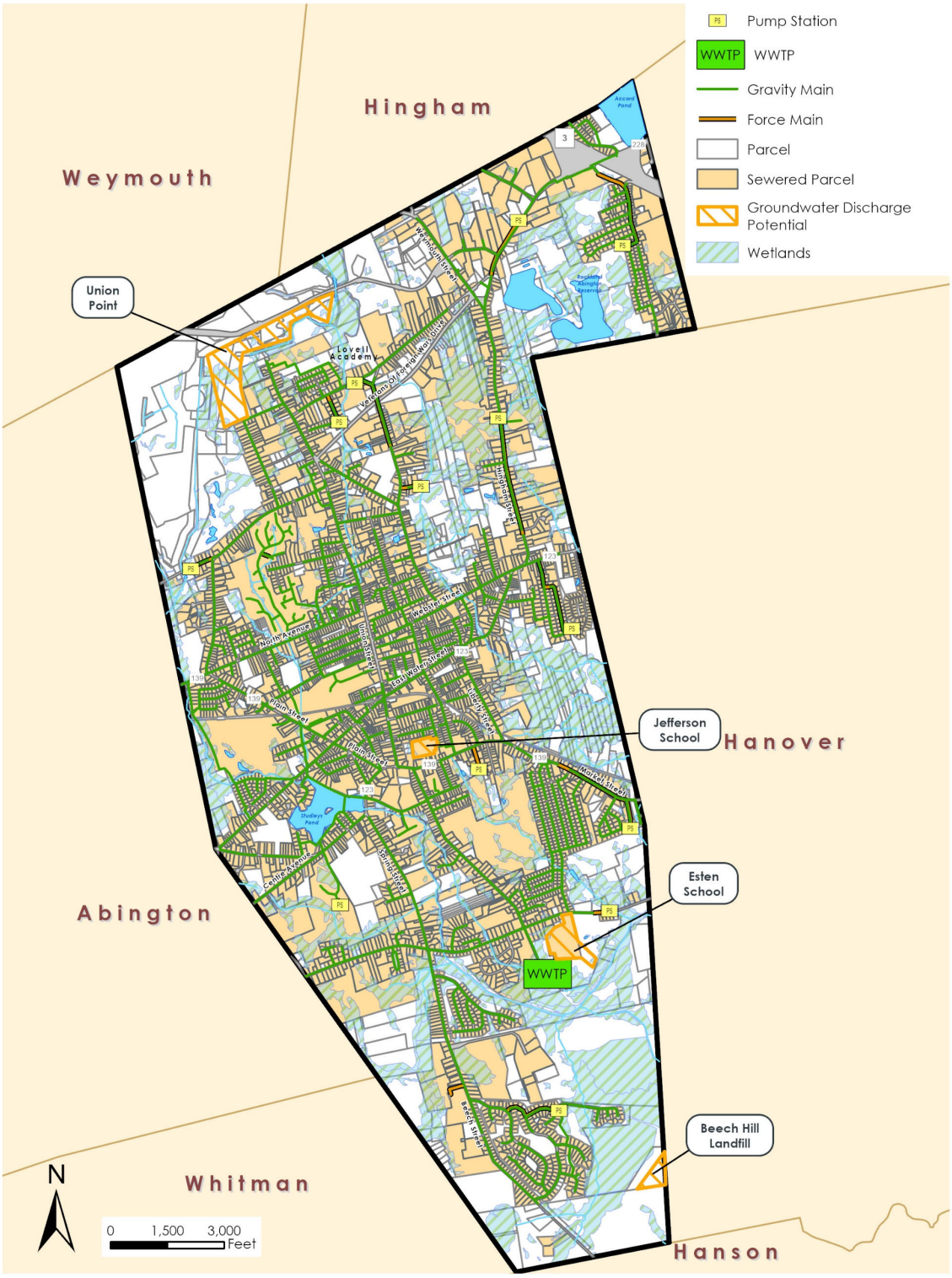
- Union Point
- Rockland Golf Course
- Harmon Golf and Fitness Club
- WWTP Land
- Esten School Land
- Southern Lands
- McCarthy Farm

Upon communication with the Town and key stakeholders, five sites were removed as suitable locations and an additional two sites were added to the final shortlisted sites including the following locations:

- Union Point (reduced in size)
- Jefferson School
- Esten School Land
- Beech Hill Landfill

It was determined that most of the Union Point area is planned for development, the golf courses are encumbered by unsuitable soil and high groundwater, the Southern Lands and McCarthy Farm Open Space would likely not pass public approval, and the WWTP land had unsuitable soils and high groundwater. It appears a portion of the Beech Hill Landfill land is adequate for effluent disposal and the Jefferson School land could be re-purposed for effluent disposal. Figure 3-1 shows the shortlisted disposal areas identified.

Figure 3-1 Groundwater Disposal Locations



3.3 Flow Estimates

Several scenarios were analyzed as part of the groundwater discharge evaluation. These include effluent disposal from the existing WWTP and new decentralized WWTF with effluent disposal for Needs Area 1 and potential flow shedding from the existing collection system. For effluent disposal from the existing WWTP, the evaluation included improvements needed at the existing WWTP to meet a groundwater discharge permit (total nitrogen and nitrate of 10 mg/L) and infrastructure to convey wastewater from the WWTP to the disposal site. This will involve a pump station and piping to convey wastewater to each site. The amount of flow to each site is based on the usable area of the site for groundwater disposal. This would provide an option for the Town to reduce the amount of flow to the French Stream with minimal impacts to the existing system and avoids constructing a new WWTF. The second scenario evaluates constructing a new decentralized WWTF with effluent disposal. The only site that would accommodate a new WWTF and have remaining room for effluent disposal would be Union Point. The Union Point area includes receiving flow from Needs Area 1 and portions of the existing northern collection system to "shed flow" to alleviate capacity issues at the WWTP. In addition, it is likely that the development at Union Point would be interested in using a part of this facility as a solution to their wastewater management needs in the future, potentially sharing in capital and operating costs. Flow estimates and the portions of the collection system and Needs Area 1 are provided in each section below.

3.3.1 Needs Area 1

Flows were estimated based on MassDEP Title 5 design and TR-16 Guidelines. Future build-out flows were calculated based on the number of undeveloped parcels and the quantity of commercial or residential buildings that could be developed on the parcel. For residential flow, four three-bedroom homes were assumed as the potential future residential development. For commercial flow, four offices and one hotel were assumed as the potential future commercial development. Peak daily flows were estimated using 110 gpd/bedroom for the residential homes and hotel, and 75 gpd/1,000 square feet were used for the offices. Table 3-1 summarizes the wastewater flows from Needs Area 1 for potential residential and commercial build-out of the undeveloped parcels.

Table 3-1 Wastewater Flows from Needs Area 1

Building Use	Unit	Quantity	MassDEP Title V Flow (gal)	Flow (gpd)
Residential				
Single Family Home	Bedroom	12	110	1,320
Commercial				
Hotel	Rooms	300	110	33,000
Office	1,000 SF	23.6	75	1,770
Total				**34,770**

3.3.2 Flow Shedding

Reducing flows to the Rockland WWTP can alleviate capacity issues at the facility. By adding additional effluent disposal or a new decentralized WWTF, flow can be "shed" from the existing collection system. Flows from the northern portion of the existing collection system can be redistributed to a new decentralized WWTF and effluent disposal at the Union Point site, reducing flow to the Rockland WWTP.

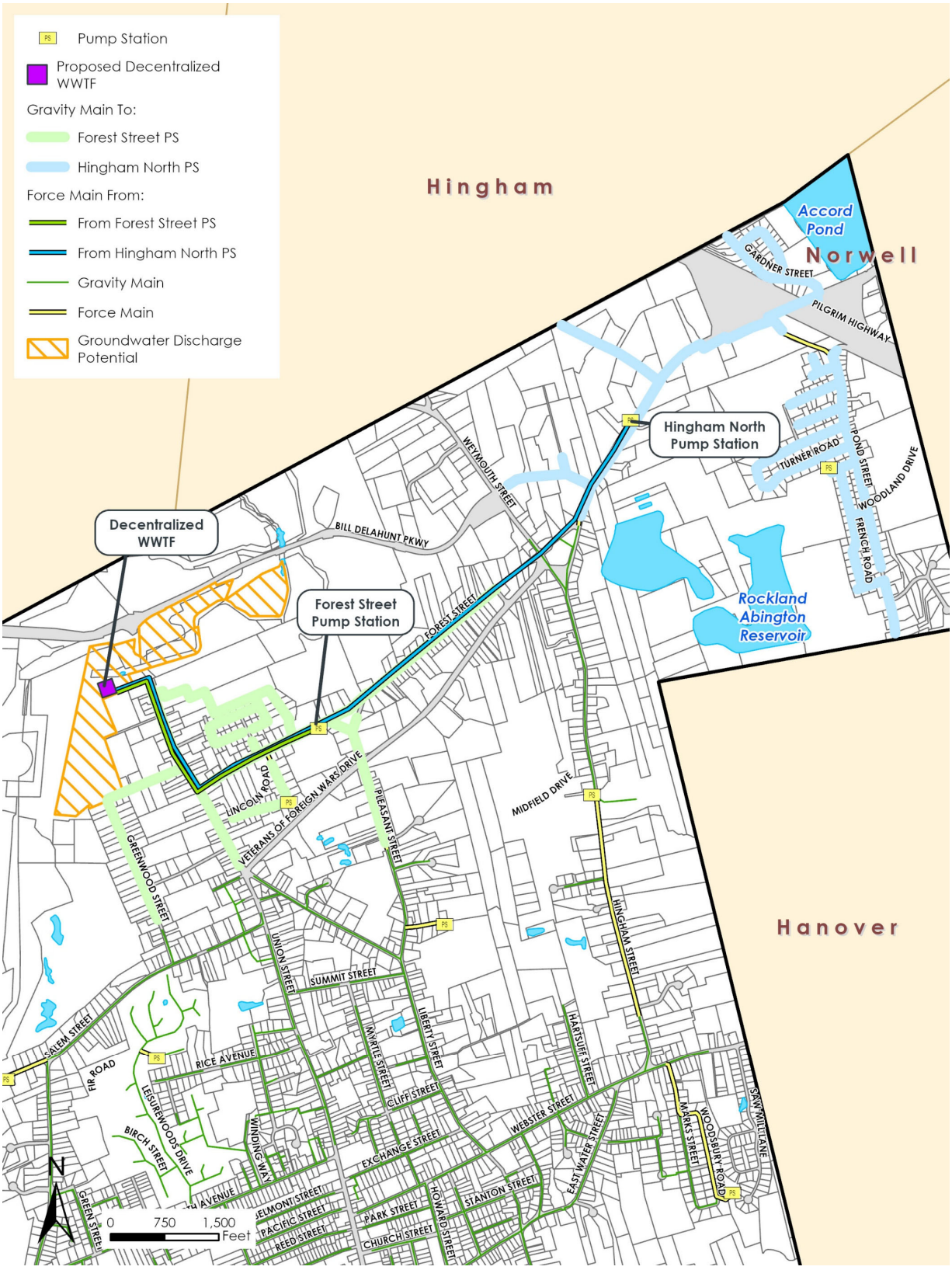
3.3.2.1 Northern Collection System

Flow from the northern collection system of Rockland can be redirected via the existing Forest Street Pump Station and/or the Hingham Street North Pump Station to the Union Point site to a potential decentralized WWTF for groundwater discharge. The Forest Street Pump Station has a rated capacity of 400 gpm, which equates to 576,000 gpd. The Hingham Street North Pump Station has a rated capacity of 1,000 gpm which equates to 1,440,000 gpd. These can be considered peak daily flows.

Forest Street Pump Station collects flow from parcels along Greenwood Street, Oregon Avenue, Lincoln Road, Pleasant Street, Forest Street and Union Street. Redirecting flow from this pump station to the Union Point discharge site would reduce the flow in the existing collection system by approximately 240,000 gpd on an average daily basis assuming a peaking factor of 2.4 per TR-16 guidelines. For Hingham Street North Pump Station, flow is collected from the Old Country Way Pump Station and from parcels along Reservoir Park Drive, Commerce Road, Gardner Street, Wilson Street, Colby Street, Turner Road, French Road, Pond Street, Nelson Road, and Hingham Street. This could potentially direct approximately 686,000 gpd of flow on a daily average basis to the Union Point effluent disposal site assuming a peaking factor of 2.4. If both pump stations were redirected to Union Point, a combined 926,000 gpd could be shed from the existing collection system. Based on usage and current buildout, flows would likely be less, but would still result in a significant flow reduction to the existing WWTP. If Needs Area 1 were also directed to Union Point, additional flow between 1,000 and 35,000 gpd would be added.

Redirecting flow to Union Point would require the rerouting of the force main of the Forest Street Pump Station and/or the Hingham Street North Pump Station to the decentralized WWTF and disposal site. Figure 3-2 shows the routing of the northern collection system to a decentralized WWTF with effluent disposal at the Union Point site.

Figure 3-2 Union Point Disposal Site Sewer Routing



3.4 Effluent Disposal Capacity

Four sites were evaluated for groundwater discharge, including Union Point, the Jefferson and Esten Schools, and the Beech Hill Landfill. Based on soil conditions, wetlands, required setbacks from wetlands and surface waters, and groundwater elevation, the usable disposal areas were reduced in size, shown in Figure 3-1. These areas were further reviewed to determine likely required dimensions/constructability of effluent disposal area. Estimated usable disposal area is summarized in Table 3-2 below. Additionally, based on a minimum loading rate of 1.5 gpd/square foot and a maximum loading rate of 4 gpd/square foot, disposal capacities are summarized in the table.

Table 3-2 Capacity of Effluent Disposal Sites

Site Name	Parcel Size (acres)	Usable Disposable Area (acres)	Disposal Capacity (gpd)	
			1.5 gpd/sq ft	4 gpd/sq ft
Beech Hill Landfill	16	1.9	124,100	331,100
Esten School	19	13	849,400	2,265,100
Jefferson School	6.5	3.8	248,300	662,100
Union Point	63	42	2,744,300	7,318,100

The values listed in the above table are peak daily flows. This is also based on a desktop evaluation and further study is required to determine the actual disposal capacity of each site. Refer to discussion below.

3.5 Sewer Routing to Effluent Disposal Sites

In order to alleviate effluent disposal capacity issues at the existing Rockland WWTP, a portion of final effluent could be pumped to the effluent disposal sites discussed above, limited by the capacity of each. This would not address average and peak flows processed through the facility, but would reduce flows discharged to the French Stream, which would bring the plant into compliance with its current NPDES permit.

In order to discharge treated effluent from the existing WWTP to groundwater, nitrate and total nitrogen must be reduced. Typical groundwater discharge permits contain limits for both parameters of 10 mg/L. In 2021, Wright-Pierce completed a WWTP evaluation for the Town of Rockland and provided several recommendations for improvements to the Rockland WWTP. To provide nitrogen removal, improvements to the secondary system of the Rockland WWTP would be required. This would include new equipment, upgrades to existing equipment/systems, and modifications of the existing secondary treatment process to convert to an A_20 process to achieve biological nitrogen and phosphorus removal. Upgrades highlighted by the 2021 evaluation are discussed in more detail in Section 6 of this report. The report concludes that with the proposed upgrades, total nitrogen levels in the effluent could be 8 mg/L. With these upgrades, a portion of the WWTP effluent could be conveyed to one or more effluent disposal sites identified. The below section discusses how flow could be conveyed to each site.

3.5.1 Union Point

As discussed above, Union Point appears to have ample area for effluent disposal. It is understood that this site is likely going to be used by the current developer for some or all of their own wastewater disposal needs. However, it is possible that a partnership between the developer and the Town could occur. For this reason, the site is

continued for analysis. A new pump station at the WWTP would pump flow through approximately 15,300 feet of force main along Concord Street, north to the intersection of Union Street and Veterans of Foreign Wars Drive where piping would transition to approximately 2,900 feet of new gravity sewer, discharging effluent to the Union Point site for disposal. Figure 3-3 shows the potential sewer routing from the Rockland WWTP to the Union Point site for groundwater discharge.

3.5.2 Jefferson School

Jefferson School is an old public elementary school that is no longer in use. The school is currently slated for re-development into open space and/or a park. The parcel is suitable for effluent disposal. Flow would be delivered to Jefferson School via a new pump station at the WWTP via approximately 7,200 feet of force main along Concord Street and Market Street. Figure 3-4 shows the potential sewer routing from the Rockland WWTP to the Jefferson School site for groundwater discharge. Based on the size of this parcel, it is likely that an additional site would be required to reduce flows meaningfully at the WWTP.

3.5.3 Esten School

The R. Stewart Esten School is an elementary school with a large open field and abutting vacant land. The site is situated near the Rockland WWTP. The field and undeveloped area is suitable for groundwater discharge. Flow would be delivered to the potential site from the Rockland WWTP with a new pump station and approximately 1,300 feet of force main routing treated effluent across the WWTP property to the Esten School site for disposal via a cross-country easement. Figure 3-5 shows the potential sewer routing from the Rockland WWTP to the Esten School site for groundwater discharge.

3.5.4 Beech Hill Landfill

The Beech Hill Landfill has area of vacant land on the north part of the site, away from the landfill itself. Flow would be delivered from the Rockland WWTP via a new pump station and approximately 9,000 feet of force main routing treated effluent along Summer Street and Spring Street, transitioning to approximately 5,600 feet of new gravity sewer, which can convey the effluent to the final destination at the Beech Hill Landfill for effluent disposal. A cross-country easement is not likely due to crossing through conservation land. Figure 3-7 shows the potential sewer routing from the Rockland WWTP to the Beech Hill Landfill site for groundwater discharge. Based on the size of this parcel, it is likely that an additional site would be required to reduce flows meaningfully at the WWTP.

3.5.5 Effluent Disposal Technologies

Effluent disposal technologies that could be utilized at these sites were discussed in Phase 2. Detailed hydrogeological field investigations, infiltrative capacity of the soil, depth to groundwater, groundwater modeling, MassDEP regulatory setbacks and aesthetics will all play a role in the final selection of the most advantageous disposal technology for each disposal site. Conventional disposal technologies with relatively high allowable loading rates include open sand beds, subsurface leaching systems and subsurface leaching chambers. The allowable loading rate for drip dispersal is a maximum of 1.5 gpd/sf and although land requirements are at least twice that of conventional disposal, drip disposal can be used to alleviate high groundwater issues and would reduce clearing. Wicks can offer a lower cost solution with reduced area disturbance in at sites with very permeable soils and deep groundwater, or where semi-permeable lenses impede downward effluent flow as determined during detailed hydrogeological investigations. Spray irrigation has similar advantages and disadvantages and the main unique disadvantage for Rockland is that spray systems are only suitable for seasonal use and require full conventional disposal redundancy for winter operations.

Figure 3-3 Sewer Routing from Rockland WWTP to Union Point

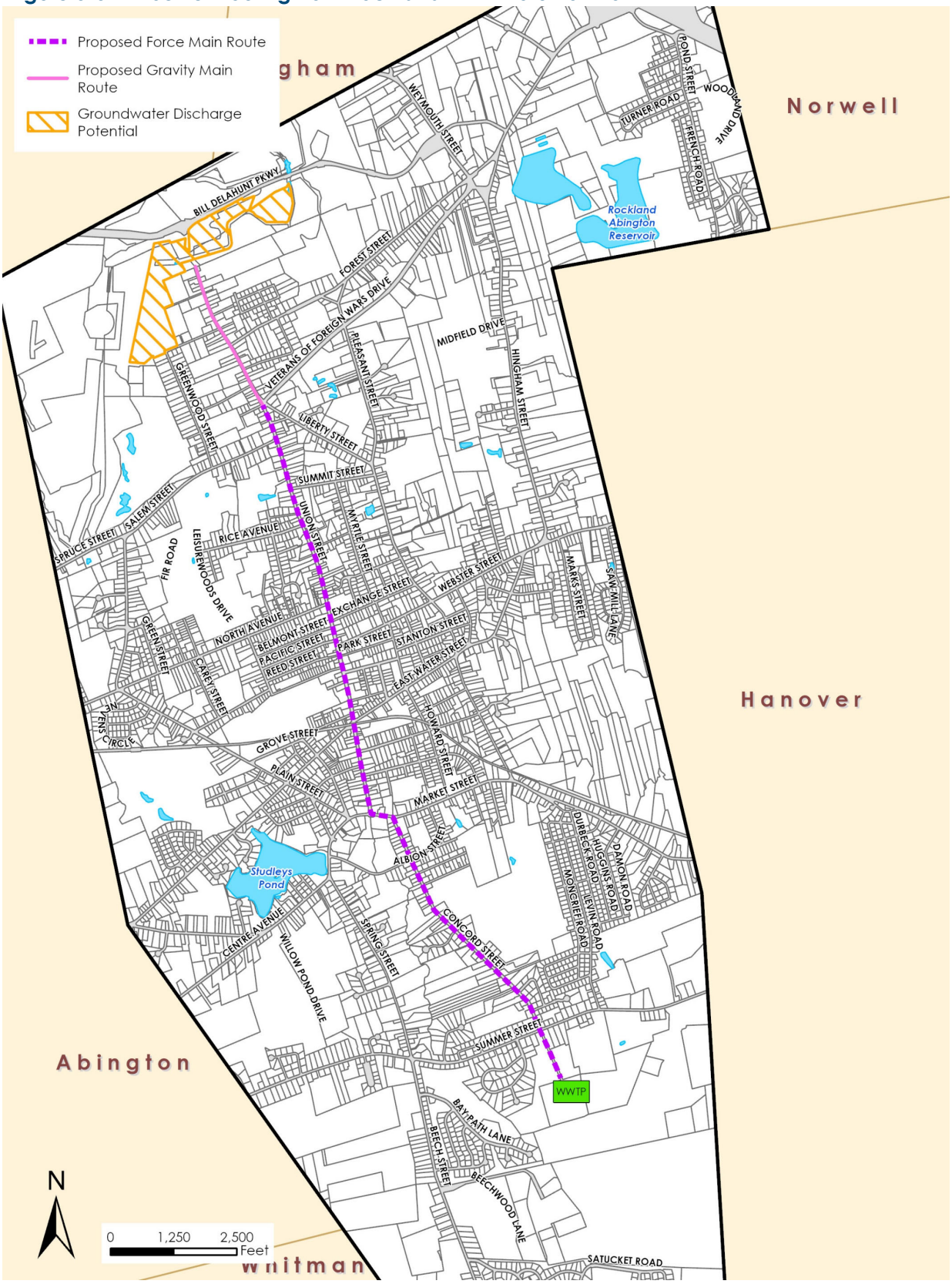


Figure 3-4 Sewer Routing from Rockland WWTP to Jefferson School

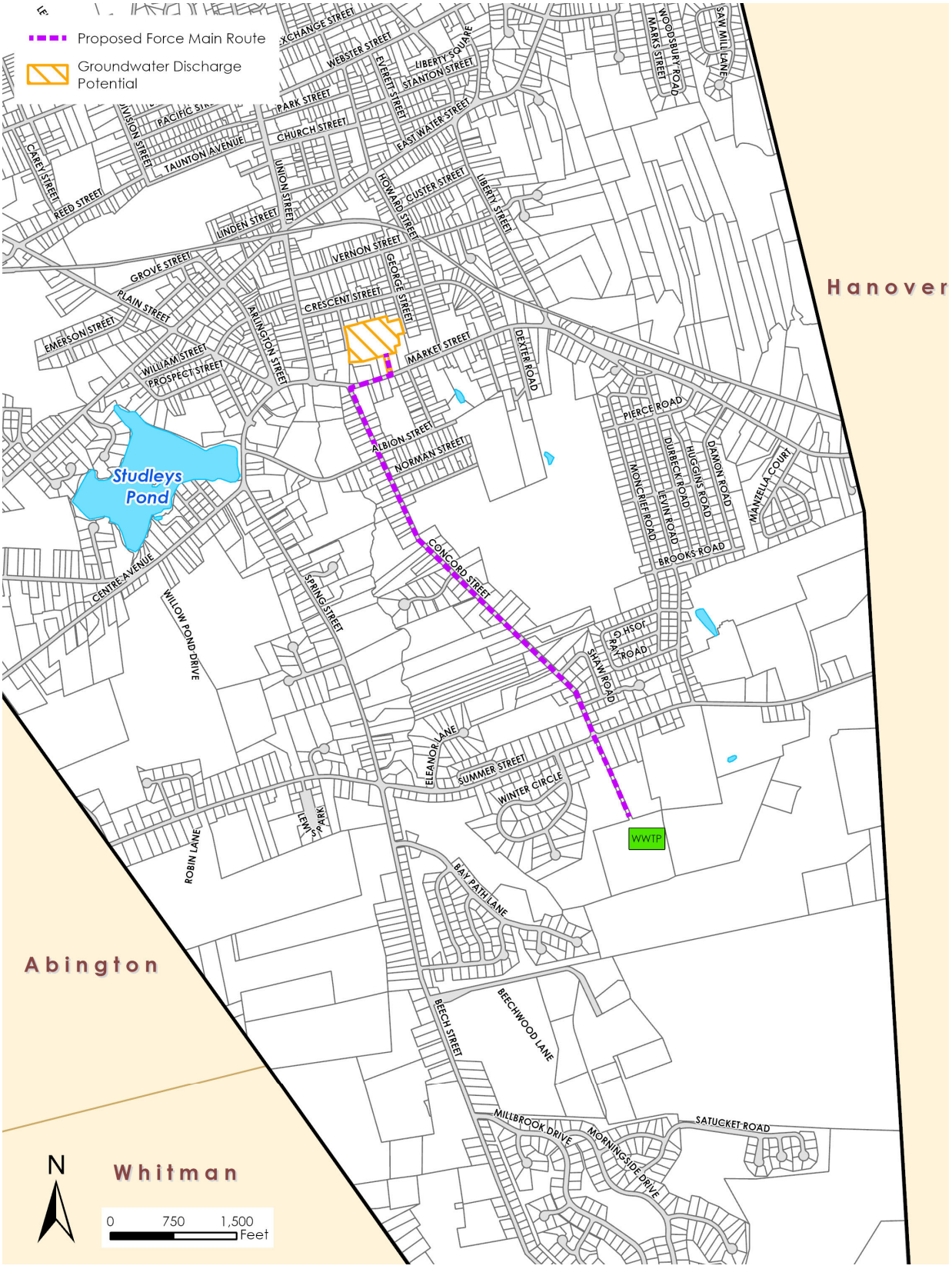


Figure 3-5 Sewer Routing from Rockland WWTP to Esten School

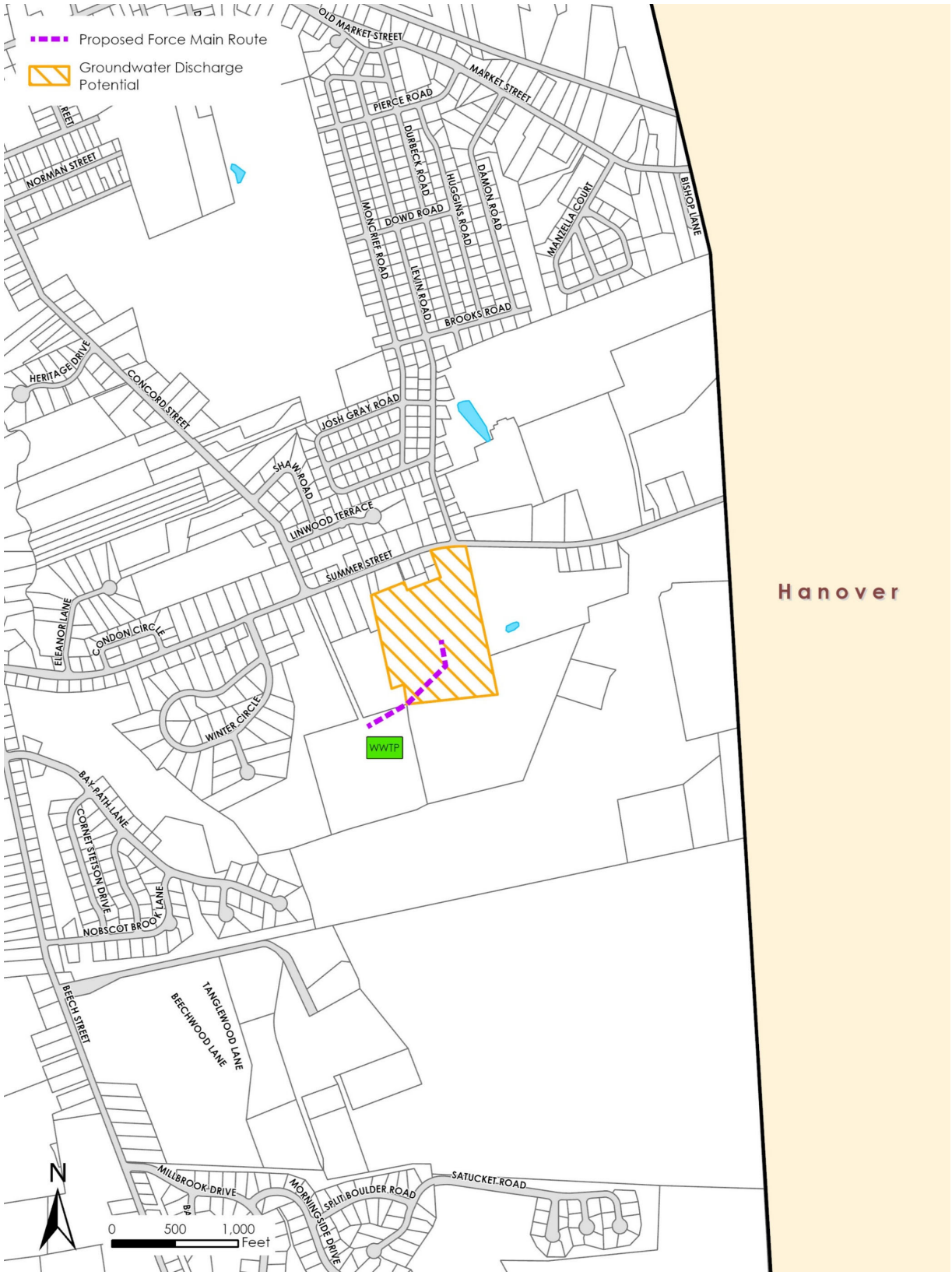
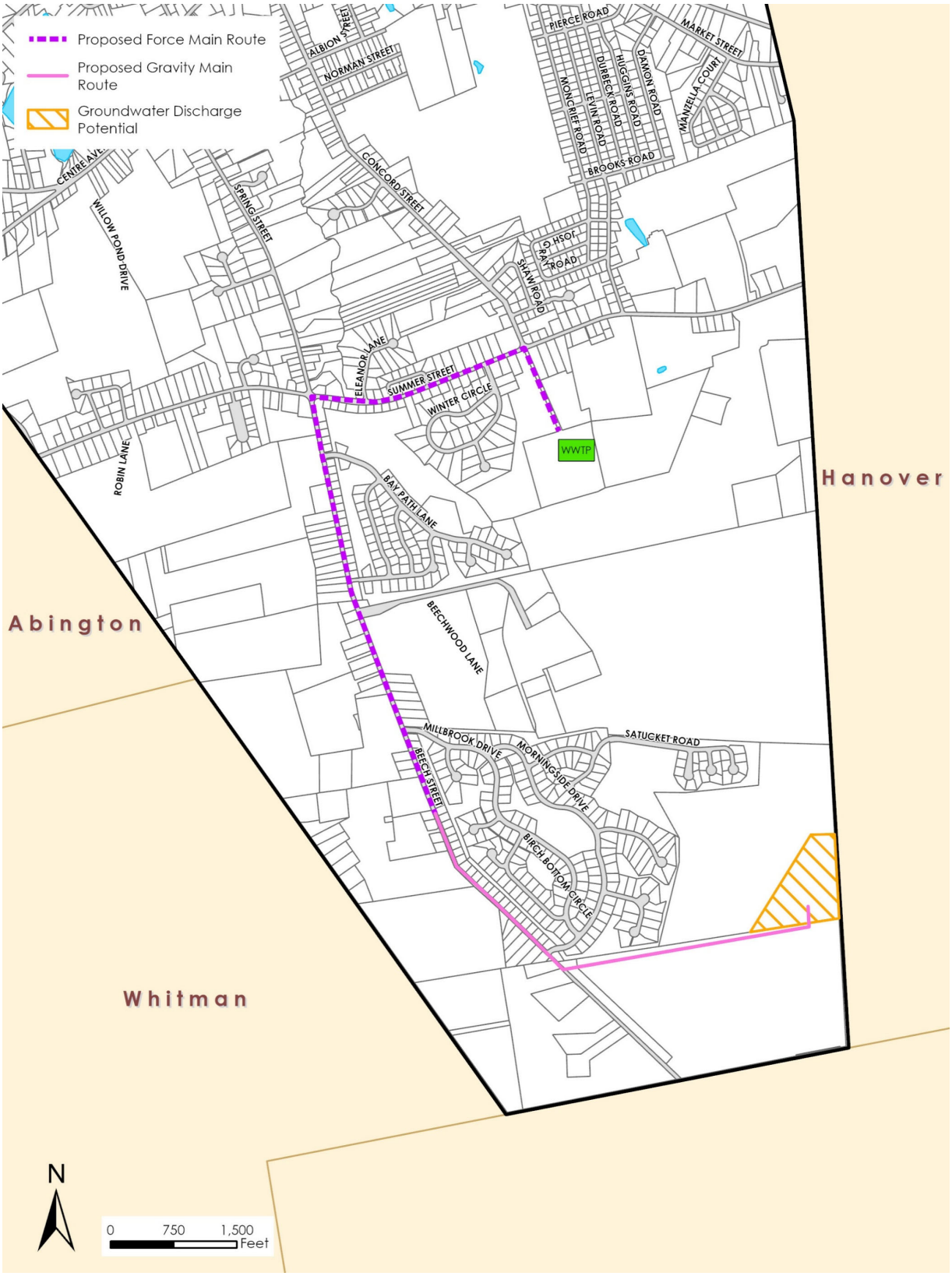


Figure 3-6 Sewer Routing from Rockland WWTP to Beech Hill Landfill



3.6 Decentralized WWTF

As discussed above, the Union Point Site can provide an area for effluent disposal. In addition to receiving flow from the existing WWTP, a new decentralized WWTF could be constructed on the site. A new WWTF at this site could receive flow from the existing northern collection system identified above, Needs Area 1, and be used by the developer of Union Point. Based on a WWTF sized to treat between 0.5 and 1.0 MGD (would need to be larger to accommodate developer's wastewater flow), an approximate area of 1 acre would be used for the WWTF. The Union Point site has a maximum effluent disposal capacity of between 2.7 and 7.3 MGD based on loading rates from 1.5 to 4 gpd/square foot. Utilizing 1 acre for the WWTF would provide ample disposal capacity for the purposes outlined above. The decentralized facility would include flow equalization receiving tanks, screening, biological treatment tanks, and likely effluent pumping. Biological treatment could be various technologies, as discussed in Phase 2, such as Membrane Bioreactors (MBR), Sequencing Batch Reactors (SBR), or Amphidrome®.

3.7 Cost Estimates

Several scenarios were considered to provide wastewater solutions for the Town. Cost analysis was performed for connecting the Needs Area and northern portion of the existing collection system to a new decentralized WWTF and to provide WWTP flow shedding via an additional groundwater effluent disposal site. The cost analysis was based on accepted engineering economic principles as stated in MassDEP Guidelines.

Effluent disposal costs can be highly variable and as such, has a large range of cost implications. Because of the variables, these costs are for planning purposes only. A hydrogeological investigation and evaluation will need to be performed on a potential site to determine if the site is favorable for effluent disposal. This type of evaluation can be very straightforward with basic field investigations and hydraulic modeling. If results are favorable, the cost for the investigation can be in the range of $50,000. However, if initial results are not favorable, costs can significantly increase to conduct additional evaluations. In addition, the larger the site to be investigated, the more expensive the evaluation becomes. For this reason, a cost has not been included in the tables below.

Once the hydrogeological results are favorable, the process of DEP approval and engineering design of the disposal system can begin. Based on recent projects, a general dollar/square foot of disposal area was used to estimate the construction cost for each disposal system.

In order to dispose of treated wastewater from the existing WWTP to a new disposal site, secondary system upgrades would be required as summarized in the 2021 WWTP evaluation. The construction costs for these improvements were ENR'd forward to today's dollars.

Sewer routing construction costs were based on construction of a new pump station, force main and gravity sewers from the WWTP to the respective effluent disposal sites.

Table 3-3 summarizes the estimated construction costs of adding effluent disposal at various sites and conveying flow from the Rockland WWTP to each disposal site discussed in prior sections. The effluent disposal costs are based on the 2 gpd/square foot loading rate, which will be a higher cost based on the increased amount of land required.

Table 3-3 Estimated Cost of Additional Groundwater Disposal for Rockland WWTP: ENR 13175

Site	1.1 MGD Capacity	2.7 MGD Capacity	0.12 MGD Capacity	0.25 MGD Capacity	0.85 MGD Capacity
	Union Point		Beech Hill Landfill	Jefferson School	Esten School
Effluent Disposal Cost ($)	$10,700,000	$25,700,000	$1,800,000	$2,900,000	$8,400,000
Rockland WWTP Secondary Upgrades Costs ($)	$16,000,000	$16,000,000	$16,000,000	$16,000,000	$16,000,000
Sewer Routing Cost ($)	$18,500,000	$18,500,000	$15,000,000	$6,100,000	$1,900,000
Total Costs	**$45,200,000**	**$60,200,000**	**$32,800,000**	**$25,000,000**	**$26,300,000**

The costs presented above are estimated construction costs, only. They do not include the hydrogeological evaluation, engineering fees, legal, and/or typical project financing fees. These are also planning level costs for comparison, only.

In addition to shedding flow from the existing WWTP, a new decentralized WWTF could be constructed at Union Point to shed flow from the northern collection system and Needs Area 1. Construction costs for a new WWTF are based on previous experience with other decentralized facilities. Effluent disposal and sewer routing costs are based on the same method listed above. A hydrogeological investigation/evaluation will need to be performed to determine if the site is favorable for effluent disposal, however, based on variability in the evaluations, a cost has not been presented in the table below. Sewer routing construction costs consider routing sewer from either Forest Street Pump Station or Hingham Street North Pump Station or both stations to the decentralized WWTF at Union Point. Table 3-4 summarizes the estimated construction costs for a new decentralized WWTF and groundwater disposal at Union Point. The Needs Area 1 costs are negligible as they would also flow to Hingham Street North Pump Station. For this study, it is assumed that a decentralized facility would be on a 1-acre portion of the parcel, sized for 1.2 MGD and not have a partnership with the developers.

Table 3-4 Estimated Cost of New Decentralized WWTF and Effluent Disposal at Union Point: ENR 13175

Collection System Routing	Forest Street Pump Station	Hingham Street North Pump Station	Both Pump Stations
Decentralized WWTF Cost ($)[1]	$26,500,000	$46,300,000	$56,500,000
Effluent Disposal Cost ($)	$5,900,000	$22,200,000	$31,100,000
Existing Sewer Rerouting Cost ($)	$3,300,000	$6,700,000	$10,000,000
Total Costs	**$35,700,000**	**$75,200,000**	**$97,500,000**

In addition to capital costs, a new facility would require significant operation and maintenance costs, including additional operators to run the facility.

Several options were analyzed for groundwater discharge of treated wastewater above. These options have impacts on Needs Area 1, the existing collection system, and plans for the WWTP and required improvements.

The first set of alternatives evaluated consists of utilizing effluent disposal sites for treated effluent at the WWTP. To complete this, nitrogen removal upgrades would be required at the WWTP. Should these be implemented, a pump station can be constructed at the plant, which would pump treated wastewater, prior to effluent flow metering and surface water discharge, to a groundwater disposal site. This would not alleviate average and peak flow issues for the WWTP processes but would reduce flow to the French Stream and alleviate permit compliance issues related to flow. The analysis completed for effluent disposal sites is desktop only at this time. Based on the analysis, it appears that constructing effluent disposal at the Esten School is the most viable option at this time. The site potentially has good disposal capacity and sewer routing from the WWTP can be accomplished cross-country, which would reduce construction costs (reduced pavement and utility disturbance, for example). It is also the closest site to the WWTP of the four options evaluated. The Town should consider this as a viable option for alleviating WWTP flow concerns if long-term I/I reduction does not adequately address the issue.

In addition to pumping treated effluent from the WWTP to satellite groundwater disposal locations, decentralized WWTFs were evaluated for viability to treat wastewater from Needs Area 1 and shedding flow from the existing collection system. Flow “shedding” would help to reduce influent flow to the existing WWTP, which would alleviate concerns of average and peak flow capacity. The Union Point area has the largest available land area for effluent disposal. With such a large available area, a WWTF could be constructed on 1-acre of site area and still allow room for effluent disposal. In addition, the site is located in the northern part of town, which is where the highest flow in the existing collection system is pumped and conveyed. Three options were reviewed to send flow from the existing collection system to a new decentralized WWTF at Union Point. The Forest Street pump station, Hingham Street North pump station, and a combination of both stations could have new force mains constructed to re-direct flow from the existing collection system to a new decentralized WWTF. Based on the pump station capacities, it appears that re-routing Hingham Street North or a combination of both stations would be the most viable option to fully utilize the Union Point area and to address flow issues at the existing WWTP. Due to the high cost of constructing a new facility and disposal area, it is likely that this option would only be viable if the developers of Union Point partnered with the Town. In addition, part of the area is sited as Open Space, which may lead to conflicts with public opinion on the best use of this land area.

4

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Section 4 Evaluation of Wastewater Collection System and I/I Control Plan

4.1 Introduction

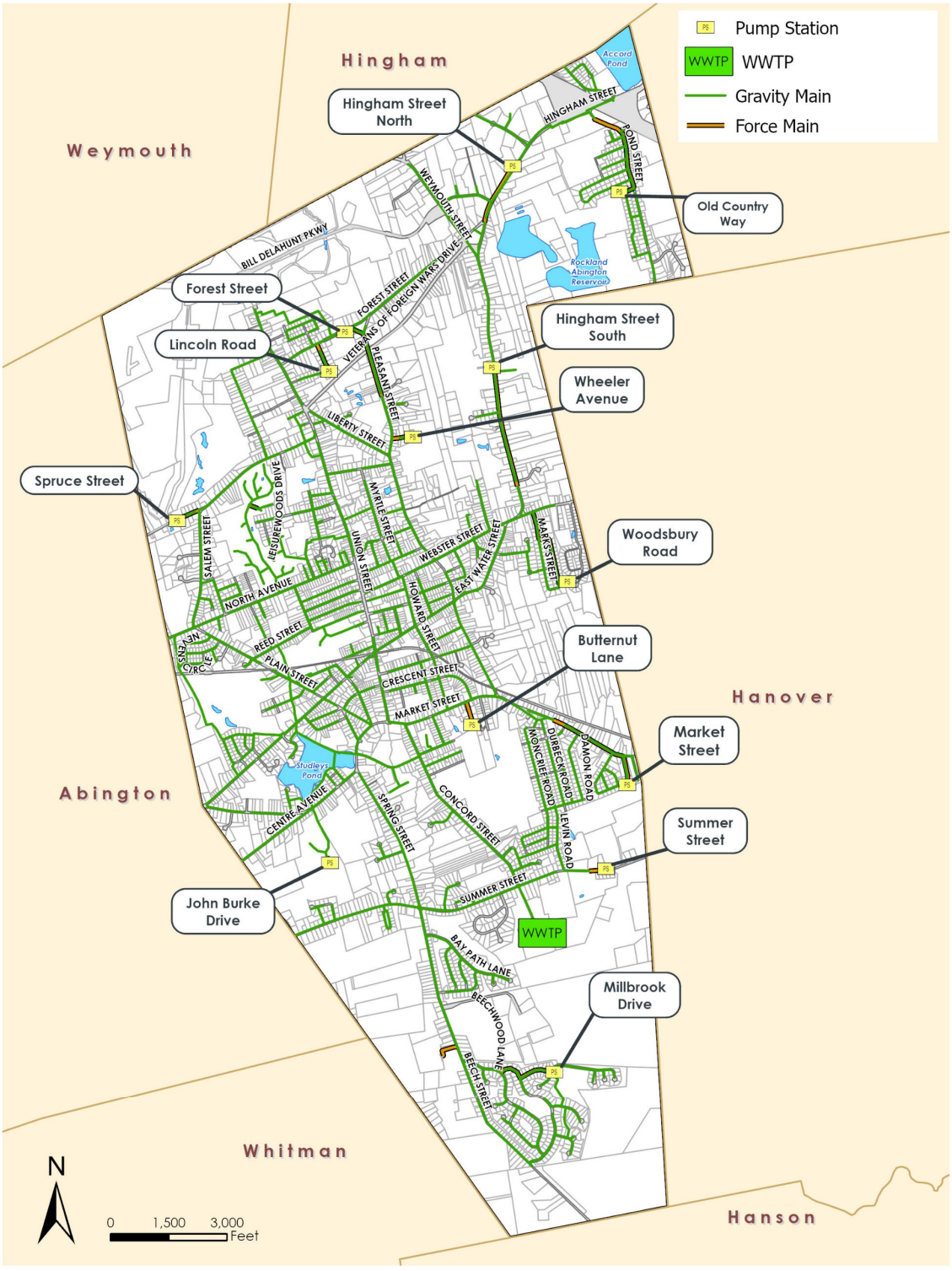
The Town of Rockland's wastewater collection system consists of 57 miles of gravity sewer and 1,600 manholes. Figure 4-1 shows the collection system map. The Town faces a serious problem in the collection system through the entry of clean water through infiltration and inflow (I/I). Infiltration is considered to be groundwater entering the system through pipes and manholes. Inflow is considered to be groundwater and surface water such as runoff and rain that enters the collection system through sump pumps, roof leaders, and catch basins that should not be connected to the sewer system. Based on continuing investigative work in the collection system, it is thought that over 50% of the average flow to the Rockland WWTP is from I/I. This is clean water that does not need to be treated at the WWTP and limits the capacity of the overall system from collection, through pumping stations, and at the wastewater treatment facility itself. The collection system is conveying so much I/I to the WWTP that it is routinely at or over its permitted flow capacity. During wet weather, the facility had to put in place a treatment bypass due to the amount of flow at the WWTP. Operational strategies for these scenarios are included in the High Flow Management Plan, discussed further in Section 6. In addition, the Sewer Department issued a sewer moratorium that barred new connections to the sewer system due to the flow capacity issues at the WWTP. Finally, due to flow capacity concerns, EPA and MassDEP have become involved, and EPA issued an Order in Summer 2022 with a major focus being flow capacity and I/I control. With aging infrastructure at the WWTP and new permit limits for phosphorus that require upgrades to the WWTP, I/I removal and flow capacity are high priorities for the Town in the 20-year planning period.

The collection system was originally constructed from the mid-60s to the early 90s. From the mid-60s to mid-70s, the primary material of construction for the sewer pipes is Vitrified Clay (majority of the collection system). There is some cast iron and reinforced concrete, but the pipes are predominantly clay. In 1980 and beyond, the new sewers constructed were predominantly PVC (plastic). As clay pipe ages and as soils shift, the pipes routinely crack and/or break, which allows groundwater infiltration into the system. Joint separation between pipe segments can also occur over time. In clay pipe, joints are only separated by 2-to-3-foot segments. Newer pipe materials have longer spacing between joints. In addition, groundwater infiltration occurs in manholes as they age and soils settle, which causes the pipe connections to separate from the manhole structure and the seams between manhole sections widen. Without regular investigation and routine replacement of this pipe, the issues compound. Similar issues occur with PVC pipe over time, but clay and concrete pipe are much more likely to fail. Capital expenditure is required to rehabilitate and/or replace the aging pipes and manholes on a continuous basis. To understand where best to spend capital, studies are required to identify trouble areas in the system.

The Town has been investigating I/I issues since 1999. Multiple Sewer System Evaluation Surveys (SSES) have been conducted to investigate sources of I/I in the sewer system in 2008, 2013, and 2021. In addition, the Sewer Department issues an annual I/I report.

Collection system capacity, prior I/I work, and recommended future I/I work are described below.

Figure 4-1 Wastewater Collection System



4.2 Wastewater Collection System

This section of the report discusses the existing wastewater collection system, capacity of the pipes, strategies and options for reducing peak flow volumes to the WWTP through the collection system, and I/I control work.

4.2.1 Summary of Past I/I Work

As mentioned above, the Town has been investigating I/I in the collection system since 1999. In 2021 AECOM developed an SSES Report for the Town. The SSES Report provided recommendations to reduce sources of I/I from the sewer system. The SSES work involved flow isolations and camera inspections of 8-inch diameter and larger sewer piping in the Town's sewer system. The evaluation found that there were 140 infiltration sources from main pipelines, manholes, and lateral connections that were cost-effective to remove. These sources are estimated to contribute approximately 219,300 gallons per day of I/I. The cost for rehabilitation of the identified manholes and main pipeline sections was estimated in September 2021 at $134,500.

The AECOM SSES found that there is more infiltration entering the sewer system from lateral service connections rather than from the main pipelines. AECOM recommended lining 69 lateral service connections that are contributing to infiltration to the system. These service connections contribute an estimated 153,100 gpd of infiltration to the sewer system and would cost approximately $674,900 to rehabilitate. The main concern with addressing service connections is who owns the pipe, individual homeowner or the Sewer Department, and who pays for the rehabilitation work. In Rockland, the homeowner owns the lateral service connection from the building connection to the main (entire pipe for the service connection).

AECOM also recommended further investigation of five pipe segments located near Memorial Park School to receive CCTV inspection during a high groundwater period to determine the pipe condition and any sources of infiltration. The report can be found in Appendix B.

The Town has also taken other measures to reduce I/I from the system. During the construction of the new elementary school, the main piping of an abandoned sewer system previously connected to a combined sewer overflow (CSO) was plugged. Another source of infiltration was removed on West Water Street by repairing the breaks in the sewer line that were discovered from camera inspections. Additionally, repair of various mainline breaks in the collection system was conducted that assisted in removing infiltration.

During Fall 2022, the Sewer Department developed a bid package to complete the recommended work from the 2021 SSES that involves 78 infiltration sources in existing sewer manholes and main pipelines that are estimated to contribute approximately 68,000 gallons per day of infiltration. Green Mountain was awarded the project in early March 2023 and plans to complete the work between April and August of 2023, which will involve manhole and pipeline lining.

In December 2022 the Sewer Department developed a letter of intent regarding an I/I control plan that was submitted to MassDEP. The letter is attached in Appendix B. The purpose of the letter was to outline prior SSES, and I/I control work and to provide the plan and schedule for future work. Future work is indicated to start in Spring 2023, which will involve a Town-wide flow monitoring program to better define problem areas and baseline I/I in the system. The data will be used to further develop the Annual I/I Control Program, which will consist of inspection, private inflow removal program, television inspection, manhole inspections, and smoke testing. The program is planned to be phased into 3 projects over 4 years, with rehabilitation projects occurring after each study phase. The engineer for the first phase has been selected and awarded the contract in early March 2023. The flow

monitoring is slated to begin in conjunction with the rehabilitation work in Summer 2023. 15 flow meters are currently proposed to be installed throughout the system. The flow monitoring data will be used to evaluate removal of I/I after rehabilitation/replacement projects are complete.

The annual program is summarized in a table in the letter to MassDEP, included as Table 4-1 below.

After rehabilitation work, it is important to perform post-construction flow-monitoring to establish how much I/I was successfully reduced from the system and if the WWTP has seen a reduction in flow or whether groundwater has migrated and entered at another location in the collection system. The steps outlined below will help to identify and remove I/I within the existing system. Further studies beyond those noted in the table below are not envisioned as necessary at this time, as the previous work and proposed work encompasses typical methods to identify and remove I/I. The Town is committed to addressing I/I removal in the system.

The Town completed the first flow monitoring program in the Spring and Summer of 2023. The Town also completed the first SSES construction work (from the AECOM report) in the Summer of 2023. Results will be updated in the Final CWMP.

Table 4-1 Annual I/I Program Summary Table, Created by Weston & Sampson

Fiscal Year	Calendar Year/Month	Project Name	Scope	Subarea(s)	Sewer Length (lf)	Manholes	Estimated Cost[2]
FY 2023	Spring 2023	Year 1 Program	Town-wide meeting program and GIS-based Depth-to-Groundwater Analysis	-	-	-	$150,000
Phase 1							
FY 2024	Spring 2024	Year 2 Infiltration	Manhole inspections and television inspections	-	34,000	170	$150,000
FY 2025	Spring 2025	Year 3 Infiltration	Manhole inspections and television inspections	-	34,000	170	$155,000
FY 2026	Spring 2026	Year 4 Infiltration	Manhole inspections and television inspections	-	34,000	170	$160,000
FY 2027	Summer 2026 – Spring 2027	Year 2 to 4 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$200,000
FY 2028	Design – Summer 2027 Bid – Fall/Winter 2027 Construction – Spring 2028	Year 2 to 4 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]
Phase 2							
FY 2029	Spring 2029	Year 5 Infiltration	Manhole inspections and television inspections	-	34,000	170	$170,000
FY 2030	Spring 2030	Year 6 Infiltration	Manhole inspections and television inspections	-	34,000	170	$175,000
FY 2031	Spring 2031	Year 7 Infiltration	Manhole inspections and television inspections	-	34,000	170	$180,000
FY 2032	Summer 2031 – Spring 2032	Year 5 to 7 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$220,000
FY 2033	Design – Summer 2032 Bid – Fall/Winter 2032 Construction – Spring 2033	Year 5 to 7 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]
Phase 3							
FY 2034	Spring 2034	Year 8 Infiltration	Manhole inspections and television inspections	-	34,000	170	$191,000
FY 2035	Spring 2035	Year 9 Infiltration	Manhole inspections and television inspections	-	34,000	170	$197,000
FY 2036	Spring 2036	Year 10 Infiltration	Manhole inspections and television inspections	-	34,000	170	$203,000
FY 2037	Summer 2036 -Spring 2037	Year 8 to 10 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$240,000
FY 2038	Design – Summer 2037 Bid – Fall/Winter 2037 Construction – Spring 2038	Year 8 to 10 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]

1. Estimated costs includes construction and engineering
2. Estimated unit cost is based on 3-4% increase from previous year

	Infiltration
	Inflow
	Rehab/Construction

4.2.2 Existing System Capacity Analysis

For some communities, during a CWMP, it becomes apparent that a hydraulic model or capacity analysis is required for their collection system piping. This is typically triggered by a documented history of Sanitary Sewer Overflows (SSOs) or feedback from the Sewer Department that there are repeated issues in certain parts of the collection system during high flows. This is not the case for Rockland. Good design practice and guidance documents such as TR-16 suggest a pipe should be replaced with a larger diameter pipe when average flows reach 80% full pipe capacity. Rockland has a GIS database with pipe size, pipe slope, and other metrics that would populate a model to determine this. However, they do not have good flow data for their system. After the flow monitoring program, this should be rectified. It is recommended that after the flow monitoring program is conducted, the Town should consider building a hydraulic model for their system. This will assist in identifying trouble areas and also help determine where new connections could be made and whether pipes would need to be replaced to accept new connections. A hydraulic model for the overall collection system was not part of the scope of this evaluation.

4.3 Peak Flow Reduction Strategy

In 1999, the Town developed a High Flows Management Plan (HFMP), last updated in 2016, to identify actions that need to be taken at the WWTP and associated pump stations in the event of high flows. The HFMP outlines procedures to process high flows at the WWTP by diverting flows above 6 MGD to offline process tanks and when the storage capacity of the tanks is exceeded, flow is diverted to the outfall.

The EPA Order requires the CWMP evaluation to review strategies to reduce peak flow at the WWTP. The evaluation reviews inline storage options, such as a large pipe or box culvert placed in the collection system, and offline storage, such as above-ground holding tanks at the WWTP. In order to reduce or eliminate bypass events, flow equalization options were analyzed.

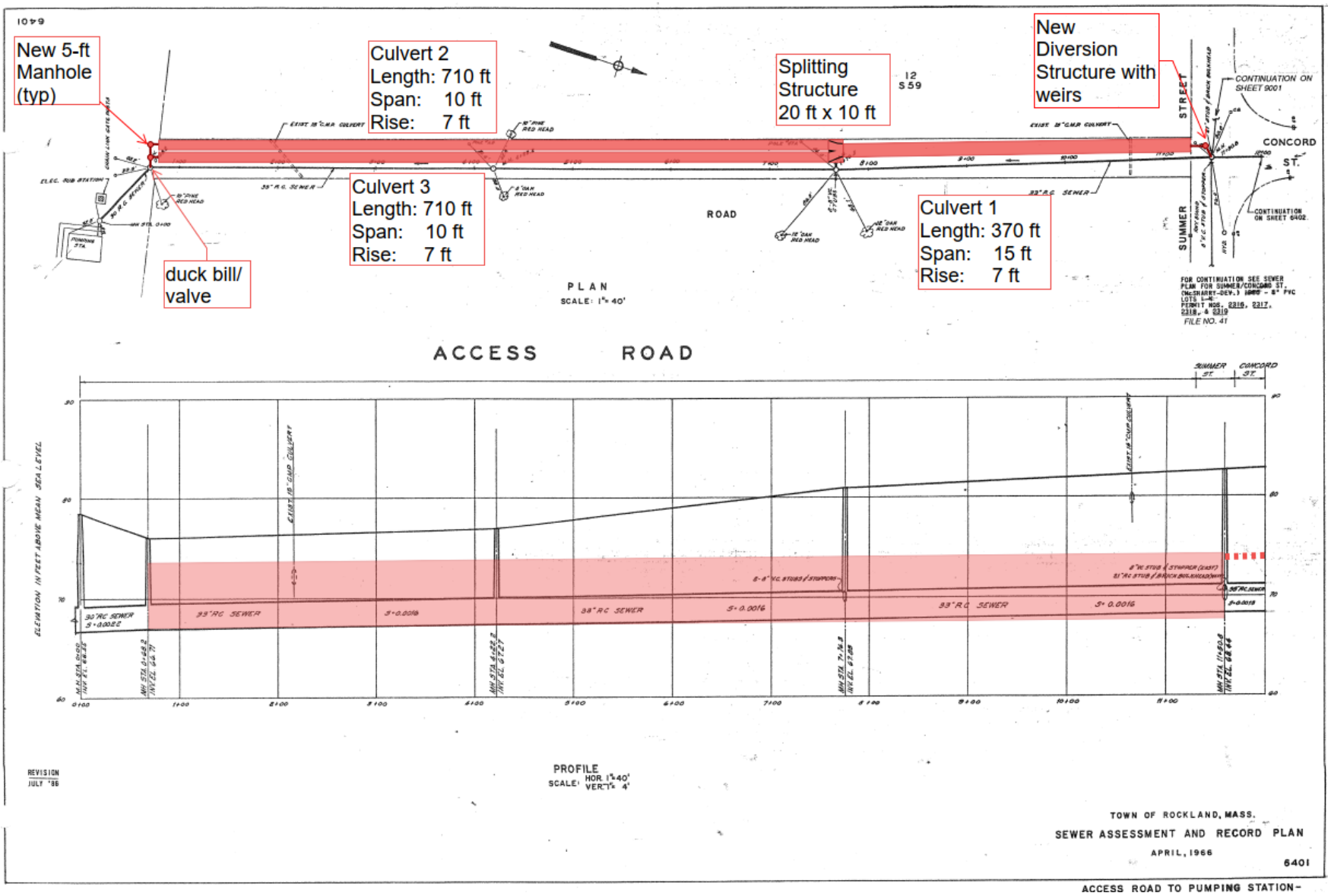
4.3.1 Storage Options

4.3.1.1 Inline Storage

The first option analyzed is inline storage, or storage within the piping network of the collection system. The existing collection system is widespread throughout Rockland and is predominantly made up of small diameter pipe. There is a large interceptor pipe that runs from Hingham Street to the WWTP that conveys the majority of flow in Rockland to the treatment facility. This 33-inch diameter interceptor, shown on Figure 4-1, runs along an access road to the WWTP from the intersection of Concord and Summer Streets. This access road could be an ideal location to construct a new inline storage system. The interceptor buried in the access road conveys all of the flow from the collection system to the WWTP and the access road only services the facility, meaning there are no homes and/or businesses that would be affected by construction of a new inline storage system.

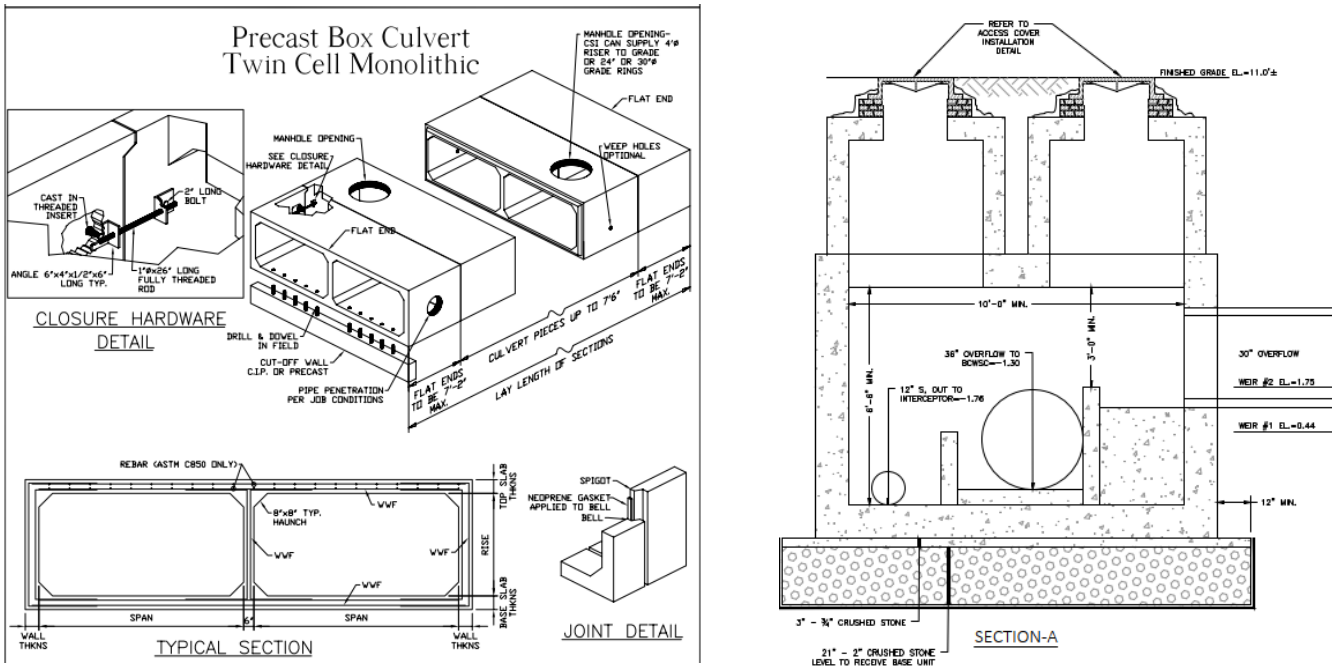
Inline storage typically consists of large diameter pipe or a box culvert, which creates a “wide-point” in the collection system. There is typically a structure constructed at the inlet and outlet of the wide point that ties the new structure into the existing collection system. The structures also typically consist of weirs, gates, and/or valves to control when flow is diverted to and from the wide point. This allows excess flow to be stored in the wide point during high flow events and then metered out once flows drop. For the location in the access road, a series of box culverts is the most logical option for inline storage. The access road is 1,100 feet long and 25-feet wide. The existing pipe runs in the center of the road from the Summer Street intersection to a point 370 feet towards the WWTP to a manhole. At this point, the pipe is directed toward the east edge of the road, which allows for more space between the outside wall of the pipe and the west edge of the road. Figure 4-3 illustrates a potential system of box culverts that could be constructed to provide inline storage for Rockland to reduce peak flows to the WWTP.

Figure 4-2 Inline Storage Layout



Currently, the culverts shown in Figure 4-3 assume there are no utilities that would interfere with placing the new culverts. This is likely not the case. Figure 4-3 illustrates a single culvert for the first 370 feet, which has less space available due to the existing sewer pipe running in the center of the road. This culvert would be 15-feet wide and 7-feet deep. At the outlet, a new splitting structure would be placed. This structure could divert flow to one of two or both culverts for the last 700 feet to the WWTP. The two 700-foot culverts would be placed side-by-side and be 10-feet wide and 7-feet deep. Two culverts are required as one wide culvert would be significantly more expensive to construct (thicker concrete walls required). Figure 4-4 shows the typical box culvert detail. Figure 4-4 shows a diversion structure designed for another community. The outlet of the two box culverts would enter into a new manhole and then flow to the existing WWTP headworks. A duckbill valve could be placed to ensure backflow does not occur during normal operations. This system of box culverts would provide 1 million gallons of storage volume.

Figure 4-3 Typical Box Culvert and Access/Diversion Structure Details

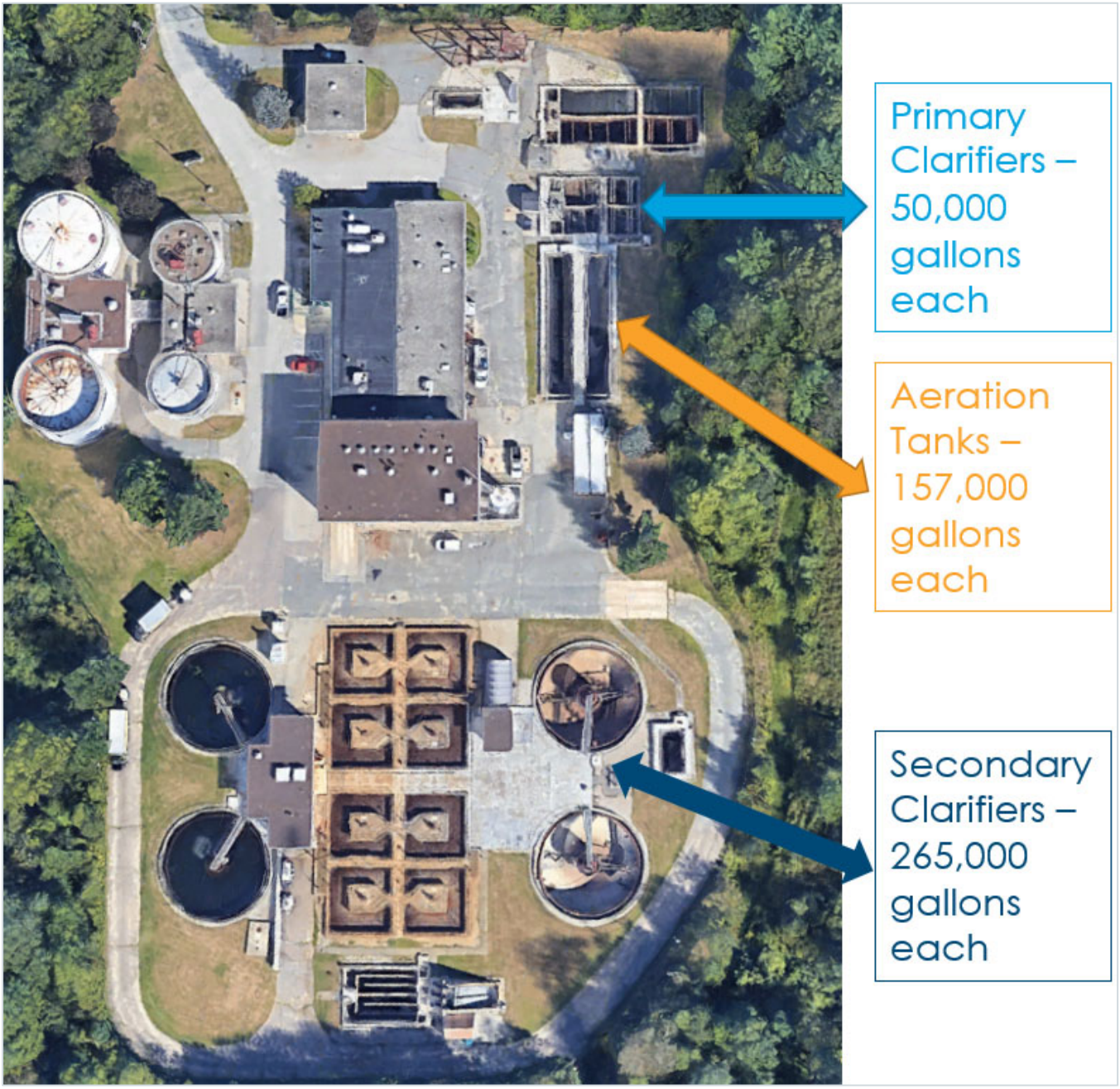


4.3.1.2 Offline Storage

The Rockland WWTP was originally constructed in 1964 with primary and secondary treatment. The tanks constructed during this phase consisted of two primary settling tanks, two aeration basins, and two secondary settling tanks. The facility was expanded in 1977. During the expansion, two additional primary settling tanks, aeration basins, and secondary settling tanks were constructed. In 1984, the 1964 tanks were taken offline. During subsequent years, the offline 1964 tanks were re-purposed for equalization storage tanks for high flow management. Figure 4-5 shows the tanks that are currently used for equalization and their volumes. In total, there is 950,000 gallons of available offline storage at the existing WWTP. The evaluation in 2021 concluded that the secondary settling tanks could be re-purposed for a new secondary treatment system designed to remove nutrients. In addition, one of the aeration basins was proposed to be used for sludge storage. If these tanks are repurposed, additional tankage could be constructed onsite for flow equalization. There is adequate space available for new tankage to be constructed. It would likely require being pumped to and pumped out of based on existing facility hydraulics and where the tanks could be located. If there is only 250,000 gallons of flow equalization volume remaining from old offline tanks after the WWTP upgrade, additional volume of 750,000 gallons could be added to equal the proposed inline storage noted in the above section. The area next to the old aeration tanks could be used for a large equalization tank. For budgetary purposes, an 80-foot by 80-foot by 20-foot tank will be assumed, which would provide approximately 950,000 gallons of storage volume. There would also be pumps, piping, and valves and electrical and instrumentation requirements for the new tank. 1 million gallons of storage volume is a good target for the flow equalization needs as the existing WWTP is only designed to treat up to 6 MGD and the future maximum daily flow in the facility evaluation is stated to be 7 MGD. 1 MG of storage volume would allow for fewer bypasses at the WWTP.

Offline storage can also be constructed in the collection system, such as at pump stations. This option was not investigated as the amount of land required, and the remote nature of any system constructed is less favorable to constructing tankage at the WWTP site.

Figure 4-4 Offline Storage Available at WWTP



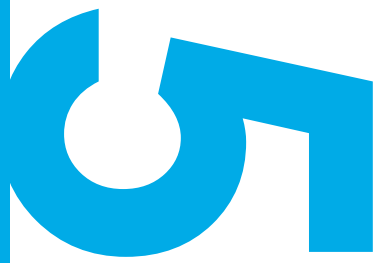
4.3.2 Cost Estimate

In order to compare the inline and offline storage options, budgetary costs were prepared for both scenarios. These costs utilize conceptual layouts and sizing of tanks and equipment and include many assumptions that would need to be confirmed during design of either project, should they be undertaken. These costs are for comparison, only. Table 4-2 summarizes the construction costs for each option.

Table 4-2 Storage Option Conceptual Cost Comparison

Option	Construction Cost
Inline Storage Box Culverts	$6.5 million
Offline Storage Equalization Tank	$3.4 million

Table 4-2 shows that the offline storage tank option is more cost effective to undertake. Because there is room at the WWTP to construct the tankage, which requires much less excavation and paving than the inline storage box culvert option, this option is more favorable for flow equalization needs. Recommendations are discussed in Section 7.



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Section 5 Evaluation of Wastewater Pump Stations

5.1 Introduction

There are 13 pump stations located throughout Rockland's wastewater collection system as shown in Figure 5-1. The pump stations were evaluated during Phase 1. The following sections summarize the evaluation, recommended upgrades, cost estimates, and implementation schedule. It should be noted that the implementation plan presented is one option, but the Town and Sewer Commission have WWTP upgrades, and I/I reduction work that are higher priority, which may result in pump station upgrades deviating from the implementation plan as noted below.

5.2 Pump Station Evaluations

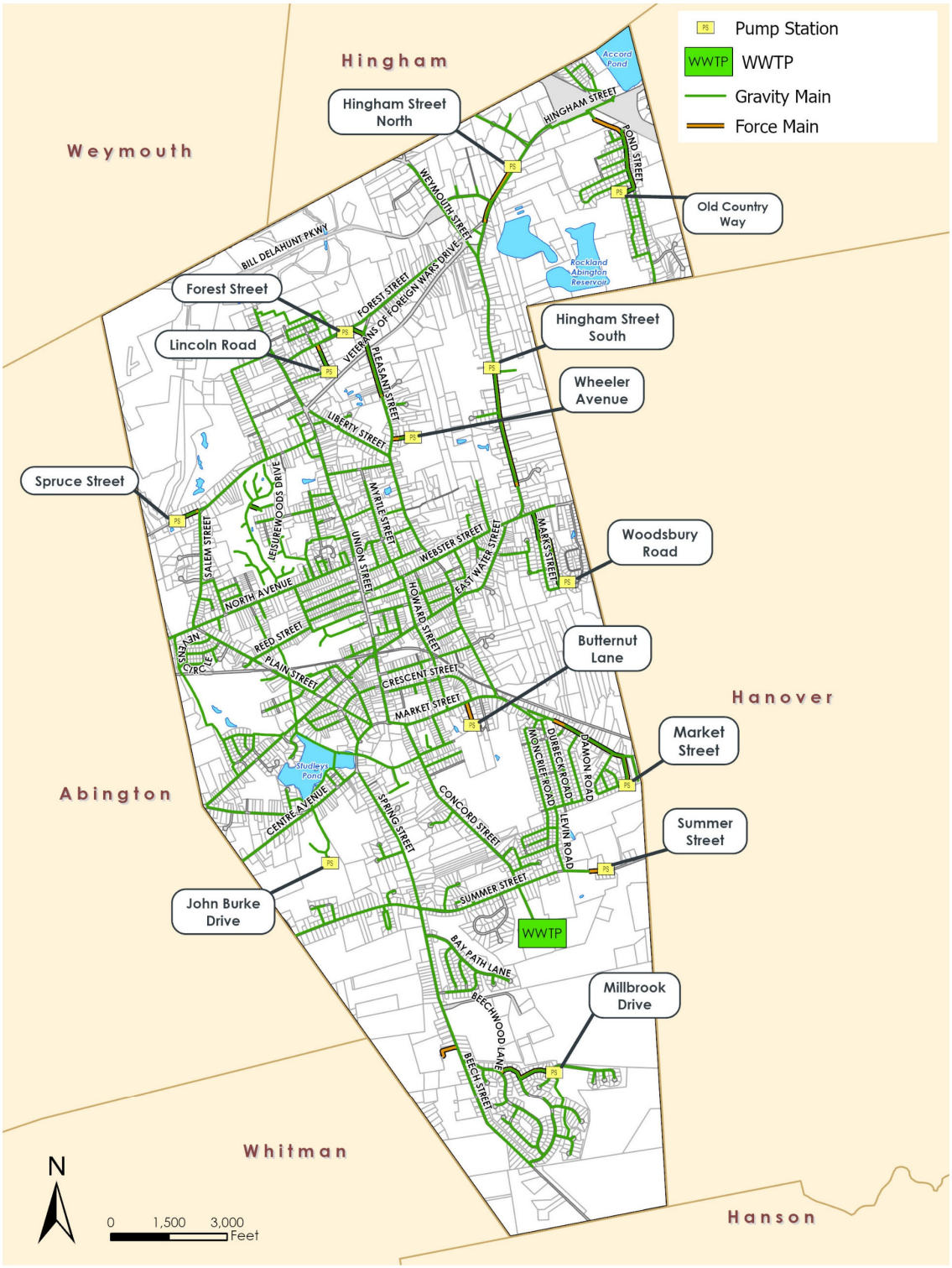
The condition assessments of the pump station assets were performed through the review of available information and field inspections. The field inspections were primarily based on visual and auditory observations, as it was limited to accessible area. The wet wells were not emptied and entered for inspection, only a visual inspection from above was conducted.

After the condition assessments, which were summarized with the design information for each station in Phase 1, a list of recommended improvements for each pump station was compiled along with a cost estimate. The following section summarizes each pump station and the recommendations. The recommendations are divided into normal and high priority items based on criticality. It is important to note that many of the stations and equipment are original and past their useful life, requiring replacement. Veolia, the contract operator for the WWTP and pump stations replaces equipment at each station as it fails under current practice.

It is important to note that drawdown tests were not conducted as part of the scope of this project. Most pump stations in Town are assumed to be fully "built out", as their service area is not likely to grow. Therefore, the original pumping capacity designed is assumed to be adequate for the future. The two exceptions to this are the pump stations on Hingham Street (North and South), as they are in a commercial area. Both stations would be affected by High Needs Areas 1 connecting to Town sewer (should that occur). Because of the existing flow capacity issues at the WWTP, it is not recommended at this time to connect additional sewer, and as such, the Hingham Street pump stations were assumed to have adequate capacity for the existing system. Each station should be evaluated during any preliminary design for upgrades/replacements.

In addition, there are scenarios presented in Section 3 discussing potential collection system flow shedding in the northern collection system and sending wastewater to a new decentralized WWTF at Union Point. Should this actually occur, pump station designs would need to be re-visited.

Figure 5-1 Pump Station Locations



5.3 Pump Station Descriptions and Recommendations

Field inspections occurred in the summer of 2022. The data collected on the pump station's individual assets was then used to determine overall condition and criticality to replace/upgrade. Recommendations were identified for each station and a capital improvement plan was developed for the next twenty years. Costs are presented in February 2023 dollars, ENR Index 13175.

Each cost estimate assumes a 4% inflation rate per year and a midpoint to construction based on the implementation schedule. The cost estimates also assume construction factors, such as general contractor overhead and profit, bonds and insurances at 22%. Engineering services consist of design, bidding, construction administration, and resident project representation and have been estimated based on similar projects. Legal and administrative fees are assumed to be 2%. Materials testing and Conservation Commission allowances for work within wetlands and/or waterfronts have been made on a case-by-case basis. A project contingency of 25% has been included for unknowns to the project.

5.3.1 Forest Street Pump Station

The Forest Street Pump Station is a submersible type station that was built in 1999. The pump station consists of a wet well, valve vault, and building. It is located across from 184 Forest Street and behind the Boxberry Lane condominiums. The pump station has a rated capacity of 400 gallons per minute (gpm) with 29 horsepower (hp) motors and an indoor natural gas generator to supply backup power.

The wet well interior, hatch, and concrete are in average condition and the piping is in fair condition due to corrosion. The access hatch does not have fall protection. It was noted that the level transmitter had broken conduit and appeared to be misaligned. Heavy grease buildup was noted. The davit crane base was in poor condition and should be replaced. The valve vault hatch is in average to fair condition but does not have fall protection. The valves and piping in the valve vault are in average to fair condition due to some corrosion. The building exterior was in fair to poor condition, specifically the roof trim being poor. The generator exhaust is not extended past the roof line, which was causing staining issues on the building. The building interior was in fair condition, but the paint was flaking and in generally poor condition. The interior equipment, which includes HVAC, instrumentation, electrical starters, fire alarm devices and controls, and the generator are all in fair condition but past their useful life.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The HVAC and architectural improvements are normal priority recommended improvements. Table 5-1 summarizes the costs for the recommended improvements to the pump station. Table 5-2 summarizes the full project costs.

Table 5-1 Recommended Improvements for Forest Street Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Valves and Piping Instrumentation and Controls Electrical Equipment and Motor Starters	Interior Painting Roof Trim replacement Hatch fall protection Davit Crane Base Building HVAC replacement	$245,000	$46,000	$291,000

Table 5-2 Forest Street Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$245,000	$46,000	$291,000
Construction Factors	$54,000	$10,100	$64,000
Utility Allowance	$10,000	-	$10,000
Engineering Services	$200,000	$75,000	$275,000
Legal/Administrative	$6,200	$1,100	$7,300
Inflation to Midpoint	$124,000	$32,000	$155,000
Contingency	$129,000	$33,000	$162,000
Total Project Cost	**$768,200**	**$197,200**	**$964,300**

The total project costs are carried in the implementation schedule below.

5.3.2 Lincoln Road Pump Station

The Lincoln Pump Station is a submersible type station that was built in 1999. The pump station consists of a wet well, valve vault, and control panel with enclosure. It is located across from 109 Lincoln Road. The pump station has a rated capacity of 100 gallons per minute (gpm) with 7.5 horsepower (hp) motors. The station does not have permanent backup power but does have the ability to have a portable generator provide power as needed.

The wet well interior, hatch, piping and concrete are in good condition. The access hatch does not have fall protection. The valve vault hatch is in good condition but does not have fall protection. The valves and piping in the valve vault are in good condition. The enclosure interior equipment, which includes instrumentation and electrical gear, are all in good condition but past their useful life. The perimeter fencing is in fair condition.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The fencing improvements are normal priority recommended improvements. Table 5-3 summarizes the costs for the recommended improvements to the pump station. Table 5-4 summarizes the full project costs.

Table 5-3 Recommended Improvements for Lincoln Road Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Instrumentation and Controls Electrical Equipment	Hatch fall protection Perimeter Fencing	$125,000	$12,000	$137,000

Table 5-4 Lincoln Road Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$125,000	$12,000	$137,000
Construction Factors	$27,500	$2,600	$30,100
Utility Allowance	$10,000	$-	$10,000
Conservation Commission Allowance	$2,000	$2,000	$4,000
Engineering Services	$200,000	$30,000	$230,000
Legal/Administrative	$3,300	$500	$3,800
Inflation to Midpoint	$88,300	$11,300	$99,600
Contingency	$92,000	$11,800	$103,800
Total Project Cost	**$548,100**	**$70,200**	**$618,300**

5.3.3 Wheeler Avenue Pump Station

The Wheeler Avenue Pump Station is a submersible type station that was built in 1999. The pump station consists of a fiberglass wet well and a control panel with enclosure. It is located across from 46 Wheeler Avenue. The pump station has a rated capacity of 30 gallons per minute with 2 horsepower motors. There is a generator hookup available for backup power but no permanent source.

Although the station is in overall fair to good condition, the equipment is past its useful life, there is no valve vault, and the fiberglass wet well is recommended to be replaced with a new precast concrete wet well. A new valve vault is recommended as well as replacement of the control panel and electrical equipment. There are several other stations similar to this that are discussed below and recommended to be replaced at the same time as part of one contract, as shown in the implementation schedule.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. Table 5-5 summarizes the costs for the recommended improvements to the pump station. Table 5-6 summarizes the full project costs.

Table 5-5 Recommended Improvements for Wheeler Avenue Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Station Overhaul - New precast wet well New valve vault New pumps New Instrumentation and electrical equipment	N/A	$391,000	-	$391,000

Table 5-6 Wheeler Avenue Estimated Total Project Costs

Item	High Priority
Bare Costs	$391,000
Construction Factors	$86,000
Utility Allowance	$10,000
Engineering Services	$300,000
Materials Testing	$5,000
Legal/Administrative	$9,700
Inflation to Midpoint	$160,400
Contingency	$200,500
Total Project Cost	**$1,162,600**

5.3.4 Summer Street Pump Station

The Summer Street Pump Station is a submersible type station that was built in 1999. The pump station consists of a fiberglass wet well and a control panel with enclosure. It is located across from 839 Summer Street. The pump station has a rated capacity of 40 gallons per minute with 2 horsepower motors. There is a generator hookup available for backup power but no permanent source.

Although the station is in overall fair to good condition, the equipment is past its useful life, there is no valve vault, and the fiberglass wet well is recommended to be replaced with a new precast concrete wet well. A new valve vault is recommended as well as replacement of the control panel and electrical equipment. There are several other stations similar to this that are discussed below and recommended to be replaced at the same time as part of one contract, as shown in the implementation schedule.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. Table 5-7 summarizes the costs for the recommended improvements to the pump station. Table 5-8 summarizes the full project costs.

Table 5-7 Recommended Improvements for Summer Street Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Station Overhaul - New precast wet well New valve vault New pumps New Instrumentation and electrical equipment	N/A	$391,000	-	$391,000

Table 5-8 Summer Street Estimated Total Project Costs

Item	High Priority
Bare Costs	$391,000
Construction Factors	$86,000
Utility Allowance	$10,000
Traffic Control Allowance	$5,000
Engineering Services	$300,000
Materials Testing	$5,000
Legal/Administrative	$9,800
Inflation to Midpoint	$161,400
Contingency	$202,000
Total Project Cost	**$1,170,200**

5.3.5 John Burke Drive Pump Station

The John Burke Drive Pump Station is a submersible type station that was built in 1999. The pump station consists of a fiberglass wet well and a control panel with enclosure. It is located in front of 47 John Burke Drive in the middle of a cul-de-sac. The pump station has a rated capacity of 40 gallons per minute with 2 horsepower motors. There is a generator hookup available for backup power but no permanent source.

Although the station is in overall fair to good condition, the equipment is past its useful life, there is no valve vault, and the fiberglass wet well is recommended to be replaced with a new precast concrete wet well. A new valve vault is recommended as well as replacement of the control panel and electrical equipment. There are several other stations similar to this that are discussed below and recommended to be replaced at the same time as part of one contract, as shown in the implementation schedule.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. Table 5-9 summarizes the costs for the recommended improvements to the pump station. Table 5-10 summarizes the full project costs.

Table 5-9 Recommended Improvements for John Burke Drive Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Station Overhaul - New precast wet well New valve vault New pumps New Instrumentation and electrical equipment	N/A	$391,000	-	$391,000

Table 5-10 John Burke Drive Estimated Total Project Costs

Item	High Priority
Bare Costs	$391,000
Construction Factors	$86,000
Utility Allowance	$10,000
Engineering Services	$300,000
Materials Testing	$5,000
Legal/Administrative	$9,700
Inflation to Midpoint	$160,400
Contingency	$200,500
Total Project Cost	**$1,162,600**

5.3.6 Hingham Street North Pump Station

The Hingham Street North Pump Station is a submersible type station that underwent a major upgrade in 2002. It is located across from the Best Western. It receives flow from the Old Country Way Pump Station and pumps to the Hingham Street South Pump Station. The pump station has a rated capacity of 1,000 gpm with 20 hp motors and an indoor diesel generator for backup power. The pump station consists of a wet well, valve vault, and building. Additionally, suction-lift pumps were added as backup to the submersible pumps.

The wet well concrete is in good condition with the interior concrete being in average condition. The hatch is in poor condition and does not have fall protection. The wet well has a lot of ragging build up. The wet well piping is in poor condition. The valve vault interior, hatch, and concrete are in good condition. The valve vault piping is in average condition. The exterior building brick façade is in good condition, but the trim is in fair condition. The building lighting and louver are in poor condition, otherwise the interior of the building is in good condition. The instruments are in good condition, but past their useful life. The generator is in fair to poor condition. The suction lift pumps and associated control panel are in good condition but past their useful life. During design of an upgrade, it should be determined if these pumps are still required. It is unclear why they were added to the station originally. The diesel fuel tank is located inside the building, which should be removed and located outside with containment.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The HVAC and architectural improvements are normal priority recommended improvements. Table 5-11 summarizes the costs for the recommended improvements to the pump station. Table 5-12 summarizes the full project costs.

Table 5-12 Recommended Improvements for Hingham Street North Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Valves and Piping Instrumentation and Controls Electrical Equipment and Motor Starters New Generator	Interior Painting Hatch fall protection Wet well hatch replacement Building HVAC replacement Fuel tank replacement and containment	$515,000	$62,000	$577,000

Table 5-12 Hingham Street North Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$515,000	$62,000	$577,000
Construction Factors	$113,000	$13,600	$126,600
Utility Allowance	$20,000	-	$20,000
Engineering Services	$250,000	$75,000	$325,000
Legal/Administrative	$13,000	$1,500	$14,500
Inflation to Midpoint	$255,100	$42,800	$297,900
Contingency	$227,800	$38,300	$266,100
Total Project Cost	**$1,393,900**	**$233,200**	**$1,627,100**

The total project costs are carried in the implementation schedule below.

5.3.7 Hingham Street South Pump Station

The Hingham Street South Pump Station is a submersible type station that underwent a major upgrade in 2002. It is located across from 497 Hingham Street. It receives flow from the Hingham Street North Pump Station. The pump station has a rated capacity of 1,800 gpm with 100 hp motors and an indoor natural gas generator for backup power. The pump station consists of a wet well, valve vault, and building. Additionally, suction-lift pumps were added as backup to the submersible pumps.

The wet well concrete, hatch, and interior are in good condition and the piping is in fair condition. The valve vault hatch and interior are in good condition and the concrete is in average condition. The valve vault piping is in fair condition and one of the valves looks like it may be leaking. There is no fall protection in either structure.

For the exterior building, the brick façade is in good condition, but the roof and trim are in poor to fair condition. For the interior of the building, the ceiling is in good condition, the walls are in fair condition, and the concrete slab is in average condition. The controls are past their useful life. The fence is in average condition with some vine growth. There is odor control at this station and it is only used during the summer.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The odor control, HVAC and architectural improvements (new roof) are normal priority recommended improvements. Based on age, the generator should be replaced but it is currently in working condition and not a high priority. Table 5-13 summarizes the costs for the recommended improvements to the pump station. Table 5-14 summarizes the full project costs.

Table 5-33 Recommended Improvements for Hingham Street South Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Valves and Piping Instrumentation and Controls Electrical Equipment and Motor Starters	Replace roof Hatch fall protection Building HVAC replacement Odor control New Generator	$400,000	$267,000	$667,000

Table 5-14 Hingham Street South Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$400,000	$267,000	$667,000
Construction Factors	$88,000	$58,700	$146,700
Utility Allowance	$10,000	-	$10,000
Engineering Services	$250,000	$75,000	$325,000
Legal/Administrative	$10,000	$6,500	$16,500
Inflation to Midpoint	$212,200	$114,200	$326,400
Contingency	$189,500	$102,000	$291,500
Total Project Cost	**$1,159,700**	**$623,400**	**$1,783,100**

The total project costs are carried in the implementation schedule below.

5.3.8 Market Street Pump Station

The Market Street Pump Station is a submersible type station that was built in 1994. It is located behind the Rockland Highway Department. The station consists of a wet well, vault, and building. The pump station has a rated capacity of 250 gpm with 7.5 hp motors and an indoor propane generator for backup power.

The propane tank is located outside but has no containment. The wet well concrete, hatch, and interior are in good condition, but the hatch has no fall protection. The wet well piping and cable are in fair condition due to corrosion. The valve vault hatch, concrete, interior, and piping are in good condition, but there is no fall protection. The brick façade of the building is in good condition and the roof and trim are in fair condition. The interior of the building is in fair condition. The equipment is past its useful life, including the generator.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The HVAC and architectural improvements are normal priority recommended improvements. Table 5-15 summarizes the costs for the recommended improvements to the pump station. Table 5-16 summarizes the full project costs.

Table 5-45 Recommended Improvements for Market Street Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Instrumentation and Controls Electrical Equipment and Motor Starters Replace Generator	Perimeter fencing Replace roof and trim Hatch fall protection Propane tank containment Building HVAC replacement	$205,000	$73,000	$278,000

Table 5-16 Market Street Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$205,000	$73,000	$278,000
Construction Factors	$45,100	$16,100	$61,200
Utility Allowance	$10,000	-	$10,000
Engineering Services	$200,000	$75,000	$275,000
Legal/Administrative	$5,200	$1,800	$7,000
Inflation to Midpoint	$55,800	$19,900	$75,700
Contingency	$116,300	$41,500	$157,800
Total Project Cost	**$637,400**	**$227,300**	**$864,700**

The total project costs are carried in the implementation schedule below.

5.3.9 Woodsbury Road Pump Station

The Woodsbury Road Pump Station is a submersible type station that was built in 1994. It is located behind 25 Corn Mill Way. The pump station has a rated capacity of 300 gpm with 15 hp motors and an indoor propane generator for backup power. The station consists of a wet well, valve vault, and building.

The wet well hatch and concrete are in good condition. The interior of the wet well is in fair condition and the piping is old and corroded. The valve vault piping and interior are in good condition and the hatch and concrete are in fair condition. The wood trim and building foundation are in good condition. The roof is in fair condition and the brick façade is in fair condition with some vines growing along the side. One of the louvers is in poor condition. The building interior is in good condition. The equipment is past its useful life. The perimeter fencing is in fair to poor condition. The valve vault and wet well hatches do not have fall protection. The propane tank does not have containment.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The HVAC and architectural improvements are normal priority recommended improvements. Table 5-17 summarizes the costs for the recommended improvements to the pump station. Table 5-18 summarizes the full project costs.

Table 5-57 Recommended Improvements for Woodsbury Road Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Instrumentation and Controls Electrical Equipment and Motor Starters	Fence replacement Hatch fall protection Building HVAC replacement Propane tank containment	$185,000	$47,000	$232,000

Table 5-18 Woodsbury Road Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$185,000	$47,000	$232,000
Construction Factors	$40,700	$10,300	$51,000
Utility Allowance	$10,000	-	$10,000
Engineering Services	$200,000	$75,000	$275,000
Legal/Administrative	$4,700	$1,100	$5,800
Inflation to Midpoint	$52,900	$16,000	$68,900
Contingency	$110,300	$33,300	$143,600
Total Project Cost	**$603,600**	**$182,700**	**$786,300**

The total project costs are carried in the implementation schedule below.

5.3.10 Millbrook Drive Pump Station

The Millbrook Pump Station is a submersible type station that was built in 2000. It is located across from 11 Millbrook Drive. The pump station has a rated capacity of 180 gpm with 15 hp motors and an indoor natural gas generator for backup power. The pump station consists of a wet well, valve vault, and building.

The wet well concrete, interior, and hatch are in good condition. The discharge piping of the wet well is in fair condition to due to corrosion. The valve vault hatch, interior, and concrete are in good condition. There is water at the bottom of the valve vault causing some corrosion that should be pumped out. The water is likely coming through the precast concrete sections of the valve vault at the joints, which should be sealed. Neither hatch has fall protection. The wood trim and concrete foundation are in fair condition. The interior of the building is in good condition. The equipment is past its useful life.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, and process equipment is recommended to be replaced as a high priority. The HVAC and architectural improvements are normal priority recommended improvements. Table 5-19 summarizes the costs for the recommended improvements to the pump station. Table 5-20 summarizes the full project costs.

Table 5-69 Recommended Improvements for Millbrook Drive Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Valves and Piping Instrumentation and Controls Electrical Equipment and Motor Starters	Roof Trim replacement Hatch fall protection Davit Crane Base Building HVAC replacement Replace generator	$132,000	$102,500	$234,500

Table 5-20 Millbrook Drive Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$132,000	$102,500	$234,500
Construction Factors	$29,000	$22,700	$51,700
Utility Allowance	$10,000	-	$10,000
Traffic Control Allowance	$5,000	-	$5,000
Engineering Services	$200,000	$75,000	$275,000
Legal/Administrative	$3,500	$2,500	$6,000
Inflation to Midpoint	$91,200	$49,000	$140,200
Contingency	$95,000	$51,000	$146,000
Total Project Cost	**$565,700**	**$302,700**	**$868,400**

The total project costs are carried in the implementation schedule below.

5.3.11 Old Country Way Pump Station

The Old Country Way Pump Station is a submersible type station with a valve vault and building and was built in 1980. It is the oldest station in the current system. It is located next to 33 Old Country Way. The pump station has a rated capacity of 350 gpm with 7.5 hp motors and an outdoor natural gas generator for backup power.

The wet well hatch, interior, and piping are in good condition. The concrete is in fair condition. There is a new mixer (2021) installed in the wet well and it is working well. The valve vault hatch and concrete are in good condition. Neither structure has fall protection. The valve vault is a raised structure and there are makeshift wooden stairs that are in poor condition and not up to code. The vinyl siding of the building is in fair to poor condition. The roof is in poor condition. The interior of the building is old and in fair condition. The ceiling and slab are in good condition and the walls are in fair condition. The generator was recently replaced and located outside on a concrete equipment bad behind the building. The other station equipment is past its useful life.

Based on the condition assessment and the age of critical equipment, the electrical, instrumentation, architectural, and process equipment is recommended to be replaced as a high priority. The HVAC improvements are normal priority recommended improvements. Table 5-21 summarizes the costs for the recommended improvements to the pump station. Table 5-22 summarizes the full project costs.

Table 5-27 Recommended Improvements for Old Country Way Pump Station

Recommendations		Estimated Cost for Improvements		
High Priority	**Normal Priority**	**High Priority**	**Normal Priority**	**Total**
Pump Replacement Instrumentation and Controls Electrical Equipment and Motor Starters Roof and siding replacement Valve stair replacement	Hatch fall protection Building HVAC replacement	$206,000	$27,000	$233,000

Table 5-22 Old Country Way Estimated Total Project Costs

Item	High Priority	Normal Priority	Total
Bare Costs	$206,000	$27,000	$233,000
Construction Factors	$45,300	$5,900	$51,200
Utility Allowance	$10,000	-	$10,000
Engineering Services	$200,000	$75,000	$275,000
Legal/Administrative	$5,200	$700	$5,900
Inflation to Midpoint	$37,300	$8,700	$46,000
Contingency	$116,500	$27,300	$143,800
Total Project Cost	**$620,300**	**$144,600**	**$764,900**

The total project costs are carried in the implementation schedule below.

5.3.12 Spruce Street Pump Station

The Spruce Street Pump Station is planned to be upgraded into a submersible type pump station in 2023. It is located next to 76 Spruce Street and is next to the Rockland Town Forest. It was built in 1980 as a pneumatic ejector station with outdoor controls.

The station has been designed and is just waiting to bid and construct. As this will be a brand new station, there are no recommendations for the 20-year planning period. However, at the end of the planning period, the pumps and control panel will likely need to be replaced. As such, a cost of $615,000 has been used in the implementation schedule below. It is important to note that the majority of the project is inflation and engineering fees, which would likely be less when the project actually occurs.

5.3.13 Butternut Lane Pump Station

The Butternut Lane Pump Station was completely replaced in 2022. It is located in the driveway of 55 Butternut Lane. The upgrade included the installation of two Tsurumi 5 Hp pumps rated for 100 gpm, above-grade control cabinet, and 4-inch discharge pipe, gate, and check valves. The existing system was retrofitted with a duplex submersible pump station with the metal vault being used as the new wet well. The electrical equipment was moved out of the vault and a duplex control panel along with an automatic transfer switch and generator hookup for backup power was mounted above ground.

As this is a brand new station, there are no recommendations for the 20-year planning period. However, at the end of the planning period, the pumps and control panel will likely need to be replaced. As such, a cost of $618,000 has been used in the implementation schedule below. It is important to note that the majority of the project is inflation and engineering fees, which would likely be less when the project actually occurs.

5.3.14 Pump Station Summary

Table 5-23 summarizes the pump station recommendations.

Table 5-23 Pump Station Recommendation Summary

Pump Station Name	Type	Capacity (ea.)	Pump Horsepower	Year Constructed/Upgraded	Recommended Project Cost
Forest Street	Submersible	400 gpm	29	1999	$964,000
Lincoln Road	Submersible	100 gpm	7.5	1999	$618,000
Wheeler Avenue	Submersible	30 gpm	3	1999	$1,163,000
Summer Street	Submersible	40 gpm	2	1999	$1,170,000
John Burke Drive	Submersible	40 gpm	2	1999	$1,163,000
Hingham Street – North	Submersible	1,000 gpm	20	2002	$1,628,000
Hingham Street – South	Submersible	1,800 gpm	100	2002	$1,784,000
Market Street	Submersible	250 gpm	7.5	1994	$864,000
Woodsbury Road	Submersible	300 gpm	15	1994	$786,000
Millbrook Drive	Submersible	180 gpm	15	2000	$765,000
Old Country Way	Submersible	350 gpm	7.5	1980	$765,000
Spruce Street	Submersible[1]	100 gpm	5	2023	$615,000
Butternut Lane	Submersible	100 gpm	5	2022	$618,000

5.4 Proposed Schedule and Capital Improvement Plan

A capital improvement plan with implementation schedule has been developed for each of the 13 pump stations in Rockland through the 20-year planning period from 2023 to 2043. It is important to note that many of the pump stations are original and the equipment is well past its useful life. In addition, the Town is faced with a large WWTP upgrade and is working to remove I/I from the collection system, both of which are higher priorities than pump station upgrades. This plan was developed based on similarity of stations, age of stations, and grouping some station upgrades together to save on engineering and construction costs. The schedule assumes most upgrade designs would take approximately 1 year and construction would take 1 to 2 years, depending on the size of the project. Pump station upgrades similar to those outlined above typically take a year or less. However, the current construction climate has shown long lead times for many aspects of the projects, especially for electrical equipment and generators. This has pushed many simple upgrade projects to take closer to 1.5 to 2 years based on the lead times. The schedule assumes Old Country Way would begin design in year 2024. Table 5-24 is the capital improvement plan for the pump stations. Currently, the Town is planning to reserve $50,000 per year to address equipment as it fails.

Table 5-24 Pumping Stations Capital Improvement Plan

Pumping Station	Total Est. Costs Per Station	Plan Year																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Forest Street	$964,000				$964,000																
Lincoln Road	$618,000				$618,000																
Wheeler Avenue	$1,163,000			$1,163,000																	
Summer Street	$1,170,000			$1,170,000																	
John Burke Drive	$1,163,000			$1,163,000																	
Hingham Street – North	$1,628,000					$1,628,000															
Hingham Street – South	$1,784,000					$1,784,000															
Market Street	$864,000		$864,000																		
Woodsbury Road	$786,000		$786,000																		
Millbrook Drive	$765,000				$765,000																
Old Country Way	$765,000	$765,000																			
Spruce Street	$615,000																			$615,000	
Butternut Lane	$618,000																			$618,000	
Total for Year	$13,015,000	$765,000	$1,650,000	$3,496,000	$2,452,000	$3,412,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,240,000	$0

The average cost per year is $981,300.

5.5 Pump Station Operations

As has been mentioned previously in this report, the Town received an Order from the EPA in mid-2022. Part of the Order requires the CWMP to review potential inline and offline storage for flow equalization during high flow periods. Part of inline storage can be "holding back" flow in the collection system to the amount practical during a storm. This involves altering pump station operations to allow the wet well and potentially the collection system piping to back up and hold additional flow. The limiting factor to how much volume can be held back is making sure basements/homes and manholes are not overflowed. This analysis is summarized further below.

5.5.1 Existing Pump Station Control

Veolia, the contract operator for the WWTP and pump stations, provided the level control for each station for this analysis. Table 5-25 summarizes the controls.

Table 5-25 Pump Station Level Control Summary

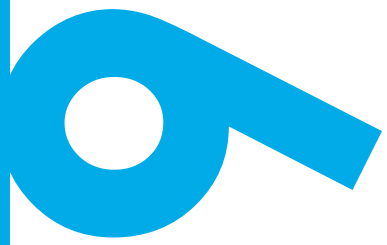
Pump Station	Pump On & Off Wet Well Levels	Wet Well Alarm Levels
Forest Street	On - 4.5' Off – 3.0'	High – 5.2' Low – 2.5'
Hingham Street - North	On – 5.6' Off – 3.4'	High – 8.0' Low – 3.0'
Hingham Street - South	On – 11.0' Off – 5.2'	High – 12.0' Low – 4.5'
John Burke Drive	On – 3.2' Off – 1.9'	High – 6.0' Low – 1.0'
Lincoln Road	On - 4.5' Off – 2.4'	High – 6.0' Low – 2.0'
Market Street	On - 4.0' Off – 2.4'	High – 4.5' Low – 2.0'
Millbrook Drive	On – 2.0' Off – 0.6'	High – 2.8' Low – 0.2'
Old Country Way	On - 4.3' Off – 2.9'	High – 4.8' Low – 2.0'
Summer Street	On – 1.2' Off – 0.9'	High – 3.4' Low – 0.5'
Wheeler Avenue	On - 2.5' Off – 1.6'	High – 3.0' Low – 1.3'
Woodsbury Road	On - 4.0' Off – 2.9'	High – 5.1' Low – 2.0'
Butternut Lane	On – 2.5' Off – 1.9'	High – 3.0' Low – 1.5'
Spruce Street	N/A	N/A

Table 5-26 summarizes the station wet well floor elevations, pump on level, influent sewer invert level, and wet well diameters, which is used to calculate additional volume that could be held during storm/high flows.

Table 5-26 Pump Station Volume Summary

Pump Station	Wet Well Floor Elevation	Pump On Elevation	Influent Invert Elevation	Wet Well Diameter	Volume Available (gallons)
Forest Street	110	114.5	117.7	8x10	1,915
Hingham Street -North	118.9	124.5	127.97	10	2,039
Hingham Street -South	106.35	117.35	118.79	10	846
John Burke Drive	89.8	93	92.8	6	-42
Lincoln Road	119	123.5	124.2	6	148
Market Street	65.79	69.79	71	8	455
Millbrook Drive	63.5	65.5	68	8	940
Old Country Way	114.13	118.43	121.63	8	1,203
Summer Street	61.6	62.8	64.67	6	395
Wheeler Avenue	121.7	124.2	124.93	6	154
Woodsbury Road	78.13	82.13	83.63	8	564
Butternut Lane					
Spruce Street	114.4	119.34	119	6	-72

The control elevations listed are the normal operating setpoints. However, Veolia indicated that during wet weather months, they increase the set points. These elevations were not readily available. Based on the analysis, it appears there is an opportunity for Forest Street, Hingham Street North, and Old Country Way to hold back additional flow to reduce peak flows at the WWTP. However, Veolia has indicated that when flows are high, the amount of flow going through the stations limits how much they can alter operations safely. This is not a recommended solution. If peak flows are required to be reduced to limit bypass events at the WWTP, equalization is a better alternative.



WRIGHT-PIERCE
Engineering a Better Environment

Section 6 Evaluation of Wastewater Treatment Plant

6.1 Introduction

The Town of Rockland owns a Wastewater Treatment Plant (WWTP) which serves the Town of Rockland and parts of the Town of Abington. The WWTP is located down an access road near 587 Summer Street. The WWTP is operated by Veolia. The WWTP was originally constructed in the mid-1960s, and the plant was upgraded in the late 1970's to a two-stage nitrification activated-sludge plant. The WWTP was designed for an annual average flow of 2.5 MGD and a peak hourly flow of 6.0 MGD. The plant operates under a NPDES Permit (No. MA0101923) and a Medium WWTP General Permit (No. MAG590038). The NPDES permit was finalized and reissued in November 2021 and the General Permit was received in 2022, which supersedes the NPDES permit. The permits are in Appendix C.

6.2 WWTP Evaluation Report Summary

In 2021, Wright-Pierce completed a WWTP evaluation for the Town of Rockland. A comprehensive evaluation had not been completed since the upgrade in 1977. The purpose of the evaluation was to identify and plan for needed improvements at the WWTP. Wright-Pierce evaluated the unit processes, structures, buildings, building systems, instrumentation and controls, electrical service and distribution, and site conditions to develop recommendations for needed upgrades.

Overall, the evaluation report goals were as follows:

- Calculating the current flows and loads received by the facility and assessing the expected growth in flows and loads over the next 20-year planning period.
- Assessing key permit issues facing the WWTP and conduct an alternatives evaluation of the improvements needed to meet current and potential future permitting/regulations (discharge limits, etc.). This included a pending effluent total phosphorus (TP) limit and likely a future total nitrogen (TN) limit.
- A comprehensive assessment of existing equipment and unit processes at the WWTP; conducting a condition assessment of existing process and building systems; and developing a capital improvement plan (CIP) to address the condition, age, useful life and efficiency of each unit process and associated equipment currently installed at the wastewater treatment plant.
- Conducting a screenings analysis of potential alternatives to provide influent pumping, flow measurement, screening, and grit removal at the WWTP to accommodate planned future growth, ease of operation and maintenance activities versus cost implications.
- Conducting a screenings analysis of potential alternatives to provide biological phosphorus and nitrogen removal.
- Conducting a screenings analysis of alternative tertiary treatment processes for low level phosphorus removal.
- Conducting a screenings analysis of the existing anaerobic digestion process. Included an evaluation of the economics associated with rehabilitating the existing digestion system and/or enhancements to the digestion process.
- Conducting a screenings analysis of potential sludge dewatering alternatives.
- Compilation of overall recommended improvements into a capital improvements plan based on current and anticipated future needs over the 20-year planning period.

6.2.1 Upgrade History

The original Rockland WWTP, as it was constructed in 1964, consisted of an influent pumping facility, two primary clarifiers, two aeration tanks, two secondary clarifiers, and an anaerobic digestion system. The WWTP was upgraded in 1977 to a two-stage nitrification activated-sludge process for ammonia removal. The two-stage process was abandoned shortly after this upgrade to a single sludge nitrification activated sludge process and, in 2000, the Administration Building was expanded.

In general, most of the wastewater equipment currently in use at the facility consists of items that were installed as part of the 1977 upgrade. The existing infrastructure (i.e., structures, tanks, buildings, etc.) currently being used date from the original 1964 construction and the 1977 upgrade. A brief description of plant improvements since its original construction in 1964 is provided below.

Improvements constructed in **1964** (Sewage Treatment Facilities, Contract 64-1, Metcalf and Eddy) include:

- Influent screening and pump station with process equipment, electrical, and HVAC equipment
- Two primary clarifier tanks (currently not used)
- Two aeration tanks (currently used for wet weather flow diversion)
- Two secondary clarifiers (have since been demolished)
- Administration Building
- Two-stage anaerobic digestion process
- Chlorine contact tanks
- Site piping to accommodate the new structures and tanks constructed
- Site electrical distribution system

Improvements constructed in **1977** (Water Pollution Control Facilities, Contract 77-1, Metcalf and Eddy) include:

- Two new Primary Settling Tanks
- Two new Secondary Settling Tanks
- Two Nitrification Reactors
- Two Nitrification Settling Tanks
- New Chlorine Contact Tank, Effluent Pumping, and post Aeration Structure
- Expansion of the Administration Building
- Two additional anaerobic digestion tanks
- New Electrical Building
- Replacement of existing pumping systems and equipment throughout the facility
- New site piping to accommodate the new buildings and structures constructed.
- New site electrical distribution and stand-by generator
- Other improvements to electrical, HVAC, and Instrumentation.

Improvements constructed in **2000** (2000 Expansion Program of the Administration Building R.A.D. Jones Architects, Inc.) include:

- Expansion of the Administration Building including new:
  - Laboratory Facilities
  - Conference and reception area

- Break Room
- Shower and locker area

Improvements constructed in 2013 (WWTP Digester Mixing System Replacement, HTA) include:

- New mixing system for Primary Digester No.2

The Town began several upgrades in 2022, including installing a new effluent flow meter and improvements to the anaerobic digesters. The flow meter project has been completed.

As part of developing the CWMP, representatives of Wright-Pierce toured the WWTP along with the Town and Veolia, the Town's contract operator, in order to update the CIP recommendations based on completed and upcoming projects and the final NPDES permit received (with TP limit of 0.1 mg/L during the growing season). In addition, several items were evaluated as required in the EPA's Order issued in 2022, as discussed below.

The EPA Order and plant evaluation are included in the Phase 1 appendices.

6.2.2 WWTP Flows and Loads

Section 2 of the plant evaluation and Section 3 of Phase 1 of the CWMP discuss current and future flows and loads for the plant. Phase 1 served as a cursory update to the original evaluation, with Table 2-5 Design Year Flows and Loads from the evaluation remaining the design condition. The annual average flow was maintained at the permitted level of 2.5 MGD for the 20-year planning period and the peak flow capacity was recommended to be increased from 6.0 MGD to 7.0 MGD as can be seen in Table 6-1 below, which is a copy of Table 2-5 from the 2021 evaluation. For the last several years, the plant has been operating at or above its permitted average flow limit of 2.5 MGD. In addition, peak flows at the plant have surpassed 6 MGD and the bypass has been necessary.

Table 6-1 Design Year Flows and Loads

Parameter	Flow		BOD_5			TSS		
	MGD	P.F.	mg/L	lbs./day	P.F.	mg/L	lbs./day	P.F.
Minimum Day	1.15	0.46	121	1,159	0.25	159	1,521	0.24
Minimum Month	1.36	0.54	192	2,176	0.47	310	3,507	0.56
Annual Average	2.50	-	221	4,600	-	301	6,266	-
Maximum Month[1]	4.35	1.74	188	6,832	1.49	314	11,368	1.81
Maximum Month Loading[2]	3.44	1.38	238	6,832	1.49	395	11,342	1.81
Maximum Day[3] (98th %)	4.76	1.91	211	8,400	1.83	1347	53,511	8.54
Maximum Day[4] (100th %)	7.00	2.80	283	16,530	3.59	548	31,982	5.10
Parameter	Temperature		NH3-N			Total Phosphorus		
	C	P.F.	mg/L	lbs./day	P.F.	mg/L	lbs./day	P.F.
Minimum Day	8.89	0.56	37.04	355	0.60	2.01	19	0.21
Minimum Month	9.80	0.62			-			-
Annual Average	15.76	-	28.23	589	-	4.44	93	-
Maximum Month[1]	9.80	0.62	21.73	788	1.34	3.75	136	1.47
Maximum Month Loading[2]	9.80	0.62						
Maximum Day[3] (98th %)	22.22	1.41						
Maximum Day[4] (100th %)	23.33	1.48						

6.2.3 Recommended Improvement Summary

The Rockland WWTP needs to be upgraded to address aging infrastructure and provide capacity to meet growth needs and permit modifications. It is important to note that the majority of the existing equipment was installed as part of the 1977 upgrade and is now almost 40 years old and is well beyond the end of its useful life. Most WWTPs undergo comprehensive upgrades every 25 years to address worn out equipment and systems. Furthermore, the existing WWTP infrastructure (tanks, buildings, electrical systems) have not been addressed since the 1977 upgrade and are also in need of being addressed. This includes significant corrosion and concrete damage, inoperable mechanical HVAC systems, leaking roofs, water intrusion in the underground electrical duct banks, and various building and life safety code compliance issues. It should be noted that Veolia has replaced various high priority pieces of equipment at the WWTP to maintain successful operation of the facility. While certainly beneficial and something that should be continued moving forward, these equipment replacements do not eliminate or delay the need for a comprehensive upgrade.

It is recommended that the Town of Rockland undertake a comprehensive upgrade of the WWTP which should commence near-term. Based on the scope of needs at the WWTP, a comprehensive upgrade will be a multi-year process, resulting in further strain on the existing systems and equipment.

The plant evaluation recommended the following improvements:

- Screening and Grit Facility
  - Provide a new facility located upstream of the influent pump station
  - One new mechanical screen and associated wash press
  - One new vortex style grit removal system and associated grit washer
  - One new grit and screenings receiving roll off
- Influent Pump Station Modifications
  - Replace existing pumps and piping
  - Address structural issues in lower wet well
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Primary Clarifier Modifications
  - Replace clarifier sludge removal mechanisms
  - Address tank structural issues
- Secondary System Modifications
  - Modify the secondary treatment process to an A2O process to achieve additional treatment capacity and biological nitrogen and phosphorus removal
  - Repurpose the existing secondary settling tanks to activated sludge tanks (selector zones)
  - Provide a new flow distribution structure
  - Provide new mixing system for anaerobic and anoxic zones
  - Provide new mechanical mixer/aerators for the oxic zones
  - Provide new blowers and associated blower building
  - Provide new internal recycle system
  - Provide new instrumentation and control system
  - Address secondary settling tank and nitrification tank structural issues
  - Provide new return and waste activated sludge pumps, piping and valves
  - Provide new mechanical/HVAC system for lower gallery

- Secondary Clarifier Modifications
  - Modify the effluent weirs to raise the tank water surface by three feet
  - Provide new sludge removal mechanisms
  - Address tank structural issues
- Tertiary Building
  - Provide a new tertiary treatment process for phosphorus removal
  - Tertiary treatment process will include two ballasted flocculation units complete with associated pumps, mixers, hydrocylcones, chemical feed and polymer system
  - Provide a new ferric chloride storage and feed system
- Chemical Building
  - Provide a new chemical building
  - New magnesium hydroxide storage and feed system for supplemental alkalinity
  - New sodium hypochlorite storage and feed system
  - New sodium bisulfite storage and feed system
- Chlorine Contact Tanks and Effluent Pump Station
  - Address tank structural issues
- Sludge Storage tanks
  - Repurpose the ex. aeration tank to two new sludge storage tanks
  - Provide aeration and mixing devices
  - Provide a tank cover and associated odor control unit
  - Address tank structural issues
- Administration Building
  - Provide new primary sludge piping and valves
  - Provide new dewatering and sludge transfer pumps
  - Provide new blower for sludge tank mixing
  - Demolish existing lime system
  - Demolish existing lower-level chemical systems
  - Provide two new screw presses for sludge dewatering
  - Provide new polymer system
  - Provide new sludge transfer conveyor, truck loading system and odor control unit
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Garage and Electrical Building
  - Provide a new electrical building with additional garage space
  - Provide a new generator
  - Provide a new main switch gear
- General
  - Provide a new electrical distribution system
  - Provide new site piping as required
  - Replace all existing motor control centers throughout the facility
  - Provide a new fiberoptic network and plant SCADA system
  - Address existing site lighting

The evaluation recommended abandoning the existing anaerobic digestion process. The Sewer Commission did not favor this option at the time and should be re-evaluated during preliminary design.

6.2.4 Estimated Project Cost

Planning level project costs were estimated for the recommended facilities upgrades/improvements. Total project costs by major unit processes are presented in Table 6-2. The total project cost estimate for the comprehensive upgrade is presented in Table 6-3. The project cost estimate includes project costs related to the installation of a tertiary process (ballasted floc basis). These planning-level costs were developed using standard cost estimating procedures consistent with industry standards utilizing concept layouts, unit cost information, and planning-level cost curves, as necessary. Total project capital costs include estimated construction costs to account for construction contingency, design, and construction engineering, permitting, as well as financing, administrative and legal expenses. The original project costs were based on an ENR Construction Cost Index of 11625 (December 2020). The costs have been brought forward to today's dollars in the tables below. The costs assume one large project. Phasing and additional design approaches are discussed in the following section.

Many factors arise during preliminary and final design phases (e.g., foundation conditions, owner selected features and amenities, code issues, etc.) that cannot be definitively identified and estimated at this time. These factors are typically covered by the allowances described above; however, this allowance may not be adequate for all circumstances.

For planning level cost estimation, the following assumptions were made:

- **Administrative and Legal Costs** – The administrative and legal costs are estimated to be approximately 1% of the total construction cost. This includes Town costs such as bond council and accounting services that are associated with the project.
- **Financing** – The Town will likely incur interim financing costs until the final loan is closed. 1.5% of the total project cost has been carried for interim financing costs.
- **Engineering Services** – The engineering services cost is estimated to be approximately 20% of the construction cost and is for all phases of engineering services associated with the project. The services include design, permitting, bidding, construction administration, onsite field observation (resident project representative), development of record drawings, development of the operation and maintenance manual, and commissioning phase services.
- **Contingency Costs** – There are two contingency costs – construction contingency (5%) to account for unexpected conditions in the field identified once construction starts, and design contingency (20%) to account for potential design changes necessary to address unforeseen or unaccounted for items. The contingency costs are a percentage of the total construction cost associated with the project.
- **Materials Testing Costs** – The materials testing costs are estimated to be approximately 0.5% of the total construction cost. This cost is for miscellaneous materials testing such as soils and concrete testing associated with the project.
- **Midpoint Inflation** – Assumes an inflation rate of 4% per year and a construction start of June 2026 and ending of December 2028.

Table 6-2 Project Cost Estimate by Unit Process

Project Component	Cost
Civil	$1,379,000
Architectural	$2,993,000
Structural	$2,767,000
Process	$11,063,000
HVAC/Plumbing	$1,057,000
Instrumentation	$1,085,000
Electrical	$5,416,000
Specials	$370,000
Construction Factors	$4,727,000
Subtotal	**$30,858,000**
Design Contingency	$6,172,000
Construction Contingency	$2,190,000
Inflation To Midpoint of Construction	$6,728,000
Estimated Construction Cost	**$45,948,000**
Engineering Services	$8,752,000
Materials Testing	$219,000
Legal/Administrative	$428,000
Financing	$837,000
Total Project Cost	**$56,163,000**

Notes:

1. Cost estimate is based on ENR INDEX 11625, 12/2020
2. Cost estimate is based on eliminating the anaerobic digestion process in favor of an alternative solids handing scheme. Refurbishing the existing anaerobic digestion process would add an additional $3.0M to $5.0M to the total project cost.

Using the current ENR Index of 13175 (March 2023), the new project cost in today's dollars is $63,675,000. Based on the recent bidding climate, inflation variations over the last 2 years, and supply chain issues, a conservative planning total project cost is realistically $72 million.

6.2.5 Project Schedule

A typical project schedule for an upgrade of this size is presented below in Table 6-3. The schedule was developed based on one single, large scale project that utilizes SRF funding and the milestones required by MassDEP and the Trust for that funding. Phasing is discussed in the following section.

Table 6-3 Potential Upgrade Schedule

Milestone	Timeline*
Appropriate Engineering Funds for Design	Annual Town Meeting, May 2023
Preliminary Design (30%)	**8 months, following Notice-to-Proceed**
Preliminary Design Begins	August 2023
MassDEP SRF Project Evaluation Form (PEF) Submitted	July 2023
MassDEP SRF Intended Use Plan (IUP) Notification Draft	January 2024
Final IUP	1 month
Final Design & Permitting	**12-14 months, beginning after Preliminary Design**
Appropriate Construction Funds	Annual Town Meeting, May 2024
SRF Application Submission (90% Design)	By October 15, 2024
MassDEP Project Approval Certificate (PAC)	By December 31, 2024
100% Design and Permitting Complete	December 2024
Bidding	**4 months, after 100% Design complete**
Prequalification of GCs and Subs	January 2025 (2 months)
Filed Sub-bids	March 2025 (4 weeks)
GC Bids	April 2025 (6 weeks)
Construction*	**30 months, beginning after GC selected and NTP**
Contractor Notice-to-Proceed	By June 30, 2025
Substantial Completion	December 2027
Final Completion	February 2028
One-Year Warranty Period	December 2028

*Extended construction period expected based on lead times for equipment such as generator, MCCs, switchgear, etc.

The NPDES permit compliance schedule for phosphorus requires the facility to be in compliance by February 2025. Based on the schedule outlined above, a time extension would be required from the regulators.

6.2.6 Design-Build Phased Approach

Discussions with the Town of Rockland are ongoing to complete necessary capital improvements at the WWTP on a design-build basis under an amendment to Veolia's current operating agreement. Design-build is an alternative approach to the more common design-bid-build approach. Most municipal projects are conducted as follows:

- Town/Department hires design engineer
- Design engineer creates plans (drawings) and specifications for the upgrade to 100% level
- Engineer puts plans and specifications out to public bid for contractors
- Bids are received and lowest responsible bidder is selected for the project
- Contractor and Town enter into agreement and the upgrades are constructed

The design-build approach differs from the above, mainly by streamlining the design stage and by removing the bidding stage. Veolia has used this approach on a vast number of projects across the country and several in Massachusetts. Wright-Pierce has worked on several of these projects with Veolia in the past. The design-build approach is summarized below:

- Veolia directly hires engineer and contractor under two separate contracts
- Engineer develops plans and specifications to 60% level
- Project is value-engineered by Town, Veolia, Engineer, and Contractor
- Contractor develops a Guaranteed Maximum Price (GMP) based on the revised 60% documents
- Engineer finalizes plans and specifications to 100%
- Contractor constructs facility upgrades

The Town, Veolia, and Wright-Pierce are currently working to review the recommendations included in the April 2021 WWTP Evaluation and identify and develop design packages to obtain a GMP for each package from Veolia's general contractor. Wright-Pierce has prepared a proposed approach to developing these bid packages and prioritizing implementation so that the Town of Rockland can complete phased improvements to the WWTP. The packages are identified below. Figure 6-1 shows the contracts on the site plan.

Contract No. 1 – Tertiary Treatment

The Town of Rockland is required to upgrade their WWTP to meet more stringent effluent phosphorus requirements by early 2024 and optimize the process and come into compliance with new total phosphorus limits by February 1, 2025. As recommended in the April 2021 WWTP Evaluation, a new tertiary process is required to meet the new effluent limit of 0.1 mg/L, reliably. Either a cloth disk filter or ballasted flocculation system may be able to meet these limits. To determine which alternative is more cost effective, Veolia is collecting effluent samples from the secondary clarifiers for testing by Aqua Aerobics, who manufactures a cloth disk filter, and Krüger, who manufactures a ballasted flocculation system. The bench top testing is needed to assess the ability of each process to meet the required effluent limits as well as to understand the potential chemical dosing that may be required. Further pilot testing may be conducted before or during preliminary design.

In addition to tertiary phosphorus removal, the plant electrical equipment is in need of replacement. The equipment is served from an outdoor main switchboard that was installed in the mid-1970s. Power is distributed at 480 volts to seven different MCCs throughout the WWTP. The main switchboard also includes the automatic transfer switch served by a 500-kW generator. Based on the age and condition of the power distribution

equipment, the April 2021 WWTP Evaluation recommended complete replacement of the main switchboard, MCCs, and duct banks/feeders.

As part of this tertiary treatment contract, it is recommended that the main switchboard be replaced with a new indoor main switchboard to provide service to the new tertiary treatment facilities. As part of this contract, new duct bank, conduit, and wiring would be run to refeed the existing MCCs at other locations throughout the WWTP. As noted in the April 2021 WWTP Evaluation, the existing duct banks are subjected to groundwater intrusion which may cause equipment/system failures and other problems at the facility. Upgrading the electrical distribution system to address these issues and replacing aging feeders should be included in this contract as a high priority item. The remaining existing MCCs would then be replaced under subsequent projects as those process areas are upgraded.

A summary of the improvements included under Contract No. 1 is presented below.

- Selection of tertiary treatment process (ballasted flocculation or cloth disk filtration) including ancillary equipment and building to house electrical, pumps, and chemical storage and feed equipment. Chemical building would also be sized to house sodium hypochlorite and sodium bisulfite for effluent disinfection. Space would also be left for chemical storage and metering pumps for alkalinity addition.
- Design of tertiary process around a pre-selected manufacturer's equipment.
- Design of secondary effluent or tertiary effluent pump station.
- Replacement of the electrical service entrance and main switchboard for the WWTP.
- Provide new duct bank, conduit, and electrical feeders from new main switchboard to new Tertiary Building Electrical Room.
- Provide new duct bank, conduit, and electrical feeders from new main switchboard to existing MCCs throughout the WWTP.
- Structural rehabilitation of the existing Chlorine Contact Tanks.

Depending on the results of the hydraulic evaluation, the Town may also elect to construct a new UV disinfection system.

Contract No. 2 – Hydraulic Capacity

One critical issue facing the Rockland WWTP is hydraulic capacity. The WWTP has a permitted flow rate of 2.5 MGD and a design peak hour flow rate of 6.0 MGD. When flows exceed 6 MGD, plant staff utilize portable bypass pumps to convey excess flow into offline tanks for storage until the flows drop. As part of the April 2021 WWTP Evaluation, it was recommended to increase the design peak hour capacity of the WWTP to 7.0 MGD.

To accommodate peak flows up to 7.0 MGD, hydraulic restrictions at the headworks facility need to be addressed. Several alternatives could be considered. A summary of alternatives that could be considered is presented below. A more detailed evaluation of Alternative Nos. 1 & 2 is required to verify that they can be feasible and achieve the desired benefits for the Town. In addition, a hydraulic profile of the entire WWTP needs to be developed to determine if there are any other hydraulic bottlenecks associated with passing the revised peak hour flow rate of 7.0 MGD.

Alternative No. 1 – Modifications to Existing Facilities

Our understanding is that the existing mechanical bar screen has a peak flow capacity of approximately 4 MGD. Flows over 4 MGD can pass through the Auger Monster in the channel next to the bar screen. A third channel is available for a manually-cleaned bar rack. To provide additional screening capacity, it may be possible to demolish the channel wall between the mechanical bar screen and the Auger Monster and install a new larger bar screen capable of passing 7 MGD in the larger channel. The Auger Monster could potentially be relocated to the channel with the manual bar rack. As part of this alternative, the following improvements are anticipated:

- Demolition within the existing bar screen channel and installation of a larger mechanical bar screen. A structural evaluation of the building would be conducted to determine if an extended bar screen could be provided that discharges to a screenings washer/compactor located in a separate room of the existing building at grade.
- Rehabilitation of the influent pump station including building improvements, construction of a separate electrical room to address code requirements, structural rehabilitation of the existing wet well, and complete replacement of the influent pumps, piping, and ancillary equipment.
- Construction of a second aerated grit tank to accommodate higher flows. Consider potential for utilizing the space occupied by the unused septage receiving facility.
- Potential modifications to the influent weir splitter box to accommodate higher peak flows.

Alternative No. 2 – New Screening Facility

Because of the hydraulic limitations and space restrictions in the existing wet well screenings channel, this alternative would include a new structure upstream of the existing influent pump station to accommodate a new screenings facility. A below grade structure with two parallel channels would be provided. One channel would be equipped with a mechanical bar screen and the second channel would include a manually-cleaned bar rack. The mechanical bar screen would be designed to discharge at grade into a screenings washer/compactor. A heated enclosure would be constructed at grade to enclose the washer/compactor and screenings container as well as stairs to the lower level of the structure. These improvements would include the following:

- Demolition of the existing bar screen and Auger Monster.
- Construction of a new screenings channel and installation of a larger mechanical bar screen with a parallel manual bar rack channel. Provide a heated enclosure at grade to house the screen, washer/compactor, screenings container, and stairs to the lower level.
- Rehabilitation of the influent pump station including building improvements, construction of a separate electrical room to address code requirements, structural rehabilitation of the existing wet well, and complete replacement of the influent pumps, piping, and ancillary equipment.
- Construction of a second aerated grit tank to accommodate higher flows. Consider potential for utilizing the space occupied by the unused septage receiving facility.
- Potential modifications to the influent weir splitter box to accommodate higher peak flows.

Alternative No. 3 – New Screening and Grit Facility

This alternative is based on the recommendations in the April 2021 WWTP Evaluation Report. This alternative is similar to Alternative No. 2 but includes a new structure for both screenings and grit removal upstream of the influent pump station. Providing grit removal upstream of the influent pumps will provide additional protection of the pumps. A below grade structure with two parallel channels would be provided. One channel would be equipped with a mechanical bar screen and the second channel would include a manual bar rack. A new vortex grit removal

tank would be constructed downstream of the new bar screen. The mechanical bar screen would be designed to discharge at grade into a screenings washer/compactor. A pump would be used to pump grit up to a new grit classifier located at grade. A building would be constructed at grade to enclose the washer/compactor, grit classifier, and screenings and grit container(s) as well as stairs to the lower level of the structure. These improvements would include the following:

- Demolition of the existing bar screen and Auger Monster.
- Construction of new below grade screenings and grit removal structures including a larger mechanical bar screen with a parallel manual bar rack channel and a vortex grit removal system with bypass bar channel. Provide a building at grade to house the screen, washer/compactor, grit classifier, screenings and grit container(s), and stairs to the lower level.
- Rehabilitation of the influent pump station including building improvements, construction of a separate electrical room to address code requirements, structural rehabilitation of the existing wet well, and complete replacement of the influent pumps, piping, and ancillary equipment.
- Elimination of the existing aerated grit tank and piping modifications to direct flow to the influent weir splitter box.
- Potential modifications to the influent weir splitter box to accommodate higher peak flows.

Contract No. 3 – Miscellaneous Equipment and System Improvements

There are a number of items identified in the April 2021 WWTP Evaluation that should be addressed in the near future rather than as a future comprehensive project under a phased capital improvement plan. In addition, the April 2021 WWTP Evaluation recommended improvements to the secondary treatment process to allow for compliance with a future anticipated effluent total nitrogen limit of 8 mg/L. Three alternatives for scope to be included in Contract No. 3 is presented below.

Alternative No. 1 – Immediate Improvement Needs

Much of the equipment, systems, and structures at the Rockland WWTP are aging and are in need of replacement and/or rehabilitation. Alternative No. 1 would address some of the more immediate needs. The scope items presented below are for discussion purposes. A workshop would be held with Town and Veolia staff to further refine these items.

- Replacement of the primary clarifier sludge and scum removal mechanisms and rehabilitation of the concrete tanks.
- Misc. concrete and gate repairs to the aeration tanks and below-grade equipment spaces.
- Replacement or rehabilitation of some or all of the existing mechanical surface aerators and provision of spare parts (spare motor and gear box) to allow for continued operation.
- Replacement of the mixing system in the small primary digester and other miscellaneous improvements to maintain this tank in operation for the near term.
- Replacement of the sludge recirculation pumps in the Digester Building basement.
- Replacement of the large sludge transfer pumps.

Alternative No. 2 – Process Improvement and Rehabilitation Needs

Alternative No. 2 would include most of the items identified under Alternative No. 1, however, rather than upgrading the existing aerators, a new diffused aeration system and new aeration blowers would be installed. This will provide better D.O. control and reduced power consumption versus the existing mechanical aerators. In

addition, it will be possible to raise the water surface elevation in the aeration tanks and gain additional treatment capacity. The specific items to be included in Alternative No. 2 include:

- Replacement of the primary clarifier sludge and scum removal mechanisms and rehabilitation of the concrete tanks.
- Conversion of the existing mechanical surface aeration system to a more energy efficient aeration system including new energy efficient aeration blowers and the use of either membrane disk fine bubble diffusers or hyperbolic mixers with air sparge rings. A new blower building would be required to house the blowers, an electrical room, and control panels.
- Misc. concrete and gate repairs to the aeration tanks and below-grade equipment spaces. These improvements would include modifications to the effluent weirs to allow for the water surface elevation to be raised by two to three feet.
- Replacement of the mixing system in the small primary digester and other miscellaneous improvements to maintain this tank in operation for the near term.
- Replacement of the sludge recirculation pumps in the Digester Building basement.
- Replacement of the large sludge transfer pumps.

Alternative No. 3 – Nitrogen Removal Process Improvement and Rehabilitation Needs

Alternative No. 3 would include the items identified under Alternative No. 2. In addition, as recommended in the April 2021 WWTP Evaluation, the existing intermediate clarifiers would be modified to be part of the activated sludge process and the secondary treatment process would be converted to operate in an anaerobic-anoxic-oxic (A2O) process to achieve an effluent total nitrogen of 8 mg/L. This alternative offers additional benefits over Alternative No. 2 including additional secondary treatment capacity and the use of biological phosphorus removal to minimize the amount of ferric chloride that would be needed for phosphorus reduction. The specific items to be included in Alternative No. 3 include:

- Replacement of the primary clarifier sludge and scum removal mechanisms and rehabilitation of the concrete tanks.
- Conversion of the existing mechanical surface aeration system to a more energy efficient aeration system including new energy efficient aeration blowers and the use of either membrane disk fine bubble diffusers or hyperbolic mixers with air sparge rings. A new blower building would be required to house the blowers, an electrical room, and control panels.
- Miscellaneous concrete and gate repairs to the aeration tanks and below-grade equipment spaces. These improvements would include modifications to the effluent weirs to allow for the water surface elevation to be raised by two to three feet.
- Modifying the secondary treatment process to the A2O process including:
- New primary effluent flow distribution structure.
- Convert the existing unused secondary clarifiers to activated sludge tanks with new mixing systems for the anaerobic and anoxic zones.
- New internal nitrate recycle system.
- Replace the mechanisms in the existing secondary (nitrification) clarifiers and raise the effluent weir to provide increased side water depth.
- Replacement of the mixing system in the small primary digester and other miscellaneous improvements to maintain this tank in operation for the near term.
- Replacement of the sludge recirculation pumps in the Digester Building basement.

- Replacement of the large sludge transfer pumps.

Contract No. 4 – Solids Handling Improvements

The work under Contract No. 4 would be primarily located in the Administration Building and associated with the solids handling systems. As part of the April 2021 WWTP Evaluation, Wright-Pierce recommended that the anaerobic digestion process be eliminated. The capital costs necessary to rehabilitation the digestion process equipment, systems, and structures was estimated to exceed the annual cost savings associated with reducing the mass of solids to be disposed of offsite at current disposal costs. Prior to beginning design of solids handling improvements, the cost-effectiveness of the anaerobic digestion process should be reconsidered.

At this time, the Contract No. 4 improvements are based on the elimination of the anaerobic digestion process. In general, this contract would likely include:

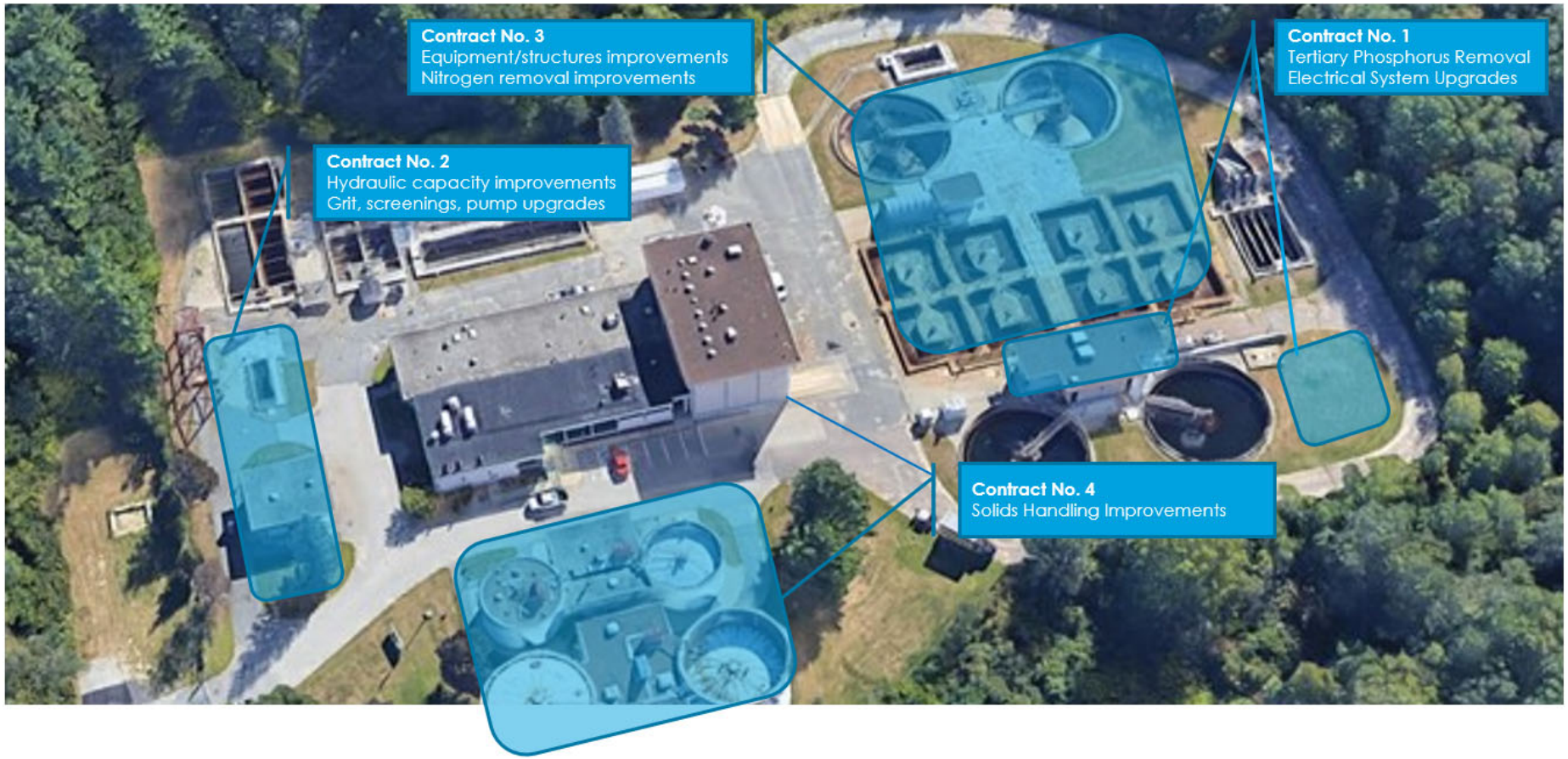
- New dewatering and sludge transfer pumps
- New blower for sludge tank mixing
- Two new screw presses for sludge dewatering and new sludge transfer conveyors and truck loading system.
- New sludge dewatering polymer system.
- Miscellaneous architectural, electrical, and mechanical/HVAC improvements.

If after reconsidering anaerobic digestion the Town would like to maintain this process, Wright-Pierce will develop a separate scope and fee for this work. Alternatively, if the Town decides not to maintain the anaerobic digestion process, Wright-Pierce can develop a separate scope and fee to either mothball the existing facilities, demolish the existing facilities, or repurpose the existing building and structures. Figure 6-1 shows the WWTP site layout and proposed contracts outlined on the buildings/structures at the WWTP.

6.2.6.1 Schedule

Implementing the design-build approach would allow the Town to prioritize immediate needs, such as the permit-required total phosphorus upgrade, and delay less critical upgrades for the facility. There is flexibility in the design-build approach, whereby the Town can elect to do one contract at a time, or several contracts can be designed and constructed at the same time. Due to the high cost associated with one large upgrade project, the design-build approach and contract development is proposed to spread out upgrades over a longer period of time. This approach would likely take 10-to-12 years to complete all of the contracts and would depend on how the Town wants to approach the upgrades. The first contract would be undertaken in order to try to meet the phosphorus compliance schedule in the permits but would likely still need an extension.

Figure 6-1 WWTP Upgrade Site Layout



6.3 Construction Permitting

The following discusses potential permits that may be required for the construction of the WWTP.

6.3.1 Federal Permits and Approvals

- NPDES Stormwater Permit for Construction:
  - Construction sites greater than one acre are subject to a National Pollutant Discharge Elimination System (NPDES) Stormwater Permit for construction. It is expected the disturbed area will be greater than one acre and it will be necessary to apply for a NPDES Stormwater Permit.
- NPDES Dewatering Permit for Construction:
  - Construction dewatering activities in Massachusetts are subject to a NPDES permit. The depth of excavation is expected to be as much as 20-feet below grade for building footings, underground piping, and utilities. At this depth, construction dewatering will likely be necessary
- Army Corps of Engineers:
  - Likely not required.

6.3.2 State Permits and Approvals

- MEPA:

  Our review of the MEPA thresholds indicates that an Environmental Notification Form (ENF) and/or Environmental Impact Report (EIR) will not be required for this upgrade project. The triggers for MEPA review would not be surpassed.
- Massachusetts Historical Commission (MHC) Approval:
  - The construction of the project will take place within the existing limits of the WWTP. The Town will need to file a Project Notification Form (PNF) with the MHC if SRF financing is pursued, as this is a requirement in the construction loan application.
- Wetlands:
  - Site disturbances have the potential to fall under the wetland regulations 100-foot buffer zone. A detailed site investigation, including updated wetland boundary delineation, will be required as part of the filing of a Notice-of-Intent (NOI) with the Conservation Commission.
- Flood Plain:
  - The WWTP was constructed in compliance with the flood plain data that was available at the time. An investigation into plant compliance with the floodproofing requirements of the National Flood Insurance Program should be completed during design.
- MassDEP Plan Approval:
  - The proposed project will be subject to plan approval for modifications to a treatment plant. The submittal process will be in accordance with DEP Form # WM-16. This typically involves submitting the Preliminary Design Report and plans and specifications submittal to DEP for review and comment.
- Operator Certification:
  - The Town will submit a process flow schematic to the Wastewater Operators Certification Board at the completion of the design phase to determine if any change in the level of operator skills will be mandated. It is anticipated that the level of skill mandated will not change. Since 2008, the WWTP has been classified as a 7-C operator grade.

6.3.3 Other Permits and Approvals

The project will require building, plumbing, electrical, and demolition permits. The permits cannot be applied for until General Contractor and Subcontractors have been awarded the project for each category. The specifications will require the Contractors to apply for and obtain the permits prior to construction.

Filed sub-bids would apply to relevant sub-trades, such as electrical and HVAC, based on the size of the project.

6.4 State Revolving Fund (SRF) Loan Financing

The Town plans to seek low-interest financing from the State Revolving Fund for the project. This would require filing a Project Evaluation Form (PEF) when they become available during the first design year (which is typically the beginning of July). The typical due date for PEFs is in mid-August, and a draft Intended Use Plan (IUP) is issued by the beginning of the next year. If selected on the IUP, the full SRF construction loan application is due by October 15th prior to going out to bid the following year. The construction project must be awarded to the General Contractor by June 30th the year after the loan application is submitted in order to qualify for principal forgiveness.

In addition to low-interest loan financing, it is possible that a portion of the project may qualify for 0% interest loan financing through the nutrient removal program that is part of the SRF program. In addition to an approved Comprehensive Wastewater Management Plan (CWMP), there are several requirements the Town will need to complete to potentially qualify for 0% loan financing. The requirements are:

- The project is primarily intended to remediate or prevent nutrient enrichment of a surface water body or a source of water supply;
- The applicant is not currently subject, due to a violation of a nutrient-related total maximum daily load standard or other nutrient based standard, to a MassDEP enforcement order, administrative consent order or unilateral administrative order, enforcement action by the United States Environmental Protection Agency or subject to a state or federal court order relative to the proposed project;
- The project has been deemed consistent with the regional water resources management plans if one exists;
- The applicant has adopted land use controls, subject to the review and approval of MassDEP in consultation with the Department of Housing and Economic Development and, where applicable, any regional land use regulatory entity, intended to limit wastewater flows to the amount authorized under the land use controls that were in effect on the date the Secretary of the Executive Office of Energy and Environmental Affairs issued a certificate for the CWMP pursuant to the Massachusetts Environmental Policy Act, M.G.L. c. 30, §§ 61-62H, and the MEPA regulations at 301 CMR 11.00.

6.5 Alternative Surface Water Discharge

As part of the EPA Order, the Town is required to review alternative surface water discharge options for the WWTP. Currently, the WWTP discharges to the French Stream, which is an impaired water body with a Total Maximum Daily Load (TMDL) issued by MassDEP. As part of this requirement, the surface waters in the Town of Rockland and abutting Towns of Weymouth, Abington, Whitman, Hanson, Pembroke, and Hanover were analyzed for suitability for a new WWTP surface water discharge.

Historically, ponds and lakes have more stringent effluent limits than rivers and oceans. This is also true for rivers and streams that flow into a pond or lake. As can be seen in Figure 6-2, the surface waters surrounding Rockland are impaired, similar to the French Stream. After reviewing the published TMDLs from MassDEP through 2018, the North River in Hanover/Norwell appeared to be the only viable surface water discharge. Figure 6-3 shows the proposed path for flow to be pumped from the Rockland WWTP to the point of discharge in the North River. After reviewing the 2022 Draft TMDLs issued by MassDEP, it was noted that the North River has been added to the TMDL list for Enterococcus and Fecal Coliform. As such, there are no viable surface waters for the Town of Rockland to discharge to in the area. Regardless, a cost estimate was prepared for the proposed sewer route to the North River. Table 6-4 summarizes the costs. Two pump stations would be required to pump flow to the new discharge point. It is important to note that historically, obtaining new surface water discharge permits is unlikely to occur. In addition, the Town would require Hanover and Norwell to agree to the new sewer route, with the majority of the construction and infrastructure being located in the Town of Hanover. This is also unlikely to occur as Hanover would not see a benefit from the infrastructure. Intermunicipal Agreements would be required for both communities.

Figure 6-2 Impaired Waters Surrounding Rockland

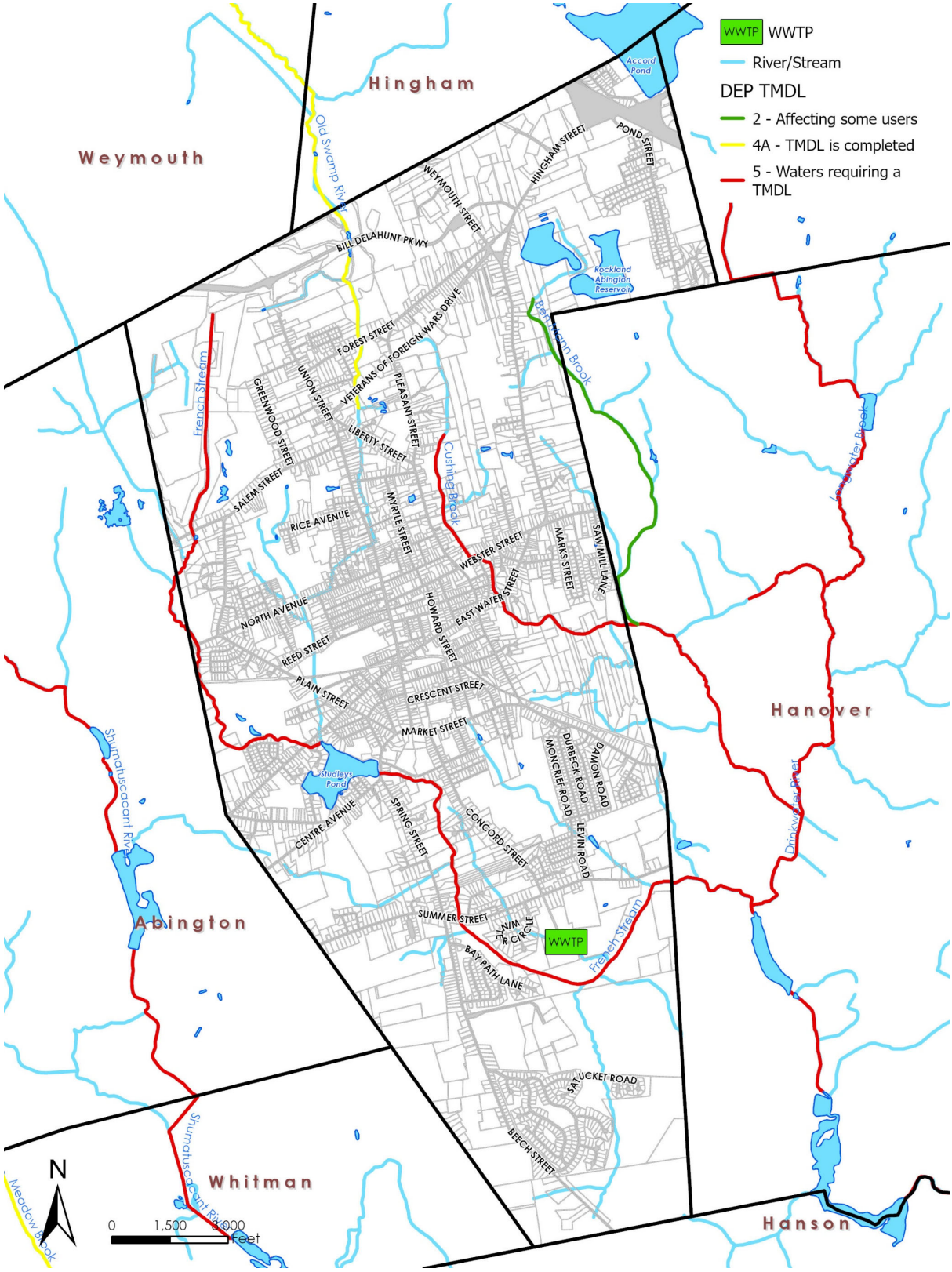


Figure 6-3 Sewer Route, Alternative Surface Water Discharge

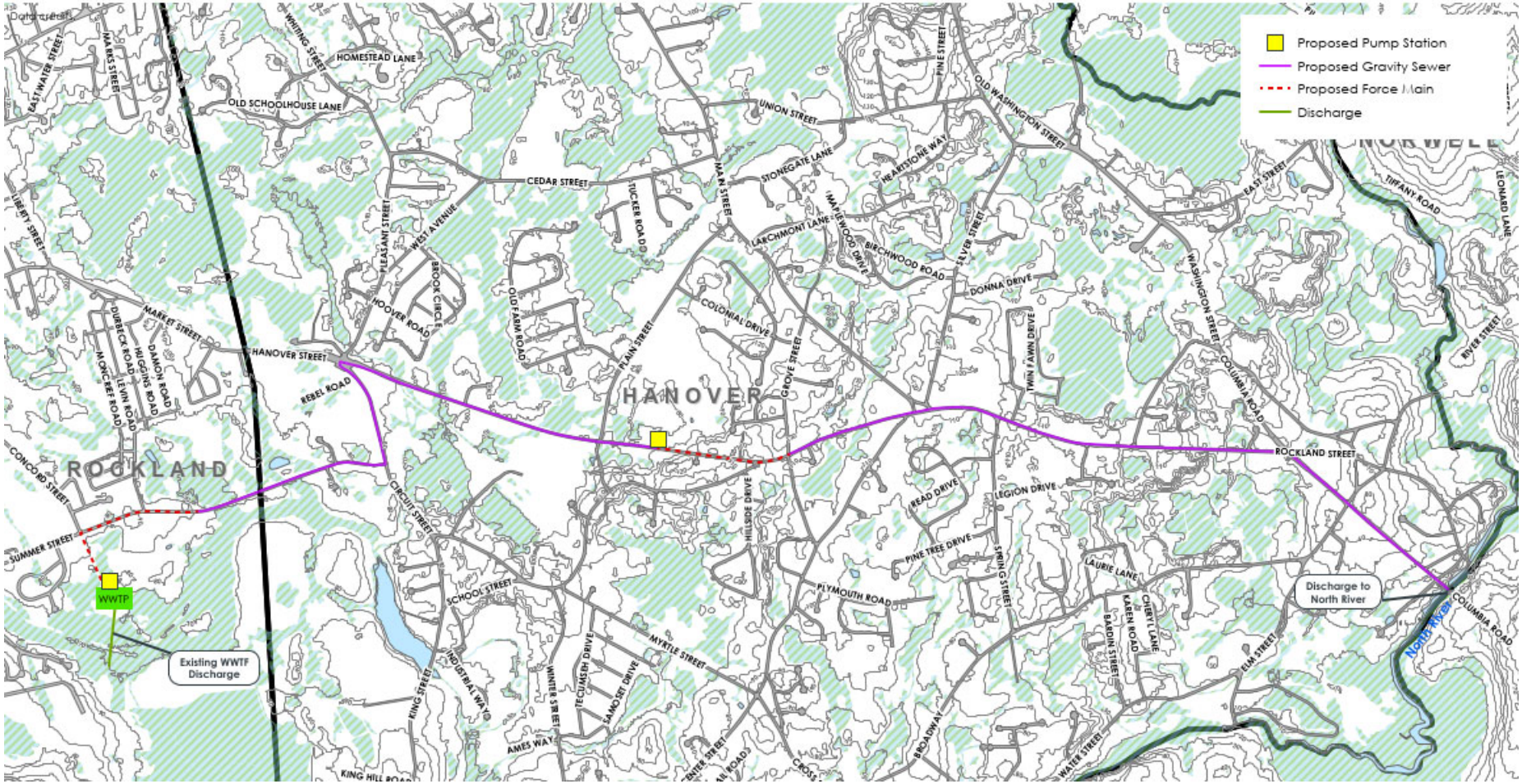


Table 6-4 Cost Estimate for Proposed Alternative Surface Water Discharge

Project Component	Cost
Gravity Sewer	$11,321,000
Manholes and Cleanouts	$843,000
Pump Stations	$1,500,000
Force Main	$1,348,000
Air Release Structures	$14,000
Ledge Allowance	$104,000
Paving	$3,126,000
Erosion Control Allowance	$50,000
Subtotal	**$18,306,000**
Construction Factors	$3,478,000
Design Contingency	$4,357,000
Inflation To Midpoint of Construction	$1,307,000
Construction Contingency	$2,740,000
Estimated Construction Cost	**$30,188,000**
Engineering Services	$4,117,000
Police Detail / Traffic Control Allowance	$250,000
Materials Testing	$137,000
Land Acquisition / Easements	$1,000,000
Legal/Administrative	$1,372,000
Financing	$274,000
Total Project Cost	$37,340,000

In addition to the impaired waters and unlikelihood of receiving a NPDES permit and public acceptance for the project, the cost for constructing new sewer and pumping stations is not economical. This approach is not recommended for the WWTP.

7

WRIGHT-PIERCE
Engineering a Better Environment

Section 7 Recommended Wastewater Management Plan

7.1 Introduction

The recommendations presented in this section of the CWMP were developed from a review of potential environmental impacts, conceptual design criteria, economic factors, regulatory compliance, and an implementation schedule that is appropriately suited for the Town of Rockland. Further, a comprehensive set of criteria were developed and evaluated, as presented in each Phase, to ensure the most appropriate wastewater management system was selected; including the protection of public health, water supply, surface water, and to preserve community character. It is important to note that economic factors are important, but they are not the only part of the evaluation process for recommending the appropriate wastewater management plan. A recommendation for each part of the wastewater system in Rockland is summarized below for the 20-year planning period.

7.2 Unsewered Areas Recommended Plan

In Section 2 of this report, the potential environmental impacts for the shortlisted alternatives for the High Needs Area were summarized. Other conditions, which factored into the final ranking, included implementation, institutional, monetary, and other impacts as presented in the following sections. Based on the analysis, the final ranking of the shortlisted alternatives for High Needs Area 1 is summarized in Tables 7-1 through 7-4, respectively.

7.2.1 Environmental Impacts

As shown in the following tables, onsite wastewater treatment alternatives (septic and I/A systems) for Needs Area 1 will have a minimal impact on the environment, assuming the treatment systems are properly designed, installed, and operated. The septic systems and I/A systems would not promote population growth or changes in the land use pattern.

For wastewater collection system extension, there are likely to be no environmental impacts after construction, assuming the proposed sewer pipes are properly installed. The sewer extension alternative may promote some population growth or commercial development within Needs Area 1, as not all parcels are currently developed.

Table 7-1 Final Ranking of Shortlisted Alternatives for Needs Area 1 – Weymouth Street

Rank	Treatment Alternative	Environmental Impacts		Implementation / Institutional Impacts	Level of Treatment	Total Present Worth Cost
		Direct	Indirect			
1	Septic Systems	M	N	N	M	M
2	I/A Systems	M	N	N	A	E

Legend: A=Adequate, E = Enhanced, M= Minimal, N=None

7.2.2 Implementation and Institutional Impacts

None of the onsite wastewater treatment alternatives (Septic and I/A systems) should result in significant implementation or institutional impacts on the Town. The wastewater collection system extension option would increase the workload of the Town wastewater staff as they would be responsible for maintaining the additional sewer piping.

7.2.3 Monetary Impacts

For the economic analysis, continuing the use of conventional septic systems over the 20-year planning period proved to be the most economical wastewater treatment alternative as shown in Tables 7-1 through 7-4. I/A systems were the second most economical option for the Needs Area. The extension of the municipal collection system to the Needs Area was economically feasible but exacerbates the issue of the existing WWTP flows/capacity. A decentralized treatment facility is a potential solution for this area but would require additional flow from the collection system and potentially a partnership with the Union Point developers to be economically feasible.

7.2.4 Other Impacts and Considerations

As part of providing a complete evaluation for selecting the appropriate wastewater treatment alternative, it is also imperative that the level of treatment obtainable with the proposed systems be considered. As was previously discussed in the CWMP Phase 2 report, septic systems will provide only a minimal level of wastewater treatment. Septic systems will not provide any significant treatment for BOD or other nutrients, such as nitrogen or phosphorus, or bacteria.

Depending on its complexity, an I/A system could produce an improved level of wastewater treatment as compared to a septic system. If the I/A system is designed with a blower and air diffuser system and is properly operated, it could provide an adequate level of wastewater treatment for BOD and some nutrient removal. Any of the wastewater collection system extension alternatives will provide an enhanced level of treatment at the WWTP. The discharge limits at the WWTP are stricter than can be accomplished through septic or I/A systems. Similarly, a decentralized WWTF would provide additional levels of treatment over septic and I/A systems.

7.2.5 Needs Area Flow Impact on Collection System and WWTP

7.2.5.1 WWTP Flow Capacity

The Rockland WWTP is designed and permitted to treat an average daily flow of 2.5 MGD. Currently, the WWTP is faced with flow capacity issues. The estimated residential and/or commercial flows for Needs Area 1 is between 1,000 and 35,000 gpd for maximum daily flows. This additional flow would exacerbate the current permitted flow/capacity issue at the WWTP. Should the flows be reduced at the WWTP, the estimated additional flows from Needs Area 1 would have minimal impact on the facility and the collection system and pump stations.

7.2.5.2 Existing Collection System Capacity Analysis

The existing collection system capacity was not reviewed as part of the scope of this CWMP. It is recommended that the Town create a hydraulic model to better understand the existing system and any pipe segments that may be approaching capacity. This could be done after the flow monitoring being conducted for the I/I investigation and reduction program. The Needs Area 1 flows should have minimal impact on the existing collection system based on the pipe size and pump stations the flow would be conveyed through and the amount of flow estimated.

7.2.6 Recommendations

Needs Area 1 is located in the north central part of Rockland. It is located near the Town of Hingham to the north, Union Point to the west and Study Area 2 to the east. This study area encompasses approximately 20.5 acres and is comprised of 5 parcels. The area has very poorly drained soils and high groundwater around the wetlands, and has a mixture of somewhat poorly drained to well drained soils in the areas away from wetlands. Parcel sizes are typically greater than one acre. The Study Area is within Zone A and Zone B surface water protection areas in the north. During Phase 1 of the CWMP, this area scored a total of 29 points and was identified as a High Needs Area.

The recommendation for High Needs Area 1 is to use septic systems throughout the 20-year planning period, should the parcels be developed into single-family homes. However, should any parcels be developed into commercial properties that would exceed the maximum septic system size, other alternatives could be warranted. Should flow/capacity issues at the WWTP be alleviated, or a decentralized WWTF be constructed at Union Point, undeveloped parcels in this area could look to either option should they be developed. A case-by-case basis is likely warranted for each parcel, depending on how they are developed. These decisions are based on the work performed in each phase of the CWMP, which included engineering evaluation, economic analysis, environmental and institutional impacts evaluation, and plan implementation. Septic systems could serve each parcel well and are the most economical option. I/A systems may be a better option in the future if groundwater quality becomes an issue.

7.2.7 Other Non-Needs Study Areas

At the completion of Phase 1 of the CWMP it was determined that the other 6 Study Areas are not “Needs Areas” and appear to be well-suited for the continued use of septic systems. As described in the following section, the implementation of a Septage Management Plan may be useful to best manage and prolong the life of the existing septic systems. Much of Rockland is currently sewered, and the unsewered parcels are in close proximity to existing sewer system piping. Much of the unsewered areas are also in or near wetlands, which make siting septic systems more difficult. Collection system extension to these areas could be warranted should undeveloped parcels require a solution other than septic systems and the existing WWTP alleviates flow/capacity issues.

7.2.7.1 Septage Management Plan

A Septage Management Plan (SMP) is recommended for the non-sewered Needs Areas where septic systems are being proposed as a long-term onsite wastewater disposal solution. Improper operation and inadequate maintenance of septic systems can cause poor performance and potentially lead to public health issues. The purpose of a SMP is to allow the Town to legally establish the septage management boundaries and to set onsite system management policies.

7.3 Recommendations for Existing Collection System

The existing wastewater collection system in the Town is between 30 and 60 years old. Much of the original system is vitrified clay pipe (VCP), which has a propensity to degrade and break over time. VCP also typically has 2 or 3 foot joints which can be a significant infiltration source. As such, the collection system has severe infiltration and inflow (I/I) problems. As a result, the WWTP has flow/capacity issues and requires bypass during high flow events (typically above 6 mgd), which are becoming more frequent in recent years. The Town has studied I/I since the late 90s and recently has undertaken steps to help reduce I/I in the existing system. I/I removal efforts are summarized below.

7.3.1 I/I Removal

The Town of Rockland has completed several investigations into the wastewater collection system. These efforts are summarized in Section 4 of this report. As a result of prior work, targeted I/I reduction is planned for the Summer of 2023. In addition, the Town is working with engineers to plan for future work to continue reducing I/I in the existing system. Table 7-1 shows a summary table for planned work with a schedule and costs that was produced by Weston & Sampson in late 2022. It is recommended that the Town continue with this planned work and update the plan as each phase is completed. In conjunction with the planned work, it is recommended to develop a hydraulic model of the existing collection system and continue mapping the system in GIS and update the database with as much information as possible for future use.

Table 7-2 Annual I/I Program Summary Table, Prepared by Weston and Sampson

Fiscal Year	Calendar Year/Month	Project Name	Scope	Subarea(s)	Sewer Length (lf)	Manholes	Estimated Cost[2]
FY 2023	Spring 2023	Year 1 Program	Town-wide meeting program and GIS-based Depth-to-Groundwater Analysis	-	-	-	$150,000
Phase 1							
FY 2024	Spring 2024	Year 2 Infiltration	Manhole inspections and television inspections	-	34,000	170	$150,000
FY 2025	Spring 2025	Year 3 Infiltration	Manhole inspections and television inspections	-	34,000	170	$155,000
FY 2026	Spring 2026	Year 4 Infiltration	Manhole inspections and television inspections	-	34,000	170	$160,000
FY 2027	Summer 2026 – Spring 2027	Year 2 to 4 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$200,000
FY 2028	Design – Summer 2027 Bid – Fall/Winter 2027 Construction – Spring 2028	Year 2 to 4 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]
Phase 2							
FY 2029	Spring 2029	Year 5 Infiltration	Manhole inspections and television inspections	-	34,000	170	$170,000
FY 2030	Spring 2030	Year 6 Infiltration	Manhole inspections and television inspections	-	34,000	170	$175,000
FY 2031	Spring 2031	Year 7 Infiltration	Manhole inspections and television inspections	-	34,000	170	$180,000
FY 2032	Summer 2031 – Spring 2032	Year 5 to 7 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$220,000
FY 2033	Design – Summer 2032 Bid – Fall/Winter 2032 Construction – Spring 2033	Year 5 to 7 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]
Phase 3							
FY 2034	Spring 2034	Year 8 Infiltration	Manhole inspections and television inspections	-	34,000	170	$191,000
FY 2035	Spring 2035	Year 9 Infiltration	Manhole inspections and television inspections	-	34,000	170	$197,000
FY 2036	Spring 2036	Year 10 Infiltration	Manhole inspections and television inspections	-	34,000	170	$203,000
FY 2037	Summer 2036 -Spring 2037	Year 8 to 10 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$240,000
FY 2038	Design – Summer 2037 Bid – Fall/Winter 2037 Construction – Spring 2038	Year 8 to 10 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]

1. Estimated costs includes construction and engineering
2. Estimated unit cost is based on 3-4% increase from previous year

	Infiltration
	Inflow
	Rehab/Construction

7.3.2 Peak Flow Storage Recommendations

As part of the EPA Order, inline and offline peak flow storage options were evaluated. Inline storage investigations concluded that a potential box culvert system could be constructed on the access road to the WWTP. This option is cost prohibitive. Offline storage options were analyzed at the existing WWTP site. The WWTP currently utilizes offline tanks for flow equalization during high flow events. Several of the tanks are proposed to be repurposed during recommended WWTP upgrades, including one of the old aeration tanks and both old secondary clarifiers. Should this be done, additional storage tanks could be constructed onsite. Constructing one or multiple aboveground tanks with pumping in and out of, is more economic than the inline option. During WWTP upgrades, the Town should consider constructing additional flow equalization onsite at the WWTP. Storage volumes are recommended to be upwards of 1 million gallons, as the current bypass initiates at 6 MGD and the future peak daily flow proposed in the WWTP evaluation is 7 MGD. Construction costs for additional tankage and pumping is estimated to be in the $3.5 million range.

7.4 Recommendations for Existing Pump Stations

The pump station recommendations are described in Section 5. The 13 pump stations were evaluated in Phase 1 of the CWMP, and recommendations provided in Phase 3, Section 5.

The evaluation consisted of a condition assessment and the development of a capital improvement plan. Butternut Lane was replaced and brought online in 2022. Spruce Street is slated for a similar replacement in 2023 or 2024. Minimal recommendations were made for these 2 stations. Recommendations varied for each station and are often related to the replacement of pumps, valves, safety upgrades, and electrical, instrumentation, and control upgrades, but also included other miscellaneous improvements based on the pump station. It was recommended that pump station upgrades be conducted based on age and several groupings were recommended to address similar age and type of station for improvements. The capital improvement plan with costs and schedule is summarized in the implementation table at the end of this section. It is acknowledged that I/I removal and WWTP improvements are a higher priority than pump station improvements for the Town. The implementation schedule is one option of many for station improvements. Currently, the Town is reserving $50,000 per year to address pump station equipment replacement/upgrades as these systems fail (and continue to age).

7.5 WWTP Upgrade Recommendations

The WWTP Upgrade recommendations are described in Section 6. An evaluation was completed in 2021, which outlined several recommendations for the facility based on age and permit-related improvements needed. The recommended improvements result in a very large upgrade with significant cost associated with such. The Town, Veolia, and Wright-Pierce are currently working together to develop a plan which could result in cost savings for the Town and spread-out improvements over several years. A design-build approach with a Guaranteed Maximum Price (GMP) is currently proposed. A summary of improvements and both approaches are summarized below with costs and typical project schedules for each approach.

The plant evaluation recommended the following improvements:

- Screening and Grit Facility
  - Provide a new facility located upstream of the influent pump station
  - One new mechanical screen and associated wash press
  - One new vortex style grit removal system and associated grit washer
  - One new grit and screenings receiving roll off
- Influent Pump Station Modifications
  - Replace existing pumps and piping
  - Address structural issues in lower wetwell
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Primary Clarifier Modifications
  - Replace clarifier sludge removal mechanisms
  - Address tank structural issues
- Secondary System Modifications
  - Modify the secondary treatment process to an A2O process to achieve additional treatment capacity and biological nitrogen and phosphorus removal
  - Repurpose the existing secondary settling tanks to activated sludge tanks (selector zones)
  - Provide a new flow distribution structure
  - Provide new mixing system for anaerobic and anoxic zones
  - Provide new mechanical mixer/aerators for the oxic zones
  - Provide new blowers and associated blower building
  - Provide new internal recycle system
  - Provide new instrumentation and control system
  - Address secondary settling tank and nitrification tank structural issues
  - Provide new return and waste activated sludge pumps, piping and valves
  - Provide new mechanical/HVAC system for lower gallery
- Secondary Clarifier Modifications
  - Modify the effluent weirs to raise the tank water surface by three feet
  - Provide new sludge removal mechanisms
  - Address tank structural issues
- Tertiary Building
  - Provide a new tertiary treatment process for phosphorus removal
  - Tertiary treatment process will include two ballasted flocculation units complete with associated pumps, mixers, hydrocylcones, chemical feed and polymer system
  - Provide a new ferric chloride storage and feed system

- Chemical Building
  - Provide a new chemical building
  - New magnesium hydroxide storage and feed system for supplemental alkalinity
  - New sodium hypochlorite storage and feed system
  - New sodium bisulfite storage and feed system
- Chlorine Contact Tanks and Effluent Pump Station
  - Address tank structural issues
- Sludge Storage tanks
  - Repurpose the ex. aeration tank to two new sludge storage tanks
  - Provide aeration and mixing devices
  - Provide a tank cover and associated odor control unit
  - Address tank structural issues
- Administration Building
  - Provide new primary sludge piping and valves
  - Provide new dewatering and sludge transfer pumps
  - Provide new blower for sludge tank mixing
  - Demolish existing lime system
  - Demolish existing lower-level chemical systems
  - Provide two new screw presses for sludge dewatering
  - Provide new polymer system
  - Provide new sludge transfer conveyor, truck loading system and odor control unit
  - Address architectural, electrical and mechanical/HVAC associated with the existing building
- Garage and Electrical Building
  - Provide a new electrical building with additional garage space
  - Provide a new generator
  - Provide a new main switch gear
- General
  - Provide a new electrical distribution system
  - Provide new site piping as required
  - Replace all existing motor control centers throughout the facility
  - Provide a new fiberoptic network and plant SCADA system
  - Address existing site lighting

The evaluation recommended abandoning the existing anaerobic digestion process. The Town is currently planning to keep the processes in place based on market drivers and flexibility.

Table 7-3 Project Cost Estimate by Unit Process

Project Component	Cost
Civil	$1,379,000
Architectural	$2,993,000
Structural	$2,767,000
Process	$11,063,000
HVAC/Plumbing	$1,057,000
Instrumentation	$1,085,000
Electrical	$5,416,000
Specials	$370,000
Construction Factors	$4,727,000
Subtotal	**$30,858,000**
Design Contingency	$6,172,000
Construction Contingency	$2,190,000
Inflation To Midpoint of Construction	$6,728,000
Estimated Construction Cost	**$45,948,000**
Engineering Services	$8,752,000
Materials Testing	$219,000
Legal/Administrative	$428,000
Financing	**$837,000**
Total Project Cost	$56,163,000

Notes:

1. Cost estimate is based on ENR INDEX 11625 12/2020
2. Cost estimate is based on eliminating the anaerobic digestion process in favor of an alternative solids handing scheme. Refurbishing the existing anaerobic digestion process would add an additional $3.0M to $5.0M to the total project cost.

Using the current ENR Index of 13175 (March 2023), the new project cost in today's dollars is approximately $63,675,000. Based on the recent bidding climate, inflation variations over the last 2 years, and supply chain issues, a conservative planning total project cost is realistically $72 million.

A typical project schedule for an upgrade of this magnitude is presented below in Table 7-4. The schedule is built around a project that utilizes SRF funding and the milestones required by MassDEP and the Trust for that funding. This schedule assumes as a single, large project.

Table 7-4 Potential Upgrade Schedule

Milestone	Timeline*
Appropriate Engineering Funds for Design	Annual Town Meeting, May 2023
Preliminary Design (30%)	**8 months, following Notice-to-Proceed**
Preliminary Design Begins	August 2023
MassDEP SRF Project Evaluation Form (PEF) Submitted	August 2023
MassDEP SRF Intended Use Plan (IUP) Notification Draft	January 2024
Final IUP	1 month
Final Design & Permitting	**12-14 months, beginning after Preliminary Design**
Appropriate Construction Funds	Annual Town Meeting, May 2024
SRF Application Submission (90% Design)	By October 15, 2024
MassDEP Project Approval Certificate (PAC)	By December 31, 2024
100% Design and Permitting Complete	December 2024
Bidding	**4 months, after 100% Design complete**
Prequalification of GCs and Subs	January 2025 (2 months)
Filed Sub-bids	March 2025 (4 weeks)
GC Bids	April 2025 (6 weeks)
Construction*	**30 months, beginning after GC selected and NTP**
Contractor Notice-to-Proceed	By June 30, 2025
Substantial Completion	December 2027
Final Completion	February 2028
One-Year Warranty Period	December 2028

*Extended construction period expected based on lead times for equipment such as generator, MCCs, switchgear, etc.

The NPDES permit compliance schedule for phosphorus requires the facility to be in compliance by February 2025. Based on the schedule outlined above, a time extension will likely be required.

The following list summarizes the proposed design-build approach with the following separate contracts to spread-out improvements to the facility.

- Tertiary Phosphorus Removal
- Address Hydraulic Capacity Issues
- Various Equipment and System Improvements
- Solids Handling Improvements

The tertiary phosphorus removal contract will be completed first, as the EPA compliance schedule requires the new process be in place by February 2025. Based on design and construction scheduling, it is likely an official time extension will be requested from EPA (recent and ongoing verbal discussions with EPA suggest a time extension is achievable). This is especially true as electrical work is proposed in Contract 1, and certain electrical equipment lead times can are currently 1-to-2 years out. The remaining contracts can be undertaken one after the other or spread out depending on priorities and Town preferences. It is possible that all Contracts could be completed within 10-to-12 years.

7.6 Groundwater Discharge Recommendations

Several options were analyzed for groundwater discharge of treated wastewater in Section 3. These options have impacts on Needs Area 1, the existing collection system, and plans for the WWTP and required improvements.

The first set of alternatives evaluated consists of utilizing effluent disposal sites for treated effluent at the WWTP. To complete this, nitrogen removal upgrades would be required at the WWTP. Should these be implemented, a pump station can be constructed at the plant, which would pump treated wastewater, prior to effluent flow metering and surface water discharge, to a groundwater disposal site. This would not alleviate average and peak flow issues for the WWTP processes but would reduce flow to the French Stream and alleviate permit compliance issues related to flow. The analysis completed for effluent disposal sites is desktop only at this time. Based on the analysis, it appears that constructing effluent disposal at the Esten School is the most viable option at this time. The site potentially has good disposal capacity and sewer routing from the WWTP can be accomplished cross-country, which would reduce construction costs (reduced pavement and utility disturbance, for example). It is also the closest site to the WWTP of the four options evaluated. The Town should consider this as a viable option for alleviating WWTP flow concerns if long-term I/I reduction does not adequately address the issue.

In addition to pumping treated effluent from the WWTP to satellite groundwater disposal locations, decentralized WWTFs were evaluated for viability to treat wastewater from Needs Area 1 and shedding flow from the existing collection system. Flow “shedding” would help to reduce influent flow to the existing WWTP, which would alleviate concerns of average and peak flow capacity. The Union Point area has the largest available land area for effluent disposal. With such a large available area, a WWTF could be constructed on 1-acre of site area and still allow room for effluent disposal. In addition, the site is located in the northern part of town, which is where the highest flow in the existing collection system is pumped and conveyed. Three options were reviewed to send flow from the existing collection system to a new decentralized WWTF at Union Point. The Forest Street pump station, Hingham Street North pump station, and a combination of both stations could have new force mains constructed to re-direct flow from the existing collection system to a new decentralized WWTF. Based on the pump station capacities, it appears that re-routing Hingham Street North or a combination of both stations would be the most viable option to fully utilize the Union Point area and to address flow issues at the existing WWTP. Due to the high cost of constructing a new facility and disposal area, it is likely that this option would only be viable if the developers of

Union Point partnered with the Town. In addition, part of the area is sited as Open Space, which may lead to conflicts with public opinion on the best use of this land area.

7.7 Project Costs and Financing Plan

This section presents an initial assessment of the varying programs available to the Town for its various wastewater projects and highlights those in particular that should be further considered. It should be noted that many of the funding sources identified below are in various states of the application process. For ease of review, we have included a summary table, Table 7-4, below that shows each funding source in order of when the applications are due.

Table 7-5 Funding Opportunities Summary

Grant	Due Date	Maximum Award	Match Requirement	Applicable Projects
House Congressional Earmarks	Early 2024	No maximum	20%	Collection System, WWTP
Senate Congressional Earmarks	Early 2024	No maximum	20%	Collection System, WWTP
Shared Streets and Spaces Grant Program	Spring	$5,000 to $500,000	No match	Collection System, Roads, Public Spaces
Municipal Vulnerability Preparedness (MVP) Action Grant	Spring	$25,000 - $2,000,000 Regional projects - $5,000,000	25%	WWTP
MassWorks Infrastructure Program	Spring	No maximum	Not required	Groundwater Discharge, Collection System, Pump Stations
Complete Streets Grant Program	May 1, 2023 and October 1, 2023	$500,000 in any four rolling fiscal year periods	None	Collection System
Clean Water State Revolving Fund Loan (CWSRF)*	July 2023	No maximum Current Principal Forgiveness – 9.9%	No match	All project types
Asset Management Grant	August 2023	$150,000	40%	All project types
Community Compact Cabinet Efficiency & Regionalization (E&R) Program	Fall 2024	$100,000 for a single entity $200,000 for multi-jurisdictional	No match	Groundwater Discharge with Union Point developers
FEMA/MEMA Hazard	Application deadlines	$4,000,000	25%	All project types related to

Grant	Due Date	Maximum Award	Match Requirement	Applicable Projects
Mitigation Grant Program (HMGP)	vary; applications open within 12-months of a presidential Major Disaster Declaration			infrastructure protection
EDA Economic Adjustment Assistance (EAA) & Public Works (PW) Programs	Rolling	EAA awards range from $150,000 - $1,000,000 PW awards range from $600,000 - $3,000,000	20% match up to 100% in certain circumstances	Groundwater discharge at Union Point
Energy Efficiency Conservation Block Grant (EECBG)	Guidance coming soon*	*	*	Pump Stations, WWTP

**SRF needed to help position for federal earmark*

7.7.1 Congressional Earmarks

The 117th Congress wrote a new set of rules that allowed them to revive Congressionally directed spending on projects – known as "earmarks." Earmarks can support a wide range of local priority projects ranging from transportation investments, water, wastewater, stormwater infrastructure, and water quality protection projects; and economic development initiatives that improve distressed and blighted areas and encourage community revitalization. To take advantage of earmarks, a locality must submit a request to at least one Member of Congress who will determine which projects to support. Member-selected projects are submitted for grant funding to 10 designated Appropriations Subcommittees, each of which reviews the submissions to consider its placement in legislation.

The US House of Representatives issues requests for Community Project Funding and the US Senate issues Congressionally Directed Spending Requests. These two programs allow communities to work directly with Congress to bring awareness to important local projects that are deserving of federal partnership and have full community support.

7.7.1.1 US House of Representatives - Community Project Funding Requests

In 2021, the US House of Representatives reinstated the use of earmarks (member-directed spending requests), and it is expected that these "Community Project Funding Requests" will be accepted again next year for FY2024. Within the US House Committee on Appropriations, there are subcommittees for different agencies and accounts.

If Rockland is interested in applying for water or wastewater-related assistance, they must submit a PEF to MassDEP for an IUP listing under the CWSRF and/or DWSRF program. IUP listing is required for earmark projects under the Interior Subcommittee USEPA STAG program as well as a 20% local match.

The application would be made through Representative Bill Keating's office in early 2024. https://keating.house.gov/cpf.

7.7.1.2 US Senate - Congressionally Directed Spending Requests

The US Senate also reinstated the earmark process and is expected to do so again for FY24. The same requirements as for water and wastewater infrastructure Community Project Funding Requests would apply.

Applications would be made through both Senator Elizabeth Warren's office Congressionally Directed Spending Federal Funding Requests FY2023 | Services | U.S. Senator Elizabeth Warren of Massachusetts (senate.gov) and Senator Edward Markey's office CONGRESSIONALLY DIRECTED SPENDING FEDERAL FUNDING REQUESTS FY2023 | Senator Edward Markey of Massachusetts (senate.gov) in early 2024.

7.7.2 Shared Streets and Spaces Grant Program

The Massachusetts Department of Transportation (MassDOT) administers the Shared Streets and Spaces Grant Program to provide financial support for quick-launch/quick-build projects that implement or expand improvements to plazas, sidewalks, curbs, streets, parking areas, and other public spaces in support of public health, safe mobility, and renewed commerce. Eligible applicants are all municipalities and public transit authorities in the Commonwealth. Eligible projects must align with the program goals of supporting public health, safe mobility, and strengthened commerce. Eligible projects are defined by the following categories:

- Speed Management: Projects to make streets safer for all users by reducing vehicle speeds (e.g., road diets or lane narrowing; speed humps; mini-roundabouts or traffic circles; raised center medians; raised intersections or crosswalks; pedestrian-activated warning devices; and pedestrian signal upgrades). Projects must provide observed speed data before and after intervention. The maximum grant award is $200,000.
- Bicycle and Pedestrian Infrastructure: Projects to make biking and walking a safe, comfortable, and convenient option for everyday trips (e.g., new, or significantly widened sidewalks; new or improved pedestrian crossings; pedestrian signal upgrades; bike lanes; trails or shared-use path connections; at-grade rail crossing improvements for bicyclists and pedestrians; bicycle parking; pedestrian or bicyclist lighting or wayfinding; new bike-share equipment; and bicycle-friendly drain grates). The maximum grant award is $200,000.
- Transit Supportive Infrastructure: New facilities for public buses, including but not limited to, dedicated bus lanes, traffic signal priority equipment, and bus shelters. The maximum grant award is $500,000.
- Main Streets: Repurposing streets, plazas, sidewalks, curbs, and parking areas to facilitate outdoor activities and programming. The maximum grant award is $100,000.
- Equipment Only: Purchase of eligible equipment (e.g., speed feedback signs; pedestrian-activated warning devices; flex posts and other bicycle lane delineators; bicycle racks; bicycle repair stations; signal equipment; pavement markings and/or paint; safety/ directional signage for pedestrians and bicyclists; and snow removal equipment for pedestrian and bicyclist facilities. The maximum grant award is $50,000. Municipalities are eligible to receive two Equipment Only grants in addition to an award for another project type within the same grant round.

In Round 4, preference was given to projects that: promote speed management; are in a Census Block Group identified as an Environmental Justice Community or as having a median household income below the statewide median income; support safe travel to schools; support safe routes for seniors; provide safe routes to open spaces, playgrounds, and parks; provide key public transit connections; and demonstrate community support. Priority will also be given to projects in communities that have Housing Choice designation, have implemented economic

development best practices through the Community Compact program, and/or are proposing a project that will benefit from an Opportunity Zone Fund investment. A match is not required, however, is highly recommended. For more information, visit Shared Streets and Spaces Grant Program | Mass.gov.

7.7.3 Municipal Vulnerability Preparedness (MVP) Action Grant

The Massachusetts Office of Energy and Environmental Affairs (EEA) administers the Municipal Vulnerability Preparedness Grant Program's MVP Action Grants to provide financial and technical assistance to designated "MVP Communities" to implement priority adaptation actions identified through the MVP planning process, or similar climate change vulnerability assessment and action planning that has led to MVP designation.

Eligible projects must address one (or more) priority implementation actions within the municipalities MVP plan/report and use best available techniques and climate projections.

Funding amounts range from $25,000 to $2 million. Regional projects may request up to $5 million. A minimum 25% match of the total project cost is required. Applications are typically due in late spring or early summer. Visit https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program for more information.

7.7.4 MassWorks Infrastructure Program

The Massachusetts Executive Office of Housing and Economic Development administers the MassWorks Infrastructure Program to provide competitive grants for public infrastructure that support and accelerate housing production, spur private development, and create jobs. Eligible projects include the design, construction, building, land acquisition, rehabilitation, repair, and other improvements to publicly owned infrastructure including, but not limited to, sewers, utility extensions, streets, roads, curb-cuts, parking, water treatment systems, telecommunications systems, transit improvements, public parks and spaces within urban renewal districts, and pedestrian and bicycle ways. Program investments will be targeted to projects that require infrastructure improvements or expansion to support and/or facilitate new growth or address safety issues.

Generally, the most competitive applications are:

- Advanced in their design and permitting,
- Ready to begin in the upcoming construction season,
- Leveraging related private development that is also ready to start construction in the near term, and
- Aligned with the program's spending targets, and the state's sustainable development goals.

Only those projects that are prepared to proceed to construction in the Spring 2024 construction season should apply for consideration (a 25% design must be complete by grant application submission deadline). There are no set minimum or maximum grant awards. A match is not required, however, applications that include funding support from other government or private sources (particularly local funds) will be more competitive.

Section 3A to the Zoning Act (Chapter 40A of the General Laws) requires each of the 175 MBTA communities to have a zoning district in which multifamily zoning is permitted as of right, and that meets other requirements set forth in the statute. Any MBTA community that does not comply with Section 3A will not be eligible for funding from the MassWorks Infrastructure Program.

Applications are typically due in the spring and submitted through the Massachusetts Community One Stop for Growth application portal.

7.7.5 Complete Streets Grant Program

The MassDOT Complete Streets Funding Program provides technical assistance and construction funding to eligible municipalities. Eligible municipalities must pass a Complete Streets Policy and develop a Prioritization Plan. The Complete Streets grant funding awards are used to fund local, multi-modal infrastructure improvement projects, as identified in each municipality's submitted Complete Streets Prioritization Plan. Examples of projects that can be addressed through the program include improved street lighting, radar speed signage, intersection signalization, new shared bike paths, designated bicycle lanes, ADA/AAB compliant curb ramps, transit signal prioritization, and transit pedestrian connection improvements such as ramps, signage, and new signals at crosswalks.

Effective Fiscal Year 2022 Grant Round 1, municipalities are eligible to receive up to $500,000 in any rolling four-fiscal-year period. In other words, a municipality may only receive one full $500,000 grant, or several smaller grants, during any four-fiscal-year timeframe. Tier 3 construction applications are accepted on May 1st or October 1st, annually.

7.7.6 Clean Water State Revolving Fund Loan (CWSRF)

The CWSRF program provides low-interest rate financing to municipalities to construct water quality protection projects such as sewers and wastewater treatment facilities. A variety of publicly owned water quality improvement projects are eligible for financing. As part of the BIL, Massachusetts expects to receive $60.48 million for the CWSRF Supplemental Grant. The Supplemental CWSRF Grant requires that Massachusetts provide at least $29.6 million, 49% of its total grant amount, as loan forgiveness to eligible projects based on the affordability tier system. The Clean Water State Revolving Fund (CWSRF) offers loans at a 0% interest rate for projects primarily intended to remediate or prevent nutrient enrichment of a surface water body or water supply.

In addition, communities that have earned the Housing Choice designation at the time of the SRF project solicitation are eligible to have their loan's interest rate reduced by 0.5% (for example from 2% to 1.5% for a standard term loan).

Rockland is currently designated a Tier 2 Affordability Community (disadvantaged). and is eligible to receive 6.6% principal forgiveness.

Table 7-6 SRF Loan Forgiveness Summary

Tier	Percent of State APCI	Minimum Loan Forgiveness
1	Greater than 80%, but less than 100%	3.3%
2	Greater than 60%, but less than 80%	6.6%
3	Less than 60%	9.9%

Project Evaluation Forms (PEFs) are due annually in July/August.

7.7.7 Asset Management Grant Program

The Massachusetts Department of Environmental Protection (MassDEP) in partnership with the Massachusetts Clean Water Trust (the Trust) administers the Asset Management Plan Grant program to assist public entities in developing water infrastructure Asset Management Plans (AMPs). Up to $2 million was available for CY 2022. Eligible applicants are any city, town, special district, or other existing municipal governmental sub-unit which owns and controls a drinking water, wastewater, stormwater, or water re-use treatment or conveyance system. Eligible projects are new and complete AMPs, or supplements to existing AMPs that do not cover all aspects of asset management. Eligible project activities include:

- Asset Inventory: All activities that expand the applicant's asset information and ability to access and organize that information for management purposes.
- Level of Service: All activities that clarify the applicant's performance goals and means of measuring performance are eligible.
- Criticality/Risk Analysis: All activities related to asset characterization and identification of critical assets are eligible. Evaluations of the consequences of failure (criticality), such as replacement costs, collateral damage, and reduction in level of service to sensitive customers are also eligible activities.
- Life Cycle Cost (LCC) Analysis: All activities that apply LCC analysis to inform decisions about capital projects are eligible including asset construction, expansion, rehabilitation, or replacement.
- Funding Analysis: All activities that lead to creating a sustainable financial structure for the utility including determining the full cost of service over the long term and creating a rate structure that is suitable for the community.
- Asset Management Software and Training: All activities required to select, purchase, install, integrate, and successfully run AM Software are eligible including associated training.
- Asset Management Program Plan (AMPP): provisions for creating a written plan for continuing to operate and/or develop the AMP.
- Asset Management Report (AMR): provisions for generating reports of the conclusions of various asset evaluations and prioritizations, level of service goals and performance analysis, LCC analysis, and rate structure review, etc.
- Public Education: provisions for sharing the conclusions of the AM Planning or the status and capabilities of the AMP with the public in any format. Applicants must select a pre-qualified engineering consultant (e.g., Wright-Pierce) from a list approved by the Trust to assist with preparation of the AMP. The maximum grant award is $150,000, or 60% of the total project cost, whichever is less. A 40% match is required, of which up to 50% may be made up of in-kind services.

Small systems may be eligible to use in-kind services for up to 100% of their total match. Applicants may use Clean Water or Drinking Water SRF loans to finance cash contributions. Applicants must complete the Project Evaluation Form (PEF) to be included on the CY 2023 Intended Use Plan (IUP) project list for consideration to receive funding. PEFs are due in August 2023. For more information, visit Asset Management Planning Grant Program | Mass.gov.

7.7.8 Community Compact Cabinet Efficiency and Regionalization (E&R) Program

The Massachusetts Department of Revenue, Division of Local Services administers the Community Compact Cabinet Efficiency and Regionalization (E&R) program to provide financial support for governmental entities interested in implementing regionalization and other efficiency initiatives that allow for long-term local government. Eligible applicants are sustainability municipalities, regional school districts, school districts considering forming a regional school district or regionalizing services, regional planning agencies, and councils of

governments. Municipalities are eligible to submit one individual application and may participate in one multi-jurisdictional application. Funds will be provided to assist in the planning and implementation of regionalization and other efficiency initiatives that support long-term municipal sustainability:

- Regionalization: shared services, joint or regional facilities, intergovernmental agreements, consolidations, mergers and other collaborative efforts.
- Internal Efficiencies: for a single entity to plan and implement innovative strategies that improve the quality and efficiency of municipal service delivery.

Planning and implementation activities are eligible. All municipalities associated with the application must have entered into a Compact in order to qualify for bonus points. The maximum award is $100,000 for a single entity and $200,000 for multi-jurisdictional applications. **Applications opened in the Fall of FY23.** For more information, visit Asset Management Planning Grant Program | Mass.gov.

7.7.9 Hazard Mitigation Grant Program (HMGP)

The Massachusetts Emergency Management Agency (MEMA) administers the federal Hazard Mitigation Grant Program (HMGP). Funds may be available statewide following a Presidential Major Disaster Declaration as requested by the Governor, with priority given to projects in the area of the state affected by the disaster. These funds assist communities to enact mitigation measures that reduce the risk of loss of life and property from future disasters. Eligible applicants include local governments who are part of a FEMA-approved multi-jurisdictional county hazard mitigation plan (or plan that is in the process of being updated), Native American tribes, and private non-profit organizations (sponsored by local government).

HMGP funds new and/or updated hazard mitigation plans, planning-related activities, and projects that result in an increase in the level of protection from natural hazard damages including:

- Stormwater upgrades.
- Drainage and culvert improvements.
- Property acquisition.
- Slope stabilization.
- Infrastructure protection.
- Seismic and wind retrofits; and
- Structure elevations.

All applicants and sub-applicants for projects must have a FEMA-approved Hazard Mitigation Plan by the application deadline and at the time of obligation of grant funds. Generally, the cost-share is 80% federal grant / 20% non-federal match (cash and/or in-kind services)**. Additional funding rounds may be available following a Presidential disaster declaration.**

7.7.10 U.S. Economic Development Agency Economic Adjustment Assistance and Public Works Program

The U.S. Economic Development Administration's (EDA) Economic Adjustment Assistance and Public Works Program provides funding to help distressed communities build, design, or engineer critical infrastructure and facilities that will help implement regional development strategies and advance bottom-up economic development goals to promote regional prosperity. Eligible projects shall build, design, or engineer sewer infrastructure and facilities that will help implement regional development strategies and advance bottom-up economic development goals to promote regional prosperity in distressed communities.

Investments made through the Public Works program must be aligned with a current CEDS or EDA-accepted regional economic development strategy and clearly lead to the creation or retention of long-term high-quality jobs.

To be eligible for funding each project must be consistent with the region's current Comprehensive Economic Development Strategy (CEDS) or equivalent EDA-accepted regional economic development strategy that meets EDA's CEDS or strategy requirements. Grant awards typically range from $600,000 to $3 million and the average award is approximately $1.4 million. Generally, the amount awarded by the Public Works Program is 50% of the total project cost. However, depending on the economic needs of the region in which the project is located, the EDA may award up to 80% of the total project cost. Applications are accepted on a rolling basis.

7.7.11 Energy Efficiency Conservation Block Grant (EECBG)

The Bipartisan Infrastructure Law (BIL) allocated $550 million for the Energy Efficiency and Conservation Block Grant (EECBG) to support communities with financial assistance to complete renewable energy, sustainable transportation and energy efficiency projects. Cities with a population greater than 35,000 or the top 10 most populous cities in each state are automatically eligible for EECBG formula funding from the U.S. Department of Energy (DOE). Cities that do not meet the criteria for the formula funds are eligible to apply through their state.

DOE released formula allocations (EECBG Program Formula Grant Application Hub | Department of Energy) along with information on how to receive the funding. Massachusetts EECBG non-formula grant guidance will be released in the coming months.

7.7.12 Rate Study

In addition to funding opportunities listed above, primary funding for upgrades to the collection system, pump stations, and WWTP are recovered through user fees. A rate study was conducted in late 2022 through early 2023. The report can be found in Appendix D. A summary of the findings is included below in Table 7-7.

Table 7-7 Rate Study Findings

Depart.	Project	Estimated $	Funding Source	Req. Year	Rec. Year	FY 2023	FY 2024	FY 2025	FY 2026	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038
Sewer	Inflow & Infiltration Remediation Syst - Extended FY33	$2,200,000	Sewer Und FB	2016	2019		$200,000	$200,000	$200,000.00	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000						$200,000
Sewer	Inflow & Infiltration Annual Control Plan- Extended FY38	$2,241,000.	Sewer Und FB	2023	2024		$150,000	$155,000	$160,000	$200,000		$170,000	$175,000	$180,000	$220,000		$191,000	$197,000	$203,000	$240,000		$155,000
Sewer	Inflow & Infiltration Reoperation	$330,000	ARPA	2022	2023	$330,000																
Sewer	Digester Building Gas Lines	$350,000	Sewer Und FB + ARPA	2022	2024		$20,000															
Sewer	Digester Recirculation Pumps	$50,000	Sewer Und FB	2022	2025			$50,000														$50,000
Sewer	New Heating System - office building	$150,000	Sewer Und FB Grant to cover $50,000	2023	2025			$100,000														$100,000
Sewer	Portable Generator	$500,000	ARPA	2023	2024																	
Sewer	Spruce Street Ejector Station	$100,000	Sewer Und FB	2022	2024		$100,000															
Sewer	Sewer I/I Rehabilitation (Every 4 Years, $2M/year)	$6,000,000	SRF Borrowing	2028	2029						$2,000,000					$2,000,000					$2,000,000	
Sewer	Pump Station Upgrade - Phases 2 to 5	$200,000	SRF Borrowing	2024	2025			$50,000	$50,000	$50,000	$50,000											$50,000
Design Phase	WWTF Design/ Bidding - $2.5M total - Contract 1	$1,500,000	Conventional Loan ($1.5M) ARPA ($1M)	2024	2025		$1,500,000															
Treatment Upgrade	Phosphorus/ Tertiary Treatment Upgrade - Contract 1	$12,500,000	SRF Borrowing	2025	2026			$12,500,000														$12,500,000
Construction	WWTP Upgrades - Contracts 2 thru 4	$65,000,000	SRF Borrowing	2026	2027		$200,000		$12,000,000	$12,000,000	$11,000,000	$7,000,000	$7,000,000	$6,000,000	$5,000,000	$5,000,000						
							Phosphorous Treatment System,		Improve Hydraulic Capacity, New Screening, and Grit			Misc. Equipment, System Improvements, and Nitrogen				Solids Handling and Process						

Table 7-8 Summary

Funding Source			FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
ARPA			$330,000	$830,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Conventional Loan			$ -	$1,500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Gen Fund			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grant			$ -	$ -	$50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Und FB			$ -	$470,000	$505,000	$360,000	$400,000	$200,000.00	$370,000	$375,000	$380,000	$420,000	$200,000
SRF Borrowing			$ -	$ -	$12,550,000	$12,050,000	$12,050,000	$13,050,000	$7,000,000	$7,000,000	$6,000,000	$5,000,000	$7,000,000
Totals			$330,000	$2,800,000	$13,105,000	$12,410,000	$12,450,000	$13,250,000	$7,370,000	$7,375,000	$6,380,000	$5,420,000	$7,200,000
Control			$330,000	$2,800,000	$13,105,000	$12,410,000	$12,450,000	$13,250,000	$7,370,000	$7,375,000	$ 6,380,000	$ 5,420,000	$7,200,000
Diff			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

7.8 Implementation Plan

The wastewater management plan includes the financing and construction of various capital improvement projects throughout the Town. These recommendations include careful consideration, planning, and scheduling over the 20-year planning period. An implementation schedule is included in Table 7-9 which summarizes each aspect of the recommended upgrades presented in Phase 3 of the CWMP. The recommendations do not include costs for groundwater discharge or peak flow storage options as they are not recommended at this time.

Table 7-9 WWTP, Pump Stations, and Wastewater Collection System Implementation Plan

Item	Total Est. Costs Per Item	Plan Year																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Collection System	$6,741,000	$150,000	$155,000	$160,000	$200,000	$1,500,000	$170,000	$175,000	$180,000	$220,000	$1,500,000	$191,000	$197,000	$203,000	$240,000	$1,500,000	$250,000	$250,000	$250,000	$250,000	$2,000,000
Pump Stations																					
Forest Street	$964,000					$964,000															
Lincoln Road	$618,000					$618,000															
Wheeler Avenue	$1,163,000				$1,163,000																
Summer Street	$1,170,000				$1,170,000																
John Burke Drive	$1,163,000				$1,163,000																
Hingham Street – North	$1,628,000						$1,628,000														
Hingham Street – South	$1,784,000						$1,784,000														
Market Street	$864,000			$864,000																	
Woodsbury Road	$786,000			$786,000																	
Millbrook Drive	$765,000					$765,000															
Old Country Way	$765,000		$765,000																		
Spruce Street	$615,000																				$615,000
Butternut Lane	$618,000																				$618,000
WWTP	$72,000,000	$1,000,000	$1,115,000	$15,512,000	$641,000	$640,000	$9,395,000	$1,661,000	$1,661,000	$24,360,000	$961,000	$961,000	$14,093,000								
Total	$91,644,000	$1,150,000	$2,035,000	$17,322,000	$4,337,000	$4,487,000	$12,977,000	$1,836,000	$1,841,000	$24,580,000	$2,461,000	$1,152,000	$14,290,000	$203,000	$240,000	$1,500,000	$250,000	$250,000	$250,000	$250,000	$3,233,000

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APPENDIX

Appendix A
Public Hearing Presentation & Meeting Minutes

Comprehensive Wastewater Management Plan

Public Hearing

September 6, 2023

Kevin Olson, PE
Adam Higgins, PE

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Presentation Overview

- Project Team
- Reasons for Comprehensive Wastewater Management Plan (CWMP)
- Phase 1 Overview
- Phase 2 Overview
- Phase 3 Overview
- Funding/Financing
- Questions & Discussion

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Project Team – Town of Rockland

Board of Sewer Commissioners

Chuck Heshion

Daniel E. DuRoss

Sherri Vallie

Project Team – Veolia

Veolia Staff, WWTP and PS Operations

Rick Kotouch
Project Manager

Megan Lynch
Asst. Project Manager

Project Team – Wright-Pierce Engineers

Kevin Olson

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978.416.8900

Adam Higgins

adam.higgins@wright-pierce.com
978.416.8020

Reasons for the CWMP

Town-Wide Planning
- 20-year period
- Unsewered areas
- Proposed developments
- Key areas of protection and environmental concern

Wastewater Collection System
- Existing pipes
- Pump stations
- Capacity
- I/I Control

Wastewater Treatment Plant
- New NPDES Permit
- Aging equipment
- Current building code requirements
- Capacity

Project Financing
- 0/2 % SRF Loan
- 20 or 30-year Loan
- Other requirements

Town, Veolia, EPA and MassDEP involvement throughout project: Workshops, Meetings, Reviews

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Comprehensive Wastewater Management Plan Approach

1 Phase 1 – Existing Conditions, Problem Identification and Needs Assessment

2 Phase 2 – Alternatives Identification and Screening

3 Phase 3 – Detailed Evaluation of Alternatives and Recommended Wastewater Management Plan

Rockland's Overall CWMP Approach

1 Phase 1 – Assessment of Existing Conditions

2 Phase 2 – Alternatives Identification and Screening

3 Phase 3 – Evaluation of Short-Listed Alternatives in Phase 2 and Develop a Recommended Wastewater Management Plan

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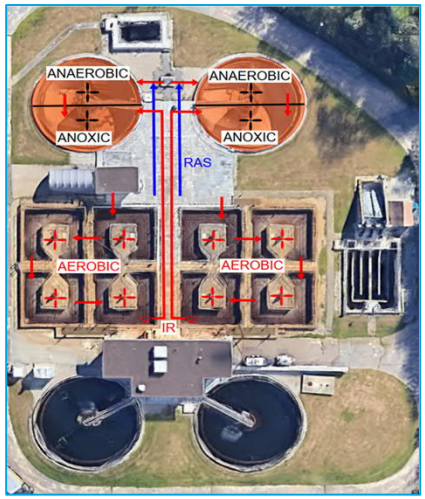
Previous Planning/Studies/Projects



WWTP Assessment

WP evaluated the WWTP and provided recommendations to improve the WWTP, including secondary and tertiary treatment solutions. Completed Spring 2021.

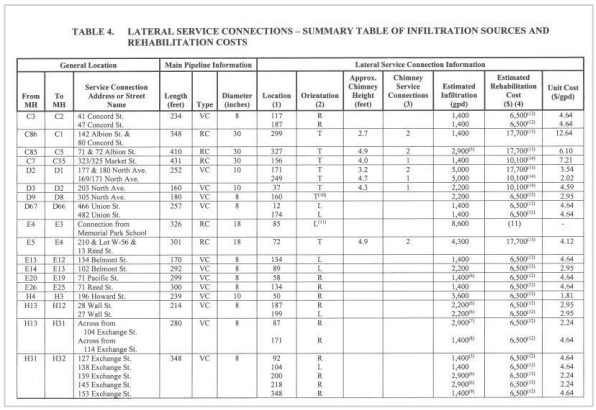
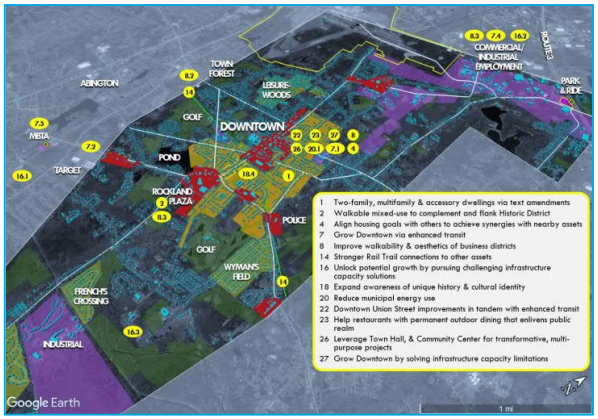


TABLE 4. LATERAL SERVICE CONNECTIONS – SUMMARY TABLE OF INFILTRATION SOURCES AND REHABILITATION COSTS

General Location			Main Pipeline Information			Lateral Service Connection Information						
From MH (gpd)	To MH	Service Connection Address or Street Name	Length (feet)	Type	Diameter (inches)	Location (1)	Orientation (2)	Approx. Chimney Height (feet)	Chimney Service Connections	(3)	Estimated Infiltration (gpd)	Estimated Rehabilitation Cost ($) (4)	Unit Cost ($/gpd)
C3	C2	41 Concord St.	234	VC	8	117	R				1,400	6,500[12]	4.64
		47 Concord St.				187	R				1,400	6,500[12]	4.64
C86	C1	142 Albion St. & 80 Concord St.	348	RC	30	299	T	2.7	2		1,400	17,700[13]	12.64
C85	C5	71 & 72 Albion St.	410	RC	30	327	T	4.9	2		2,900[15]	17,700[13]	6.10
C7	C35	323/325 Market St.	431	RC	30	156	T	4.0	1		1,400	10,100[14]	7.21
D2	D1	177 & 180 North Ave. 169/171 North Ave.	252	VC	10	171	T	3.2	2		5,000	17,700[13]	3.54
						249	T	4.7	1		5,000	10,100[14]	2.02
D3	D2	203 North Ave.	160	VC	10	37	T	4.3	1		2,200	10,100[14]	4.59
D9	D8	305 North Ave.	180	VC	8	160	T[10]				2,200	6,500[12]	2.95
D67	D66	466 Union St.	257	VC	8	12	L				1,400	6,500[12]	4.64
		482 Union St.				174	L				1,400	6,500[12]	4.64
E4	E3	Connection from Memorial Park School	326	RC	18	85	L[11]				8,600	(11)	-
E5	E4	210 & Lot W-56 & 13 Reed St.	301	RC	18	72	T	4.9	2		4,300	17,700[13]	4.12
E13	E12	134 Belmont St.	170	VC	8	134	L				1,400	6,500[12]	4.64
E14	E13	102 Belmont St.	292	VC	8	89	L				2,200	6,500[12]	2.95
E20	E19	71 Pacific St.	299	VC	8	58	R				1,400[16]	6,500[12]	4.64
E26	E25	71 Reed St.	300	VC	8	134	R				1,400	6,500[12]	4.64
H4	H3	196 Howard St.	239	VC	10	50	R				3,600	6,500[12]	1.81
H13	H12	28 Wall St.	214	VC	8	187	R				2,200[16]	6,500[12]	2.95
		27 Wall St.				199	L				2,200[16]	6,500[12]	2.95
H13	H31	Across from 104 Exchange St. Across from 114 Exchange St.	280	VC	8	87	R				2,900[17]	6,500[12]	2.24
						171	R				1,400[18]	6,500[12]	4.64
H31	H32	127 Exchange St.	348	VC	8	92	R				1,400[15]	6,500[12]	4.64
		138 Exchange St.				104	L				1,400	6,500[12]	4.64
		139 Exchange St.				200	R				2,900[16]	6,500[12]	2.24
		145 Exchange St.				218	R				2,900[16]	6,500[12]	2.24
		153 Exchange St.				348	R				1,400[18]	6,500[12]	4.64

Infiltration/Inflow (I/I) and Sewer System Evaluation Survey (SSES)

I/I and SSES work previously completed and ongoing. 2021 SSES included recommendations to reduce I/I. Sewer rehabilitation project and flow monitoring completed in Summer 2023



Master Plan of 2030

The Town of Rockland's roadmap for planning from 2020 to 2030 to achieve the Town's long-term goals and objectives for the community.

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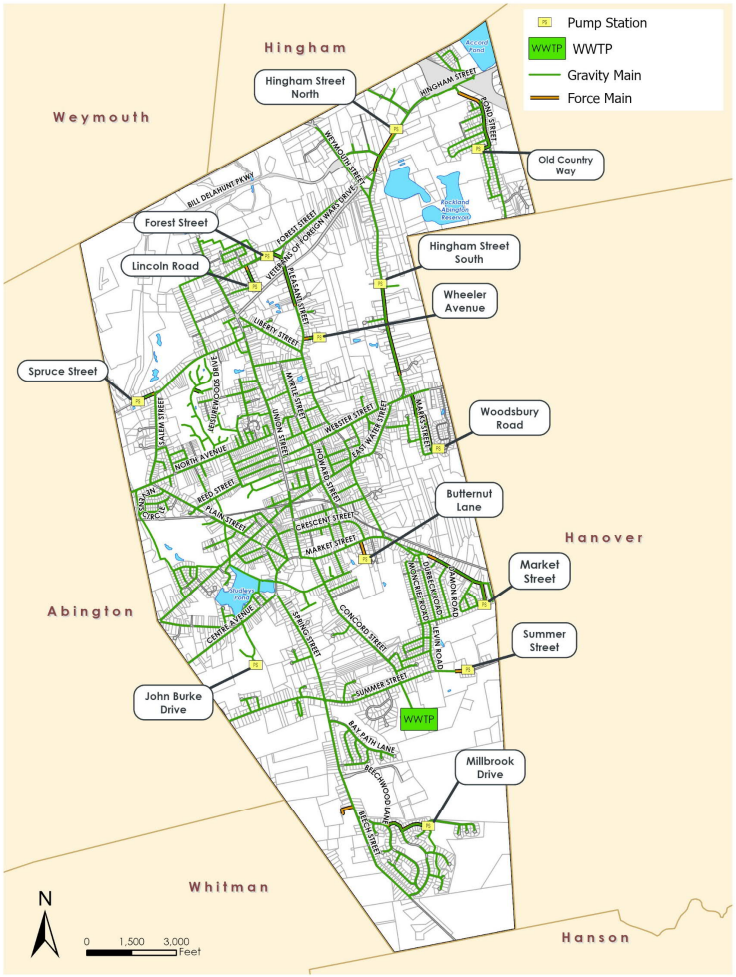
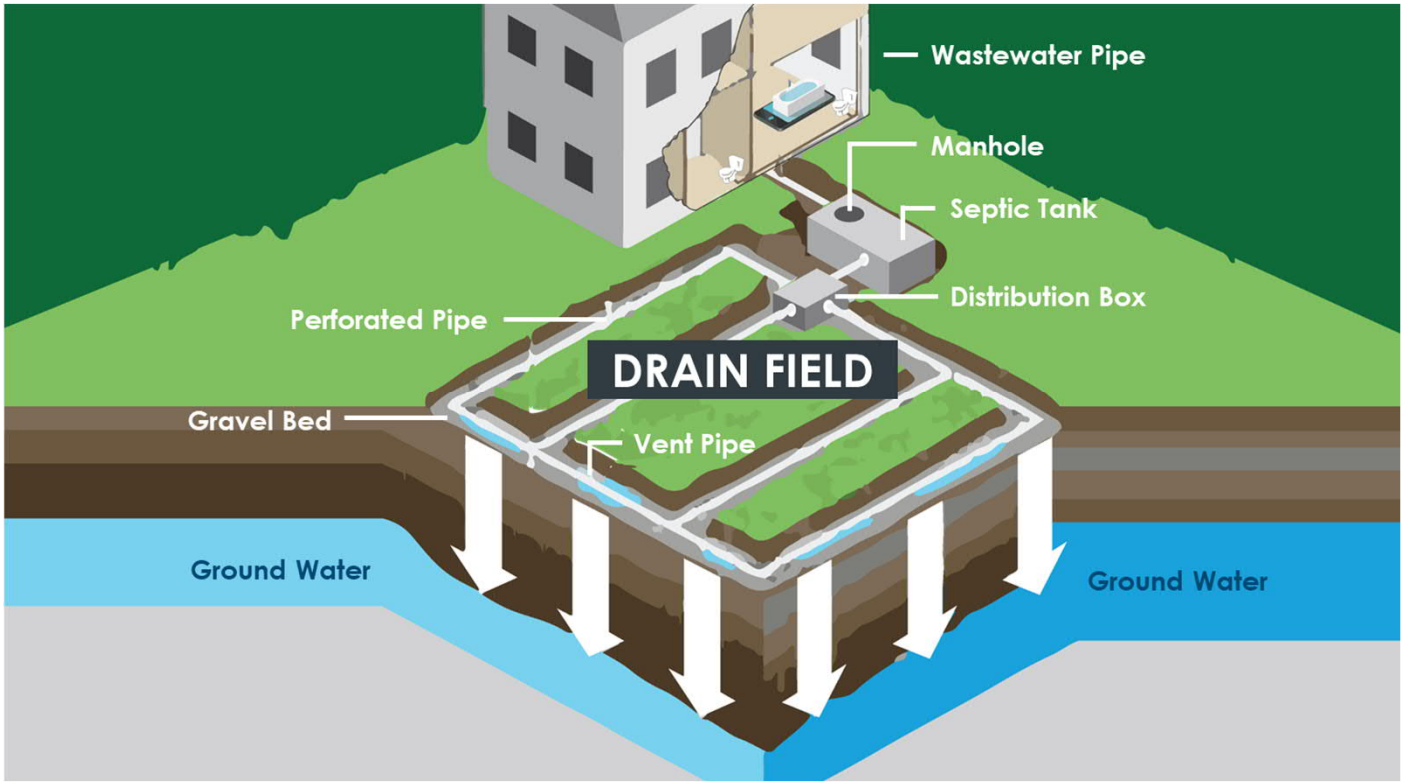
Phase 1 CWMP

- Existing conditions
  - Town metrics
  - Planning area
  - Wastewater collection & treatment
  - Water treatment & distribution
- Develop Study Areas
- Perform wastewater needs assessment

Existing Wastewater Collection System



Onsite Subsurface Wastewater Disposal Systems

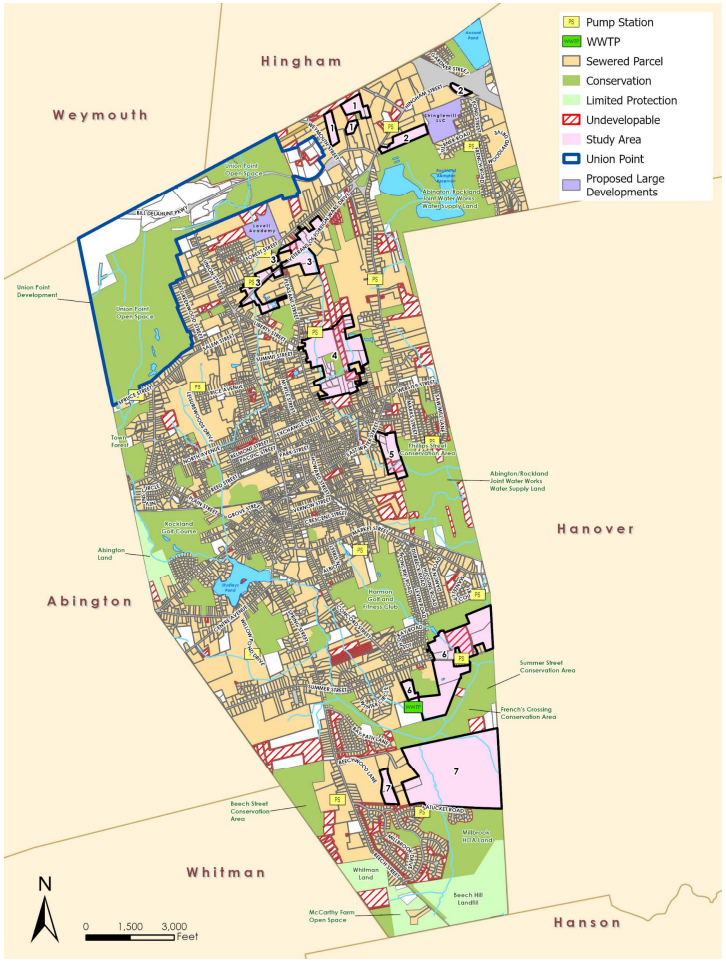


- Few residents serviced by onsite systems
- Septic systems typically include
  - Septic tank
  - Distribution box
  - Leach/drain field
- Cost-effective solution
  - Need
    - Ideal soils
    - Adequate depth to groundwater/bedrock
    - Spatial parcel sizes
    - Separation from drinking water supplies

Determination of Study Areas for Non-Sewered Areas

7 Study Areas

- Areas determined by
  - Environmental criteria
  - Topography
  - Major roads
- Parcels removed
  - Protected open space
  - Non-developable area (wetlands, etc.)
  - Town-owned land
  - Planned large developments



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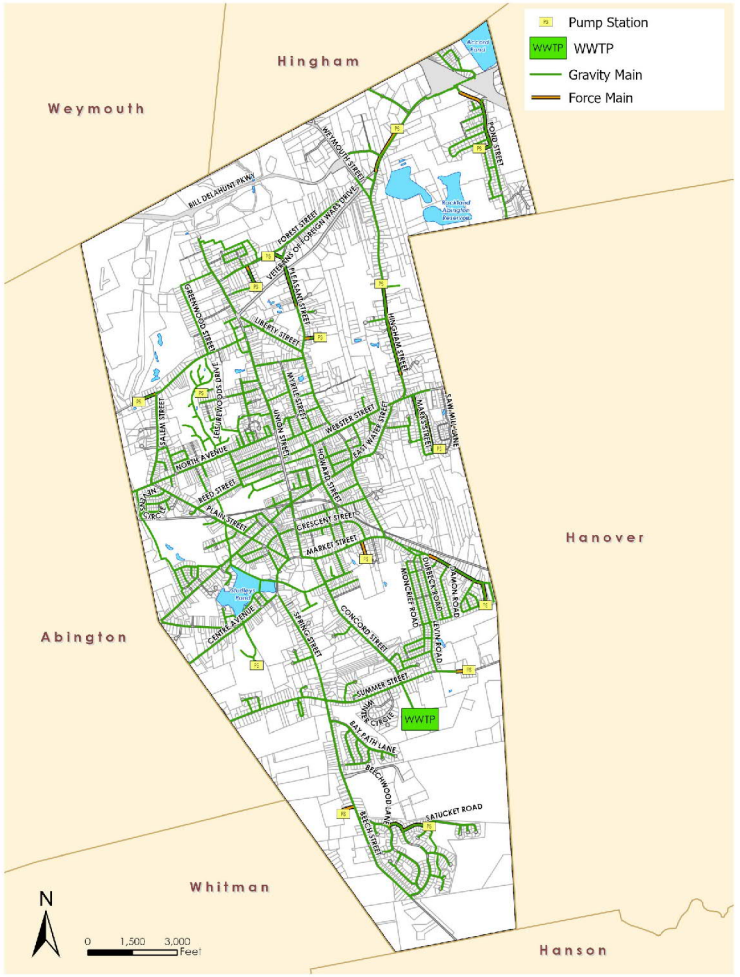
Scoring of Study Areas

Study Area		Primary Criteria (Ranking 0 to 10)						Secondary Criteria (Ranking 0 to 5)						Total Score	Study Area Ranking
No.	Name	Soils Drainage Class	Depth to Water Table	Depth to Bedrock	Parcel Sizes	Private Wells	*Primary Total*	Drinking Water Protection District	Areas Within Regulated Setbacks	Flood Plains	Priority/Established Habitat Areas	Historic District	*Secondary Subtotal*		
1	Weymouth Street	6	8	3	1	0	*18*	3	2	4	0	0	*9*	27	High
2	Pond Street	5	4	0	1	0	*10*	5	3	4	0	0	*12*	22	Avg
3	VFW	4	3	0	3	0	*10*	3	3	0	0	0	*6*	16	Low
4	Liberty Street	5	5	0	1	2	*13*	0	2	2	0	0	*4*	17	Low
5	East Water Street	8	7	0	1	0	*16*	0	2	2	0	0	*4*	20	Avg
6	Summer Street	8	6	0	0	0	*14*	0	2	3	0	0	*5*	19	Low
7	Industrial Way	7	6	0	0	0	*13*	3	2	4	0	0	*9*	22	Avg

Existing Wastewater Infrastructure

- Approximately 57 miles of gravity sewer and 4 miles of force main
- 13 pump stations
- Serves approximately 18,000 customers from Rockland and small parts of Abington
- 1 WWTP with NPDES Permit flow limit of 2.5 MGD with new strict seasonal TP Limit of 0.1 mg/L



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Collection System Evaluation

Pump Stations Evaluation

WWTP Evaluation

WWTP Upgrade Drivers

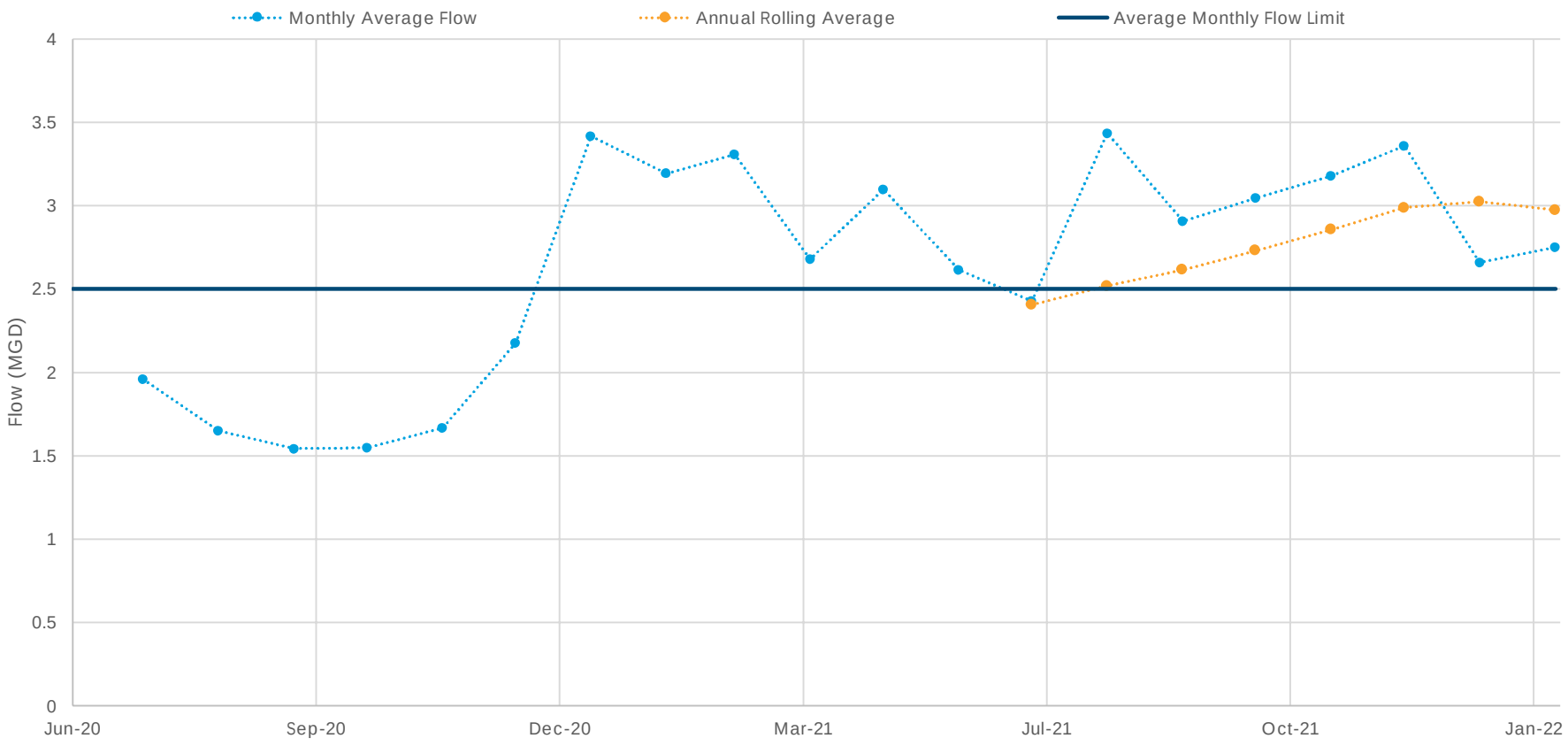
WWTP Upgrade Drivers

WWTP Upgrade Drivers

WWTP Upgrade Drivers

Parameter	Limitation	Sample Frequency
BOD_5 Removal	>85%	1/month
TSS removal		
Escherichia coli	Average Monthly = 126 cfu/100 mL Maximum Daily = 409 cfu/100 mL	3/week, grab
Total Phosphorous (TP)	Average Monthly: Apr 1 - Oct 31 = 0.1 mg/L Nov 1 - Mar 31 = 1.0 mg/L Maximum Daily = Report	 2/week, 24-hour composite 2/week, 24-hour composite
Dissolved Oxygen	> 7.4 mg/L	1/day, grab
Total Copper	Average Monthly = 12 µg/L Maximum Daily = 19 µg/L	1/month, 24-hour composite
Total Aluminum	Average Monthly = 87.2 µg/L Maximum Daily = Report	1/month, 24-hour composite
PFAS compounds	Maximum Daily = Report	1/quarter composite

WWTP Upgrade Drivers



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EPA Order

- Reduce flows to WWTF
  - I/I reduction
  - Peak flow reduction
- TP Compliance
- Evaluate “Flow Shedding” options
  - Groundwater discharge
- Alternative Surface Water Discharge

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1

IN THE MATTER OF	)	**DOCKET NO. CWA-AO-R01-FY22-05**
	)	
Town of Rockland, Massachusetts	)	**FINDINGS OF VIOLATION**
NPDES Permit No. MA0101923	)	
	)	**AND**
Proceedings Under Sections 308(a) and	)	
309(a)(3) of the Clean Water Act,	)	**ORDER FOR COMPLIANCE**
33 U.S.C. §§ 1318(a) and 1319(a)(3)	)	
	)	

STATUTORY AUTHORITY

The following FINDINGS are made, and ORDER issued pursuant to Section 308(a) and Section 309(a)(3) of the Clean Water Act, (the “Act”), 33 U.S.C. §§ 1318, 1319(a)(3). Section 309(a)(3) of the Act grants the Administrator of the U.S. Environmental Protection Agency (“EPA”) the authority to issue orders requiring persons to comply with Sections 301, 302, 306, 307, 308, 318 and 405 of the Act and any permit condition or limitation implementing any of such sections in a National Pollutant Discharge Elimination System (“NPDES”) permit, issued under Section 402 of the Act, 33 U.S.C. § 1342. Section 308(a) of the Act, 33 U.S.C. § 1318(a), authorizes EPA to require the submission of any information required to carry out the objectives of the Act. These authorities have been delegated to the EPA Region 1 Administrator, and, in turn, to the EPA, Region 1 Director of the Enforcement and Compliance Assurance Division (the “Director”).

Rockland's Overall CWMP Approach

1 Phase 1 – Assessment of Existing Conditions

2 Phase 2 – Alternatives Identification and Screening

3 Phase 3 – Evaluation of Short-Listed Alternatives in Phase 2 and Develop a Recommended Wastewater Management Plan

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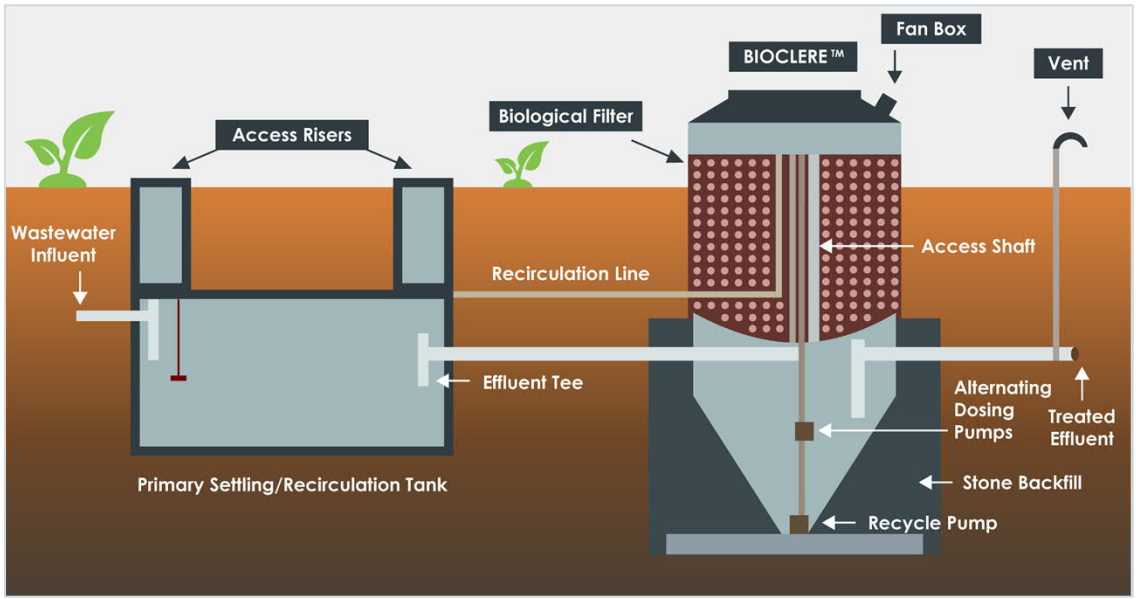
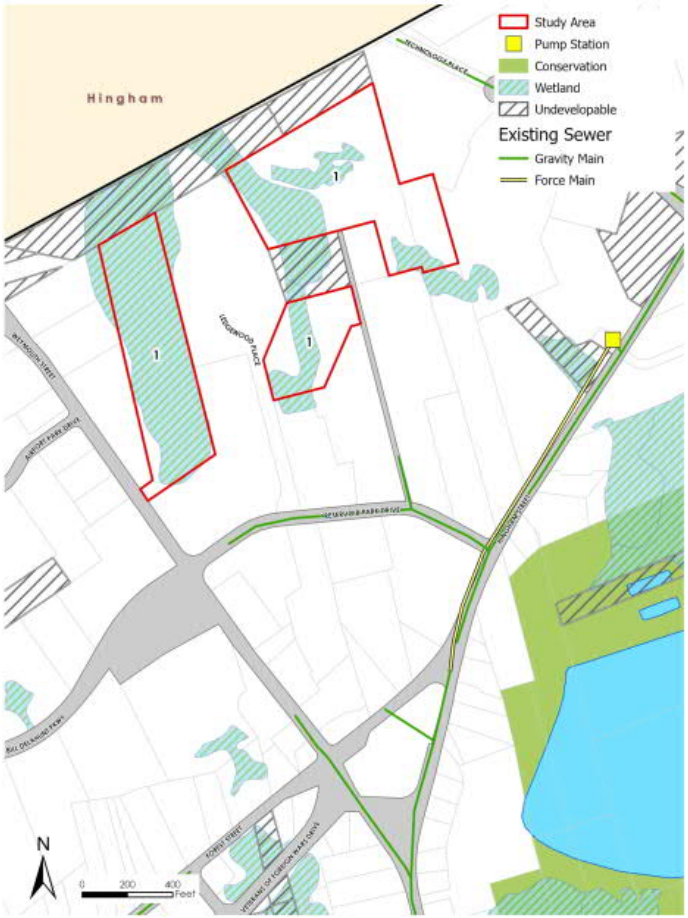
Phase 2 Goals



- Evaluate wastewater management alternatives for high needs area 1
  - Onsite systems
  - Innovative/Alternative (I/A) Systems
  - Decentralized WWTF
  - Collection system extension
- Evaluate groundwater discharge locations
- Shortlist alternatives to move into Phase 3

High Needs Area 1 – Weymouth Street

- 4 Parcels
- Northern part of Town
- High groundwater
- Near existing sewer system and Union Point Development



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Needs Area Grading Results

Treatment Alternative	Primary Criteria (Scoring from 0 to 10)						Secondary Criteria (Scoring from 0 to 5)						Total Score
	Level of Treatment	Nutrient Treatment	Land/Site Requirements	Capital / Construction Costs	Ease of Operation	*Primary Criteria Subtotal*	Public Acceptance	Regulatory	Legal	O&M Costs	Environmental	*Secondary Criteria Subtotal*	
On-site													
Conventional Septic Systems	8	9	5	1	2	*25*	0	1	0	1	4	*6*	31*
I/A Systems	6	6	4	3	4	*23*	1	2	1	2	3	*9*	32*
Decentralized													
Shared Septic Systems	8	9	6	4	3	*30*	3	1	2	2	4	*12*	42
Shared I/A Systems	6	6	7	5	5	*29*	3	2	2	3	3	*13*	42
Decentralized WWTF	1	2	8	7	6	*24*	1	3	3	4	1	*12*	36*
Collection System Extensions													
Town of Rockland	0	2	2	3	1	*8*	1	5	5	2	2	*15*	23*

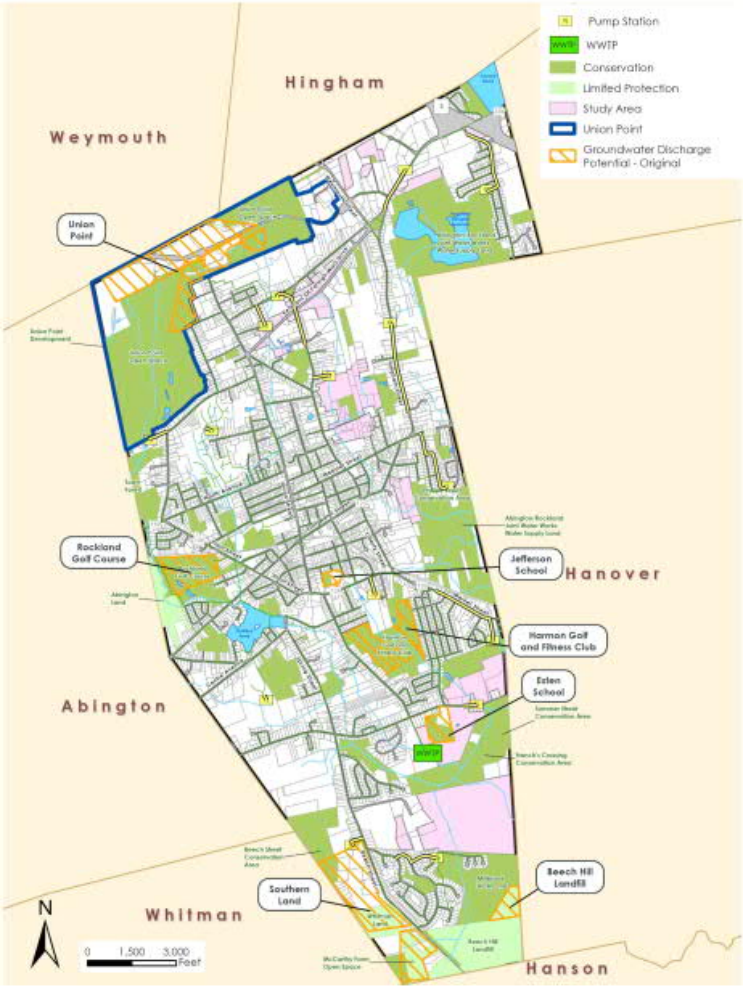
*Indicates Shortlisted Alternative

Needs Area Flow Estimates

Study Area	Potential Existing Flow	+	Estimated Build-out Flow	+	Estimated Flow from I/I	=	Total Future Flow Estimate
1 – Weymouth Street	0	+	34,800	+	1,100	=	35,900

Groundwater Discharge Alternatives

- Open Space
- Not protected
- Not wetland
- Town-owned is best



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Rockland's Overall CWMP Approach

1 Phase 1 – Assessment of Existing Conditions

2 Phase 2 – Alternatives Identification and Screening

3 Phase 3 – Evaluation of Short-Listed Alternatives in Phase 2 and Develop a Recommended Wastewater Management Plan

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Shortlisted Alternatives for Needs Area 1

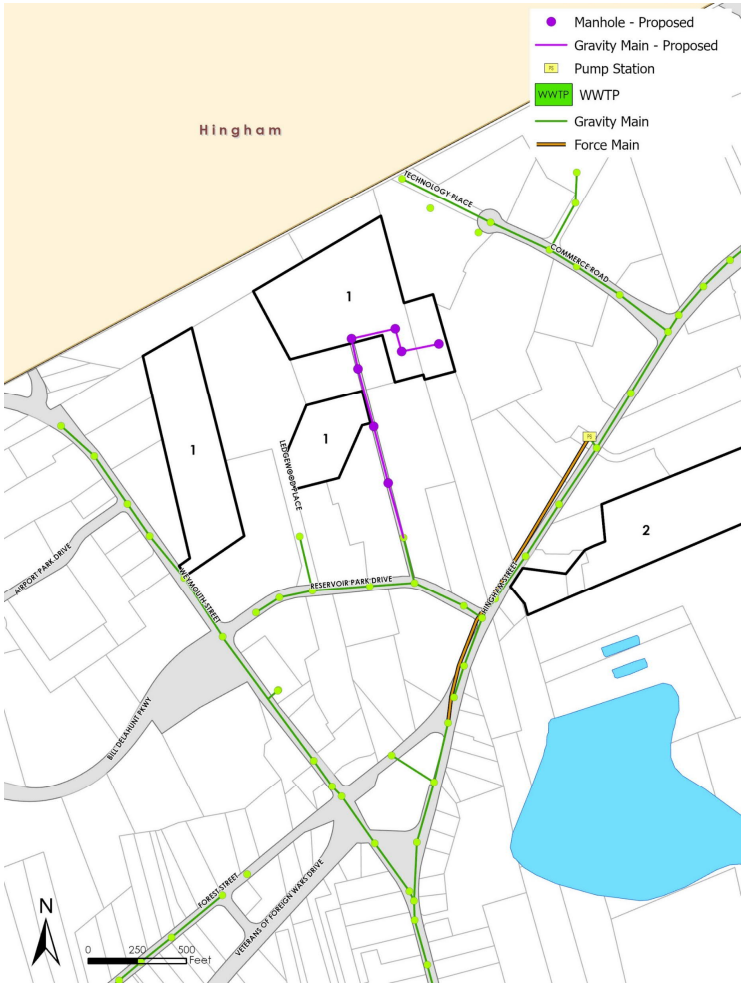
Shortlisted Alternatives

- Septic systems
- I/A systems
- Collection system extension
- Decentralized WWTF

Needs Area Description

- Northeastern part of Rockland
- 22 acres, 4 parcels
- Varies between very good and very poor soils, and wetlands

Collection System Extension for Needs Area 1



Present Worth Cost Estimates

Summary of Cost Estimates for Needs Area 1

Cost Estimate	Treatment Alternatives		
	Septic System	Innovative/Alternative System	Collection System Extension
Initial Capital Cost	$ 0	$ 0	$1,560,000
Present Worth of Future Capital Costs	$ 309,000	$ 380,000	-
Present Worth of O&M Costs	$ 20,000	$ 190,000	$ 0
Total Present Worth	$ 329,000	$ 570,000	$ 1,560,000

Collection System I/I Control Plan

- Work completed to date
- I/I Control Plan recommendations
  - Phase 1 Sewer System Evaluation Survey (SSES) Tasks ongoing
- Recommended schedule
- Cost estimate

I/I Control Plan Cost Estimate & Schedule

Fiscal Year	Calendar Year/Month	Project Name	Scope	Subarea(s)	Sewer Length (lf)	Manholes	Estimated Cost[2]
FY 2023	Spring 2023	Year 1 Program	Town-wide metering program and GIS-based Depth-to-Groundwater Analysis	-	-	-	$150,000
Phase 1							
FY 2024	Spring 2024	Year 2 Infiltration	Manhole inspections and television inspections	-	34,000	170	$150,000
FY 2025	Spring 2025	Year 3 Infiltration	Manhole inspections and television inspections	-	34,000	170	$155,000
FY 2026	Spring 2026	Year 4 Infiltration	Manhole inspections and television inspections	-	34,000	170	$160,000
FY 2027	Summer 2026 – Spring 2027	Year 2 to 4 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$200,000
FY 2028	Design – Summer 2027 Bid – Fall/Winter 2027 Construction – Spring 2028	Year 2 to 4 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]

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1. Estimated costs includes construction and engineering
2. Estimated unit cost is based on 3-4% increase from previous year

	Infiltration
	Inflow
	Rehab/Construction

I/I Control Plan Cost Estimate & Schedule

Fiscal Year	Calendar Year/Month	Project Name	Scope	Subarea(s)	Sewer Length (lf)	Manholes	Estimated Cost[2]
Phase 2							
FY 2029	Spring 2029	Year 5 Infiltration	Manhole inspections and television inspections	-	34,000	170	$170,000
FY 2030	Spring 2030	Year 6 Infiltration	Manhole inspections and television inspections	-	34,000	170	$175,000
FY 2031	Spring 2031	Year 7 Infiltration	Manhole inspections and television inspections	-	34,000	170	$180,000
FY 2032	Summer 2031 – Spring 2032	Year 5 to 7 Inflow	Smoke testing, dye testing/flooding with TV, and building inspections	-	102,000	-	$220,000
FY 2033	Design – Summer 2032 Bid – Fall/Winter 2032 Construction – Spring 2033	Year 5 to 7 Rehabilitation	Sewer System Rehabilitation – cost effective and structural defective rehabilitation	-	TBD	TBD	$1,500,000[1]

1. Estimated costs includes construction and engineering
2. Estimated unit cost is based on 3-4% increase from previous year

	Infiltration
	Inflow
	Rehab/Construction

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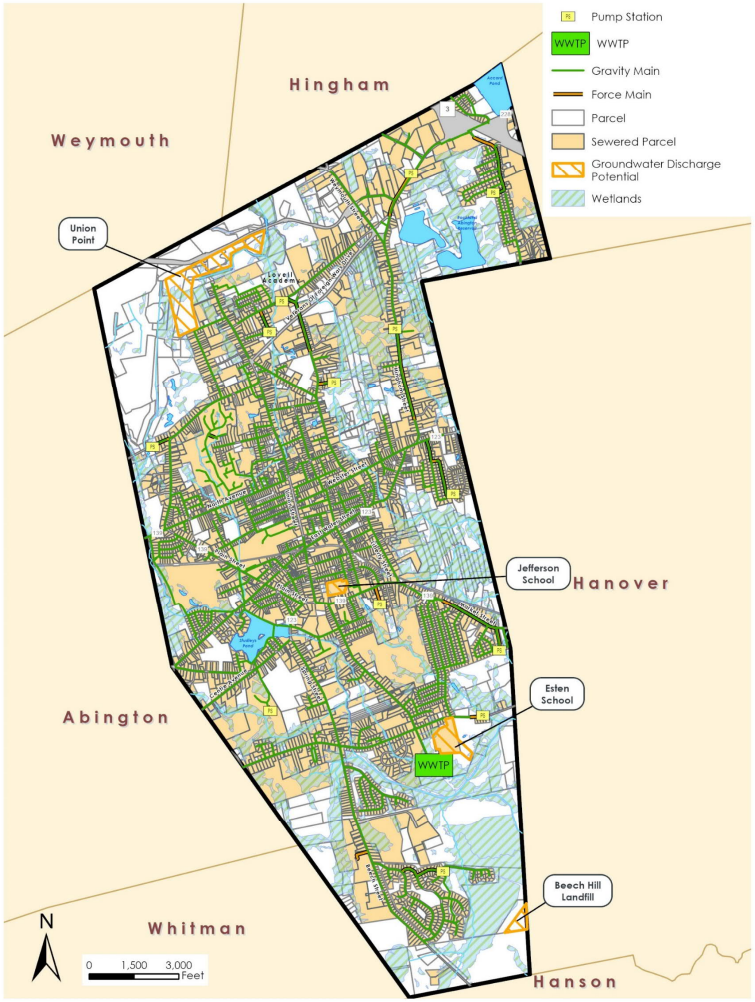
Groundwater Discharge - Options

- Met with Stakeholders
- Shortlisted sites
  - Union Point (reduced in size)
  - Jefferson School
  - Esten School Land
  - Beech Hill Landfill
- Reduced site size with soil info



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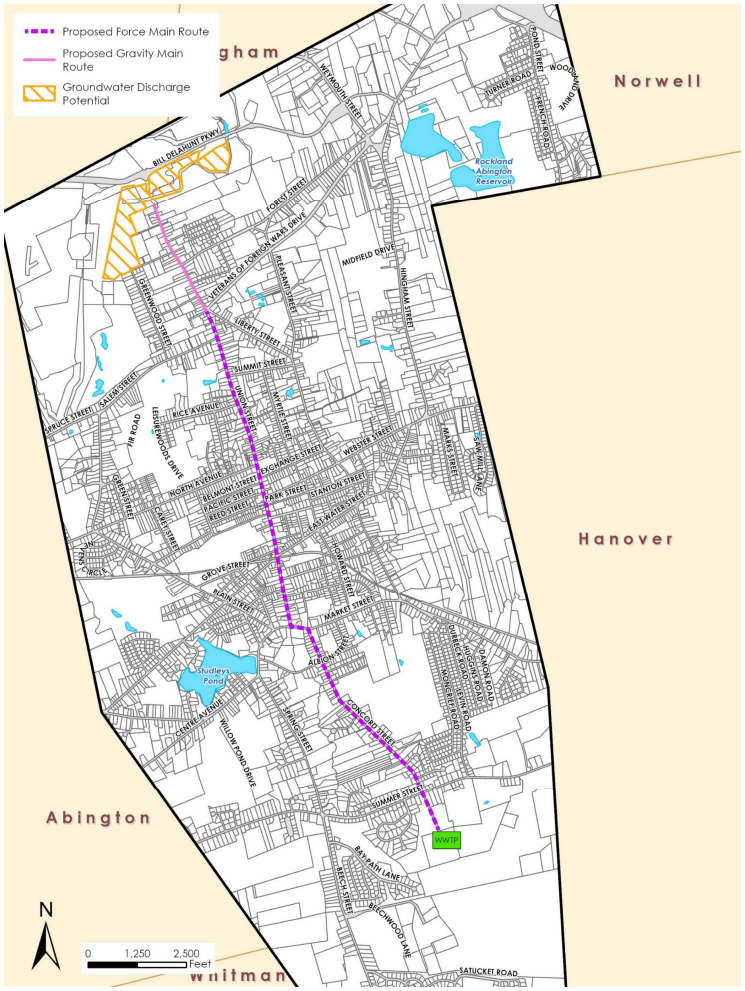
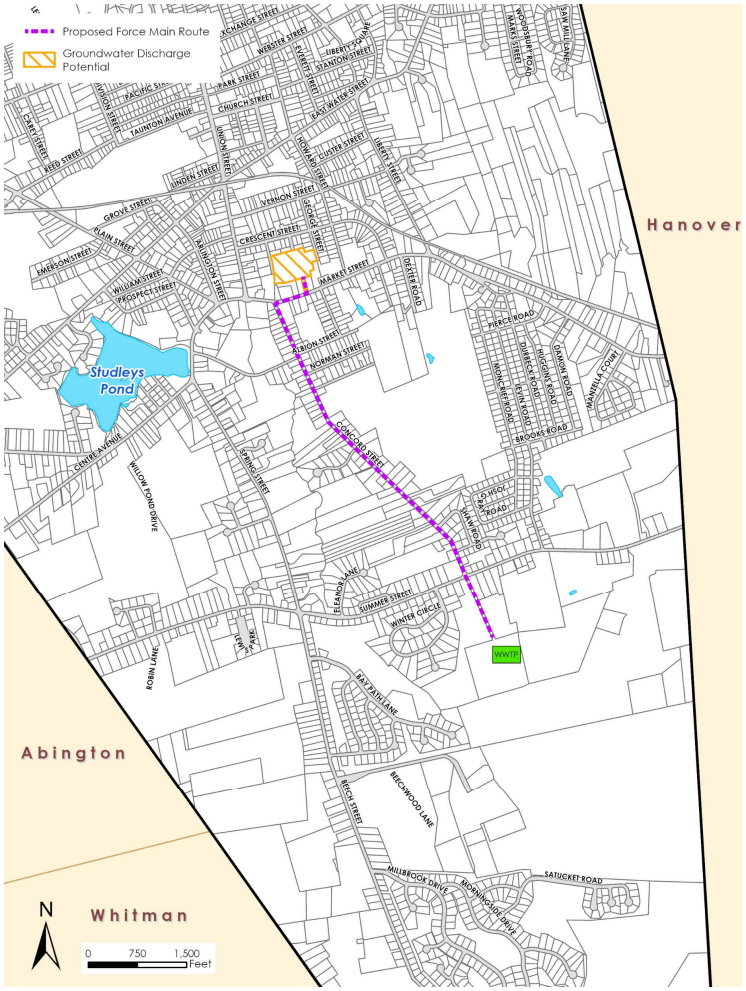
Groundwater Discharge – Effluent Disposal

Site Name	Parcel Size (acres)	Usable Disposable Area (acres)	Disposal Capacity (gpd)	
			1.5 gpd/sq ft	4 gpd/sq ft
Beech Hill Landfill	16	1.9	124,100	331,100
Esten School	19	13	849,400	2,265,100
Jefferson School	6.5	3.8	248,300	662,100
Union Point	63	42	2,744,300	7,318,100

Groundwater Discharge – Effluent Disposal: Union Point



Groundwater Discharge – Effluent Disposal: Jefferson School



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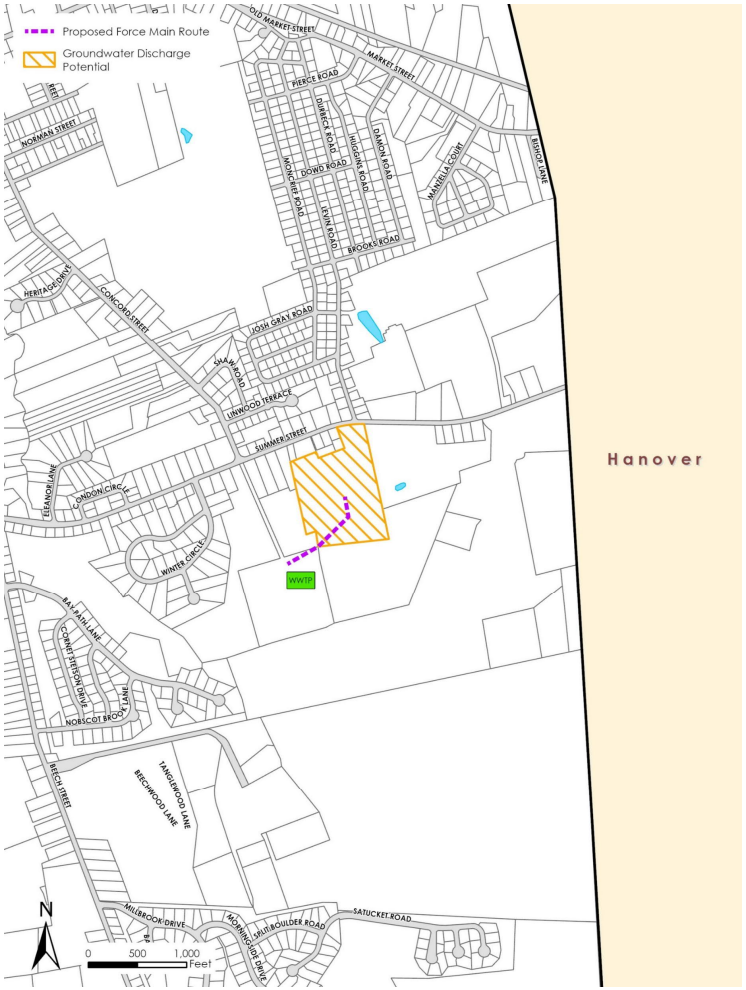
Groundwater Discharge – Effluent Disposal: Esten School



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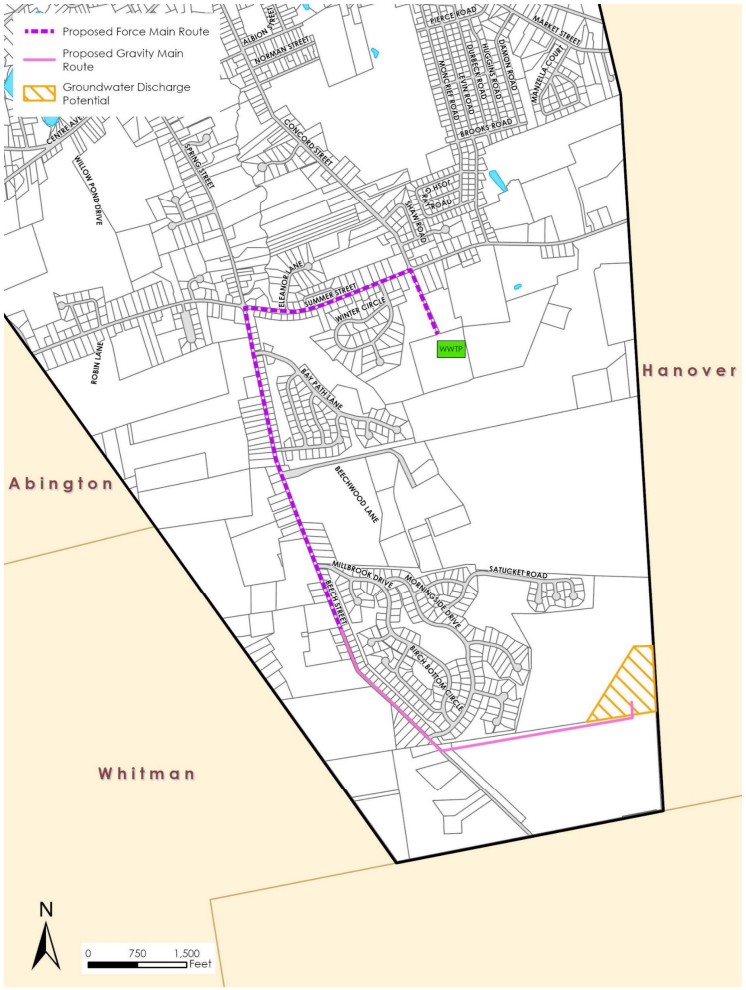
Groundwater Discharge – Effluent Disposal: Beech Hill Landfill



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Groundwater Discharge – Portion of WWTP Flow Costs

	1.1 MGD Capacity	2.7 MGD Capacity	0.12 MGD Capacity	0.25 MGD Capacity	0.85 MGD Capacity
Site	Union Point		Beech Hill Landfill	Jefferson School	Esten School
Effluent Disposal Cost ($)	$10,700,000	$25,700,000	$1,800,000	$2,900,000	$8,400,000
Rockland WWTP Secondary Upgrades Costs ($)	$16,000,000	$16,000,000	$16,000,000	$16,000,000	$16,000,000
Sewer Routing Cost ($)	$18,500,000	$18,500,000	$15,000,000	$6,100,000	$1,900,000
Total Costs	$45,200,000	$60,200,000	$32,800,000	$25,000,000	$26,300,000

Groundwater Discharge – Flow Shedding

Forest Street Pump Station

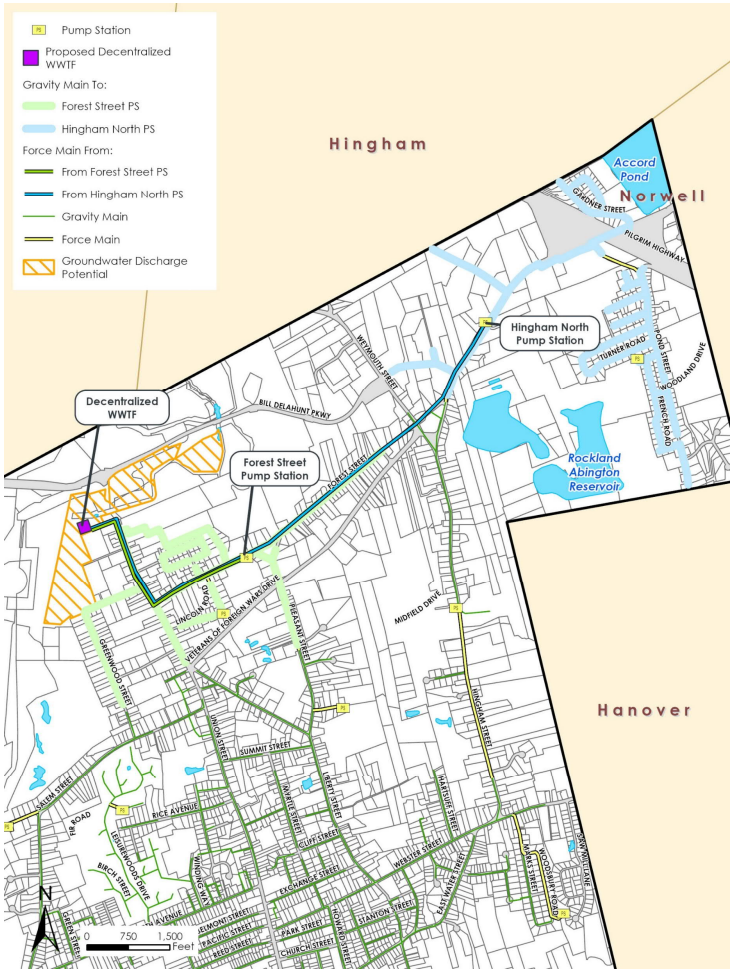
- Rated capacity of 400 gpm
- 576,000 gpd peak flow
- Average daily flow shed of 240,000 gpd

Hingham North Pump Station

- Rated capacity of 1,000 gpm
- 1,440,000 gpd peak flow
- Average day flow shed of 686,000 gpd

Combination of both

- 926,000 average gpd shed
- 1,000 – 35,000 gpd additional from Needs Area 1



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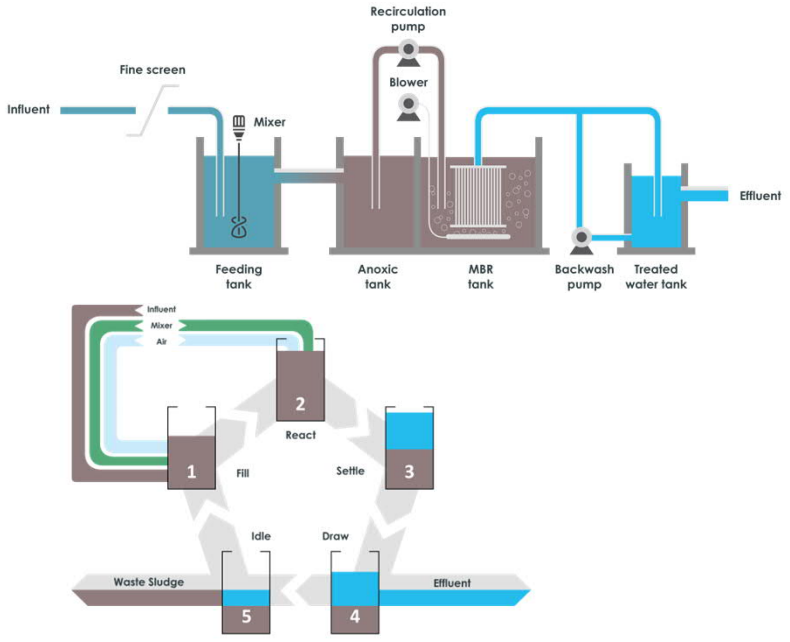
Groundwater Discharge – Decentralized WWTF

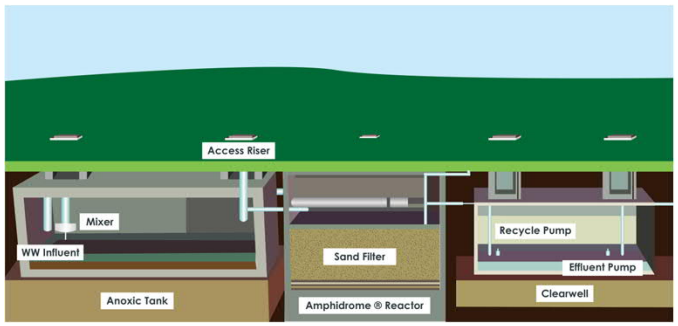
Decentralized WWTF

- 0.5-1 MGD (larger for Union Point developer flows)
- Receive flows from Forest Street and/or Hingham North Pump Station
- Approximately 1 acre needed for facility
- Biological treatment
  - Membrane Bioreactors (MBR), Sequencing Batch Reactors (SBR), or Amphidrome

Union Point Disposal Site

- 2.7-7.3 MGD disposal capacity based on loading rates from 1.5-4 gpd/SQFT





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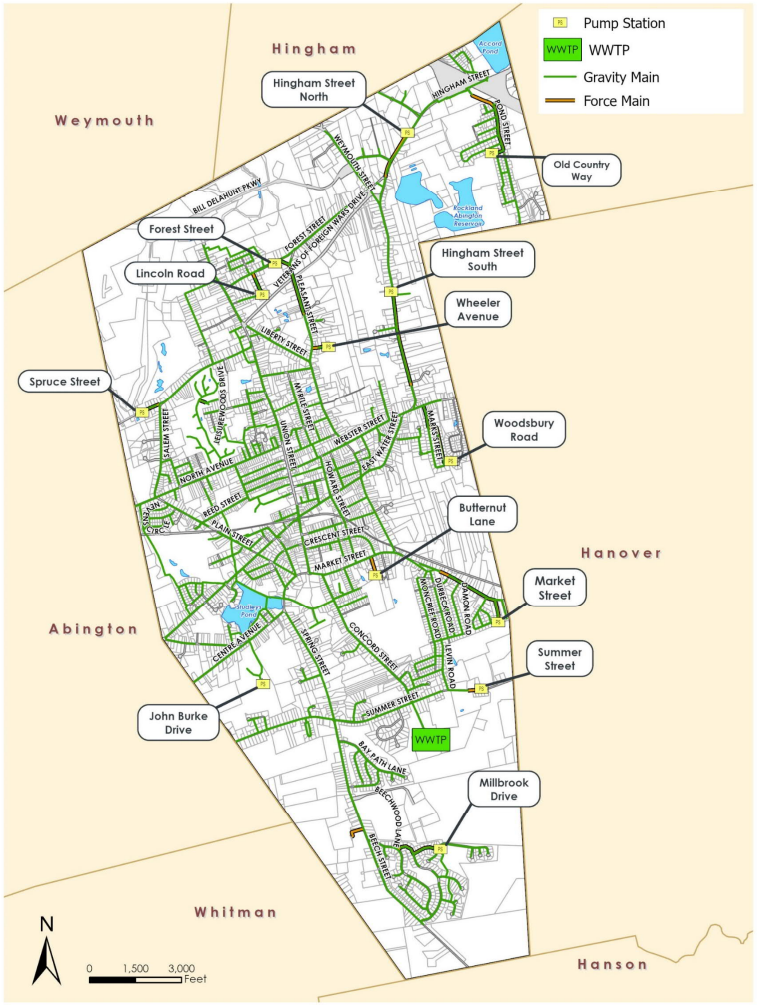
Groundwater Discharge – Decentralized WWTF Costs, Union Point

	Forest Street PS Shedding	Hingham Street, North PS Shedding	Both Pump Stations
Effluent Disposal Cost ($)	$5,900,000	$22,200,000	$31,100,000
Decentralized WWTF ($)	$26,500,000	$46,300,000	$56,500,000
Sewer Routing Cost ($)	$3,300,000	$6,700,000	$10,000,000
Total Costs	$35,700,000	$75,200,000	$97,500,000

Pump Stations Evaluation

- Evaluated all 13 pump stations
  - Condition assessment in Phase 1
  - Developed improvements/recommendations
- Developed a capital improvement plan with costs over 20-year planning period
  - Aggressive schedule based on age of station/equipment
  - Likely going to replace equipment as it fails so Town can focus on I/I and WWTP projects

Rockland Pump Stations



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Rockland Pump Station Cost Estimates

Pump Station Name	Type	Capacity (ea.)	Pump Horsepower	Year Constructed / Upgraded	Recommended Project Cost
Forest Street	Submersible	400 gpm	29	1999	$964,000
Lincoln Road	Submersible	100 gpm	7.5	1999	$618,000
Wheeler Avenue	Submersible	30 gpm	3	1999	$1,163,000
Summer Street	Submersible	40 gpm	2	1999	$1,170,000
John Burke Drive	Submersible	40 gpm	2	1999	$1,163,000
Hingham Street – North	Submersible	1,000 gpm	20	2002	$1,628,000
Hingham Street – South	Submersible	1,800 gpm	100	2002	$1,784,000
Market Street	Submersible	250 gpm	7.5	1994	$864,000
Woodsbury Road	Submersible	300 gpm	15	1994	$786,000
Millbrook Drive	Submersible	180 gpm	15	2000	$765,000
Old Country Way	Submersible	350 gpm	7.5	1980	$765,000
Spruce Street	Submersible	100 gpm	5	2024	$615,000
Butternut Lane	Submersible	100 gpm	5	2022	$618,000

Pump Stations Capital Improvement Plan

Pumping Station	Total Est. Costs Per Station	Plan Year																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Forest Street	$964,000				$964,000																
Lincoln Road	$618,000				$618,000																
Wheeler Avenue	$1,163,000			$1,163,000																	
Summer Street	$1,170,000			$1,170,000																	
John Burke Drive	$1,163,000			$1,163,000																	
Hingham Street – North	$1,628,000					$1,628,000															
Hingham Street – South	$1,784,000					$1,784,000															
Market Street	$864,000		$864,000																		
Woodsbury Road	$786,000		$786,000																		
Millbrook Drive	$765,000				$765,000																
Old Country Way	$765,000	$765,000																			
Spruce Street	$615,000																			$615,000	
Butternut Lane	$618,000																			$618,000	
Total for Year	$13,015,000	$765,000	$1,650,000	$3,496,000	$2,452,000	$3,412,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,240,000	$0

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The average cost per year is **$981,300.**

WWTP – Scope of Improvements

Plant evaluation recommended improvements:

- New Screening and Grit Facility
- Influent Pump Station Modifications
- Primary Clarifier Modifications
- Secondary System Modifications
- Secondary Clarifier Modifications
- Tertiary System and Building
- Chemical Building
- Chlorine Contact Tanks and Effluent Pump Station
- Sludge Storage tanks
- Administration Building
- Garage and Electrical Building
- General

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WWTP Recommended Improvements Cost Estimate

Project Component	Cost
Civil	$1,379,000
Architectural	$2,993,000
Structural	$2,767,000
Process	$11,063,000
HVAC/Plumbing	$1,057,000
Instrumentation	$1,085,000
Electrical	$5,416,000
Specials	$370,000
Construction Factors	$4,727,000
Subtotal	$30,858,000
Design Contingency	$6,172,000
Construction Contingency	$2,190,000
Inflation To Midpoint of Construction	$6,728,000
Estimated Construction Cost	$45,948,000
Engineering Services	$8,752,000
Materials Testing	$219,000
Legal/Administrative	$428,000
Financing	$837,000
Total Project Cost	$56,163,000*

- Recent bidding and construction climate has led to increased project costs and high inflation – planning value of $72 million is more realistic

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WWTP Typical Schedule

Milestone	Timeline*
Appropriate Engineering Funds for Design	Annual Town Meeting, May 2023
Preliminary Design (30%)	8 months, following Notice-to-Proceed
Preliminary Design Begins	August 2023
MassDEP SRF Project Evaluation Form (PEF) Submitted	August 2023
MassDEP SRF Intended Use Plan (IUP) Notification Draft	January 2024
Final IUP	1 month
Final Design & Permitting	12-14 months, beginning after Preliminary Design
Appropriate Construction Funds	Annual Town Meeting, May 2024
SRF Application Submission (90% Design)	By October 15, 2024
MassDEP Project Approval Certificate (PAC)	By December 31, 2024
100% Design and Permitting Complete	December 2024
Bidding	4 months, after 100% Design complete
Prequalification of GCs and Subs	January 2025 (2 months)
Filed Sub-bids	March 2025 (4 weeks)
GC Bids	April 2025 (6 weeks)
Construction*	30 months, beginning after GC selected and NTP
Contractor Notice-to-Proceed	By June 30, 2025
Substantial Completion	December 2027
Final Completion	February 2028
One-Year Warranty Period	December 2028

*Extended construction period expected based on lead times for equipment such as generator, MCCs, switchgear, etc.

Permit Total Phosphorus Compliance Date is February 2024 to complete construction

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WWTP – Design Build Phased Approach

Contract No. 1- Tertiary Treatment (Currently Under Design)

- Phosphorus removal
- Electrical updates

Contract No. 2- Hydraulic Capacity

- Alternative No. 1 - Modifications to existing facilities
- Alternative No. 2 - New screening facility
- Alternative No. 3 - New screening and grit facility

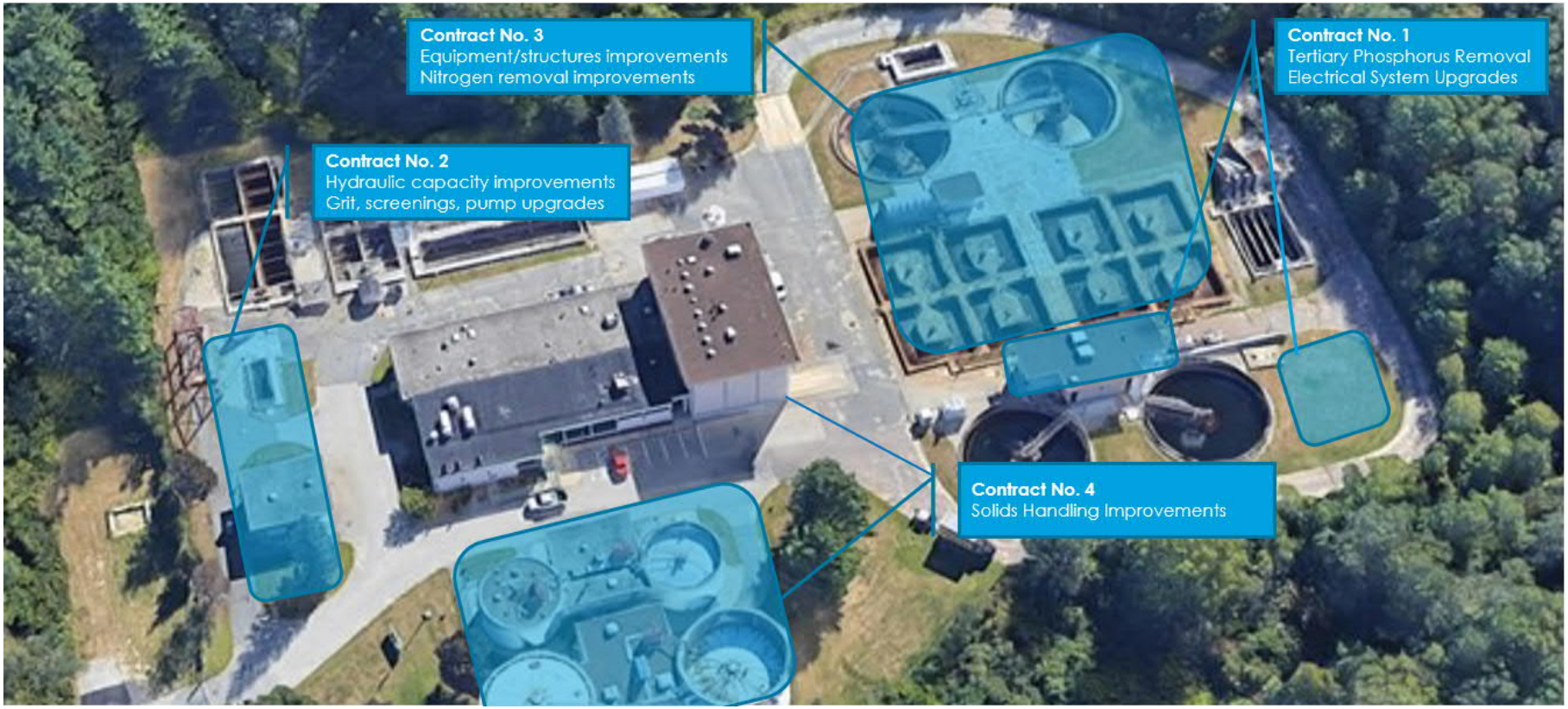
Contract No. 3- Miscellaneous Equipment and System Improvements

- Alternative No. 1 - Immediate improvement needs
- Alternative No. 2 - Process improvement and rehabilitation needs
- Alternative No. 3 - Nitrogen Removal Process Improvement and Rehabilitation Needs

Contract No. 4- Solids Handling Improvements

- Dewatering system

WWTP – Site Plan



Recommendation Summary

Needs Area

- Onsite septic systems
- Septage Management Plan

Collection System and I/I Control

- Permit and EPA Order related needs
- Age related needs
- Condition related needs

Groundwater Discharge

- Esten School for additional disposal is an option
- Partnership with Union Point developers to address flow shedding from northern collection system

WWTP

- Permit and EPA Order related needs
- Age related needs
- Condition related needs
- Design Build Approach

Implementation Plan – Years 1-10

Item	Total Est. Costs Per Item	Plan Year 1 2024	2 2025	3 2026	4 2027	5 2028	6 2029	7 2030	8 2031	9 2032	10 2033
Collection System	$6,741,000	$150,000	$155,000	$160,000	$200,000	$1,500,000	$170,000	$175,000	$180,000	$220,000	$1,500,000
Pump Stations											
Forest Street	$964,000					$964,000					
Lincoln Road	$618,000					$618,000					
Wheeler Avenue	$1,163,000				$1,163,000						
Summer Street	$1,170,000				$1,170,000						
John Burke Drive	$1,163,000				$1,163,000						
Hingham Street – North	$1,628,000						$1,628,000				
Hingham Street – South	$1,784,000						$1,784,000				
Market Street	$864,000			$864,000							
Woodsbury Road	$786,000			$786,000							
Millbrook Drive	$765,000					$765,000					
Old Country Way	$765,000		$765,000								
Spruce Street	$615,000										
Butternut Lane	$618,000										
WWTP	$72,000,000	$1,000,000	$1,115,000	$15,512,000	$641,000	$640,000	$9,395,000	$1,661,000	$1,661,000	$24,360,000	$961,000
Total	$91,644,000	$1,150,000	$2,035,000	$17,322,000	$4,337,000	$4,487,000	$12,977,000	$1,836,000	$1,841,000	$24,580,000	$2,461,000

Implementation Plan – Years 11-20

Item	Plan Year									
	11	12	13	14	15	16	17	18	19	20
	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Collection System	$191,000	$197,000	$203,000	$240,000	$1,500,000	$250,000	$250,000	$250,000	$250,000	$2,000,000
Pump Stations										
Forest Street										
Lincoln Road										
Wheeler Avenue										
Summer Street										
John Burke Drive										
Hingham Street – North										
Hingham Street – South										
Market Street										
Woodsbury Road										
Millbrook Drive										
Old Country Way										
Spruce Street										$615,000
Butternut Lane										$618,000
WWTP	$961,000	$14,093,000								
Total	$1,152,000	$14,290,000	$203,000	$240,000	$1,500,000	$250,000	$250,000	$250,000	$250,000	$3,233,000

Funding/Financing

Develop Funding/Financing Plan to Support

- WWTP Upgrade
- Collection system SSES and rehabilitation work

Potential Grant/Loan Funding Opportunities

- 0% SRF Loan for the WWTF Nutrient Upgrades?
- ~2% SRF loan for collection system rehabilitation
- Investigate other grant options
  - Congressional Earmarks
  - MVP & MassWorks

Sewer User Fees

- Rate study findings – Approximately $75 annual increase each year over next 5 years for average home

Additional Questions?

Additional Questions can be directed to Adam Higgins with Wright-Pierce via email. Questions are due by 5 PM on September 22

adam.higgins@wright-pierce.com

THANK YOU

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Engineering a Better Environment

Date: 9/7/2023

Project No.: 20926A

To: Rockland Sewer Commission

From: Adam Higgins, PE

Subject: CWMP Public Hearing – User Log and Q&A

This memorandum summarizes the users present at the September 6, 2023 Public Hearing via Zoom. The list was recorded as shown in the participant panel. In addition, the questions and formal answers from the hearing are included. Below that are questions and answers received via email.

Zoom Participant Log

1. Chuck Heshion
2. Sherri Valley
3. Dan DuRoss
4. Mike Buckley
5. Kevin Olson
6. Adam Higgins
7. Kim Quam
8. Matt Malone
9. Kathleen
10. Dave
11. Lisa
12. Beth Howard
13. S. Corlies
14. John Ward
15. Fran DeCoste
16. Patrick Scott
17. M. Flaherty
18. Teresa Hamm
19. Art Egerton
20. Amanda Mallon
21. Unnamed User 1, 2, and 3
22. Bruce Ketchen
23. John Galvin
24. Samantha Woods
25. Tricia DeGiulio
26. Sandra
27. Heather
28. Renee Parry
29. CVS

Public Hearing Questions and Answers

Sherri Vallie:

Q1: What would be a typical planning, permitting, design, bidding, construction schedule be for the groundwater disposal options noted?

A1: Typically, this is at least a 5-year process. It could take longer depending on the hydrogeological investigations, evaluation and permitting.

Chuck Heshion:

Q2: Are all costs, such as engineering, hydrogeological evaluations, etc. included in the groundwater disposal costs presented?

A2: Yes. An assumed value was used for the hydrogeological investigations and evaluation, but those can vary greatly depending on size and length.

Samantha Woods:

Q3: For the WWTP upgrade, are other methods of disinfection on the table? Such as UV?

A3: Yes, UV is currently on the table. Chlorine disinfection is also an option.

Q4: For the I/I Control Plan, will the 10-year plan evaluate the entire system? Will a majority of the system be repaired?

A4: No, the initial efforts will target known trouble areas. Following that, results from flow metering that show high flows where there shouldn't be any will be used for the next target. As I/I sources are identified, they will be considered for repair, rehabilitation, or replacement. This plan will target the most critical areas or those seen with the highest I/I.

Q5: When will a decision be made on a groundwater disposal alternative?

A5: Groundwater disposal is not recommended at this time. The Town is focusing on the WWTP Upgrade and I/I reduction. Should an additional solution be needed, or should Union Point Developers come to the table, groundwater disposal options can be revisited.

Q6: What are the next steps?

A6: The CWMP will be finalized with the slides and the Q&A. The final document will be published and sent to the regulators (EPA and MassDEP) for final approval. Once MassDEP approves, the Town will have completed one checklist item to potentially position for 0% interest SRF loans (for nutrient related upgrade projects). The Town also has a deliverable due at the end of September to EPA that states what they are committed to completing from the CWMP and an anticipated schedule to perform the work.

Emailed Questions and Answers

Samantha Woods, NSRWA

Q1: The Phase 3 Report in section 7.3 states "As a result, the WWTP has flow/capacity issues and requires bypass during high flow events (typically above 6 mgd), which are becoming more frequent in recent years." Climate change is increasing precipitation in New England. Overall, precipitation in the Northeast has increased 30% and extreme precipitation has increased 50%. The CWMP makes no mention of climate change impacts on I/I, nor the frequency or increase of peak flows which is the driver for releasing partially treated sewage. The increase in precipitation must have some impact on the current and proposed infrastructure.

A1: Climate change, storm resiliency, and intense rain events are critical when planning any infrastructure improvements. The CWMP does not specifically address this as it requires a much more in-depth analysis, which could be carried out separately. However, the WWTP upgrades will seek to increase the peak flow that is able to pass through the plant, from 6 to 7 mgd, which should help reduce peak flow bypass events. In addition, the Town is continuing to work on I/I mitigation and continues to analyze flow equalization.

Q2: We are encouraged by the work planned to reduce the I/I in the system, but we ask that there be an overall flow reduction goal and milestones with a timeline put in place to hold the town accountable for meeting their flow reduction requirements. We would like to see an increase in investment in I/I reduction to accelerate the removal of flows to the system. The goal should be zero releases of partially treated wastewater and to meet the monthly average flow of 2.5 MGD that the permit requires. It is unclear to us if meeting a 2.5 MGD monthly average will eliminate the risk of partially treated wastewater being discharged into our waters. We ask for some clarification on how often there have been releases and under what conditions and for the plan to examine how increased precipitation and groundwater levels might increase flows to the plant and how to mitigate those flows. We support continuing the sewer hookup moratorium until there is real progress towards the goal of zero release of partially treated wastewater to French Stream.

A2: The monthly average flow does not have a direct bearing on partially treated releases to the French Stream. These events occur when flows to the facility exceed 6 MGD and the offline tanks cannot accommodate bypassed flows. The WWTP upgrades, as mentioned in Answer 1, plan to include provisions to increase the capacity of the WWTP from 6 to 7 mgd, which should result in fewer bypass events. The Town continues to address I/I issues within the collection system and has committed to following the schedule laid out in the CWMP. Notice of all releases are issued following the MassDEP's public notice requirements. The WWTF has developed contingency planning during wet weather events that have resulted in few direct releases over the years. Unfortunately, these measures are not sustainable and have been taken into consideration as part of the facility upgrade planning process.

Q3: Sump Pumps from residences have been stated in public hearings by the Sewer Commission as having a large potential impact to flow into the system. This should be quantified to verify their impacts and a sump pump removal plan should be part of the cost estimates for the I/I plan.

A3: Sump pumps in private homes can lead to inflow to the sewer collection system. The Town and the homeowners must work together to identify illicit connections and work together to remove them. This is challenging due to the private nature of the connections. In addition, costs borne by the homeowner can be a challenge to remove illicit connections. The Town will continue to identify connections and work with homeowners to remove the connection to the sewer system, as outlined in the CWMP. As part of the I/I control plan, CCTV

inspections within suspect I/I areas will be identified, including active factory taps (service laterals). These inspections will follow NASSCO PACP standards. This will provide an indicator of suspect illicit connections. Subsequent actions and approach will be formulated pending the findings. However, individual homeowners may assess and remove these connections without Town assistance through a certified plumber.

Q4: We support the following recommendation for additional storage for high flow events as part of the CWMP in Section 7.3.2, "During WWTP upgrades, the Town should consider constructing additional flow equalization onsite at the WWTP. Storage volumes are recommended to be upwards of 1 million gallons, as the current bypass initiates at 6 mgd and the future peak daily flow proposed in the WWTP evaluation is 7 mgd. Construction costs for additional tankage and pumping is estimated to be in the $3.5 million range". We note that the Implementation Section 7.8 says "The recommendations do not include costs for groundwater discharge or peak flow storage options as they are not recommended at this time." We would like clarification on what is being recommended and implemented regarding additional storage for high flows.

A4: It is recommended that the Town review flow equalization during Contract 2 or 3 for the WWTP upgrades. Should Town funding/budget allow, this could be a viable option to assist with peak flow reduction and bypass events. Although current focus is on the facility's needed treatment upgrades, the capacity issue and how it could correlate with the climate impacts have been highlighted for discussion and planning purposes.

Q5: French's Stream is listed in the Massachusetts 2022 303 d list of Integrated Waters as Impaired and not meeting its Clean Water Act use for Total Phosphorus, Dissolved Oxygen, Fecal Coliform, E. Coli and fish bioassessments. The Drinkwater River, which French Stream feeds into, is also listed for eutrophication and phosphorus amongst other pollutants. TMDLs are required for these pollutants. Reducing phosphorus from this source is an important step in improving the health of these streams. We note that phosphorus discharge in the winter is not benign as studies have shown that phosphorus will be attracted to sediments if the concentration of phosphorus in sediments is less than the water column. Could the plant treat to the lower seasonal level year round? While phosphorus is a limiting nutrient in freshwater systems these streams discharge eventually into the tidal North River. In coastal waters nitrogen is a limiting factor and tertiary treatment for nitrogen is required at downstream wastewater treatment plants. Should this plant also treat nitrogen to protect downstream receiving water bodies?

A5: The WWTP upgrades are designed to meet the current discharge permit. There is a significant cost to treating to 0.1 mg/L in the winter, with little benefit to the receiving water. Should the EPA/MassDEP include a stricter limit year-round, the facility could be operated that way. There are no plans to operate to a discharge of 0.1 mg/L year-round at this time. Nitrogen removal upgrades to the WWTP are planned in Contract 3.

Q6: Downstream resources are also impaired for E. coli and Fecal coliform. In the most recent bypass in January and March of 2023 the downstream shellfish beds were closed to harvest over concerns from the discharge upstream at the Rockland Treatment Plant. Concerns over bacteria (E. coli/Fecal coliform) and viruses are what triggers the closures. Both have potential public health implications for consumption of shellfish downstream. Due to this impact, we would like to ask that UV treatment be considered instead of or in addition to chlorination. UV is less toxic than chlorine and can be effective at removing viruses.

A6: UV is being considered during Contract 1 of the WWTP upgrades. Based on hydraulic requirements to add in tertiary treatment, it is possible that the existing chlorine contact tanks will be abandoned or repurposed and UV

disinfection will be constructed. This has not been finalized and is still under evaluation. In addition, peak flow reductions are a major concern for the Town and continue to be worked on.

Q7: The proposed wastewater treatment upgrades should, at a minimum, ensure that future treatment for PFAS can be done should the current testing of the effluent indicate it is in the wastewater at high enough levels to impact downstream aquatic life.

A7: As there are no current permit limits for wastewater effluent or biosolids for PFAS (permit is monitor only), the Town is not planning for this at this time. Contract 4 of the WWTP upgrades include solids processing system improvements. Should there be a requirement by the time of that contract, that is when options would be evaluated.

Q8: We are in favor of any discharge being removed from surface waters and being discharged to groundwater either at the Esten Field or Union Point. Groundwater discharge allows for much more treatment prior to it entering into the watershed.

A8: The Town continues to evaluate these options.

Q9: We hope that the treatment plant upgrades will include the installation of solar panels to reduce electricity costs associated with pumping and treatment. The savings could be put towards further reduction of I/I.

A9: Typically, during design, energy saving measures are evaluated and if determined to be cost effective, implemented. This will continue to be reviewed throughout the 4 contracts for the WWTP upgrades. Solar panel installation is not currently included as part of the WWTP upgrades.

Appendix B
Sanitary Sewer Evaluation Survey Report & I/I Control Plan Letter

Prepared for:

TOWN OF ROCKLAND, MASSACHUSETTS

SEWER SYSTEM EVALUATION SURVEY

September 2021

Prepared By:

AECOM
250 Apollo Drive
Chelmsford, Massachusetts

AECOM

BACKGROUND

On January 13, 2021, AECOM received an executed Agreement from the Town of Rockland to solicit bids and procure a subcontractor to perform infiltration/inflow (I/I) investigative field work, and to document the findings in a sewer system evaluation survey (SSES) report. The work consists of flow isolation of approximately 90% of all pipe ranging in size from 8 to 12-inch diameter and follow-up television inspection in pipes that qualify for that work; and television inspection of approximately one/third of all pipe ranging in size from 15 to 33-inch diameter. The locations of the work are further identified in the "Figures" subsection of this report.

In accordance with the Agreement, the scope of work for this project includes the following:

1. Coordinate the work between the subcontractor and the Town to perform the field work, review the results of the flow isolation for pipe sizes 8 to 12-inch diameter and identify locations that qualify for follow-up CCTV inspection, review television inspection videos and written inspection logs and identify locations where rehabilitation is warranted to remove I/I sources.

2. For each I/I source identified in item 1, identify the type of rehabilitation method and estimate the rehabilitation cost.

3. Prepare a letter report documenting the findings of the field work including a general description and summary of the work, a summary of the sewer pipeline and/or manhole defects (I/I sources), rehabilitation costs and a priority ranking of I/I sources recommended for rehabilitation.

Presented in this report are the results of the field work and recommended follow-up rehabilitation work to remove I/I sources from the sewer system.

FIGURES

The following two figures are presented in Attachment A:

- Figure 1, Field Work Locations, identifies the locations of areas that were flow isolated and the main pipeline that received television inspection as part of this study.
- Figure 2, General Location Plan of Work, identifies the locations of I/I sources recommended for rehabilitation or further investigation as described later in this report.

DATA COLLECTION

Field work performed for this project consisted of flow isolation, internal preparatory cleaning and closed-circuit television (CCTV) inspection of sewer pipelines to identify infiltration sources. These efforts are described in the text below. The field work was performed by National Water Main Cleaning Company (NWM) under subcontract to AECOM.

Flow Isolation

Between March 1, 2021 and April 9, 2021, a total of 200,451 linear feet of mainline sewer with diameter from 8 to 12-inches received flow isolation work generally between the hours of midnight and 5:00 a.m. In most locations, the upstream manhole of each manhole-to-manhole pipe segment was plugged. After installation of the plug, the flow was measured in the downstream manhole using precalibrated weirs. The measured flow during the early morning hours is considered to be infiltration.

A detailed breakdown of the results of the flow isolation work is presented in a letter report dated April 30, 2021, prepared by AECOM and submitted to the Town of Rockland. The letter report and related backup tables are included in Attachment B of this report. The letter report includes the following tables and plan:

- Table 1. Rank of Pipe Segments with Infiltration Greater than 4,000 gpd/in-mi.

- Flow Isolation Summary Tables.

- Plan showing locations of sewer segments 8 to 12-inch diameter recommended for television inspection based on flow isolation results, and locations of pipe larger than 12-inch diameter that are scheduled for CCTV inspection.

In summary, Table 1 presented in Attachment B identifies 81 pipe segments with infiltration above 3,000 gpd/inch-mile. These pipe segments, representing a total length of approximately 19,131 linear feet of main pipeline, were scheduled for television inspection. Note: as explained in the letter report dated April 30, 2021, some pipe segments with infiltration greater than 3,000 gpd/in-mi but less than 4,000 gpd/in-mi were included in the list of pipe segments scheduled for CCTV inspection.

Sewer manholes that were accessed during the flow isolation work were observed for infiltration sources. The rate of infiltration observed entering the sewer system through each manhole was estimated, and the location of each manhole infiltration source was noted in the "Comments" column of the Flow Isolation Report tables presented in Attachment B.

Presented in Table 1 is a summary of manhole defects and estimated infiltration amounts from the manholes observed to have infiltration sources during the field work. A total of 34 manholes were found to have infiltration sources. Chemical sealing is the recommended rehabilitation method for all manholes. In some manholes with more serious leaks, the addition of a cementitious liner is also recommended. The information from Table 1 was used to identify manholes which qualify for rehabilitation work as described later in this report.

Preparatory Cleaning and Internal Television Inspection

Approximately 31,541 linear feet of main pipeline was scheduled for preparatory cleaning and internal television inspection. This total represents the sum of the following:

- 19,131 linear feet of 8 to 12-inch diameter pipe that qualified for CCTV inspection based on the flow isolation results.

- 8,860 linear feet of 15 to 21-inch diameter pipe which represents approximately one/third of the total pipe length in the Town of Rockland within that pipe range.

TABLE 1. SUMMARY OF MANHOLE DEFECTS FOUND DURING FLOW ISOLATION WORK

Manhole Number	Street Name	Defect	Estimated Infiltration (gpd)	Recommended Rehabilitation
D1	North Ave.	Walls	1,400	Chemical Seal & Cementitious Liner
D133	Leisurewoods Dr.	Walls	1,400	Chemical Seal & Cementitious Liner
D144	Leisurewoods Dr.	Walls	300	Chemical Seal
E2	Plain St.	Walls	300	Chemical Seal
E5	Reed St.	Walls	300	Chemical Seal
E12	Belmont St.	Pipe Connections (PC)	300	Chemical Seal
E13	Belmont St.	PC	300	Chemical Seal
E14	Belmont St.	Bench	300	Chemical Seal
E15	Belmont St.	Bench	300	Chemical Seal
E19	Pacific St.	Bench	300	Chemical Seal
E20	Pacific St.	Bench	300	Chemical Seal
E22	Pacific St.	Walls	300	Chemical Seal
E24	Reed St.	Walls	300	Chemical Seal
E28	Reed St.	Bench	300	Chemical Seal
E32	Taunton Ave.	Bench	300	Chemical Seal
E70	Grove St.	PC	300	Chemical Seal
H40	Park St.	Walls	300	Chemical Seal
H67	School St.	Invert & PC	2,900	Chemical Seal & Cementitious Liner
J4	Shaw Rd.	PC	150	Chemical Seal
J6	Josh Gray Rd.	Walls	400	Chemical Seal
L10	Liberty St.	Walls @ PC	1,100	Chemical Seal & Cementitious Liner
L12	Sunnybank Ave.	Wall @ PC	150	Chemical Seal
L21	Webster St.	Walls	300	Chemical Seal
L33	Everett St.	Walls	300	Chemical Seal
L61	Hingham St.	Walls	300	Chemical Seal
N113	Liberty St.	Bench	300	Chemical Seal
N115	Liberty St.	Walls	300	Chemical Seal
N143	Liberty St.	Wall @ PC	3,600	Chemical Seal & Cementitious Liner
N152	Liberty St.	Walls	300	Chemical Seal
N156	Liberty St.	PC	300	Chemical Seal
S190	Summer St.	Wall @ PC	5,000	Chemical Seal & Cementitious Liner
W7	Culver Dr.	Walls	300	Chemical Seal
W46A	Salem St.	Wall @ PC	300	Chemical Seal
W89	Brookside Rd.	Walls	1,400	Chemical Seal & Cementitious Liner
Totals	34 Manholes		24,700	

Notes:
(1) Estimated infiltration is based on a visual assessment of each infiltration source.

- 3,550 linear feet of 24 to 33-inch diameter pipe which represents approximately one/third of the total pipe length in the Town of Rockland within that pipe range.

The internal television inspection work was performed to identify specific pipeline defects or infiltration sources within a length of sewer from one manhole to another (pipe segment). Where necessary to perform the work, pipe segments were cleaned by a high-pressure jet to remove minor obstructions and to clean the pipe walls so that if defects are present they can be visually detected. Subsequently, a closed-circuit television camera, with audio, was used to inspect and record the condition of the pipe segment. The location, type and magnitude of each pipeline defect or infiltration source was documented.

From April 20, 2021 to May 6, 2021, a total of 31,618 linear feet of municipal sewer main pipeline received internal television inspection. This length of pipeline represents the sum of 19,385 feet of pipe 8 to 12-inch diameter plus 8,739 feet of pipe 15 to 21-inch diameter plus 3,494 feet of pipe 24 to 33-inch diameter.

The results of the internal television inspections are documented in videos and corresponding television inspection logs, also identified as "NWMCC Inspection Report", prepared by NWM. A hard copy of the television inspection logs and a thumb drive containing electronic copies of both the television inspection logs and the videos were provided separately to the Town of Rockland. The television inspection logs and the videos prepared by NWM are made a part of this report by reference.

AECOM performed a review of the television inspection videos and corresponding logs to determine the locations and types of pipeline defects, to estimate infiltration amounts associated with each defect, and to determine recommended rehabilitation methods. Presented in Table 2 is a summary of the pipeline defects identified from this study and an estimate of infiltration entering the sewer system from each defect. Recommended rehabilitation for each defect is presented separately in Tables 3 and 4, described later in this report.

TABLE 2. SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information				Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Main Pipeline Defect Severity	Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Concord	C2	C1	Concord St.	300	VC	8	None				8/R 78/R 114/L 173/R	700 700 300 300
Concord	C3	C2	Concord St.	234	VC	8	Minor	100		400	117/R 130/L 187/R	1,400 300 1,400
Concord	C1	C63	Concord St.	41	RC	30	None					
Concord	C86	C1	Albion St.	348	RC	30	Minor	233		150	75/T 121/T 168/T 299/T	700 150 700 1,400
Concord	C5	C86	Albion St.	355	RC	30	Minor	136		700	80/T 120/T 215/T	300 300 700
Concord	C85	C5	Albion St.	410	RC	30	None				327/T	2,900[4]
Concord	C85	C35	Albion St.	379	RC	30	Minor	79; 90; 190		900	83/T 162/T	150 300
Concord	C7	C35	Market St.	431	RC	30	None				20/T 156/T	700 1,400
Division	D2	D1	North Ave.	252	VC	10	Minor	40	250	3,000	12/T 171/T 249/T	300 5,000 5,000
Division	D3	D2	North Ave.	160	VC	10	Minor		156[5]		37/T	2,200
Division	D4	D3	North Ave.	87	VC	10	Minor	36		1,400	82/R	700
Division	D7	D6	North Ave.	230	VC	8	Minor	227[6]	218-220	2,900		
Division	D9	D8	North Ave.	180	VC	8	Minor		52; 100	2,900	46/T 79/T 143/T 160/T	700 700 700 2,200
Division	D68	D67	Union St.	291	VC	8	None				126/L	700

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information				Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Main Pipeline Defect Severity	Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Division	D67	D66	Union St.	257	VC	8	None				12/L 66/R 174/L	1,400 300 1,400
Emerson	E1	M23	Easement	228	RC	18	None					
Emerson	E2	E1	Easement	267	RC	18	None					
Emerson	E3	E2	Easement	358	RC	18	None					
Emerson	E4	E3	Easement	326	RC	18	Minor	311		700	85/L	8,600
Emerson	E5	E4	Easement	301	RC	18	Minor	142		300	72/T	4,300
Emerson	E13	E12	Belmont St.	170	VC	8	None				65/L 107/R 134/L 166/R	150 400 1,400 400
Emerson	E14	E13	Belmont St.	292	VC	8	Minor	226		400	72/L 89/L	400 2,200
Emerson	E19	E18	Pacific St.	300	VC	8	Minor		71-72[5]; 108-109[5]		226/R 228/L	700[7] 400
Emerson	E20	E19	Pacific St.	299	VC	8	Minor	88		700	31/L 58/R 124/R 287/R	400[7] 1,400[7] 300 150
Emerson	E21	E22	Pacific St.	242	VC	8	None				72/L 74/R	150 300
Emerson	E24	E9	Reed St.	300	VC	8	Minor		33[5]		43/L	400
Emerson	E25	E24	Reed St.	301	VC	8	None				21/R 85/R 191/L 286/R	400 400 700 400
Emerson	E26	E25	Reed St.	300	VC	8	Moderate		215-216	2,900	45/L 134/R	700 1,400
Emerson	E30	E8	Division St.	112	VC	10	None					
Emerson	E31	E30	Taunton Ave.	253	VC	8	Minor		62[5]		154/R	700
Emerson	E32	E31	Taunton Ave.	265	VC	8		160; 256	160-161; 256-257	7,200		
Howard	H3	H2	Howard St.	201	VC	10	Minor	3; 114		4,300	8/R	150

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information			Main Pipeline Defect Severity	Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)		Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Howard	H4	H3	Howard St.	239	VC	10	Minor	214		700	50/R 68/L 123/R	3,600 700 300
Howard	H6	H5	Howard St.	300	VC	8	None				234/L	700
Howard	H7	H6	Howard St.	303	VC	8	Minor	99		150		
Howard	H8	H7	Howard St.	226	VC	8	Moderate	148; 158; 163	12-13; 22-23[15]	900	179/L	700
Howard	H9	H8	Howard St.	165	VC	8	Minor	13; 30		700	19/L 48/R	300 300
Howard	H10	H9	Howard St.	336	VC	8	Minor	90; 260		600	100/R 108/L 182/L 202/R	400 400 700 400
Howard	H13	H12	Wall St.	214	VC	8	Minor	66		700	72/L 187/R 199/L	700 2,200[7] 2,200[7]
Howard	H14	H13	Exchange St.	45	VC	8	None					
Howard	H15	H14	Exchange St.	337	VC	8	None				23/R 124/R 187/R 209/L 252/L	700 400 400 150 300
Howard	H13	H31	Exchange St.	280	VC	8	None				87/R 171/R	2,900[8] 1,400[9]
Howard	H31	H32	Exchange St.	348	VC	8	None				92/R 104/L 200/R 218/R 347/L 348/R	1,400[4] 1,400 2,900[7] 2,900[7] 400[17] 1,400[17]
Howard	H17	H16	Del Prete Ave.	340	VC	8	Minor	121; 264	152-153[5]	3,000	19/R 95/L 222/L	2,200 700 150

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information				Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Main Pipeline Defect Severity	Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Howard	H39	H38	Park St.	241	VC	8	Minor	129; 215		1,700	18/R 30/L 37/R 114/R 170/R 232/R	2,200[7] 1,400 3,600 700 1,400 400
Howard	H42	H5	East Water St.	209	VC	8	Minor	80	80-81	2,200	9/L	700
Howard	H43	H42	East Water St.	215	VC	8	None					
Howard	H61	H67	School St.	321	VC	8	Minor	152	(10)	1,400	164/L 176/R	400 150[8]
Howard	H68	H67	School St.	230	VC	8	None				82/R	400
Josh Gray	J2	J1	Linwood Ter.	260	RC	15	None				168/T	700
Josh Gray	J4	J2	Shaw Rd.	223	RC	15	None				63/T 129/T	1,400 2,900
Josh Gray	J5	J4	Easement	316	RC	15	None				15/T 238/T[11]	1,400 0
Josh Gray	J6	J5	Josh Gray Dr.	220	RC	15	None				90/T 149/T	300 700
Josh Gray	J7	J6	Josh Gray Dr.	273	RC	15	Minor	126	87[5]	4,300	44/T 125/T 210/T	700 1,400 2,900[4]
Josh Gray	J7	J8	Josh Gray Dr.	262	RC	15	Minor	62; 85		1,900	29/T 89/T 131/T[12]	150 700[4] 700
Josh Gray	J9	J8	Levin Rd.	120	RC	15	None				23/R 62/R 113/L[13]	1,400[4] 1,400 0
Josh Gray	J10	J9	Levin Rd.	297	RC	15	None				42/L 190/L 234/R	300 300 2,900
Josh Gray	J11A	J10A	Levin Rd.	14	AC	10	None					
Josh Gray	J11B	J10B	Levin Rd.	14	AC	10	None					

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information				Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Main Pipeline Defect Severity	Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Josh Gray	J12	J11	Levin Rd.	290	RC	15	None		20[5]		20/L 55/R 148/R 219/L 243/R	400 300 1,400[4] 400 400
Josh Gray	J13	J12	Levin Rd.	234	RC	15	None				78/R 90/L 156/L 176/R	400 300 400[7] 400[7]
Josh Gray	J17	J16	Moncreif Rd.	301	VC	10	Minor	3; 30; 246; 256		9,000	56/L 120/L 127/R 273/L	400 400 1,400[4] 400
Josh Gray	J18	J17	Moncreif Rd.	287	VC	10	Minor	91; 116; 126; 152; 187		3,900	146/T 248/T	700 400
Josh Gray	J19	J18	Moncreif Rd.	296	VC	10	None				50/T 142/T 242/T	5,800 400 400
Josh Gray	J20	J19	Moncreif Rd.	299	VC	10	None				41/T 122/T 204/T 280/T	1,400 700 1,400 4,300
Josh Gray	J21	J20	Moncreif Rd.	298	VC	10	None		(14)		61/T 148/T 249/T	400 1,400 400
Josh Gray	J22	J21	Pierce Rd.	242	VC	10	None		97[5]		73/T 169/T	1,400 2,900
Josh Gray	J23	J22	Levin Rd.	327	VC	10	None				80/T 187/T 253/T	2,900 1,400 700
Josh Gray	J25	J23	Levin Rd.	228	VC	10	None				57/T 154/T	400 700
Josh Gray	J25	J24	Old Market St.	88	PVC	8	None					
Josh Gray	J28	J27	Moncreif Rd.	76	VC	8	None				67/R	2,200[4]
Josh Gray	J34	J10	Josh Gray Rd.	242	VC	8	None				80/R	700

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information			Main Pipeline Defect Severity	Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)		Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Josh Gray	J39	J38	Moncreif Rd.	269	VC	8	None				69/R	1,400[4]
Josh Gray	J50	J13	Levin Rd.	321	PVC	8	None				75/L 170/L	2,200 1,400
Josh Gray	J51	J50	Levin Rd.	319	PVC	8	None				136/T 173/T 254/L 256/R 312/T 314/T	700 2,900[4] 400 700 2,900 150
Josh Gray	J54	J13	Brooks Rd.	240	VC	10	Minor	29	222-223[5]	300		
Josh Gray	J55	J54	Durbeck Rd.	308	VC	8	Minor	127; 171; 186		1,300	16/R 94/L 158/L 273/L	2,900[7] 2,200 300 700
Josh Gray	J56	J55	Durbeck Rd.	275	VC	8	Minor	84; 191; 193		6,100	21/L 101/L 124/R 176/L 193/R 270/L	1,100 700 700 2,200 700 700
Josh Gray	J59	J58	Durbeck Rd.	303	VC	8	None					
Josh Gray	J60	J59	Durbeck Rd.	219	VC	8	Minor	8; 12; 32		2,900	9/L	700
Josh Gray	J61	J54	Brooks Rd.	226	VC	8	Minor		89[5]		204/L	700
Josh Gray	J62	J61	Huggins Rd.	351	VC	8	Minor		296-297[5]		42/L	700
Josh Gray	J64	J63	Huggins Rd.	349	PVC	8	None				5/R 345/R	3,600 2,200
Liberty	L9	L8	Liberty St.	270	RC	21	Minor	61; 108; 122		3,900	20/T	700
Liberty	L10	L9	Liberty St.	261	RC	21	Minor	12		400	89/T 132/T 164/T	300 1,400 150
Liberty	L11	L10	Liberty St.	170	RC	21	None					
Liberty	L66	L11	East Water St.	131	RC	21	Minor	48; 95		300	58/T 97/T	300 300
Liberty	L12	L66	Sunnybank Ave.	251	RC	21	Minor	152		700		
Liberty	L13	L12	Sunnybank Ave.	199	RC	21	Minor	115		300		

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information				Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Main Pipeline Defect Severity	Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
Liberty	L14	L13	Sunnybank Ave.	124	RC	21	None					
Liberty	L15	L14	Sunnybank Ave.	101	RC	21	None					
Liberty	L16	L15	Sunnybank Ave.	306	RC	21	None				95/T 138/T 168/T	300 150 300
Liberty	L17	L16	Sunnybank Ave.	235	RC	21	None				135/T	400
Liberty	L30	L10	East Water St.	351	VC	8	Minor	141	94-95[15]	700	68/T 126/R 133/R 140/L 220/T	700 400 300 700 2,900
Liberty	L68	L71	East Water St.	34	AC	8	None					
JD Mem.	M1	C63	John Dunn Mem. Dr.	349	RC	24	Minor	67; 276; 298; 332		600	103/R 258/T	400 400
JD Mem.	M2	M1	John Dunn Mem. Dr.	300	RC	24	Minor	37; 115; 226		3,200	215/R	700
JD Mem.	M3	M2	John Dunn Mem. Dr.	106	RC	24	None					
JD Mem.	M4	M3	John Dunn Mem. Dr.	107	RC	24	None					
JD Mem.	M5	M4	John Dunn Mem. Dr.	178	RC	24	None					
JD Mem.	M6	M5	John Dunn Mem. Dr.	179	RC	24	None					
JD Mem.	M7	M6	John Dunn Mem. Dr.	196	RC	24	Minor	1; 34		300		
JD Mem.	M8	M7	John Dunn Mem. Dr.	115	RC	24	None				15/R	700
JD Mem.	M9	M8	John Dunn Mem. Dr.	243	RC	21	None				23/T	400
JD Mem.	M97	M9	Studley's Pond Easement	476	RC	21	None					
JD Mem.	M97	M98	Studley's Pond Easement	360	RC	21	None					
JD Mem.	M99	M98	Studley's Pond Easement	301	RC	21	None					
JD Mem.	M87	M99	Studley's Pond Easement	484	RC	21	None					
JD Mem.	M20	M87	Studley's Pond Easement	234	RC	21	Minor	6		150		
JD Mem.	M21	M20	Emerson St. Easement	213	RC	18	None					
JD Mem.	M22	M21	Emerson St. Easement	193	RC	18	None					
JD Mem.	M23	M22	Emerson St. Easement	210	RC	18	None					
JD Mem.	M25	M24	West Water St.	193	VC	8	None				23/R 98/L 177/T	400 1,400[4] 700
-	N143	N144	Liberty St.	169	PVC	12	None				104/T	700

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

Location				Pipe Information				Pipeline Defects				
								Main Pipeline			Service Connections	
Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Main Pipeline Defect Severity	Leak in Joint[1]	Cracked or Broken Pipe [1]	Estimated Infiltration (gpd)[2]	Service Connection Location (Station/ Orientation)[3]	Estimated Infiltration (gpd)[2]
-	N144	N147	Liberty St.	179	VC	12	Minor	36; 144; 156		4,300		
-	N284	N285	Marks St.	57	PVC	8	None					
Pond	P3	P7	Pond St.	238	AC	8	None					
Pond	P7	P10	Pond St.	102	AC	8	None					
Pond	P10	P11	Pond St.	237	AC	8	None		(16)		138/T 180/T	1,400 150
Pond	P31	P32	Old Country Way	115	PVC	8	None					
Pond	P36	P35	French Rd.	369	PVC	8	None					
Pond	P36	P37	French Rd.	80	PVC	8	None					
-	S181	S180	Summer St.	10	PVC	8	None					
-	S181	S182	Summer St.	114	PVC	8	None					
-	S190	S195	Summer St.	164	PVC	8	None					
-	S195	S196	Summer St.	242	PVC	8	None				169/T	700
-	S196	S197	Summer St.	308	PVC	8	None				177/T	700
West Water	W26	W25	North Ave.	223	PVC	12	None					
West Water	W27	W26	North Ave.	165	PVC	12	None					
West Water	W27	W28	North Ave.	86	VC	12	None					
West Water	W88	W87	Brookside Rd.	291	VC	10	None				78/T 110/T 177/T 200/T 256/T	400 2,900 3,600 1,400 400
West Water	W88	W89	Brookside Rd.	85	VC	10	None					
Total										85,450		226,500

Notes:

(1) The number in this column is the distance in feet from the first manhole identified in the "Location" column, and represents the location of the defect.

(2) Estimated infiltration is based upon a visual assessment of each infiltration source (pipeline defect).

(3) The station is the distance in feet from the first manhole identified in the "Location" column. For orientation, when advancing from the first manhole identified in the "Location" column toward the second manhole, L=left side; R=right side; T=top.

(4) Leaks visible in first joint at pipe connection between main pipeline and service connection.

(5) Very minor crack observed with no visible infiltration. Pipe appears to be structurally sound. Rehabilitation not recommended.

(6) Leaks visible in joint of vertical portion of drop inlet at MH D6.

(7) Leaks visible in service connection within first few joints from the main pipeline.

(8) Leaks entering from capped lateral about 0.5' to 1' from main pipeline.

TABLE 2 (Continued). SUMMARY OF SEWER PIPELINE DEFECTS

(9) Lateral filled with grease or other material at the main pipeline.
(10) Heavy debris (pieces of asphalt) observed in pipe at 314' from MH H61.
(11) Heavy mineral deposits in service connection.
(12) Extensive roots observed in service connection at connection with main pipeline, and protruding into main pipeline.
(13) Yellow water (usage) entering main pipeline from this service connection. Service connection has heavy mineral deposits.
(14) Previously installed liner at 66' from MH J21 is miss-shapen from 7 to 8 o'clock, but remains smooth and liner appears to be structurally sound.
(15) Broken pipe. No visible infiltration.
(16) Brick observed across sewer at 65' from MH P10.
(17) Located in pipe stub connected to MH H32.

REHABILITATION OF INFILTRATION SOURCES ON MAIN PIPELINE AND SEWER MANHOLES

Presented in Table 3 is a summary of the proposed rehabilitation methods for the removal of the infiltration sources found in the main pipelines and sewer manholes, including estimated removable infiltration rates, rehabilitation costs and unit costs. Each rehabilitation cost represents the estimated construction cost for the noted rehabilitation method without an allowance for engineering and contingencies. With both the estimated rehabilitation cost and the estimated removable infiltration rate known, the unit cost of infiltration removed ($/gpd) is calculated for each source by dividing the rehabilitation cost by the removable infiltration.

A cost-effectiveness analysis was performed to establish a cost-effective breakpoint for the rehabilitation of infiltration sources. The cost-effective breakpoint is a unit cost, typically presented as cost per gallon per day (gpd), whereby an infiltration source with a unit cost for removal greater than the cost-effective breakpoint is not considered cost-effective to remove.

Key items for consideration in establishing the cost-effective breakpoint include the following:

Annual transportation and treatment costs. Information was collected from the Town to estimate the annual cost to transport and treat wastewater flow. The most current information reflects an annual cost of approximately $2,480,000 which includes costs for sewer related operation and maintenance tasks such as payment for a third party for the operation and maintenance of the wastewater treatment plant (WWTP), labor, vehicle repair and maintenance, etc.

Annual average daily flow. Based upon town records at the WWTP for the last five years (2016 through 2020), the average daily flow is approximately 2,420,000 gpd.

Using a 20-year planning period and an interest rate of 4 percent, the present worth of the transportation and treatment cost is approximately $33,704,000. The cost-effective breakpoint is established by dividing the present worth of the transportation and treatment cost by the average daily flow at the WWTP:

TABLE 3. MAIN PIPELINE AND MANHOLES – SUMMARY TABLE OF INFILTRATION SOURCES, REHABILITATION METHODS AND COSTS

Location					Pipe Information			Heavy Cleaning	Main Pipeline Recommended Rehabilitation Method			Manhole Chemical Seal	Removable Infiltration (gpd) [1]	Rehabilitation Cost ($) [2]	Unit Cost ($/gpd)
Rank	Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)		Joint Test & Seal	Grout Spot Repair	Structural Spot Repair				
1	Josh Gray	J17	J16	Moncrief Rd.	301	VC	10		X				4,500	2,300	0.51
2	Howard	H67	-	School St.								X[3]	2,900	1,600	0.55
3	-	S190	-	Summer St.								X[3]	5,000	2,800	0.56
4	-	N143	-	Liberty St.								X[3]	3,600	2,400	0.67
5	Josh Gray	J56	J55	Durbeck Rd.	275	VC	8		X				3,050	2,100	0.69
6	-	N144	N147	Liberty St.	179	VC	12		X				2,150	1,500	0.70
7	Howard	H3	H2	Howard St.	201	VC	10		X				2,150	1,600	0.74
8	Division	D4	D3	North Ave.	87	VC	10		X				700	700	1.00
9	Division	D133	-	Leisurewoods Dr.								X[3]	1,400	1,400	1.00
10	Josh Gray	J7	J6	Josh Gray Dr.	273	RC	15		X				2,150	2,200	1.02
11	Josh Gray	J18	J17	Moncrief Rd.	287	VC	10		X				1,950	2,200	1.13
12	Josh Gray	J60	J59	Durbeck Rd.	219	VC	8		X				1,450	1,700	1.17
13	Liberty	L9	L8	Liberty St.	270	RC	21		X				1,950	2,700	1.39
14	Division	D1	-	North Ave.								X[3]	1,400	2,200	1.57
15	West Water	W89	-	Brookside Rd.								X[3]	1,400	2,400	1.71
16	Emerson	E26	E25	Reed St.	300	VC	8				215-216		1,450	2,500	1.72
17	Howard	H17	H16	Del Prete Ave.	340	VC	8		X				1,500	2,600	1.73
18	Josh Gray	J6	-	Josh Gray Rd.								X	400	700	1.75
19	Emerson	E32	E31	Taunton Ave.	265	VC	8		X		160-161; 256-257		3,600	7,000	1.94
20	Howard	H39	H38	Park St.	241	VC	8		X				850	1,800	2.12
21	JD Mem.	M2	M1	JD Mem. Dr.	300	RC	24		X				1,600	3,500	2.19
22	Howard	H42	H5	East Water St.	209	VC	8				80-81		1,100	2,500	2.27
23	Division	D144	-	Leisurewoods Dr.								X	300	700	2.33
24	Emerson	E2	-	Plain St.								X	300	700	2.33
25	Emerson	E5	-	Reed St.								X	300	700	2.33
26	Emerson	E12	-	Belmont St.								X	300	700	2.33
27	Emerson	E13	-	Belmont St.								X	300	700	2.33
28	Emerson	E14	-	Belmont St.								X	300	700	2.33
29	Emerson	E15	-	Belmont St.								X	300	700	2.33
30	Emerson	E19	-	Pacific St.								X	300	700	2.33
31	Emerson	E20	-	Pacific St.								X	300	700	2.33
32	Emerson	E22	-	Pacific St.								X	300	700	2.33

TABLE 3 (Continued). MAIN PIPELINE AND MANHOLES – SUMMARY TABLE OF INFILTRATION SOURCES, REHABILITATION METHODS AND COSTS

Location					Pipe Information				Main Pipeline Recommended Rehabilitation Method						
Rank	Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Heavy Cleaning	Joint Test & Seal	Grout Spot Repair	Structural Spot Repair	Manhole Chemical Seal	Removable Infiltration (gpd) [1]	Rehabilitation Cost ($) [2]	Unit Cost ($/gpd)
33	Emerson	E24	-	Reed St.								X	300	700	2.33
34	Emerson	E28	-	Reed St.								X	300	700	2.33
35	Emerson	E22	-	Taunton Ave.								X	300	700	2.33
36	Emerson	E70	-	Grove St.								X	300	700	2.33
37	Howard	H40	-	Park St.								X	300	700	2.33
38	Liberty	L21	-	Webster St.								X	300	700	2.33
39	Liberty	L33	-	Everett St.								X	300	700	2.33
40	Liberty	L61	-	Hingham St.								X	300	700	2.33
41	-	N113	-	Liberty St.								X	300	700	2.33
42	-	N115	-	Liberty St.								X	300	700	2.33
43	-	N152	-	Liberty St.								X	300	700	2.33
44	-	N156	-	Liberty St.								X	300	700	2.33
45	West Water	W7	-	Culver Dr.								X	300	700	2.33
46	West Water	W46A	-	Salem St.								X	300	700	2.33
47	Liberty	L10	-	Liberty St.								X[3]	1,100	3,000	2.73
48	Josh Gray	J7	J8	Josh Gray Dr.	262	RC	15		X[4]				950	2,600	2.74
49	Division	D7	D6	North Ave.	230	VC	8		X[5]		218-220		1,450	4,500	3.10
50	Division	D2	D1	North Ave.	252	VC	10		X		250		1,500	4,700	3.13
51	Howard	H61	H67	School St.	321	VC	8	314[6]	X				700	2,400	3.43
52	Division	D9	D8	North Ave.	180	VC	8				52; 100		1,450	5,000	3.45
53	Josh Gray	J55	J54	Durbeck Rd.	308	VC	8		X				650	2,300	3.54
54	Howard	H9	H8	Howard St.	165	VC	8		X				350	1,300	3.71
55	Howard	H13	H12	Wall St.	214	VC	8		X				350	1,600	4.57
56	Josh Gray	J4	-	Shaw Rd.								X	150	700	4.67
57	Liberty	L12	-	Sunnybank Ave.								X	150	700	4.67
58	Howard	H4	H3	Howard St.	239	VC	10		X				350	1,800	5.14
59	Emerson	E20	E19	Pacific St.	299	VC	8		X				350	2,300	6.57
60	Liberty	L12	L66	Sunnybank Ave.	251	RC	21		X				350	2,500	7.14
61	Howard	H10	H9	Howard St.	336	VC	8		X				300	2,500	8.33
62	Emerson	E4	E3	Easement	326	RC	18		X				350	3,000	8.57
63	Liberty	L66	L11	East Water St.	131	RC	21		X				150	1,300	8.67
64	Concord	C3	C2	Concord St.	234	VC	8		X				200	1,800	9.00
65	Emerson	E14	E13	Belmont St.	292	VC	8		X				200	2,200	11.00
66	Howard	H8	H7	Howard St.	226	VC	8		X	12-13	22-23		450	5,000	11.11
67	Josh Gray	J54	J13	Brooks Rd.	240	VC	10		X				150	1,800	12.00

TABLE 3 (Continued). MAIN PIPELINE AND MANHOLES – SUMMARY TABLE OF INFILTRATION SOURCES, REHABILITATION METHODS AND COSTS

Location					Pipe Information				Main Pipeline Recommended Rehabilitation Method						
Rank	Sewer Subbasin	From MH	To MH	Street Name	Length (ft)	Type	Dia. (in.)	Heavy Cleaning	Joint Test & Seal	Grout Spot Repair	Structural Spot Repair	Manhole Chemical Seal	Removable Infiltration (gpd) [1]	Rehabilitation Cost ($) [2]	Unit Cost ($/gpd)
68	Concord	C85	C35	Albion St.	379	RC	30		X				450	5,700	12.67
69	Liberty	L10	L9	Liberty St.	261	RC	21		X				200	2,600	13.00
70	Liberty	L13	L12	Sunnybank Ave.	199	RC	21		X				150	2,000	13.33
71	JD Mem.	M1	C63	JD Mem. Dr.	349	RC	24		X				300	4,000	13.33
72	Concord	C5	C86	Albion St.	355	RC	30		X				350	5,300	15.14
73	JD Mem.	M7	M6	JD Mem. Dr.	196	RC	24		X				150	2,300	15.33
74	Liberty	L30	L10	East Water St.	351	VC	8		X		94-95		350	6,000	17.14
75	Emerson	E5	E4	Easement	301	RC	18		X				150	2,700	18.00
76	Howard	H7	H6	Howard St.	303	VC	8		X				75	2,300	30.67
77	JD Mem.	M20	M87	Studley's Pond Easement	234	RC	21		X				75	2,400	32.00
78	Concord	C86	C1	Albion St.	348	RC	30		X				75	5,200	69.33
Total													67,425	160,700	

Notes:

(1) Infiltration rates shown are estimated removable infiltration rates. It was assumed that recommended rehabilitation work would remove 100 percent of the infiltration entering the system through manhole walls and bases and 50 percent of infiltration through main pipelines.
(2) Rehabilitation costs do not include an allowance for engineering and contingencies.
(3) Recommended rehabilitation includes chemical seal and installation of cementitious liner.
(4) Root removal required at 130' from MH J7.
(5) Recommended rehabilitation is for testing and sealing joints in drop connection at MH D6.
(6) Heavy debris (pieces of asphalt) observed in pipe at 314' from MH 61. Pipe cleaning is recommended.

General Notes:

A. Refer to Tables 1 and 2 for detailed breakdown of manhole defects and pipeline defects, respectively.
B. The number noted in the "Spot Repair" columns or the "Heavy Cleaning" column is the distance in feet from the first manhole identified in "Location" column, and represents the location of recommended pipe spot repair or heavy cleaning.

$$\frac{\text{Present worth of transportation and treatment cost}}{\text{Average daily flow}} = \frac{\$33,704,000}{2,420,000 \text{ gpd}} = \$13.93/\text{gpd}$$

This means that any infiltration source with a unit cost for removal equal to or less than $13.93 per gallon per day is considered cost-effective to remove. An infiltration source with a unit cost for removal greater than $13.93 per gallon per day is not considered cost-effective to remove.

Table 3 includes a priority ranking of infiltration sources from the lowest unit cost to the highest unit cost. We recommend that all infiltration sources with a unit cost for removal equal to or less than $13.93 be rehabilitated. In applying this criteria to Table 3, a total of approximately 66,200 gpd of infiltration can be cost-effectively removed from the main pipelines and manholes by rehabilitating 71 infiltration sources at an estimated construction cost of $134,500.

REHABILITATION OF INFILTRATION SOURCES ON SERVICE CONNECTIONS

The results of the television inspection and flow isolation work show a significant amount of infiltration entering the sewer system through lateral service connections. In fact, as shown in the "Total" row at the bottom of Table 2, the estimated infiltration entering the sewer system from service connections within the sewers that were televised is substantially greater than the estimated infiltration entering the sewer system from the main pipeline (226,500 gpd versus 85,450 gpd, respectively). Evidence of infiltration from service connections was noted by the following methods:

- During the television inspection work, the camera used to inspect the main pipeline had the pan and tilt capability to peer directly into the incoming service connection. In many locations, the resulting video clearly shows the locations of leaks in joints within the first few pipe lengths of the service connection.

- Service connections noted to be running with a constant flow of clear water over a period of several minutes.

There are four typical methods to rehabilitate a service connection to remove infiltration sources, as described below. The estimated costs presented below are construction costs and do not include an allowance for engineering and contingencies.

a. **Joint Test and Seal.** This work is typically performed by inserting joint testing and sealing equipment into the service connection from the main pipeline. Joints and pipe cracks in the service connection are then chemically grouted in a manner similar to that used in the main pipeline. During this work, it is often difficult for the equipment to negotiate the pipe bends commonly installed on service connections and the extent of work is generally limited to short distances of up to 20 feet from the main pipeline. The estimated cost to test and seal the joints in a service connection as referenced above is approximately $3,000 per connection.

b. **Excavate and Replace.** The service connection may be excavated and replaced from the face of the dwelling to the main pipeline in the street. The cost of this work will vary depending upon the length of the service connection, the depth of pipe, the need for dewatering of groundwater in the pipe trench, the extent of above ground reinstatement work that would need to be performed to improved lawns and shrubbery, sidewalk and pavement replacement in the main road, and traffic control. A typical cost for replacement of a service connection 55 feet long may approach $10,000 per service connection, if the service connection is connected to the main pipeline through a wye branch.

   If a service connection is connected to the main pipeline through a chimney, as defined later in this report, the estimated cost to excavate and replace the chimney and 10 feet of main pipeline (5 feet each side of chimney) is approximately $10,000 per chimney. Thus, the total cost to excavate and replace a service connection connected to a chimney is approximately $20,000, being the sum of $10,000 for the service connection plus $10,000 for the chimney and 10 feet of main pipeline.

c. **Pipe Lining Through Wye Branch Connection.** There are several trenchless technologies available for installing a cured-in-place lateral liner into the existing service connection between the house and the main pipeline. The lining is typically installed from the main pipeline into the wye branch of the lateral and consists of a one-piece product affixed to the walls of the lateral pipe and at the junction within the main pipeline. This method of rehabilitation eliminates the joints between the main pipeline and the service connection, and along the service connection to the termination of the liner typically at the cleanout near the house. Depending upon the number of bends that exist in the lateral, a lateral liner can be installed up to 100 feet into the lateral from the main pipeline. A typical cost for service connection lining is approximately $6,500 per connection, assuming an average service connection length of 55 feet. This cost is estimated using a cost of $4,500 for the first 30 feet of liner from the main pipeline, plus $55 per linear foot of liner beyond the first 30 feet from the main pipeline, plus $600 for CCTV inspection of the new liner roughly a year after completion to confirm no defects.

d. **Pipe Lining with Chimney Connection.** Some service connections connect to the main pipeline through a chimney instead of a wye branch. A chimney is a vertical pipe that extends upward from the main pipeline and connects to the service connection at the top of the chimney with a 90 degree "tee" fitting. The tee fitting may connect to either one or two lateral service connections at the top. Where a chimney exists, installation of a continuous liner between the main pipeline and the lateral service connection to the cleanout of the house is not possible because the equipment is usually not capable of navigating the 90 degree bend at the top of the chimney. Instead, current technology allows for the bottom two feet of the chimney to be sealed from the main pipeline including the key connection between the chimney with the main pipeline where infiltration is commonly found; and a liner is installed in the service connection from the cleanout near the house to the top of the chimney at the main pipeline. Under this procedure, the service connection is lined and a portion of the chimney is sealed, but the length of chimney greater than 2 feet from the main pipeline remains unsealed. For example, if a chimney vertical dimension is 5 feet, only the bottom 2 feet of the chimney would be sealed and the remaining top 3 feet of the chimney would not be sealed.

Where one service connection is connected to the top of a chimney, a typical estimated cost for service connection liner with the bottom 2 feet of chimney seal is approximately $10,100 per connection, assuming an average service connection length of 55 feet. This cost is estimated using a unit rate of $100 per linear foot of liner installed from cleanout to the main pipeline ($5,500) plus $2,500 for the bottom 2 feet of the chimney to be sealed at the main pipeline, plus $1,500 for work at the cleanout near the house from where the liner will be installed, plus $600 for CCTV inspection of the new liner through the cleanout roughly a year after completion to confirm no defects.

Where two service connections are connected to the top of the chimney, a typical estimated cost for two service connection liners with a chimney seal is approximately $17,700 using the same unit rates identified above.

As shown above, joint testing and sealing is the least expensive method for rehabilitating a service connection. However, joint testing and sealing is not recommended for rehabilitation of a service connection because of the limited length (approximately 20 feet) that joint testing and sealing can be performed from the main pipeline. The 20 feet length is approximately one/third of the total length of a typical service connection. If only the first 20 feet of the service connection is sealed, there is a potential for infiltration to migrate to the joints along the service connection that are left unsealed.

The recommended method for rehabilitating service connections is pipe lining, which eliminates joints between the main pipeline to the terminus of the liner at the cleanout near the house. During the initial stages of the rehabilitation work, television inspection of each service connection should be performed to confirm if the service connection is an appropriate candidate for pipe lining or if another rehabilitation method is appropriate, based on the nature and location of the pipe defects and leaks, and the location of bends in the pipe.

Presented in Table 4 is a summary of the lateral service connections with infiltration sources identified during the field work and the related rehabilitation costs. Only the service connections with estimated infiltration amounts of 1,000 gpd or greater are shown in the table.

TABLE 4. LATERAL SERVICE CONNECTIONS – SUMMARY TABLE OF INFILTRATION SOURCES AND REHABILITATION COSTS

General Location			Main Pipeline Information			Lateral Service Connection Information						
From MH	To MH	Service Connection Address or Street Name	Length (feet)	Type	Diameter (inches)	Location (1)	Orientation (2)	Approx. Chimney Height (feet)	Chimney Service Connections (3)	Estimated Infiltration (gpd)	Estimated Rehabilitation Cost ($) (4)	Unit Cost ($/gpd)
C3	C2	41 Concord St. 47 Concord St.	234	VC	8	117 187	R R			1,400 1,400	6,500[12] 6,500[12]	4.64 4.64
C86	C1	142 Albion St. & 80 Concord St.	348	RC	30	299	T	2.7	2	1,400	17,700[13]	12.64
C85	C5	71 & 72 Albion St.	410	RC	30	327	T	4.9	2	2,900[5]	17,700[13]	6.10
C7	C35	323/325 Market St.	431	RC	30	156	T	4.0	1	1,400	10,100[14]	7.21
D2	D1	177 & 180 North Ave. 169/171 North Ave.	252	VC	10	171 249	T T	3.2 4.7	2 1	5,000 5,000	17,700[13] 10,100[14]	3.54 2.02
D3	D2	203 North Ave.	160	VC	10	37	T	4.3	1	2,200	10,100[14]	4.59
D9	D8	305 North Ave.	180	VC	8	160	T[10]			2,200	6,500[12]	2.95
D67	D66	466 Union St. 482 Union St.	257	VC	8	12 174	L L			1,400 1,400	6,500[12] 6,500[12]	4.64 4.64
E4	E3	Connection from Memorial Park School	326	RC	18	85	L[11]			8,600	(11)	-
E5	E4	210 & Lot W-56 & 13 Reed St.	301	RC	18	72	T	4.9	2	4,300	17,700[13]	4.12
E13	E12	134 Belmont St.	170	VC	8	134	L			1,400	6,500[12]	4.64
E14	E13	102 Belmont St.	292	VC	8	89	L			2,200	6,500[12]	2.95
E20	E19	71 Pacific St.	299	VC	8	58	R			1,400[6]	6,500[12]	4.64
E26	E25	71 Reed St.	300	VC	8	134	R			1,400	6,500[12]	4.64
H4	H3	196 Howard St.	239	VC	10	50	R			3,600	6,500[12]	1.81
H13	H12	28 Wall St. 27 Wall St.	214	VC	8	187 199	R L			2,200[6] 2,200[6]	6,500[12] 6,500[12]	2.95 2.95
H13	H31	Across from 104 Exchange St. Across from 114 Exchange St.	280	VC	8	87 171	R R			2,900[7] 1,400[8]	6,500[12] 6,500[12]	2.24 4.64
H31	H32	127 Exchange St. 138 Exchange St. 139 Exchange St. 145 Exchange St. 153 Exchange St.	348	VC	8	92 104 200 218 348	R L R R R			1,400[5] 1,400 2,900[6] 2,900[6] 1,400[9]	6,500[12] 6,500[12] 6,500[12] 6,500[12] 6,500[12]	4.64 4.64 2.24 2.24 4.64

TABLE 4 (Continued). LATERAL SERVICE CONNECTIONS – SUMMARY TABLE OF INFILTRATION SOURCES AND REHABILITATION COSTS

General Location			Main Pipeline Information			Lateral Service Connection Information						
From MH	To MH	Service Connection Address or Street Name	Length (feet)	Type	Diameter (inches)	Location (1)	Orientation (2)	Approx. Chimney Height (feet)	Chimney Service Connections (3)	Estimated Infiltration (gpd)	Estimated Rehabilitation Cost ($) (4)	Unit Cost ($/gpd)
H17	H16	37 Christine Ave.	340	VC	8	19	R			2,200	6,500[12]	2.95
H39	H38	57 Park St.	241	VC	8	18	R			2,200[6]	6,500[12]	2.95
		58/56 Park St.				30	L			1,400	6,500[12]	4.64
		65 Park St.				37	R			3,600	6,500[12]	1.81
		75/73 Park St.				170	R			1,400	6,500[12]	4.64
J4	J2	Shaw Rd. "lots"	223	RC	15	63	T	6.2	2	1,400	17,700[13]	12.64
		16 & 32 Linwood Ter.				129	T	6.2	2	2,900	17,700[13)]	6.10
J5	J4	38 & 43 Josh Gray Rd.	316	RC	15	15	T	6.4	2	1,400	17,700[13]	12.64
J7	J6	20 & 19 Josh Gray Rd.	273	RC	15	125	T	3.1	2	1,400	17,700[13]	12.64
		24 & 23 Josh Gray Rd.				210	T	4.1	2	2,900[5]	17,700[13]	6.10
J9	J8	307 Levin Rd.	120	RC	15	23	R			1,400[5]	6,500[12]	4.64
		5 Josh Gray Rd.				62	R			1,400	6,500[12]	4.64
J10	J9	299 Levin Rd.	297	RC	15	234	R			2,900	6,500[12]	2.24
J12	J11	265 Levin Rd.	290	RC	15	148	R			1,400[5]	6,500[12]	4.64
J17	J16	139 Moncrief Rd.	301	VC	10	127	R			1,400[5]	6,500[12]	4.64
J19	J18	123 & 122 Moncrief Rd.	296	VC	10	50	T	6.1	2	5,800	17,700[13]	3.05
J20	J19	91 & 90 Moncrief Rd.	299	VC	10	41	T	4.2	2	1,400	17,700[13]	12.64
		107 & 104 Moncrief Rd.				204	T	4.4	2	1,400	17,700[13]	12.64
		115 & 114 Moncrief Rd.				280	T	4.4	2	4,300	17,700[13]	4.12
J21	J20	74 & 73 Moncrief Rd.	298	VC	10	148	T	4.2	2	1,400	17,700[13]	12.64
J22	J21	61 Levin Rd.	242	VC	10	73	T	4.2	1	1,400	10,100[14]	7.21
		64 Moncrief Rd. & 6 Pierce Rd.				169	T	4.3	2	2,900	17,700[13]	6.10
J23	J22	30 & 27 Levin Rd.	327	VC	10	80	T	4.3	2	2,900	17,700[13]	6.10
		38 & 37 Levin Rd.				187	T	4.2	2	1,400	17,700[13]	12.64
J28	J27	21 Moncrief Rd.	76	VC	8	67	R			2,200[5]	6,500[12]	2.95
J39	J38	263 Moncrief Rd.	269	VC	8	69	R			1,400[5]	6,500[12]	4.64
J50	J13	208 Levin Rd.	321	PVC	8	75	L			2,200	6,500[12]	2.95
		216 Levin Rd.				170	L			1,400	6,500[12]	4.64
J51	J50	185 Levin Rd.	319	PVC	8	173	T[10]			2,900[5]	6,500[12]	2.24
		138 Levin Rd.				312	T[10]			2,900	6,500[12]	2.24
J55	J54	193 Durbeck Rd.	308	VC	8	16	R			2,900[6]	6,500[12]	2.24
		204 Durbeck Rd.				94	L			2,200	6,500[12]	2.24

TABLE 4 (Continued). LATERAL SERVICE CONNECTIONS – SUMMARY TABLE OF INFILTRATION SOURCES AND REHABILITATION COSTS

General Location			Main Pipeline Information			Lateral Service Connection Information						
From MH	To MH	Service Connection Address or Street Name	Length (feet)	Type	Diameter (inches)	Location (1)	Orientation (2)	Approx. Chimney Height (feet)	Chimney Service Connections (3)	Estimated Infiltration (gpd)	Estimated Rehabilitation Cost ($) (4)	Unit Cost ($/gpd)
J56	J55	172 Durbeck Rd.	275	VC	8	21	L			1,100	6,500[12]	5.91
		188 Durbeck Rd.				176	L			2,200	6,500[12]	2.95
J64	J63	65 Huggins Rd.	349	PVC	8	5	R			3,600	6,500[12]	1.81
		101 Huggins Rd.				345	R			2,200	6,500[12]	2.95
L10	L9	225 East Water St.	261	RC	21	132	T	4.3	1	1,400	10,100[14]	7.21
L30	L10	222 East Water St.	351	VC	8	220	T	3.0	1	2,900	10,100[14]	3.48
M25	M24	232 West Water St.	193	VC	8	98	L			1,400[5]	6,500[12]	4.64
P10	P11	154R Pond St.	237	AC	8	138	T	8.6	1	1,400	10,100[14]	7.21
W88	W87	60 Brookside Rd.	291	VC	10	110	T	2.6	1	2,900	10,100[14]	3.48
		69 Brookside Rd.				177	T	2.4	1	3,600	10,100[14]	2.81
		70 Brookside Rd.				200	T	2.4	1	1,400	10,100[14]	7.21
Total										161,700	674,900	

Notes:

(1) The number noted in the "Location" column is the distance in feet from the first manhole identified in the "General Location" column.

(2) When advancing from the first manhole identified in the "General Location" column toward the second manhole, L = left side; R = right side; T = top.

(3) Number in column indicates number of lateral service connections that are connected to the top of chimney.

(4) Rehabilitation costs do not include an allowance for engineering and contingencies.

(5) Leaks visible in first joint at pipe connection between main pipeline and chimney.

(6) Leaks visible in service connection within first few joints from the main pipeline.

(7) Leaks entering from capped lateral about .5' to 1' from main pipeline.

(8) Lateral filled with grease or other material at the main pipeline.

(9) Located in pipe stub connected to MH H32.

(10) One LSC connection at top of main pipeline, but not a chimney.

(11) Approximate 300' long service connection (6" & 8" VC pipe) extending to Memorial Park School, consisting of approximately 5 pipe segments. Internal CCTV inspection of the 300 LF of pipe is recommended in order to confirm if any subsequent rehabilitation work is needed.

(12) Estimated rehabilitation cost is for lining the LSC from the main pipeline to the cleanout near house.

(13) Estimated rehabilitation cost is for sealing the bottom 2 feet of chimney at the main pipeline and for lining each of the two LSC's from cleanout at each house to the top of the chimney at the main pipeline.

(14) Estimated rehabilitation cost is for sealing the bottom 2 feet of chimney at the main pipeline and for lining the LSC from the cleanout at house to the top of the chimney at the main pipeline.

The rehabilitation costs represent the estimated construction costs without an allowance for engineering and contingencies.

A review of Table 4 shows the following types of lateral service connections:

- A total of 40 service connections are shown to be connecting to the main pipeline either from the left or the right, identified as "L" or "R" respectively, in the orientation column. These service connections are typically connected to the side of the main pipeline through a wye branch at an angle not greater than 45 degrees.

- A total of 30 service connections are shown to connect to the main pipeline from the top, identified as "T" in the orientation column. Three of these service connections are connected to the main pipeline from the top through a wye branch and the other 27 are connected to the main pipeline through a chimney. Table 4 identifies the number of service connections connected to each chimney and the approximate height of each chimney. As shown in Table 4, 10 chimneys connect to one service connection at the top of the chimney, and 17 chimneys connect to two service connections at the top of the chimney.

The locations of the service connections with infiltration listed in Table 4 were reviewed. If service connections for adjacent houses are found to exhibit high infiltration rates, this is an indication that the general area may have high groundwater and defective service connections, and the most effective way to reduce the infiltration is to rehabilitate all of the service connections in that area. A group of 9 service connections listed in Table 4 recommended for rehabilitation is clustered along Exchange Street and Wall Street between manhole Nos. H32 and H12. Another group of 9 service connections is clustered along Moncrief Road and Levin Road between manhole Nos. J18 an J23.

Table 4 includes a column showing the unit cost ($/gpd), representing the estimated rehabilitation cost divided by the estimated infiltration removed for each infiltration source. For estimating the unit cost, we assume the recommended rehabilitation method will remove all the

estimated infiltration in the service connection. As derived earlier in this report, an infiltration source with a unit cost for removal equal to or less than $13.93 per gallon per day is considered cost-effective to remove. In applying this criteria to Table 4, a total of approximately 153,100 gpd of infiltration can be cost-effectively removed from the lateral service connections and chimneys by rehabilitating 69 infiltration sources at an estimated construction cost of approximately $674,900.

SUMMARY

The field work performed as part of this study identified 78 infiltration sources in sewer manholes and main pipelines. These sources contribute an estimated 67,500 gpd of removable infiltration. The field work also identified 69 service connections with estimated infiltration amounts equal to or greater than 1,000 gpd each. These service connections contribute an estimated 153,100 gpd of infiltration to the sewer system.

A cost-effectiveness analysis was performed, and 140 infiltration sources contributing a total of approximately 219,300 gpd of infiltration were determined to be cost-effective to remove. The total construction cost of this rehabilitation effort is estimated at $809,400, representing the sum of approximately $134,500 to rehabilitate manholes and main pipeline plus approximately $674,900 to rehabilitate lateral service connections.

We recommend that the infiltration sources which were determined to be cost-effective to remove be rehabilitated.

During the television inspection work between manhole Nos. E4 and E3 (easement for 18-inch pipe off Reed Street), a pipe connection thought to be a service connection was found to have significant infiltration of approximately 8,600 gpd. A subsequent review of available plans in this area shows that the pipe connection is actually an approximate 300 feet long service connection consisting of about 5 pipe segments (6-inch and 8-inch vitrified clay pipe) extending to the Memorial Park School. We recommend the 5 pipe segments receive follow-up CCTV

inspection during a high groundwater period to determine the pipe condition and location of any infiltration sources.

ATTACHMENT A

- Figure 1 Field Work Locations
- Figure 2 General Location Plan of Work

ATTACHMENT B

AECOM Letter Report Dated April 30, 2021 Documenting Flow Isolation Results and Recommendations for Television Inspection

Town of Rockland

Sewer Commission

Post Office Box 330
ROCKLAND, MASSACHUSETTS 02370

Tel: 781.878.1964
Fax: 781.878.1909

Charles Heshion, *Chairman*
Daniel Duross, *Commissioner*
Sherri Vallie, *Commissioner*

December 12, 2022

David Burns
Municipal Services
Massachusetts Department of Environmental Protection
20 Riverside Drive
Lakeville, MA 02347

Re: **Town of Rockland Infiltration/Inflow Control Plan**

Dear Mr. Burns,

The purpose of this letter is to present the Town of Rockland's Infiltration/Inflow (I/I) Control Plan and to request compliance with 314 CMR 12.00, *Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers*.

BACKGROUND

The Town of Rockland is located approximately 20 miles south of Boston, Massachusetts, and contains approximately 340,000 linear feet (lf) of sanitary sewers. In 2021, Rockland completed an I/I Sewer System Evaluation Survey (SSES). This project focused on identifying excessive and cost effective I/I present in the sewer system.

SANITARY SEWER OVERFLOWS (SSOs)

In the past 15 years, Rockland has experienced two (2) storm event that qualifies at or above the 5-year, 24-hour storm event recurrence interval. It is listed in the table below with other significant storm events from the same period. During this time period, twenty-four (24) SSOs were recorded and were all caused by rain events. The SSO Notification Form was submitted to MassDEP and is available upon request.

Storm Date(s)	Total Precipitation (in.)[1]	Peak 24 Hour Precipitation (in.)	Approximate Recurrence Interval[2]	Documented/Reported SSO
March 14-15, 2010	7.50	4.78	25 Year, 2-Day	Yes
October 28-30, 2012	4.14	3.06	1- to 2-Year, 3-Day	No
June 7-8, 2013	4.10	2.95	2- to 5-Year, 2-Day	No
March 29-31, 2014	4.51	2.98	2- to 5-Year, 3-Day	Yes
October 21-24, 2014	4.07	2.45	1- to 2-Year, 4-Day	No
March 2-3, 2018	4.17	4.17	5-Year, 24-Hour	No
September 25-28, 2018	5.21	2.43	2- to 5-Year, 4-Day	No

Note:
1. Rainfall data is based on the NOAA rain gage located in Brockton, MA.
2. Recurrence intervals are based on Technical Paper 40 (NOAA).
3. Only storm events that qualify as at least a five-year, 24-hour storm or have a total precipitation above 4 inches are shown in the table.

SEWER SYSTEM EVALUATION STUDIES AND OTHER I/I INVESTIGATIONS

Prior investigation work completed by Rockland to evaluate their sewer system is documented below. All projects followed MassDEP's *Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys.*

In 2021, the Town of Rockland conducted a Sewer System Evaluation Survey (SSES). As part of this project, flow isolation was conducted on 200,451 lf of 8- to 12-inch diameter sewers, or approximately 90% of the system total for this size category. A total of 19,131 lf of 8- to 12-inch sewers were selected for television inspection based on flow isolation results, in addition to 12,410 lf of 15- to 33-inch diameter sewers representing approximately one-third of the system total for this size category, were selected for further television inspection. Approximately 67,400 gallon per day (gpd) of infiltration from sewer mains and manholes was identified and 161,700 gpd of infiltration from sewer lateral services was identified. Defects identified during television inspection were recommended for rehabilitation in the report dated September 2021 on the basis of cost-effectiveness considering estimated cost of construction versus approximate cost of transportation and treatment.

PLAN AND SCHEDULE OF FUTURE WORK

The Town of Rockland Sewer Commission is prepared to address I/I in the sewer system. A sewer system rehabilitation project is scheduled to be performed to eliminate the I/I identified in the 2021 I/I SSES Report. Approximately 119,350 gpd of I/I is anticipated to be eliminated as the result of the rehabilitation project.

Moving forward, the Town has developed an Annual I/I Control Program. Year 1 of the program is anticipated to start in Spring 2023 and will focus on Town-wide flow monitoring to establish a new baseline for I/I. Data from flow monitoring will be analyzed and the Town will implement an Annual I/I Control Program that will consist of focused annual inspection including a private inflow removal program, television inspection, manhole inspections, and smoke testing. The annual program will be broken into three (3) phases. Each phase includes three (3) years of infiltration work (manhole and television inspection) and one year of inflow work (smoke testing, dye testing/flooding, and building inspection). A rehabilitation project will be performed at the end of each phase. Funding for future projects will be from town funds and may include funding from the MassDEP SRF Program. A draft Annual Infiltration/Inflow Program table is attached for reference. It should be note that the actual sewer length to be inspected per year will be adjusted after the conclusion of Year 1 Metering program.

Based on the past and future sewer system evaluation studies and rehabilitation work stated in this letter, the Town of Rockland requests compliance with 314 CMR 12.00.

Sincerely,

Chuck Heshion
Chairman, Rockland Board of Sewer Commissioners

cc: Frank Occhipinti, PE; Weston & Sampson

Weston & Sampson

Annual Infiltration/Inflow Program
Town Rockland, Massachusetts

Note: Sewer length and number of manholes are estimated based on a 15-year program. Actual sewer length to be inspected per year will be adjusted after the conclusion of Year 1/Metering program.

Fiscal Year	Calendar Year/Month	Project Name	Scope	Subarea(s)	Sewer Length (lf)	Manholes	Estimated Cost [2]
FY2023	Spring 2023	Year 1 Program	Town-wide Metering Program and GIS-based Depth-to-Groundwater Analysis	-	-	-	$ 150,000
Phase 1							
FY2024	Spring 2024	Year 2 Infiltration	Manhole inspections and television inspection	-	34,000	170	$ 150,000
FY2025	Spring 2025	Year 3 Infiltration	Manhole inspections and television inspection	-	34,000	170	$ 155,000
FY2026	Spring 2026	Year 4 Infiltration	Manhole inspections and television inspection		34,000	170	$ 160,000
FY2027	Summer 2026 - Spring 2027	Year 2 to 4 Inflow	Smoke Testing, Dye Testing/Flooding with TV, and Building Inspection	-	102,000	-	$ 200,000
FY2028	Design - Summer 2027 Bid - Fall/Winter 2027 Construction - Spring 2028	Year 2 to 4 Rehabilitation	Sewer System Rehabilitation - Cost Effective and Structural Defective Rehabilitation	-	TBD	TBD	$ 1,500,000 [1]
Phase 2							
FY2029	Spring 2029	Year 5 Infiltration	Manhole inspections and television inspection	-	34,000	170	$ 170,000
FY2030	Spring 2030	Year 6 Infiltration	Manhole inspections and television inspection	-	34,000	170	$ 175,000
FY2031	Spring 2031	Year 7 Infiltration	Manhole inspections and television inspection		34,000	170	$ 180,000
FY2032	Summer 2031 - Spring 2032	Year 5 to 7 Inflow	Smoke Testing, Dye Testing/Flooding with TV, and Building Inspection	-	102,000	-	$ 220,000
FY2033	Design - Summer 2032 Bid - Fall/Winter 2032 Construction - Spring 2033	Year 5 to 7 Rehabilitation	Sewer System Rehabilitation - Cost Effective and Structural Defective Rehabilitation	-	TBD	TBD	$ 1,500,000 [1]
Phase 3							
FY2034	Spring 2034	Year 8 Infiltration	Manhole inspections and television inspection	-	34,000	170	$ 191,000
FY2035	Spring 2035	Year 9 Infiltration	Manhole inspections and television inspection	-	34,000	170	$ 197,000
FY2036	Spring 2036	Year 10 Infiltration	Manhole inspections and television inspection		34,000	170	$ 203,000
FY2037	Summer 2036 - Spring 2037	Year 8 to 10 Inflow	Smoke Testing, Dye Testing/Flooding with TV, and Building Inspection	-	102,000	-	$ 240,000
FY2038	Design - Summer 2037 Bid - Fall/Winter 2037 Construction - Spring 2038	Year 8 to 10 Rehabilitation	Sewer System Rehabilitation - Cost Effective and Structural Defective Rehabilitation	-	TBD	TBD	$ 1,500,000 [1]

[1] Estimated cost includes construction and engineering

[2] Estimated unit cost is based on a 3-4% increase from previous year

Prepared 10/12/2022

Updated 12/12/2022

	Infiltration
	Inflow
	Rehab/Construction

Appendix C
NPDES Permits

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, 33 U.S.C. §§ 1251 et seq. (the "CWA"),

Town of Rockland, Massachusetts

is authorized to discharge from the facility located at

Rockland Wastewater Treatment Plant
587R Summer Street
Rockland, MA 02370

to receiving water named

French Stream
South Coastal Watershed

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature.[1]

This permit expires at midnight, five years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on January 27, 2006.

This permit consists of **Part I** including the cover page(s), **Attachment A** (Freshwater Acute Toxicity Test Procedure and Protocol, February 2011), **Attachment B** (Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013), and **Part II (**NPDES Part II Standard Conditions, April 2018).

Signed this day of

KENNETH MORAFF Digitally signed by KENNETH MORAFF Date: 2021.11.29 14:57:19 -05'00'

Ken Moraff, Director
Water Division
Environmental Protection Agency
Region 1
Boston, MA

[1] Procedures for appealing EPA's Final Permit decision may be found at 40 CFR § 124.19.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the French Stream. The discharge shall be limited and monitored as specified below; the receiving water and the influent shall be monitored as specified below.

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Rolling Average Effluent Flow[5]	Report MGD[5]	---	---	Continuous	Recorder
Effluent Flow[5]	2.5 MGD	---	Report MGD	Continuous	Recorder
BOD_5 (May 1 – September 30)	6 mg/L 125 lb/day	6 mg/L 125 lb/day	10 mg/L 209 lb/day	2/Week	Composite
BOD_5 (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	2/Week	Composite
BOD_5 Removal	≥ 85 %	---	---	1/Month	Calculation
TSS (May 1 – September 30)	10 mg/L 209 lb/day	10 mg/L 209 lb/day	15 mg/L 313 lb/day	2/Week	Composite
TSS (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	2/Week	Composite
TSS Removal	≥ 85 %	---	---	1/Month	Calculation
pH Range[6]	6.5 - 8.3 S.U.			1/Day	Grab
Total Residual Chlorine[7,8]	11 µg/L	---	19 µg/L	1/Day	Grab
Escherichia coli [7,8]	126 cfu/100 mL	---	409 cfu/100 mL	3/Week	Grab
Total Copper	12 µg/L	---	19 µg/L	1/Month	Composite
Total Aluminum	87.2 µg/L	---	Report µg/L	1/Month	Composite
Dissolved Oxygen (May 1 – Sept 30)	≥ 7.4 mg/L			1/Day	Grab
Ammonia Nitrogen (April 1 – May 31)	2.5 mg/L	2.5 mg/L	5.7 mg/L	2/Week	Composite
Ammonia Nitrogen (June 1 – Sept 30)	1.0 mg/L	1.0 mg/L	1.5 mg/L	2/Week	Composite
Ammonia Nitrogen (Oct 1 – March 31)	3.3 mg/L	3.3 mg/L	5.7 mg/L	2/Week	Composite

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Total Kjeldahl Nitrogen[9] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	Composite
Nitrate + Nitrite[9] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	Composite
Total Nitrogen[9]	Report mg/L Report lb/day	---	Report mg/L	1/Month	Calculation
Total Phosphorus[10] (April 1 – October 31)	0.1 mg/L	---	Report mg/L	2/Week	Composite
Total Phosphorus (November 1 – March 31)	1.0 mg/L	---	Report mg/L	1/Week	Composite
Perfluorohexanesulfonic acid (PFHxS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorononanoic acid (PFNA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanesulfonic acid (PFOS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanoic acid (PFOA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluoroheptanoic acid (PFHpA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorodecanoic acid (PFDA)[11]	---	---	Report ng/L	1/Quarter	Composite
Whole Effluent Toxicity (WET) Testing[12,13]					
LC_{50}	---	---	≥ 100 %	1/Quarter	Composite
C-NOEC	---	---	≥ 99 %	1/Quarter	Composite
Hardness	---	---	Report mg/L	1/Quarter	Composite
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Composite
Total Aluminum	---	---	Report mg/L	1/Quarter	Composite
Total Cadmium	---	---	Report mg/L	1/Quarter	Composite
Total Copper	---	---	Report mg/L	1/Quarter	Composite
Total Nickel	---	---	Report mg/L	1/Quarter	Composite
Total Lead	---	---	Report mg/L	1/Quarter	Composite
Total Zinc	---	---	Report mg/L	1/Quarter	Composite
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Composite

Ambient Characteristic[14]	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Hardness	---	---	Report mg/L	1/Quarter	Grab
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Grab
Total Aluminum	---	---	Report mg/L	1/Quarter	Grab
Total Cadmium	---	---	Report mg/L	1/Quarter	Grab
Total Copper	---	---	Report mg/L	1/Quarter	Grab
Total Nickel	---	---	Report mg/L	1/Quarter	Grab
Total Lead	---	---	Report mg/L	1/Quarter	Grab
Total Zinc	---	---	Report mg/L	1/Quarter	Grab
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Grab
Dissolved Organic Carbon[15]	---	---	Report mg/L	1/Quarter	Grab
pH[16]	---	---	Report S.U.	1/Quarter	Grab
Temperature[16]	---	---	Report °C	1/Quarter	Grab

Influent Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
BOD_5	Report mg/L	---	---	2/Month	Composite
TSS	Report mg/L	---	---	2/Month	Composite
Perfluorohexanesulfonic acid (PFHxS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorononanoic acid (PFNA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanesulfonic acid (PFOS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanoic acid (PFOA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluoroheptanoic acid (PFHpA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorodecanoic acid (PFDA)[11]	---	---	Report ng/L	1/Quarter	Composite

Sludge Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Perfluorohexanesulfonic acid (PFHxS)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorononanoic acid (PFNA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorooctanesulfonic acid (PFOS)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorooctanoic acid (PFOA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluoroheptanoic acid (PFHpA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorodecanoic acid (PFDA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]

Footnotes:

1. All samples shall be collected in a manner to yield representative data. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented as an electronic attachment to the applicable discharge monitoring report. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and the State of any additional testing above that required herein, if testing is in accordance with 40 CFR Part 136.

2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" to all non-detects for that reporting period and report the average of all the results.

4. A "grab" sample is an individual sample collected in a period of less than 15 minutes.

   A "composite" sample is a composite of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportional to flow.

5. The limit is a monthly average, reported in million gallons per day (MGD). The Permittee shall also report the annual rolling average, which will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months. Also report maximum daily flow in MGD.

   The Permittee must utilize an effluent flow meter to measure effluent flow. See section I.G.3 for a compliance schedule regarding installation of the effluent flow meter.

6. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.).

7. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges that have been previously chlorinated or that contain residual chlorine. The compliance level for TRC is 20 µg/L.

   Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

   The Permittee shall substitute three TRC grab samples per day, for any day that they are unable to comply with the continuous recording requirement. Each grab sample shall be taken at least 2 hours from the previous grab sample.

8. The monthly average limit for *Escherichia coli* (*E. coli*) is expressed as a geometric mean. E. coli monitoring shall be conducted concurrently with TRC monitoring, if TRC monitoring is required.

   The *E. coli* limit shall become effective in accordance with the compliance schedule found at Part I.G.1.

9. Total Kjeldahl nitrogen and nitrate + nitrite samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen, as follows.

   Total Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) + Nitrate + Nitrite (mg/L)

   Total Nitrogen (lb/day) = [(average monthly Total Nitrogen (mg/L) * total monthly effluent flow (Millions of Gallons (MG)) / # of days in the month] * 8.34

10. The phosphorus limit shall become effective in accordance with the compliance schedule found at Part I.G.2.

11. Report in nanograms per liter (ng/L). This reporting requirement for the listed per- and polyfluoroalkyl substances (PFAS) parameters takes effect the first full calendar quarter following 6 months after EPA notifies the Permittee that an EPA multi-lab validated method for wastewater is available.

12. The Permittee shall conduct acute toxicity tests (LC50) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in Attachment A and B of this permit. LC50 and C-NOEC are defined in Part II.E. of this permit. The Permittee shall test the daphnid, *Ceriodaphnia dubia*. Toxicity test samples shall be collected during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the DMR submittal that includes the results for that toxicity test.

13. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachment A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

14. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachment A and B.** Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

1. Monitoring and reporting for dissolved organic carbon (DOC) are not requirements of the Whole Effluent Toxicity (WET) tests but are additional requirements. The Permittee may analyze the WET samples for DOC or may collect separate samples for DOC concurrently with WET sampling.

2. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

3. Report in nanograms per gram (ng/g). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter following 6 months after EPA notifies the permittee that an EPA multi-lab validated method for sludge is available.

4. Sludge sampling shall be as representative as possible based on guidance found at https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf.

Part I.A., continued.

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

4. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical, chemical, or biological nature of the bottom.

5. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

6. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

7. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

8. The Permittee must provide adequate notice to EPA-Region 1 and the State of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 CFR Part 122 Appendix A as amended) discharging process water; and

    b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

    c. For purposes of this paragraph, adequate notice shall include information on:

        (1) The quantity and quality of effluent introduced into the POTW; and

        (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

9. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit in accordance with Part II.D.1.e.(1) (24-hour reporting). See Part I.H below for reporting requirements.

2. The Permittee must provide notification to the public within 24 hours of becoming aware of any unauthorized discharge, except SSOs that do not impact a surface water or the public, on a publicly available website, and it shall remain on the website for a minimum of 12 months. Such notification shall include the location and description of the discharge; estimated volume; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue.

3. Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance (O&M) of the sewer system shall be in compliance with the Standard Conditions of Part II and the following terms and conditions. The Permittee shall complete the following activities for the collection system that it owns:

1. Maintenance Staff

The Permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Provisions to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

2. Preventive Maintenance Program

The Permittee shall maintain an ongoing preventive maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. Plans and programs to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

The Permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to

control I/I shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the Permittee shall prepare a map of the sewer collection system it owns. The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;

b. All combined sewer lines, related manholes, and catch basins;

c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);

d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;

e. All pump stations and force mains;

f. The wastewater treatment facility(ies);

g. All surface waters (labeled);

h. Other major appurtenances such as inverted siphons and air release valves;

i. A numbering system that uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j. The scale and a north arrow; and

k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System O&M Plan

The Permittee shall develop, or update, as applicable and implement the Collection System O&M Plan it has previously submitted to EPA and the State. The Plan shall be available for review by federal, state and local agencies as requested. The Plan shall include:

a. A description of the collection system management goals, staffing, information management, and legal authorities;

b. A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and

c. A preventive maintenance and monitoring program for the collection system;

d. Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;

e. Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;

f. Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;

g. A description of the Permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof downspouts;

h. An educational public outreach program for all aspects of I/I control, particularly private inflow; and

i. An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The Permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year, including a quantification of I/I identified and removed;

c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;

d. A map with areas identified for investigation/action in the coming year;

e. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit; and

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's 2.5 MGD design flow (2.0 MGD), or there have been capacity related overflows, the report shall include:

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and

(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the Permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works it owns and operates, as defined in Part II.E.1 of this permit.

E. INDUSTRIAL USERS AND PRETREATMENT PROGRAM

1. The Permittee shall submit to EPA and the State the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432, 447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended) who commences discharge to the facility after the effective date of this permit.

   This reporting requirement also applies to any other IU who is classified as a Significant Industrial User which discharges an average of 25,000 gallons per day or more of process wastewater into the facility (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the facility; or is designated as such by the Control Authority as defined in 40 CFR § 403.3(f) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 CFR § 403.8(f)(6)).

2. In the event that the Permittee receives originals of reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from industrial users subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432-447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended), or from a Significant Industrial User, the Permittee shall forward the originals of these reports within ninety (90) days of their receipt to EPA, and copy the State.

3. Beginning the first full calendar quarter following 6 months after EPA has notified the Permittee that a multi-lab validated method for wastewater is available, the Permittee shall commence annual sampling of the following types of industrial discharges into the POTW:

    - Commercial Car Washes
    - Platers/Metal Finishers
    - Paper and Packaging Manufacturers
    - Tanneries and Leather/Fabric/Carpet Treaters
    - Manufacturers of Parts with Polytetrafluoroethylene (PTFE) or teflon type coatings (i.e. bearings)
    - Landfill Leachate
    - Centralized Waste Treaters
    - Contaminated Sites
    - Fire Fighting Training Facilities
    - Airports
    - Any Other Known or Expected Sources of PFAS

    Sampling shall be for the following PFAS chemicals:

Industrial User Effluent Characteristic	Maximum Daily	Monitoring Requirements	
		Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	Report ng/L	1/year	Composite
Perfluorononanoic acid (PFNA)	Report ng/L	1/year	Composite
Perfluorooctanesulfonic acid (PFOS)	Report ng/L	1/year	Composite
Perfluorooctanoic acid (PFOA)	Report ng/L	1/year	Composite
Perfluoroheptanoic acid (PFHpA)	Report ng/L	1/year	Composite
Perfluorodecanoic acid (PFDA)	Report ng/L	1/year	Composite

    The industrial discharges sampled and the sampling results shall be summarized and submitted to EPA and copy the state as an electronic attachment to the March discharge monitoring report due April 15 of the calendar year following the testing.

F. SLUDGE CONDITIONS

1. The Permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR § 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the Permittee's sludge use and/or disposal practices, the Permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices:

    a. Land application - the use of sewage sludge to condition or fertilize the soil

b. Surface disposal - the placement of sewage sludge in a sludge only landfill

c. Sewage sludge incineration in a sludge only incinerator

4. The requirements of 40 CFR Part 503 do not apply to facilities that dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities that do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR Part 503 requirements include the following elements:

   a. General requirements

   b. Pollutant limitations

   c. Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)

   d. Management practices

   e. Record keeping

   f. Monitoring

   g. Reporting

   The specific 40 CFR Part 503 requirements that are applicable to the Permittee will depend on the use or disposal practice(s) followed and the quality of sludge produced by a facility. The EPA Region 1 guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the Permittee to assist it in determining the applicable requirements.

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year, as follows:

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

   Sampling of the sewage sludge shall use the procedures detailed in 40 CFR § 503.8.

7. Under 40 CFR § 503.9(r), the Permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the Permittee contracts with another "person who prepares sewage

sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the Permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the Permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by February 19 (see also "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

G. SPECIAL CONDITIONS

1. The effluent limit for *E. coli* shall be subject to a schedule of compliance whereby the limit takes effect 12 months after the effective date of the permit. During this first year, the Permittee must comply with interim fecal coliform limits of 200 cfu/100 mL (monthly average) and 400 cfu/100 mL (daily maximum).

2. Total Phosphorus Compliance Schedule

   The effluent limit for total phosphorus, effective from April 1 through October 31, shall be subject to a schedule of compliance whereby the limit takes effect 36 months after the effective date of the permit. For the period starting on the effective date of this permit and ending 36 months after the effective date, the Permittee shall continue to comply with the existing monthly average limit of 0.2 mg/L. The schedule includes one year to evaluate potential treatment process changes (such as chemical addition), one year to implement any process changes necessary to meet the more stringent limit of 0.1 mg/L, and one year to optimize the facility after those changes have been implemented to come into compliance with the new limit. The schedule of compliance is as follows:

   a. Within twelve (12) months of the effective date of the permit, the Permittee shall submit to EPA and MassDEP a status report evaluating the potential treatment process changes (such as chemical addition) necessary to achieve the permit limit.

   b. Within twenty-four (24) months of the effective date of the permit, the Permittee shall complete any process changes necessary to achieve the total phosphorus limit and submit a progress report to EPA and MassDEP detailing these changes.

   c. Within thirty-six (36) months of the effective date of the permit, the Permittee shall complete optimization of the plant and comply with the phosphorus limit. Additionally, the Permittee shall submit a final report that summarizes the process changes and plant optimization efforts.

3. The effluent flow meter installation is subject to a schedule of compliance whereby it shall be operational 12 months after the effective date of the permit. During this first year, the Permittee may continue to report values from the influent flow meter.

H. REPORTING REQUIREMENTS

Unless otherwise specified in this permit, the Permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

   The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and the State electronically using NetDMR no later than the 15th day of the following month. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or the State. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. See Part I.H.6. for more information on State reporting. Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the report due date specified in this permit.

3. Submittal of Biosolids/Sewage Sludge Reports

   By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

4. Submittal of Requests and Reports to EPA Water Division (WD)

   a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

      (1) Transfer of permit notice;

      (2) Request for changes in sampling location;

      (3) Request for reduction in testing frequency;

      (4) Report on unacceptable dilution water / request for alternative dilution water for

WET testing.

(5) Report of new industrial user commencing discharge

(6) Report received from existing industrial user

b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

5. Submittal of Reports to EPA Enforcement and Compliance Assurance Division (ECAD) in Hard Copy Form

a. The following notifications and reports shall be signed and dated originals, submitted as hard copy, with a cover letter describing the submission:

(1) Written notifications required under Part II.B.4.c, for bypasses, and Part II.D.1.e, for sanitary sewer overflows (SSOs). Starting on 21 December 2025, such notifications must be done electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

(2) Collection System Operation and Maintenance Plan

(3) Report on annual activities related to O&M Plan

This information shall be submitted to EPA ECAD at the following address:

U.S. Environmental Protection Agency
Enforcement and Compliance Assurance Division
Water Compliance Section
5 Post Office Square, Suite 100 (04-SMR)
Boston, MA 02109-3912

6. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

7. Verbal Reports and Verbal Notifications

a. Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to the State. This includes verbal reports and notifications that require reporting within 24 hours (e.g., Part II.B.4.c.(2), Part II.B.5.c.(3), and Part II.D.1.e).

b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1510
and
MassDEP Emergency Response at 888-304-1133

I. STATE 401 CERTIFICATION CONDITIONS

1. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, beginning six (6) months after the permittee has been notified by EPA of a multi-lab validated method for wastewater, or two (2) years after the effective date of the 2021 Federal NPDES permit, whichever is earlier, the permittee shall conduct monitoring of the influent, effluent, and sludge for PFAS compounds as detailed in the tables below. If EPA's multi-lab validated method is not available by twenty (20) months after the effective date of the 2021 Federal NPDES permit, the permittee shall contact MassDEP (massdep.npdes@mass.gov) for guidance on an appropriate analytical method. Notwithstanding any other provision of the 2021 Federal NPDES Permit to the contrary, monitoring results shall be reported to MassDEP electronically, at massdep.npdes@mass.gov, or as otherwise specified, within 30 days after they are received.

Influent and Effluent (Outfall 001)

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/L	Quarterly[1]	24-hour Composite
Perfluoroheptanoic acid (PFHpA)	ng/L	Quarterly	24-hour Composite
Perfluorononanoic acid (PFNA)	ng/L	Quarterly	24-hour Composite
Perfluorooctanesulfonic acid (PFOS)	ng/L	Quarterly	24-hour Composite
Perfluorooctanoic acid (PFOA)	ng/L	Quarterly	24-hour Composite
Perfluorodecanoic acid (PFDA)	ng/L	Quarterly	24-hour Composite

Sludge

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/g	Quarterly	Composite[2]
Perfluoroheptanoic acid (PFHpA)	ng/g	Quarterly	Composite
Perfluorononanoic acid (PFNA)	ng/g	Quarterly	Composite
Perfluorooctanesulfonic acid (PFOS)	ng/g	Quarterly	Composite
Perfluorooctanoic acid (PFOA)	ng/g	Quarterly	Composite
Perfluorodecanoic acid (PFDA)	ng/g	Quarterly	Composite

2. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, beginning six (6) months after permittee has been notified by EPA of a multi-lab validated method for wastewater, or two (2) years after the effective date of the 2021 Federal NPDES permit, whichever is earlier, the permittee shall commence annual monitoring of all Significant Industrial Users[3,4] discharging into the POTW. Monitoring shall be in accordance with the table below. If EPA's multi-lab validated method is not available by twenty (20) months after the effective date of the 2021 Federal NPDES permit, the permittee shall contact MassDEP (massdep.npdes@mass.gov) for guidance on an appropriate analytical method. Notwithstanding any other provision of the 2021 Federal NPDES permit to the contrary, monitoring results shall be reported to MassDEP electronically at massdep.npdes@mass.gov within 30 days after they are received.

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/L	Annual	24-hour Composite
Perfluoroheptanoic acid (PFHpA)	ng/L	Annual	24-hour Composite
Perfluorononanoic acid (PFNA)	ng/L	Annual	24-hour Composite
Perfluorooctanesulfonic acid (PFOS)	ng/L	Annual	24-hour Composite
Perfluorooctanoic acid (PFOA)	ng/L	Annual	24-hour Composite
Perfluorodecanoic acid (PFDA)	ng/L	Annual	24-hour Composite

ATTACHMENT A

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcement/water/dmr.html *for further important details on alternate dilution water substitution requests.*

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

ATTACHMENT B

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL

USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25 values and ≥ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value**,** for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

NPDES PART II STANDARD CONDITIONS
(April 26, 2018)[1]

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[1] Updated July 17, 2018 to fix typographical errors.

A. GENERAL REQUIREMENTS

1. Duty to Comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA or Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

a. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

b. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (83 Fed. Reg. 1190-1194 (January 10, 2018) and the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note. See Pub. L.114-74, Section 701 (Nov. 2, 2015)). These requirements help ensure that EPA penalties keep pace with inflation. Under the above-cited 2015 amendments to inflationary adjustment law, EPA must review its statutory civil penalties each year and adjust them as necessary.

(1) Criminal Penalties

(a) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than 2 years, or both.

(b) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

(c) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing

endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(d) *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(2) *Civil Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(3) *Administrative Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty as follows:

(a) *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(b) *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit

condition.

3. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from responsibilities, liabilities or penalties to which the Permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

5. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

6. Confidentiality of Information

a. In accordance with 40 C.F.R. Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or Permittee;
(2) Permit applications, permits, and effluent data.

c. Information required by NPDES application forms provided by the Director under 40 C.F.R. § 122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

7. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The Permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

8. State Authorities

Nothing in Parts 122, 123, or 124 precludes more stringent State regulation of any activity

covered by the regulations in 40 C.F.R. Parts 122, 123, and 124, whether or not under an approved State program.

9. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. *Bypass not exceeding limitations.* The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (c) and (d) of this Section.

c. Notice

(1) *Anticipated bypass*. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass. As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(2) *Unanticipated bypass*. The Permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or required to do so by law.

d. *Prohibition of bypass.*

(1) Bypass is prohibited, and the Director may take enforcement action against a Permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The Permittee submitted notices as required under paragraph 4.c of this Section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 4.d of this Section.

5. Upset

a. *Definition*. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or

improper operation.

b. *Effect of an upset.* An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph B.5.c. of this Section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. *Conditions necessary for a demonstration of upset.* A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the Permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The Permittee submitted notice of the upset as required in paragraph D.1.e.2.b. (24-hour notice).
(4) The Permittee complied with any remedial measures required under B.3. above.

d. *Burden of proof.* In any enforcement proceeding the Permittee seeking to establish the occurrence of an upset has the burden of proof.

C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least 5 years (or longer as required by 40 C.F.R. § 503), the Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

e. The Clean Water Act provides that any person who falsifies, tampers with, or

knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. *Planned Changes*. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 C.F.R. § 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 122.42(a)(1).

(3) The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. *Anticipated noncompliance*. The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. *Transfers.* This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Clean Water Act. *See* 40 C.F.R. § 122.61; in some cases, modification or revocation and reissuance is mandatory.

d. *Monitoring reports*. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices. As of December 21, 2016 all reports and forms submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by State law.

(2) If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 C.F.R. § 136, or another method required for an industry-specific waste stream under 40 C.F.R. Subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. *Twenty-four hour reporting.*

(1) The Permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. A written report shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all

reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. *See* 40 C.F.R. § 122.41(g).
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. *See* 40 C.F.R. § 122.44(g).

(3) The Director may waive the written report on a case-by-case basis for reports under paragraph D.1.e. of this Section if the oral report has been received within 24 hours.

f. *Compliance Schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. *Other noncompliance.* The Permittee shall report all instances of noncompliance not reported under paragraphs D.1.d., D.1.e., and D.1.f. of this Section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph D.1.e. of this Section. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph D.1.e. and the applicable required data in Appendix A to 40 C.F.R. Part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), §122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this Section.

h. *Other information.* Where the Permittee becomes aware that it failed to submit any

relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

i. *Identification of the initial recipient for NPDES electronic reporting data*. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in Appendix A to 40 C.F.R. Part 127) to the appropriate initial recipient, as determined by EPA, and as defined in 40 C.F.R. § 127.2(b). EPA will identify and publish the list of initial recipients on its Web site and in the FEDERAL REGISTER, by state and by NPDES data group (see 40 C.F.R. § 127.2(c) of this Chapter). EPA will update and maintain this listing.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Director shall be signed and certified. *See* 40 C.F.R. §122.22.

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under paragraph A.6. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Director. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

For more definitions related to sludge use and disposal requirements, see EPA Region 1's NPDES Permit Sludge Compliance Guidance document (4 November 1999, modified to add regulatory definitions, April 2018).

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and federal standards and limitations to which a "discharge," a "sewage sludge use or disposal practice," or a related activity is subject under the CWA, including "effluent limitations," water quality standards, standards of performance, toxic effluent standards or prohibitions, "best management practices," pretreatment standards, and "standards for sewage sludge use or disposal" under Sections 301, 302, 303, 304, 306, 307, 308, 403 and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in

"approved States," including any approved modifications or revisions.

Approved program or *approved State* means a State or interstate program which has been approved or authorized by EPA under Part 123.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass see B.4.a.1 above.

C-NOEC or *"Chronic (Long-term Exposure Test) – No Observed Effect Concentration" means* the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 C.F.R. § 501.2, required to have an approved pretreatment program under 40 C.F.R. § 403.8 (a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to 40 C.F.R. § 403.10 (e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. § 122.2, classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director, because of the potential for its sewage sludge use or disposal practice to affect public health and the environment adversely.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483and Public Law 97-117, 33 U.S.C. 1251 *et seq*.

CWA and regulations means the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily Discharge means the "discharge of a pollutant" measured during a calendar day or any

other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Direct Discharge means the "discharge of a pollutant."

Director means the Regional Administrator or an authorized representative. In the case of a permit also issued under Massachusetts' authority, it also refers to the Director of the Division of Watershed Management, Department of Environmental Protection, Commonwealth of Massachusetts.

Discharge

(a) When used without qualification, *discharge* means the "discharge of a pollutant."

(b) As used in the definitions for "interference" and "pass through," *discharge* means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Act.

Discharge Monitoring Report ("DMR") means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by Permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise "effluent limitations."

Environmental Protection Agency ("EPA") means the United States Environmental Protection

Agency.

Grab Sample means an individual sample collected in a period of less than 15 minutes.

Hazardous substance means any substance designated under 40 C.F.R. Part 116 pursuant to Section 311 of CWA.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Indirect discharger means a nondomestic discharger introducing "pollutants" to a "publicly owned treatment works."

Interference means a discharge (see definition above) which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment and disposal.

LC_{50} means the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.

Maximum daily discharge limitation means the highest allowable "daily discharge."

Municipal solid waste landfill (MSWLF) unit means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 C.F.R. § 257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be

publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

Municipality

(a) When used without qualification *municipality* means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of CWA.

(b) As related to sludge use and disposal, *municipality* means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal Agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management Agency under Section 208 of the CWA, as amended. The definition includes a special district created under State law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in Section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program."

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants;"

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source;" and

(d) Which has never received a finally effective NPDES permit for discharges at that "site."

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Director in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Director shall consider the factors specified in 40 C.F.R. §§ 125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System."

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge (see definition above) which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (40 C.F.R § 122.28). "Permit" does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or "proposed permit."

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 C.F.R. § 122.3).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

(except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq*.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train*, 8 E.R.C. 2120 (D.D.C. 1976), *modified* 12 E.R.C. 1833 (D.D.C. 1979)); also listed in Appendix A of 40 C.F.R. Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (b) not a "POTW."

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly owned treatment works (POTW) means a treatment works as defined by Section 212 of the Act, which is owned by a State or municipality (as defined by Section 504(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in Section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary industry category means any industry which is not a "primary industry category."

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 C.F.R. Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does

not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 C.F.R. § 122.2.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substance designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 C.F.R. §§ 110.10 and 117.21) or Section 102 of CERCLA (*see* 40 C.F.R. § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to section 405(d) of the CWA, and is required to obtain a permit under 40 C.F.R. § 122.1(b)(2).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe as defined in the regulations which meets the requirements of 40 C.F.R. § 123.31.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Toxic pollutant means any pollutant listed as toxic under Section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Director may designate any person subject to the standards for sewage sludge use and

disposal in 40 C.F.R. Part 503 as a "treatment works treating domestic sewage," where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 C.F.R. Part 503.

Upset see B.5.a. above.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Waste pile or *pile* means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States or waters of the U.S. means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands;"

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

    (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

    (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

    (3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test.

*Zone of Initial Dilution (*ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards.

2. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)
TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont.	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen

kg/day	Kilograms per day
lbs/day	Pounds per day
mg/L	Milligram(s) per liter
mL/L	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
Surfactant	Surface-active agent
Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
µg/L	Microgram(s) per liter
WET	"Whole effluent toxicity"
ZID	Zone of Initial Dilution

RESPONSE TO COMMENTS
NPDES PERMIT NO. MA0101923
ROCKLAND WASTEWATER TREATMENT PLANT
ROCKLAND, MASSACHUSETTS

The U.S. Environmental Protection Agency's New England Region (EPA) is issuing a Final National Pollutant Discharge Elimination System (NPDES) Permit for the Rockland Wastewater Treatment Plant (WWTP) located in Rockland, Massachusetts. This permit is being issued under the Federal Clean Water Act (CWA), 33 U.S.C., §§ 1251 *et seq.*

In accordance with the provisions of 40 Code of Federal Regulations (CFR) §124.17, this document presents EPA's responses to comments received on the Draft NPDES Permit # MA0101923 ("Draft Permit"). The Response to Comments explains and supports EPA's determinations that form the basis of the Final Permit. From August 25, 2021 through September 23, 2021, EPA solicited public comments on the Draft Permit.

EPA received comments from:

- Town of Rockland, dated September 23, 2021

Although EPA's knowledge of the facility has benefited from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit that warranted a reopening of the public comment period. EPA does, however, make certain clarifications and changes in response to comments. These are explained in this document and reflected in the Final Permit. Below EPA provides a summary of the changes made in the Final Permit. The analyses underlying these changes are contained in the responses to individual comments that follow.

A copy of the Final Permit and this response to comments document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the Final Permit may be also obtained by writing or calling Doug MacLean, U.S. EPA, 5 Post Office Square, Suite 100 (Mail Code: 06-4), Boston, MA 02109-3912; Telephone: (617) 918-1608; Email maclean.douglas@epa.gov.

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I. Summary of Changes to the Final Permit

1. A compliance schedule has been added in section I.G.3 of the Final Permit for installation of an effluent flow meter. See Response 3.
2. The TRC language in Footnote 7 of Part I.A.1 of the Final Permit has been adjusted to account for chlorine grab sampling when necessary and to require that each grab samples shall be taken at least 2 hours from the previous grab sample. See Response 5.
3. Pretreatment language in section I.E of the permit has been revised to no longer require a pretreatment program. Attachments C & D have also been removed from the Final Permit. See Response 11.

II. Responses to Comments

Comments are reproduced below as received; they have not been edited.

A. Comments from Keith Nastasia, Sewer Superintendent, Town of Rockland:

Comment 1

As the permittee of the aforementioned NPDES permit, the Town of Rockland has reviewed the Draft NPDES permit for the Rockland Wastewater Treatment Plant (WWTP). The Draft NPDES Permit includes a number of items of concern to us, which we question, and that we believe should not be changed, or which require additional explanation and justification from EPA. The changes in question are summarized as follows:

1. The plant flow characteristics are requested to be reported as rolling average, to be consistent with other communities that discharge to South Coastal Basin (page 2 of 20 of the draft permit).

2. The "Effluent Flow" term (on page 2 of 20) is requested to be changed to plant flow.

3. Objection to the lowering of the Total Aluminum limit to 87.2 ug/L mg/I (as described on page 2 of 20).

4. Language adjustment to match previous permit foot notes related to Total Chlorine Residual (page 7 of 20).

5. Objection to the lowering of the Total Phosphorous summer season limit to 0.1 mg/I, as described on page 3 of 20 of the draft permit.

6. Comment on the new requirement to sample for and report levels of PFAS compounds (including PFHxS, PFHpA, PFNA, PFOS, PFOA and PFDA), as described on pages 8 of 20 of the draft permit.

7. Adjustment to Unauthorized Discharges public posting to Town website, as discussed on page 10 of 20 of the draft permit.

8. Comment on new provisions related to the Operation and Maintenance of the sewer system, as described on pages 1 O and 11 of 20 of the draft permit.

9. Request for change to Collection System Mapping verbiage on page 11 of 20.

10. Industrial Facilities correction, affecting the Industrial Pretreatment Program requirement

Response 1

EPA acknowledges this comment and will respond to each individual point (1-10) as they are raised in more detail in the comments below.

Comment 2

Item 1 - Flow Reporting: With the new permit, it is respectfully requested that flows are to be reported as rolling monthly averages to be consistent with NPDES permits for other Massachusetts communities. The modification to using a monthly flow limit was made in the prior permit, and the Town requests the standard language be restored to the permit for flow.

Response 2

In 2007, EPA issued a permit modification to change flow monitoring from a 12-month rolling average to a monthly average, in response to Administrative Order Docket 06-33 ("the Order" or "the AO"). As stated, section II.A of the Statement of Basis for Rockland's 2007 Permit Modification, "EPA proposes to withdraw the annual average flow limit and reissue the condition as an average monthly limit of 2.5 MGD in order to more closely track the Town's efforts to reduce extraneous flows to its collection system. This change is also consistent with a request made by the Town during settlement negotiations that the rolling annual average limit be replaced with a monthly average limit."

The Rockland WWTP had 28 monthly average flow violations in the 60-month review period used for this permit reissuance (June 2016 – July 2021). This frequency of violations is consistent with the review period used during Rockland's 2006 permit renewal, when Rockland had flow violations in 16 out of 36 months, from January 2003 through December 2005. These continued flow violations indicate that Rockland has not made meaningful progress on resolving effluent flow issues and continues to need to be monitored more closely via a monthly effluent flow limit.

The comment does not provide a rationale for the requested change to a rolling annual average flow limit, other than noting that it would be consistent with NPDES permits for other Massachusetts communities. EPA acknowledges that many other Massachusetts dischargers have rolling annual average limits but considers the unique background and existing AO described above to justify the continuance of a monthly average limit in this case. Given the lack of improvement seen in effluent flow, EPA does not see a reason to change the approach adopted in 2007, and the effluent flow limit will remain as a monthly average limit in the Final Permit.

Comment 3

Item 2 -Effluent Flow: The draft permit refers to Effluent Flow in the permit limits. The Rockland I/WI/TP currently does not have an effluent flow meter, so this term is not accurate. The Town respectfully requests that the term be changed to "FLOW", as was included in the prior permit.

Response 3

EPA clarifies that influent flow and effluent flow, while related, are not identical. Flow is listed as an "Effluent Characteristic" in the permit and effluent flow must be measured. As stated in the Fact Sheet at 8,

> "…EPA uses effluent flow both to determine whether an NPDES permit needs certain effluent limitations and to calculate the limitations themselves. EPA practice is to use effluent flow as a reasonable and important worst-case condition in EPA's reasonable potential and WQBEL calculations to ensure compliance with WQSs under § 301(b)(1)(C). Should the effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be reduced, and the calculated effluent limitations may not be sufficiently protective (i.e., might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. To ensure that the assumptions underlying EPA's reasonable potential analyses and permit effluent limitation derivations remain sound for the duration of the permit, EPA may ensure the validity of its "worst-case" wastewater effluent flow assumptions through imposition of permit conditions for effluent flow. In this regard, the effluent flow limitation is a component of WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit is also necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs."

EPA notes the absence of sludge and particulate matter in effluent is going to make effluent flow different than influent. In general, effluent flow is lower than influent flow, and as such, measuring effluent flow may help the Facility with its effluent flow compliance issues. As effluent flow is the regulated pollutant, it must be measured directly by the Facility, and the Facility will need to install an effluent flow meter.

Based on the comment, it is clear that the Facility does not have an effluent flow meter and will need time to acquire and install one. As such, a 12-month compliance schedule for installation of an effluent flow meter has been included in the Final Permit, section I.G.3.

Comment 4

Item 3 -Aluminum: The Total Aluminum limit has been modified from 88 ug/L to 87.2 ug/L. It should be noted that Fact Sheet references that effluent concentrations for aluminum are well below permit limits. The data suggests that there is no reasonable potential to exceed the current

limit (or the proposed limit). The apparent lack of reasonable potential suggests that this aluminum limit be eliminated from the permit.

Moreover, the Town disagrees with the need to lower the Total Aluminum limit when the facility consistently produces high quality effluent with no history of total Aluminum exceedances. Additionally, these arbitrary Total Aluminum limits are inconsistent with Massachusetts' proposed Surface Water Quality Standards (SWQS), which include a chronic criterion of 460 ug/L for the South Coastal Basin. As such, the resulting calculated (and appropriate) limits for aluminum will increase, further reinforcing the lack of reasonable potential for the plant effluent to cause an exceedance. EPA has not substantiated that aluminum is a water quality concern in the receiving water, and the proposed Massachusetts standards reinforce the position that no specific limit is needed.

We request that the Total Aluminum limit be removed from the permit. If the limit is retained, the 88 ug/1 within the current permit should not be reduced.

Response 4

The total aluminum limit in the Draft Permit is a water quality-based effluent limitation that reflects the Massachusetts Surface Water Quality Standards (SWQS) that are currently in effect for the purpose of NPDES permitting. MassDEP promulgated final revised SWQS, including revised aluminum criteria, on November 12, 2021. However, the revised SWQS still need to go through the EPA review and approval process before they can be used in NPDES permits. The SWQS that are in effect for the purpose of NPDES permitting at 314 CMR Section 4.05(e) use the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002 as a basis for allowable receiving water concentrations not enumerated in previous sections of the chapter. According to the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002, the acute and chronic criteria for total aluminum in freshwater are 87 µg/L and 750 µg/L currently.

EPA is obligated pursuant to 40 CFR § 122.44(d) to include any effluent limit in a permit that is necessary to comply with the water quality standards (WQSs) that are in effect at the time the permit is issued. If there is a reasonable potential to violate WQSs, then pursuant to 40 CFR § 122.44(d) an effluent limitation is "necessary," and EPA is obligated to include a limit in the permit. EPA does not forestall permit issuance, pending development, submission and approval of revised WQS, particularly where, as here, the previous permit has long since expired. To do so would subject the permitting process to significant delay and uncertainty. The criteria development and adoption process often take years. The Massachusetts' WQS now in effect require that EPA base effluent limitations for metals on the criteria published in the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002, unless site-specific criteria are established or MassDEP determines that natural background concentrations are higher than the criteria (314 CMR § 4.05(5)(e)). MassDEP has not issued site-specific aluminum criteria for the French River or determined that natural background concentrations are higher than the current aluminum criteria.

Based on the reasons described above, the aluminum limit is necessary and will remain in the Final Permit. Once the Massachusetts Water Quality Standard revisions are approved by EPA, the Permittee may request a permit modification or permit reissuance to reevaluate the aluminum limit. EPA notes that because the existing aluminum limit is already effective, any future reevaluation must be consistent with anti-backsliding provisions found at CWA §§ 402(o) and 303(d)(4) and the Massachusetts antidegradation provisions found at 314 CMR 4.04.

Regarding the portion of the comment related to reasonable potential, the new limit was not set based on actual discharges from the Facility, but rather based on testing the adequacy of the limit from the 2006 Permit to continue to protect water quality standards. As stated in Fact Sheet section 5.1.11.2, "For any metal with an existing limit in the 2006 Permit, the same mass balance equation is used to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (Cd) allowable to meet WQS based on current conditions." If the facility were to discharge at the 2006 Permit limit of 88 µg/L under critical conditions, EPA determined that water quality violations may occur (as shown in Fact Sheet Appendix B). As such, the limit was lowered to a level where, should discharges occur at the new limit, water quality standards would be maintained.

This approach is further justified in Appendix B of the Fact Sheet, which stated the following:

> For any pollutant(s) with an existing WQBEL, EPA notes that the analysis described in 40 CFR § 122.44(d)(1)(i) has already been conducted in a previous permitting action demonstrating that there is reasonable potential to cause or contribute to an excursion of WQS. Given that the permit already contains a WQBEL based on the prior analysis and the pollutant(s) continue to be discharged from the facility, EPA has determined that there is still reasonable potential for the discharge of this pollutant(s) to cause or contribute to an excursion of WQS. Therefore, the WQBEL will be carried forward unless it is determined that a more stringent WQBEL is necessary to continue to protect WQS or that a less stringent WQBEL is allowable based on anti-backsliding regulations at CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). For these pollutant(s), if any, the mass balance calculation is not used to determine whether there is reasonable potential to cause or contribute to an excursion of WQS, but rather is used to determine whether the existing limit needs to be more stringent to continue to protect WQS.
>
> From a technical standpoint, when a pollutant is already being controlled because of a previously established WQBEL, EPA has determined that it is not appropriate to use new effluent data to reevaluate the need for the existing limit because the reasonable potential to cause or contribute to an excursion of WQS for the uncontrolled discharge was already established in a previous permit. If EPA were to conduct such an evaluation and find no reasonable potential for the controlled discharge to cause or contribute to an excursion of WQS, that finding

could be interpreted to suggest that the effluent limit should be removed. However, the new permit without the effluent limit would imply that existing controls are unnecessary, that controls could be removed and then the pollutant concentration could rise to a level where there is, once again, reasonable potential for the discharge to cause or contribute to an excursion of WQS. This could result in an illogical cycle of applying and removing pollutant controls with each permit reissuance. EPA's technical approach on this issue is in keeping with the Act generally and the NPDES regulations specifically, which reflect a precautionary approach to controlling pollutant discharges.

This comment does not result in any changes to the Final Permit.

Comment 5

Item 4 - Total Chlorine Residual: The existing permit has appropriate comments related to the effluent characteristic for Total Residual Chlorine which were not carried forward to this draft. It is requested that the following two statements be included from the previous permit language:

- "The permittee shall substitute three TRC grab samples per day, for any day that they are unable to comply with the continuous recording requirement."

- "For effluent limitations less than 20 ug/1, compliance/non-compliance will be determined based on the ML. Sample results of 20 ug/1 or less shall be reported as zero on the discharge monitoring report."

Response 5

Regarding the first statement, EPA agrees that this provision is appropriate to ensure TRC data is collected even when continuous monitoring equipment is not functioning properly. Therefore, the Final Permit has been revised to include the requested provision, "The permittee shall substitute three TRC grab samples per day, for any day that they are unable to comply with the continuous recording requirement."

Additionally, to ensure the three grab samples are representative of the discharge throughout the day, EPA has also included a requirement that each grab sample shall be taken at least 2 hours from the previous grab sample.

Regarding the second statement, the permit will not be changed. In section I.A of the Final Permit:

-Footnote 2 states, "In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part

136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.

-Footnote 3 states, "When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter"

-Footnote 7 states "The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges that have been previously chlorinated or that contain residual chlorine. The compliance level for TRC is 20 µg/L."

These three footnotes combine to say that the required ML for TRC testing is 20 µg/L, and that any reading below 20 µg/L should be reported as less than the ML (e.g., "< 20 µg/L" if the ML is 20 µg/L).

This second part of the comment does not result in any change to the Final Permit.

Comment 6

Item 5 – Phosphorus: The existing permit has a summer season Phosphorous limit of 0.2 mg/L. The draft permit proposes lowering this seasonal limit to 0.1 mg/L (100 ug/L). The Rockland WWTP consistently achieves a phosphorus effluent concentration within the 0.2 mg/L limit, yet a further reduction of the limit will result in a need for significant changes to the WWTP. The fact sheet does not provide specific information related to water quality impacts in the French Stream or South Coastal Basin related to phosphorus. We respectfully request that the summer season Phosphorous limit remain at 0.2 mg/L.

If the proposed lower phosphorus limit is retained in the new permit, the Town will require a longer period to implement this change efficiently. Under Section G., Special Conditions (on page 17 of 20 of the draft permit), a compliance schedule tor Total Phosphorus is provided with a total of thirty-six (36) months. We respectfully request that these periods be extended to forty-eight (48) months, with the specific milestones adjusted to fifteen (15) months, thirty-six (36) months, and forty-eight (48) months, respectively.

Response 6

The justification for a phosphorus limit of 0.1 mg/L is presented in Fact Sheet section 5.10.1.2, and the calculations are presented in Fact Sheet Appendix B. Within the justification for the new limit is the following passage,

> "EPA's 1986 Quality Criteria for Water (the "Gold Book") recommends maximum threshold concentrations that are designed to prevent or control adverse nutrient-related impacts from occurring. Specifically, the Gold Book recommends in-stream phosphorus concentrations of no greater than 0.05 mg/L in any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharging directly to lakes or impoundments, and 0.025 mg/L within a lake or reservoir. For this segment of the French Stream, 0.1 mg/L would apply downstream of the discharge."

Using this instream target, EPA conducted an analysis to determine whether a more stringent effluent limit would be necessary to ensure that the discharge does not cause or contribute to an excursion of Water Quality Standards (WQS). Given the lack of available dilution under critical low flow conditions (*i.e.*, dilution factor of 1.05), it was determined that the limit of 0.1 mg/L is necessary to continue to protect WQS in the receiving water.

Regarding the length of the compliance schedule, EPA agrees with the comment that there may be multiple pathways to achieve compliance and some of those pathways are achievable within 36 months whereas other pathways may take a longer time. EPA notes that a compliance schedule in a permit must comply with 40 CFR § 122.47(a) and (a)(1) which indicates that a permitting authority must make a reasonable determination that a schedule of compliance is "appropriate" and that the schedule proposed requires compliance "as soon as possible." Given the potential for compliance within 36 months through chemical addition, any extension of the schedule would not ensure that the schedule requires compliance "as soon as possible." Therefore, the compliance schedule in the Final Permit has not been changed. However, if the Permittee is unable to comply with the limit once it becomes effective, they may contact EPA's Enforcement and Compliance Assurance Division (ECAD) to discuss a potential administrative order with additional time to achieve the phosphorus limit through alternate means.

Comment 7

Item 6- PFAS: The draft permit includes additional requirements to sample for and report on per- and poly-fluoroalkyl substances (PFAS) in influent flow, effluent flow and sludge from the WWTP. As indicated in the fact sheet. an approved test for wastewater PFAS testing has yet to be developed. It is well known that PFAS components are present in the environment, but WWTPs should not be the target of enforcement. We support the need for limiting PFAS compounds in consumer goods and industrial uses. We understand that testing industrial users likely to contribute PFAS may be needed eventually. The Town of Rockland supports the need to provide for legislation to remove these components from commerce as the primary method of reducing the presence of these compounds in our environment.

The impacts of this monitoring requirement will be significant for all WWTPs. One of the major concerns with this monitoring requirement is the impact on sludge disposal. Once PFAS is demonstrated to be in wastewater sludge, the ability to properly dispose of sludge from not only this WWTP, but all Massachusetts WWTPs may be severely compromised. The number of facilities that can properly dispose of PFAS compounds is severely limited and will result in a significant cost increase for sludge disposal for all facilities (if they can get a contract for disposal). If facilities are not able to dispose of sludge in a timely manner, the environmental (and potential public health) impacts of stockpiling sludge on-site will be significant.

We respectfully request that the PFAS monitoring requirement be removed from the NPDES permit and that the focus of legislation related to PFAS be on removal from consumer products and industrial uses. At such time as those most important provisions are in place, a more

reasonable approach to addressing the presence of PFAS compounds in wastewater may be appropriate.

Response 7

EPA has broad authority under the CWA and NPDES regulations to prescribe the collection of data and reporting requirements in NPDES Permits. See, e.g., CWA § 308. As discussed in the Fact Sheet at 37-39, the purpose of this monitoring and reporting requirement is "to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits on a facility-specific basis." These permitting decisions may include whether there is reasonable potential to cause or contribute to a violation of the State water quality standards in the next permit reissuance, and if there is, to inform the development of numeric effluent limits or pollutant minimization practices, or some combination.

EPA notes that the concern regarding PFAS is a much broader issue than the scope of this NPDES permit. EPA is working to address PFAS, including source reduction, as outlined in EPA's 2019 PFAS Action Plan and the 2020 PFAS Action Plan Update[1]. Much work still needs to be done beyond the scope of this permit related to studying the impact to the environment, the impact to human health, and addressing source control of PFAS compounds. EPA agrees that reducing the source of PFAS is a necessary aspect of addressing the overall environmental impact, but not the only aspect. Given that PFAS has been in use since the 1940s and has been used in a wide array of consumer and industrial products, source reduction will not fully resolve the persistent impact of PFAS chemicals already in the environment. Therefore, in addition to source reduction EPA must also assess the potential environmental impact where PFAS may accumulate, such as at WWTFs.

The comment that sludge disposal costs may increase or that the ability to dispose of sludge may be compromised based on PFAS monitoring is speculative. The comment seems to suggest that as long as PFAS is not demonstrated to be in sludge then the Permittee can continue to dispose of the sludge as if it does not contain PFAS regardless of any potential impact to the environment in order to avoid potential risks associated with stockpiling sludge on-site. EPA agrees that stockpiling sludge on-site is not appropriate but notes that simply ignoring the likely presence of PFAS contamination in sludge is also not appropriate. Rather, EPA confirms that PFAS monitoring is necessary to better understand the level of PFAS in sludge and that this data should be used to inform future decisions regarding appropriate sludge disposal practices.

There are no changes to the Final Permit as a result of this comment.

Comment 8

Item 7 -Unauthorized Discharges: The draft permit discusses that any unauthorized discharges are to be posted on a publicly available website and that this information shall remain on the

[1] Available at https://www.epa.gov/pfas/epas-pfas-action-plan.

website for a minimum of 12 months. The Town respectfully requests to have this posting adjusted to a minimum of 3 months.

Response 8

EPA considers a minimum of 12 months to be reasonable to ensure that the public has open access to a full year of unauthorized discharge postings, to track such discharges over the full range of seasonal flow variations that occur each year. Given that the Town did not provide any rationale for this request, there are no changes to the Final Permit as a result of this comment.

Comment 9

Item 8 -Operation and Maintenance of the Sewer System:
The draft permit includes new provisions related to the operation and maintenance of the sewer system. The Town and its operations contractor have a current system in place to operate and maintain, and on occasion improve its wastewater collection system. These provisions are governed sufficiently by Massachusetts regulations and good practice, which have historically proven sufficient to meet the public interests. In fact, many of the required elements are already part of the necessary compliance with 314 CMR 12.00 (Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers), making the permit conditions redundant. Additional regulation of the system operations is not needed within the NPDES permit. We request that these redundant provisions be removed from the final permit.

Response 9

It is common for state regulations and federal regulations to have a certain level of overlap. Any overlapping requirements between Massachusetts' regulations and EPA's permit requirements should be easy to accomplish since the Town has presumably met those requirements already. To the extent the Permittee must update or amend its Operation and Maintenance (O&M) Plan to comply with the permit requirements, EPA suggests that the facility have a single O&M Plan that complies with all state and federal regulations in order to avoid any redundancy that may occur by having one plan that complies with state requirements and a separate plan that complies with federal regulations.

There are no changes to the Final Permit as a result of this comment.

Comment 10

Item 9 -Collection System Mapping: The Town respectfully requests that the second to last sentence of Section C.4 -Collection System (page 11 of 20) is adjusted to the following: 'The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies for review by federal, state, or local agencies, and not available for public access/viewing". This change will allow consistency with security provisions of the federal Infrastructure Protection acts.

Response 10

The provision at I.C.4 of the permit states "The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies." The comment requests the addition of "and not available for public access/viewing." EPA notes that the provision, as written in the Draft Permit, does not require the Permittee to make the map available to the public. Therefore, no change to the Final Permit is necessary as a result of this comment.

Comment 11

Item 10 -Industrial Facilities: There has been a local change in Industrial Users of the Rockland sewer system. It is noted that under Section 3.1, Location and Type of Facility (on page 11 of 37 of the Fact Sheet), the third paragraph refers to a no longer existent Significant User. There are now zero Significant Industrial Users in the Rockland system. Serano, Inc. closed their pretreatment facility operations in July 2011, and moved all research laboratories to a new facility in Billerica, MA.

Response 11

EPA acknowledges that the only Significant Industrial User is no longer in operation in Rockland. Based on this, the Permittee is no longer required to have a pretreatment program and the language in section I.E of the Final Permit no longer includes the pretreatment program requirement. Attachments C and D have also been removed from the Final Permit.

Although this requirement has been removed from the Final Permit, EPA encourages the Town to maintain a pretreatment program. In the event new users come into the area, the Town will already have the mechanisms in place to accommodate such industries without needing to reinitiate a pretreatment program. To maintain the program while there are no current industrial users, all the Town will need to do is submit a brief annual report stating there are no industrial users in the system.

Comment 12

The Town of Rockland is currently engaged in planning for the future of its wastewater collection and treatment systems. As part of these studies, the possibility has been identified of a need for more discharge capacity at the WWTP. The Town would like to engage EPA and DEP in a discussion related to the most appropriate method to address the capacity needs, including the possibility of a future permit change.

The Town of Rockland is committed to being a partner in protecting public health and the environment through proper support of the local and regional wastewater treatment works. We urge EPA to consider these comments and make the revisions to the permit requested herein.

We are available to discuss these comments at your convenience.

Response 12

As written in Fact Sheet Section 5.1.1, "EPA issued Administrative Order, Docket No. 06-33 ("2006 AO"), to the Town on September 29, 2006, in response to violations of

flow limitations in the 2006 Permit and a previous NPDES permit, issued in 1999." Section IV.3 of the Order states:

"The Plan shall, at a minimum, include:

a. An itemized listing of the recommendations contained in any infiltration/inflow, sewer system evaluation survey, wastewater collection or treatment system capacity evaluation, or wastewater collection system ("Collection System") maintenance report prepared by, or on behalf of, the Town since January 1, 1995 and the status of the Town's implementation of each of the recommendations contained in the reports, including the date that the recommendation was implemented;

b. The Town's rationale for not implementing any specific recommendation contained in the above-referenced reports. For those recommendations that will be implemented in the future, the Town must provide a schedule for the recommendation's implementation;

c. A flow monitoring plan including an implementation schedule that assesses the effectiveness of the Town's completed sewer rehabilitation efforts;

d. The specific recommendations of the May, 2006 "Draft Town of Rockland, Massachusetts Infiltration and Inflow Control Plan" (the "Draft Report") prepared by Metcalf & Eddy that will be implemented by the Town. If the Town chooses not to implement a specific recommendation of the Draft Report, the Town must provide its rationale for the decision not to implement the recommendation. For those recommendations that will be implemented in the future, the Town shall provide a schedule for their implementation and estimate the capital and operation and maintenance costs associated with their implementation;

e. Provisions and a schedule for the development and implementation of an enforceable program for eliminating sump pump and roof leader connections from the Collection System that is based upon flow contributions to the Collection System;

f. Identification of the ten (10) largest water users located within the Town and measures that the Town will implement to encourage water use audits and conservation measures at these facilities; and

g. Provisions and a schedule for the implementation of additional infiltration/inflow controls and water conservation/reuse programs, as necessary, to achieve compliance with the Flow limits in the NPDES permit."

Given that the directives in the AO repeatedly mentioned Infiltration/Inflow, it is clear that EPA intended the Town to reduce Infiltration/Inflow as a means of meeting its NPDES permit limit for design flow.

Additionally, EPA notes that adjusting the effluent flow limit in the permit must be based on an actual increase in the design flow capacity of the facility as well as the completion of an antidegradation study that evaluates potential impacts to the receiving water of an increase in effluent flow. Due to effluent limits being based on design flow, and the potential need to maintain mass loads for pollutants such as phosphorus, a flow increase may result in a decrease in the Facility's dilution factor and a subsequent tightening of effluent limits. The Facility needs to consider this possibility and be prepared to meet the new, lower pollutant limits, before seriously engaging in plans to expand design flow. If the Facility still desires a higher design flow after considering and in combination with legitimate efforts to reduce I/I in accordance with the AO, EPA recommends developing a basis for the request, and working with MassDEP to conduct an antidegradation review. Relevant antidegradation provisions are discussed in Section 2.2.2 of the Fact Sheet. EPA can discuss these requirements in greater detail when the Town is ready to do so.

This comment results in no changes to the Final Permit.

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, 33 U.S.C. §§ 1251 et seq. (the "CWA"),

Town of Rockland, Massachusetts

is authorized to discharge from the facility located at

Rockland Wastewater Treatment Plant
587R Summer Street
Rockland, MA 02370

to receiving water named

French Stream
South Coastal Watershed

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature.[1]

This permit expires at midnight, five years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on January 27, 2006.

This permit consists of **Part I** including the cover page(s), **Attachment A** (Freshwater Acute Toxicity Test Procedure and Protocol, February 2011), **Attachment B** (Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013), **Attachment C** (Reassessment of Technically Based Industrial Discharge Limits), **Attachment D** (NPDES Permit Requirement for Industrial Pretreatment Annual Report) and **Part II (**NPDES Part II Standard Conditions, April 2018).

Signed this day of

_____
Ken Moraff, Director
Water Division
Environmental Protection Agency
Region 1
Boston, MA

[1] Pursuant to 40 Code of Federal Regulations (CFR) § 124.15(b)(3), if no comments requesting a change to the Draft Permit are received, the permit will become effective upon the date of signature. Procedures for appealing EPA's Final Permit decision may be found at 40 CFR § 124.19.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the French Stream. The discharge shall be limited and monitored as specified below; the receiving water and the influent shall be monitored as specified below.

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Rolling Average Effluent Flow[5]	Report MGD[5]	---	---	Continuous	Recorder
Effluent Flow[5]	2.5 MGD	---	Report MGD	Continuous	Recorder
BOD_5 (May 1 – September 30)	6 mg/L 125 lb/day	6 mg/L 125 lb/day	10 mg/L 209 lb/day	2/Week	Composite
BOD_5 (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	2/Week	Composite
BOD_5 Removal	≥ 85 %	---	---	1/Month	Calculation
TSS (May 1 – September 30)	10 mg/L 209 lb/day	10 mg/L 209 lb/day	15 mg/L 313 lb/day	2/Week	Composite
TSS (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	2/Week	Composite
TSS Removal	≥ 85 %	---	---	1/Month	Calculation
pH Range[6]	6.5 - 8.3 S.U.			1/Day	Grab
Total Residual Chlorine[7,8]	11 µg/L	---	19 µg/L	1/Day	Grab
Escherichia coli [7,8]	126 cfu/100 mL	---	409 cfu/100 mL	3/Week	Grab
Total Copper	12 µg/L	---	19 µg/L	1/Month	Composite
Total Aluminum	87.2 µg/L	---	Report µg/L	1/Month	Composite
Dissolved Oxygen (May 1 – Sept 30)	≥ 7.4 mg/L			1/Day	Grab
Ammonia Nitrogen (April 1 – May 31)	2.5 mg/L	2.5 mg/L	5.7 mg/L	2/Week	Composite
Ammonia Nitrogen (June 1 – Sept 30)	1.0 mg/L	1.0 mg/L	1.5 mg/L	2/Week	Composite
Ammonia Nitrogen (Oct 1 – March 31)	3.3 mg/L	3.3 mg/L	5.7 mg/L	2/Week	Composite

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[4]**
Total Kjeldahl Nitrogen[9] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	Composite
Nitrate + Nitrite[9] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	Composite
Total Nitrogen[9]	Report mg/L Report lb/day	---	Report mg/L	1/Month	Calculation
Total Phosphorus[10] (April 1 – October 31)	0.1 mg/L	---	Report mg/L	2/Week	Composite
Total Phosphorus (November 1 – March 31)	1.0 mg/L	---	Report mg/L	1/Week	Composite
Perfluorohexanesulfonic acid (PFHxS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorononanoic acid (PFNA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanesulfonic acid (PFOS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanoic acid (PFOA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluoroheptanoic acid (PFHpA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorodecanoic acid (PFDA)[11]	---	---	Report ng/L	1/Quarter	Composite
Whole Effluent Toxicity (WET) Testing[12,13]					
LC_{50}	---	---	≥ 100 %	1/Quarter	Composite
C-NOEC	---	---	≥ 99 %	1/Quarter	Composite
Hardness	---	---	Report mg/L	1/Quarter	Composite
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Composite
Total Aluminum	---	---	Report mg/L	1/Quarter	Composite
Total Cadmium	---	---	Report mg/L	1/Quarter	Composite
Total Copper	---	---	Report mg/L	1/Quarter	Composite
Total Nickel	---	---	Report mg/L	1/Quarter	Composite
Total Lead	---	---	Report mg/L	1/Quarter	Composite
Total Zinc	---	---	Report mg/L	1/Quarter	Composite
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Composite

Ambient Characteristic[14]	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Hardness	---	---	Report mg/L	1/Quarter	Grab
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Grab
Total Aluminum	---	---	Report mg/L	1/Quarter	Grab
Total Cadmium	---	---	Report mg/L	1/Quarter	Grab
Total Copper	---	---	Report mg/L	1/Quarter	Grab
Total Nickel	---	---	Report mg/L	1/Quarter	Grab
Total Lead	---	---	Report mg/L	1/Quarter	Grab
Total Zinc	---	---	Report mg/L	1/Quarter	Grab
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Grab
Dissolved Organic Carbon[15]	---	---	Report mg/L	1/Quarter	Grab
pH[16]	---	---	Report S.U.	1/Quarter	Grab
Temperature[16]	---	---	Report °C	1/Quarter	Grab

Influent Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
BOD_5	Report mg/L	---	---	2/Month	Composite
TSS	Report mg/L	---	---	2/Month	Composite
Perfluorohexanesulfonic acid (PFHxS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorononanoic acid (PFNA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanesulfonic acid (PFOS)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorooctanoic acid (PFOA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluoroheptanoic acid (PFHpA)[11]	---	---	Report ng/L	1/Quarter	Composite
Perfluorodecanoic acid (PFDA)[11]	---	---	Report ng/L	1/Quarter	Composite

Sludge Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Perfluorohexanesulfonic acid (PFHxS)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorononanoic acid (PFNA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorooctanesulfonic acid (PFOS)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorooctanoic acid (PFOA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluoroheptanoic acid (PFHpA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]
Perfluorodecanoic acid (PFDA)[17]	---	---	Report ng/g	1/Quarter	Composite[18]

Footnotes:

1. All samples shall be collected in a manner to yield representative data. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented as an electronic attachment to the applicable discharge monitoring report. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and the State of any additional testing above that required herein, if testing is in accordance with 40 CFR Part 136.

2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" to all non-detects for that reporting period and report the average of all the results.

4. A "grab" sample is an individual sample collected in a period of less than 15 minutes.

   A "composite" sample is a composite of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportional to flow.

5. The limit is a monthly average, reported in million gallons per day (MGD). The Permittee shall also report the annual rolling average, which will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months. Also report maximum daily flow in MGD.

6. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.).

7. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges that have been previously chlorinated or that contain residual chlorine. The compliance level for TRC is 20 µg/L.

   Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

8. The monthly average limit for *Escherichia coli* (*E. coli*) is expressed as a geometric mean. E. coli monitoring shall be conducted concurrently with TRC monitoring, if TRC monitoring is required.

   The *E. coli* limit shall become effective in accordance with the compliance schedule found at Part I.G.1.

9. Total Kjeldahl nitrogen and nitrate + nitrite samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen, as follows.

   Total Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) + Nitrate + Nitrite (mg/L)

   Total Nitrogen (lb/day) = [(average monthly Total Nitrogen (mg/L) * total monthly effluent flow (Millions of Gallons (MG)) / # of days in the month] * 8.34

10. The phosphorus limit shall become effective in accordance with the compliance schedule found at Part I.G.2.

11. Report in nanograms per liter (ng/L). This reporting requirement for the listed per- and polyfluoroalkyl substances (PFAS) parameters takes effect the first full calendar quarter following 6 months after EPA notifies the Permittee that an EPA multi-lab validated method for wastewater is available.

12. The Permittee shall conduct acute toxicity tests (LC50) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in Attachment A and B of this permit. LC50 and C-NOEC are defined in Part II.E. of this permit. The Permittee shall test the daphnid, *Ceriodaphnia dubia*. Toxicity test samples shall be collected during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall

be submitted as an attachment to the DMR submittal that includes the results for that toxicity test.

13. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachment A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

14. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachment A and B**. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

15. Monitoring and reporting for dissolved organic carbon (DOC) are not requirements of the Whole Effluent Toxicity (WET) tests but are additional requirements. The Permittee may analyze the WET samples for DOC or may collect separate samples for DOC concurrently with WET sampling.

16. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

17. Report in nanograms per gram (ng/g). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter following 6 months after EPA notifies the permittee that an EPA multi-lab validated method for sludge is available.

18. Sludge sampling shall be as representative as possible based on guidance found at https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf.

Part I.A., continued.

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

4. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical, chemical, or biological nature of the bottom.

5. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

6. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

7. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

8. The Permittee must provide adequate notice to EPA-Region 1 and the State of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 CFR Part 122 Appendix A as amended) discharging process water; and

    b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

    c. For purposes of this paragraph, adequate notice shall include information on:

        (1) The quantity and quality of effluent introduced into the POTW; and

        (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

9. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit in accordance with Part II.D.1.e.(1) (24-hour reporting). See Part I.H below for reporting requirements.

2. The Permittee must provide notification to the public within 24 hours of becoming aware of any unauthorized discharge, except SSOs that do not impact a surface water or the public, on a publicly available website, and it shall remain on the website for a minimum of 12 months. Such notification shall include the location and description of the discharge; estimated volume; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue.

3. Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance (O&M) of the sewer system shall be in compliance with the Standard Conditions of Part II and the following terms and conditions. The Permittee shall complete the following activities for the collection system that it owns:

1. Maintenance Staff

The Permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Provisions to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

2. Preventive Maintenance Program

The Permittee shall maintain an ongoing preventive maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. Plans and programs to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

The Permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to

control I/I shall be described in the Collection System O&M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the Permittee shall prepare a map of the sewer collection system it owns. The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;

b. All combined sewer lines, related manholes, and catch basins;

c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);

d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;

e. All pump stations and force mains;

f. The wastewater treatment facility(ies);

g. All surface waters (labeled);

h. Other major appurtenances such as inverted siphons and air release valves;

i. A numbering system that uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j. The scale and a north arrow; and

k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System O&M Plan

The Permittee shall develop, or update, as applicable and implement the Collection System O&M Plan it has previously submitted to EPA and the State. The Plan shall be available for review by federal, state and local agencies as requested. The Plan shall include:

a. A description of the collection system management goals, staffing, information management, and legal authorities;

b. A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and

c. A preventive maintenance and monitoring program for the collection system;

d. Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;

e. Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;

f. Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;

g. A description of the Permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof downspouts;

h. An educational public outreach program for all aspects of I/I control, particularly private inflow; and

i. An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The Permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year, including a quantification of I/I identified and removed;

c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;

d. A map with areas identified for investigation/action in the coming year;

e. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit; and

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's 2.5 MGD design flow (2.0 MGD), or there have been capacity related overflows, the report shall include:

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and

(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the Permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works it owns and operates, as defined in Part II.E.1 of this permit.

E. INDUSTRIAL USERS AND PRETREATMENT PROGRAM

1. The Permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of this permit, the Permittee shall prepare and submit a written technical evaluation to EPA analyzing the need to revise local limits. As part of this evaluation, the Permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the Permittee shall complete and submit the attached form (see **Attachment C –** Reassessment of Technically Based Industrial Discharge Limits) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the Permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

2. The Permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the Permittee's

approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR Part 403. At a minimum, the Permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

a. Carry out inspection, surveillance, and monitoring procedures that can determine independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

b. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

c. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

d. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

3. The Permittee shall provide EPA and the State with an annual report describing the Permittee's pretreatment program activities for the twelve (12) month period ending 60 days prior to the due date in accordance with § 403.12(i). The annual report shall be consistent with the format described in **Attachment D** (NPDES Permit Requirement for Industrial Pretreatment Annual Report) of this permit and shall be submitted no later than **October 1** of each year.

4. The Permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR § 403.18(c).

5. The Permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR § 405 et seq.

6. The Permittee must modify its pretreatment program, if necessary, to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program. The Permittee must provide EPA, in writing, within 180 days of this permit's effective date proposed changes, if applicable, to the Permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the Permittee must address in its written submission the following areas: (1) Enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The Permittee will implement these proposed changes pending EPA Region1’s approval under 40 CFR § 403.18. This submission is separate and distinct from any local limits analysis submission described in Part I.E.1.

7. Beginning the first full calendar quarter following 6 months after EPA has notified the Permittee that a multi-lab validated method for wastewater is available, the Permittee shall commence annual sampling of the following types of industrial discharges into the POTW:

    - Commercial Car Washes
    - Platers/Metal Finishers
    - Paper and Packaging Manufacturers
    - Tanneries and Leather/Fabric/Carpet Treaters
    - Manufacturers of Parts with Polytetrafluoroethylene (PTFE) or teflon type coatings (i.e. bearings)
    - Landfill Leachate
    - Centralized Waste Treaters
    - Contaminated Sites
    - Fire Fighting Training Facilities
    - Airports
    - Any Other Known or Expected Sources of PFAS

    Sampling shall be for the following PFAS chemicals:

Industrial User Effluent Characteristic	Maximum Daily	Monitoring Requirements	
		Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	Report ng/L	1/year	Composite
Perfluorononanoic acid (PFNA)	Report ng/L	1/year	Composite
Perfluorooctanesulfonic acid (PFOS)	Report ng/L	1/year	Composite
Perfluorooctanoic acid (PFOA)	Report ng/L	1/year	Composite
Perfluoroheptanoic acid (PFHpA)	Report ng/L	1/year	Composite
Perfluorodecanoic acid (PFDA)	Report ng/L	1/year	Composite

    The industrial discharges sampled, and the sampling results shall be summarized and included in the annual report (see Part I.E.3).

F. SLUDGE CONDITIONS

1. The Permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR § 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the Permittee's sludge use and/or disposal practices, the Permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices:

    a. Land application - the use of sewage sludge to condition or fertilize the soil

b. Surface disposal - the placement of sewage sludge in a sludge only landfill

c. Sewage sludge incineration in a sludge only incinerator

4. The requirements of 40 CFR Part 503 do not apply to facilities that dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities that do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR Part 503 requirements include the following elements:

   a. General requirements

   b. Pollutant limitations

   c. Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)

   d. Management practices

   e. Record keeping

   f. Monitoring

   g. Reporting

   The specific 40 CFR Part 503 requirements that are applicable to the Permittee will depend on the use or disposal practice(s) followed and the quality of sludge produced by a facility. The EPA Region 1 guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the Permittee to assist it in determining the applicable requirements.

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year, as follows:

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

   Sampling of the sewage sludge shall use the procedures detailed in 40 CFR § 503.8.

7. Under 40 CFR § 503.9(r), the Permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the Permittee contracts with another "person who prepares sewage

sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the Permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the Permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by February 19 (see also "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

G. SPECIAL CONDITIONS

1. The effluent limit for *E. coli* shall be subject to a schedule of compliance whereby the limit takes effect 12 months after the effective date of the permit. During this first year, the Permittee must comply with interim fecal coliform limits of 200 cfu/100 mL (monthly average) and 400 cfu/100 mL (daily maximum).

2. Total Phosphorus Compliance Schedule (April 1 – October 31)

   The effluent limit for total phosphorus, effective from April 1 through October 31, shall be subject to a schedule of compliance whereby the limit takes effect 36 months after the effective date of the permit. For the period starting on the effective date of this permit and ending 36 months after the effective date, the Permittee shall continue to comply with the existing monthly average limit of 0.2 mg/L. The schedule includes one year to evaluate potential treatment process changes (such as chemical addition), one year to implement any process changes necessary to meet the more stringent limit of 0.1 mg/L, and one year to optimize the facility after those changes have been implemented to come into compliance with the new limit. The schedule of compliance is as follows:

   a. Within twelve (12) months of the effective date of the permit, the Permittee shall submit to EPA and MassDEP a status report evaluating the potential treatment process changes (such as chemical addition) necessary to achieve the permit limit.

   b. Within twenty-four (24) months of the effective date of the permit, the Permittee shall complete any process changes necessary to achieve the total phosphorus limit and submit a progress report to EPA and MassDEP detailing these changes.

   c. Within thirty-six (36) months of the effective date of the permit, the Permittee shall complete optimization of the plant and comply with the phosphorus limit. Additionally, the Permittee shall submit a final report that summarizes the process changes and plant optimization efforts.

H. REPORTING REQUIREMENTS

Unless otherwise specified in this permit, the Permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

   The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and the State electronically using NetDMR no later than the 15th day of the following month. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or the State. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. See Part I.H.7. for more information on State reporting. Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the report due date specified in this permit.

3. Submittal of Industrial User and Pretreatment Related Reports

   a. Prior to 21 December 2025, all reports and information required of the Permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Pretreatment Coordinator in EPA Region 1 Water Division (WD). Starting on 21 December 2025, these reports must be submitted electronically as NetDMR attachments and/or using EPA's NPDES Electronic Reporting Tool ("NeT"), or any other applicable approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/. These requests, reports and notices include:

      (1) Annual Pretreatment Reports,

      (2) Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,

      (3) Revisions to Industrial Discharge Limits,

      (4) Report describing Pretreatment Program activities, and

      (5) Proposed changes to a Pretreatment Program

   b. This information shall be submitted to EPA WD as a hard copy at the following address:

U.S. Environmental Protection Agency
Water Division
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (06-03)
Boston, MA 02109-3912

4. Submittal of Biosolids/Sewage Sludge Reports

   By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

5. Submittal of Requests and Reports to EPA Water Division (WD)

   a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

      (1) Transfer of permit notice;

      (2) Request for changes in sampling location;

      (3) Request for reduction in testing frequency;

      (4) Report on unacceptable dilution water / request for alternative dilution water for WET testing.

   b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

6. Submittal of Reports to EPA Enforcement and Compliance Assurance Division (ECAD) in Hard Copy Form

   a. The following notifications and reports shall be signed and dated originals, submitted as hard copy, with a cover letter describing the submission:

      (1) Written notifications required under Part II.B.4.c, for bypasses, and Part II.D.1.e, for sanitary sewer overflows (SSOs). Starting on 21 December 2025, such notifications must be done electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

      (2) Collection System Operation and Maintenance Plan

      (3) Report on annual activities related to O&M Plan

This information shall be submitted to EPA ECAD at the following address:

U.S. Environmental Protection Agency
Enforcement and Compliance Assurance Division
Water Compliance Section
5 Post Office Square, Suite 100 (04-SMR)
Boston, MA 02109-3912

7. State Reporting

   Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

8. Verbal Reports and Verbal Notifications

   a. Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to the State. This includes verbal reports and notifications that require reporting within 24 hours (e.g., Part II.B.4.c.(2), Part II.B.5.c.(3), and Part II.D.1.e).

   b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1510
and
MassDEP Emergency Response at 888-304-1133

I. STATE 401 CERTIFICATION CONDITIONS

This Permit is in the process of receiving state water quality certification issued by the State under § 401(a) of the CWA and 40 CFR § 124.53. EPA will incorporate appropriate State water quality certification requirements (if any) into the Final Permit.

ATTACHMENT A

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcement/water/dmr.html *for further important details on alternate dilution water substitution requests.*

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

ATTACHMENT B

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL

USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25 values and ≥ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value**,** for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

ATTACHMENT C

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

Below is a form designed by the U.S. Environmental Protection Agency (EPA - New England) to assist POTWs with approved IPPs in evaluating whether their existing Technically Based Local Limits (TBLLs) need to be recalculated. The form allows the permittee and EPA to evaluate and compare pertinent information used in previous TBLLs calculations against present conditions at the POTW.

Please read direction below before filling out form.

ITEM I.

* In Column (1), list what your POTW's influent flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present influent flow rate. Your current flow rate should be calculated using the POTW's average daily flow rate from the previous 12 months.

* In Column (1) list what your POTW's SIU flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present SIU flow rate.

* In Column (1), list what dilution ratio and/or 7Q10 value was used in your old/expired NPDES permit. In Column (2), list what dilution ration and/or 7Q10 value is presently being used in your new/reissued NPDES permit.

  The 7Q10 value is the lowest seven day average flow rate, in the river, over a ten year period. The 7Q10 value and/or dilution ratio used by EPA in your new NPDES permit can be found in your NPDES permit "Fact Sheet."

* In Column (1), list the safety factor, if any, that was used when your existing TBLLs were calculated.

* In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

ITEM II.

* List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

ITEM III.

* Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

ITEM IV.

* Since your existing TBLLs were calculated, identify the following in detail:

  (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.

  (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

ITEM V.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

  All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see EPA's Local Limit Guidance Document (July 2004).

Item VI.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period.

(Item VI. continued)

All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

  List in Column (2B) the current WQSs or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

ITEM VII.

* In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

ITEM VIII.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

  All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

  In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS (TBLLs)

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.		
	Column (1) EXISTING TBLLs	Column (2) PRESENT CONDITIONS
POTW Flow (MGD)		
Dilution Ratio or 7Q10 (from NPDES Permit)		
SIU Flow (MGD)		
Safety Factor		N/A
Biosolids Disposal Method(s)		

ITEM II.

EXISTING TBLLs			
POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)	POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)

ITEM III.

Note how your existing TBLLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

ITEM IV.

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLLs were calculated?
If yes, explain.

_____

_____

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain.

_____

_____

ITEM V.

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Headwork Loading (MAHL) values used to derive your TBLLs listed in Item II. In addition, please note the Environmental Criteria for which each MAHL value was established, i.e. water quality, sludge, NPDES etc.				
Pollutant	Column (1) Influent Data Analyses Maximum (lb/day)	Average (lb/day)	Column (2) MAHL Values (lb/day)	Criteria
Arsenic				
Cadmium				
Chromium				
Copper				
Cyanide				
Lead				
Mercury				
Nickel				
Silver				
Zinc				
Other (List)				

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.

Pollutant	Column (1) Effluent Data Analyses		Columns (2A) (2B) Water Quality Criteria (Gold Book) From TBLLs Today	
	Maximum (ug/l)	Average (ug/l)	(ug/l)	(ug/l)
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

*Hardness Dependent (mg/l - CaCO3)

ITEM VII.

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.			
Column (1) NEW PERMIT Pollutants Limitations (ug/l)		Column (2) OLD PERMIT Pollutants (ug/l)	Limitations

ITEM VIII.

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.

Pollutant	Column (1) Biosolids Data Analyses Average (mg/kg)	Columns (2A) (2B) Biosolids Criteria From TBLLs New (mg/kg)	(mg/kg)
Arsenic			
Cadmium			
Chromium			
Copper			
Cyanide			
Lead			
Mercury			
Nickel			
Silver			
Zinc			
Molybdenum			
Selenium			
Other (List)			

ATTACHMENT D

NPDES PERMIT REQUIREMENT
FOR
INDUSTRIAL PRETREATMENT ANNUAL REPORT

The information described below shall be included in the pretreatment program annual reports:

1. An updated list of all industrial users by category, as set forth in 40 C.F.R. 403.8(f)(2)(i), indicating compliance or noncompliance with the following:
   - baseline monitoring reporting requirements for newly promulgated industries
   - compliance status reporting requirements for newly promulgated industries
   - periodic (semi-annual) monitoring reporting requirements,
   - categorical standards, and
   - local limits;

2. A summary of compliance and enforcement activities during the preceding year, including the number of:
   - significant industrial users inspected by POTW (include inspection dates for each industrial user),
   - significant industrial users sampled by POTW (include sampling dates for each industrial user),
   - compliance schedules issued (include list of subject users),
   - written notices of violations issued (include list of subject users),
   - administrative orders issued (include list of subject users),
   - criminal or civil suits filed (include list of subject users) and,
   - penalties obtained (include list of subject users and penalty amounts);

3. A list of significantly violating industries required to be published in a local newspaper in accordance with 40 C.F.R. 403.8(f)(2)(vii);

4. A narrative description of program effectiveness including present and proposed changes to the program, such as funding, staffing, ordinances, regulations, rules and/or statutory authority;

5. A summary of all pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results versus threshold inhibitory concentrations for the Wastewater Treatment System and effluent sampling results versus water quality standards. Such a comparison shall be based on the sampling program described in the paragraph below or any similar sampling program described in this Permit.

At a minimum, annual sampling and analysis of the influent and effluent of the Wastewater Treatment Plant shall be conducted for the following pollutants:

a.) Total Cadmium	f.) Total Nickel
b.) Total Chromium	g.) Total Silver
c.) Total Copper	h.) Total Zinc
d.) Total Lead	i.) Total Cyanide
e.) Total Mercury	j.) Total Arsenic

The sampling program shall consist of one 24-hour flow-proportioned composite and at least one grab sample that is representative of the flows received by the POTW. The composite shall consist of hourly flow-proportioned grab samples taken over a 24-hour period if the sample is collected manually or shall consist of a minimum of 48 samples collected at 30 minute intervals if an automated sampler is used. Cyanide shall be taken as a grab sample during the same period as the composite sample. Sampling and preservation shall be consistent with 40 CFR Part 136.

6. A detailed description of all interference and pass-through that occurred during the past year;

7. A thorough description of all investigations into interference and pass-through during the past year;

8. A description of monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying parameters and frequencies;

9. A description of actions being taken to reduce the incidence of significant violations by significant industrial users; and,

10. The date of the latest adoption of local limits and an indication as to whether or not the permittee is under a State or Federal compliance schedule that includes steps to be taken to revise local limits.

NPDES PART II STANDARD CONDITIONS
(April 26, 2018)[1]

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[1] Updated July 17, 2018 to fix typographical errors.

A. GENERAL REQUIREMENTS

1. Duty to Comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA or Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

a. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

b. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (83 Fed. Reg. 1190-1194 (January 10, 2018) and the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note. See Pub. L.114-74, Section 701 (Nov. 2, 2015)). These requirements help ensure that EPA penalties keep pace with inflation. Under the above-cited 2015 amendments to inflationary adjustment law, EPA must review its statutory civil penalties each year and adjust them as necessary.

(1) Criminal Penalties

(a) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than 2 years, or both.

(b) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

(c) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing

endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(d) *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(2) *Civil Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(3) *Administrative Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty as follows:

(a) *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(b) *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit

condition.

3. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from responsibilities, liabilities or penalties to which the Permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

5. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

6. Confidentiality of Information

a. In accordance with 40 C.F.R. Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or Permittee;
(2) Permit applications, permits, and effluent data.

c. Information required by NPDES application forms provided by the Director under 40 C.F.R. § 122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

7. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The Permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

8. State Authorities

Nothing in Parts 122, 123, or 124 precludes more stringent State regulation of any activity

covered by the regulations in 40 C.F.R. Parts 122, 123, and 124, whether or not under an approved State program.

9. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. *Bypass not exceeding limitations.* The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (c) and (d) of this Section.

c. Notice

(1) *Anticipated bypass*. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass. As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(2) *Unanticipated bypass*. The Permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or required to do so by law.

d. *Prohibition of bypass.*

(1) Bypass is prohibited, and the Director may take enforcement action against a Permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The Permittee submitted notices as required under paragraph 4.c of this Section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 4.d of this Section.

5. Upset

a. *Definition*. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or

improper operation.

b. *Effect of an upset.* An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph B.5.c. of this Section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. *Conditions necessary for a demonstration of upset.* A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the Permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The Permittee submitted notice of the upset as required in paragraph D.1.e.2.b. (24-hour notice).
(4) The Permittee complied with any remedial measures required under B.3. above.

d. *Burden of proof.* In any enforcement proceeding the Permittee seeking to establish the occurrence of an upset has the burden of proof.

C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least 5 years (or longer as required by 40 C.F.R. § 503), the Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

e. The Clean Water Act provides that any person who falsifies, tampers with, or

knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. *Planned Changes*. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 C.F.R. § 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 122.42(a)(1).

(3) The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. *Anticipated noncompliance*. The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. *Transfers.* This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Clean Water Act. *See* 40 C.F.R. § 122.61; in some cases, modification or revocation and reissuance is mandatory.

d. *Monitoring reports*. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices. As of December 21, 2016 all reports and forms submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by State law.

(2) If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 C.F.R. § 136, or another method required for an industry-specific waste stream under 40 C.F.R. Subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. *Twenty-four hour reporting.*

(1) The Permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. A written report shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all

reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. *See* 40 C.F.R. § 122.41(g).
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. *See* 40 C.F.R. § 122.44(g).

(3) The Director may waive the written report on a case-by-case basis for reports under paragraph D.1.e. of this Section if the oral report has been received within 24 hours.

f. *Compliance Schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. *Other noncompliance.* The Permittee shall report all instances of noncompliance not reported under paragraphs D.1.d., D.1.e., and D.1.f. of this Section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph D.1.e. of this Section. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph D.1.e. and the applicable required data in Appendix A to 40 C.F.R. Part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), §122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this Section.

h. *Other information.* Where the Permittee becomes aware that it failed to submit any

relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

i. *Identification of the initial recipient for NPDES electronic reporting data*. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in Appendix A to 40 C.F.R. Part 127) to the appropriate initial recipient, as determined by EPA, and as defined in 40 C.F.R. § 127.2(b). EPA will identify and publish the list of initial recipients on its Web site and in the FEDERAL REGISTER, by state and by NPDES data group (see 40 C.F.R. § 127.2(c) of this Chapter). EPA will update and maintain this listing.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Director shall be signed and certified. *See* 40 C.F.R. §122.22.

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under paragraph A.6. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Director. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

For more definitions related to sludge use and disposal requirements, see EPA Region 1's NPDES Permit Sludge Compliance Guidance document (4 November 1999, modified to add regulatory definitions, April 2018).

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and federal standards and limitations to which a "discharge," a "sewage sludge use or disposal practice," or a related activity is subject under the CWA, including "effluent limitations," water quality standards, standards of performance, toxic effluent standards or prohibitions, "best management practices," pretreatment standards, and "standards for sewage sludge use or disposal" under Sections 301, 302, 303, 304, 306, 307, 308, 403 and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in

"approved States," including any approved modifications or revisions.

Approved program or *approved State* means a State or interstate program which has been approved or authorized by EPA under Part 123.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass see B.4.a.1 above.

C-NOEC or *"Chronic (Long-term Exposure Test) – No Observed Effect Concentration" means* the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 C.F.R. § 501.2, required to have an approved pretreatment program under 40 C.F.R. § 403.8 (a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to 40 C.F.R. § 403.10 (e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. § 122.2, classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director, because of the potential for its sewage sludge use or disposal practice to affect public health and the environment adversely.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483and Public Law 97-117, 33 U.S.C. 1251 *et seq*.

CWA and regulations means the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily Discharge means the "discharge of a pollutant" measured during a calendar day or any

other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Direct Discharge means the "discharge of a pollutant."

Director means the Regional Administrator or an authorized representative. In the case of a permit also issued under Massachusetts' authority, it also refers to the Director of the Division of Watershed Management, Department of Environmental Protection, Commonwealth of Massachusetts.

Discharge

(a) When used without qualification, *discharge* means the "discharge of a pollutant."

(b) As used in the definitions for "interference" and "pass through," *discharge* means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Act.

Discharge Monitoring Report ("DMR") means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by Permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise "effluent limitations."

Environmental Protection Agency ("EPA") means the United States Environmental Protection

Agency.

Grab Sample means an individual sample collected in a period of less than 15 minutes.

Hazardous substance means any substance designated under 40 C.F.R. Part 116 pursuant to Section 311 of CWA.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Indirect discharger means a nondomestic discharger introducing "pollutants" to a "publicly owned treatment works."

Interference means a discharge (see definition above) which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment and disposal.

LC_{50} means the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.

Maximum daily discharge limitation means the highest allowable "daily discharge."

Municipal solid waste landfill (MSWLF) unit means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 C.F.R. § 257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be

publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

Municipality

(a) When used without qualification *municipality* means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of CWA.

(b) As related to sludge use and disposal, *municipality* means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal Agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management Agency under Section 208 of the CWA, as amended. The definition includes a special district created under State law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in Section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program."

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants;"

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source;" and

(d) Which has never received a finally effective NPDES permit for discharges at that "site."

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Director in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Director shall consider the factors specified in 40 C.F.R. §§ 125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System."

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge (see definition above) which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (40 C.F.R § 122.28). "Permit" does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or "proposed permit."

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 C.F.R. § 122.3).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

(except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq*.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train*, 8 E.R.C. 2120 (D.D.C. 1976), *modified* 12 E.R.C. 1833 (D.D.C. 1979)); also listed in Appendix A of 40 C.F.R. Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (b) not a "POTW."

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly owned treatment works (POTW) means a treatment works as defined by Section 212 of the Act, which is owned by a State or municipality (as defined by Section 504(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in Section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary industry category means any industry which is not a "primary industry category."

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 C.F.R. Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does

not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 C.F.R. § 122.2.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substance designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 C.F.R. §§ 110.10 and 117.21) or Section 102 of CERCLA (*see* 40 C.F.R. § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to section 405(d) of the CWA, and is required to obtain a permit under 40 C.F.R. § 122.1(b)(2).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe as defined in the regulations which meets the requirements of 40 C.F.R. § 123.31.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Toxic pollutant means any pollutant listed as toxic under Section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Director may designate any person subject to the standards for sewage sludge use and

disposal in 40 C.F.R. Part 503 as a "treatment works treating domestic sewage," where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 C.F.R. Part 503.

Upset see B.5.a. above.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Waste pile or *pile* means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States or waters of the U.S. means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands;"

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

    (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

    (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

    (3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test.

*Zone of Initial Dilution (*ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards.

2. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)
TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont.	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen

kg/day	Kilograms per day
lbs/day	Pounds per day
mg/L	Milligram(s) per liter
mL/L	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
Surfactant	Surface-active agent
Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
µg/L	Microgram(s) per liter
WET	"Whole effluent toxicity"
ZID	Zone of Initial Dilution

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT NUMBER: MA0101923

PUBLIC NOTICE START AND END DATES: : August 25, 2021 – September 23, 2021

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Rockland
242 Union St
Rockland, MA 02370

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Rockland Wastewater Treatment Plant
587R Summer St
Rockland, MA 02370

RECEIVING WATER AND CLASSIFICATION:

French Stream (MA94-03)
South Coastal Watershed
Class B – Warm Water Fishery

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Appendices

Appendix A – Monitoring Data Summary

Appendix B – Reasonable Potential and Limits Calculations

Appendix C – Rockland WWTP 7Q10 Summary

1.0 Proposed Action

The above-named applicant (the "Permittee") has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge from the Rockland Wastewater Treatment Plant (the "Facility") into the French Stream.

The permit currently in effect was issued on January 27, 2006 with an effective date of July 1, 2006 (the "2006 Permit"). A Permit modification in 2007 became effective on April 1, 2007 and the 2006 Permit expired on June 30, 2011. The Permittee filed an application for permit reissuance with EPA dated January 5, 2011, as required by 40 Code of Federal Regulations (CFR) § 122.6. Since the permit application was deemed timely and complete by EPA on April 15, 2011, the Facility's 2006 Permit has been administratively continued pursuant to 40 CFR § 122.6 and § 122.21(d).

2.0 Statutory and Regulatory Authority

Congress enacted the Federal Water Pollution Control Act, codified at 33 U.S.C. § 1251-1387 and commonly known as the Clean Water Act (CWA), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specific permitting sections of the CWA, one of which is § 402. *See* CWA §§ 301(a), 402(a). Section 402(a) established one of the CWA's principal permitting programs, the NPDES Permit Program. Under this section, EPA may "issue a permit for the discharge of any pollutant or combination of pollutants" in accordance with certain conditions. CWA § 402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. *See* CWA § 402(a)(1) and (2). The regulations governing EPA's NPDES permit program are generally found in 40 CFR §§ 122, 124, 125, and 136.

"Congress has vested in the Administrator [of EPA] broad discretion to establish conditions for NPDES permits" in order to achieve the statutory mandates of Section 301 and 402. *Arkansas v. Oklahoma,* 503 U.S. 91, 105 (1992). *See also* 40 CFR §§ 122.4(d), 122.44(d)(1), and 122.44(d)(5). CWA §§ 301 and 306 provide for two types of effluent limitations to be included in NPDES permits: "technology-based" effluent limitations (TBELs) and "water quality-based" effluent limitations (WQBELs). *See* CWA §§ 301, and 304(d); 40 CFR Parts 122, 125, 131.

2.1 Technology-Based Requirements

Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. *See* CWA § 301(b). As a class, publicly owned treatment works (POTWs) must meet performance-based requirements based on available wastewater treatment technology. *See* CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH. *See* 40 CFR Part 133.

Under CWA § 301(b)(1), POTWs must have achieved effluent limits based upon secondary treatment technology by July 1, 1977. Since all statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired, when technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. *See* 40 CFR § 125.3(a)(1).

2.2 Water Quality-Based Requirements

The CWA and federal regulations also require that permit effluent limits based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when less stringent TBELs would interfere with the attainment or maintenance of water quality criteria in the receiving water. *See* CWA § 301(b)(1)(C) and 40 CFR §§ 122.44(d)(1), 122.44(d)(5).

2.2.1 Water Quality Standards

The CWA requires that each state develop water quality standards (WQSs) for all water bodies within the State. *See* CWA § 303 and 40 CFR § 131.10-12. Generally, WQSs consist of three parts: 1) the designated use or uses assigned for a water body or a segment of a water body; 2) numeric or narrative water quality criteria sufficient to protect the assigned designated use(s); and 3) antidegradation requirements to ensure that once a use is attained it will not be degraded and to protect high quality and National resource waters. *See* CWA § 303(c)(2)(A) and 40 CFR § 131.12. The applicable State WQSs can be found in 314 of the Code of Massachusetts Regulations, Chapter 4 (314 CMR 4.00).

As a matter of state law, state WQSs specify different water body classifications, each of which is associated with certain designated uses and numeric and narrative water quality criteria. When using chemical-specific numeric criteria to develop permit limitations, acute and chronic aquatic life criteria and human health criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. In general, aquatic-life acute criteria are considered applicable to daily time periods (maximum daily limit) and aquatic-life chronic criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific human health criteria are typically based on lifetime chronic exposure and, therefore, are typically applicable to average monthly limits.

When permit effluent limitation(s) are necessary to ensure that the receiving water meets narrative water quality criteria, the permitting authority must establish effluent limits in one of the following three ways: 1) based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use," 2) based on a "case-by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, 3) in certain circumstances, based on use of an indicator parameter. *See* 40 CFR § 122.44(d)(1)(vi)(A-C).

2.2.2 Antidegradation

Federal regulations found at 40 CFR § 131.12 require states to develop and adopt a statewide antidegradation policy that maintains and protects existing in-stream water uses and the level of water quality necessary to protect these existing uses. In addition, the antidegradation policy

ensures maintenance of high quality waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and to support recreation in and on the water, unless the State finds that allowing degradation is necessary to accommodate important economic or social development in the area in which the waters are located.

Massachusetts' statewide antidegradation policy, entitled "Antidegradation Provisions" is found in the State's WQSs at 314 CMR 4.04. Massachusetts guidance for the implementation of this policy is in an associated document entitled "Implementation Procedure for the Anti-Degradation Provisions of the State Water Quality Standards," dated October 21, 2009. According to the policy, no lowering of water quality is allowed, except in accordance with the antidegradation policy, and all existing in-stream uses, and the level of water quality necessary to protect the existing uses of a receiving water body must be maintained and protected.

This permit is being reissued with effluent limitations sufficiently stringent to satisfy the State's antidegradation requirements, including the protection of the existing uses of the receiving water.

2.2.3 Assessment and Listing of Waters and Total Maximum Daily Loads

The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to EPA, the U.S. Congress, and the public. To this end, EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both § 305(b) and § 303(d) of the CWA. The integrated list format allows states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories: 1) unimpaired and not threatened for all designated uses; 2) unimpaired waters for some uses and not assessed for others; 3) insufficient information to make assessments for any uses; 4) impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) impaired or threatened for one or more uses and requiring a TMDL.

A TMDL is a planning tool and potential starting point for restoration activities with the ultimate goal of attaining water quality standards. A TMDL essentially provides a pollution budget designed to restore the health of an impaired water body. A TMDL typically identifies the source(s) of the pollutant from point sources and non-point sources, determines the maximum load of the pollutant that the water body can tolerate while still attaining WQSs for the designated uses, and allocates that load among to the various sources, including point source discharges, subject to NPDES permits. *See* 40 CFR § 130.7.

For impaired waters where a TMDL has been developed for a particular pollutant and the TMDL includes a waste load allocation (WLA) for a NPDES permitted discharge, the effluent limitation in the permit must be "consistent with the assumptions and requirements of any available WLA". 40 CFR § 122.44(d)(1)(vii)(B).

2.2.4 Reasonable Potential

Pursuant to CWA § 301(b)(1)(C) and 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to TBELs that are necessary to achieve water quality standards established under § 303 of the CWA. *See also* 33 U.S.C. § 1311(b)(1)(C). In addition, limitations

"must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the permitting authority determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality." 40 CFR § 122.44(d)(1)(i). To determine if the discharge causes, or has the reasonable potential to cause, or contribute to an excursion above any WQS, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) the variability of the pollutant or pollutant parameter in the effluent; 3) the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity); and 4) where appropriate, the dilution of the effluent by the receiving water. *See* 40 CFR § 122.44(d)(1)(ii).

If the permitting authority determines that the discharge of a pollutant will cause, has the reasonable potential to cause, or contribute to an excursion above WQSs, the permit must contain WQBELs for that pollutant. *See* 40 CFR § 122.44(d)(1)(i).

2.2.5 State Certification

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate the State WQSs, the State waives, or is deemed to have waived, its right to certify. *See* 33 U.S.C. § 1341(a)(1). Regulations governing state certification are set forth in 40 CFR § 124.53 and § 124.55. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the Draft Permit will be certified.

If the State believes that conditions more stringent than those contained in the Draft Permit are necessary to meet the requirements of either CWA §§ 208(e), 301, 302, 303, 306 and 307, or applicable requirements of State law, the State should include such conditions in its certification and, in each case, cite the CWA or State law provisions upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. EPA includes properly supported State certification conditions in the NPDES permit. The only exception to this is that the permit conditions/requirements regulating sewage sludge management and implementing CWA § 405(d) are not subject to the State certification requirements. Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through EPA's permit appeal procedures of 40 CFR Part 124.

In addition, the State should provide a statement of the extent to which any condition of the Draft Permit can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to final permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition.

It should be noted that under CWA § 401, EPA's duty to defer to considerations of State law is intended to prevent EPA from relaxing any requirements, limitations or conditions imposed by State law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." 40 CFR § 124.55(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." *Id.* EPA regulations pertaining to permit

limitations based upon WQSs and State requirements are contained in 40 CFR §§ 122.4(d) and 122.44(d).

2.3 Effluent Flow Requirements

Sewage treatment plant discharge is encompassed within the definition of "pollutant" and is subject to regulation under the CWA. The CWA defines "pollutant" to mean, *inter alia*, "municipal...waste" and "sewage…discharged into water." 33 U.S.C. § 1362(6).

Generally, EPA uses effluent flow both to determine whether an NPDES permit needs certain effluent limitations and to calculate the limitations themselves. EPA practice is to use effluent flow as a reasonable and important worst-case condition in EPA's reasonable potential and WQBEL calculations to ensure compliance with WQSs under § 301(b)(1)(C). Should the effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be reduced, and the calculated effluent limitations may not be sufficiently protective (i.e. might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying EPA's reasonable potential analyses and permit effluent limitation derivations remain sound for the duration of the permit, EPA may ensure the validity of its "worst-case" wastewater effluent flow assumptions through imposition of permit conditions for effluent flow.[1] In this regard, the effluent flow limitation is a component of WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit is also necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs.

The limitation on wastewater effluent flow is within EPA's authority to condition a permit to carry out the objectives of the Act. *See* CWA §§ 402(a)(2) and 301(b)(1)(C); 40 CFR §§ 122.4(a) and (d), 122.43 and 122.44(d). A condition on the discharge designed to ensure the WQBEL and reasonable potential calculations account for "worst case" conditions is encompassed by the references to "condition" and "limitations" in CWA §§ 402 and 301 and implementing regulations, as they are designed to assure compliance with applicable water quality regulations, including antidegradation. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of wastewater effluent is consistent with the overall structure and purposes of the CWA.

In addition, as provided in Part II.B.1 of this permit and 40 CFR § 122.41(e), the Permittee is required to properly operate and maintain all facilities and systems of treatment and control. Operating the facility's wastewater treatment systems as designed includes operating within the facility's design wastewater effluent flow.

EPA has also included the effluent flow limit in the permit to minimize or prevent infiltration and inflow (I/I) that may result in unauthorized discharges and compromise proper operation and

[1] EPA's regulations regarding "reasonable potential" require EPA to consider "where appropriate, the dilution of the effluent in the receiving water," *id* 40 CFR §122.44(d)(1)(ii). *Both* the effluent flow and receiving water flow may be considered when assessing reasonable potential. *In re Upper Blackstone Water Pollution Abatement Dist.,* 14 E.A.D. 577. 599 (EAB 2010). EPA guidance directs that this "reasonable potential: analysis be based on "worst-case" conditions. *See In re Washington Aquaduct Water Supply Sys. 11 E.A.D. 565, 584 (EAB 2004)*

maintenance of the facility. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow added to the collection system that enters the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity available for treatment and the operating efficiency of the treatment works and to properly operate and maintain the treatment works.

Furthermore, the extraneous flow due to significant I/I greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems. Consequently, the effluent flow limit is a permit condition that relates to the permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 CFR §§ 122.41(d), (e).

2.4 Monitoring and Reporting Requirements

2.4.1 Monitoring Requirements

Sections 308(a) and 402(a)(2) of the CWA and the implementing regulations at 40 CFR Parts 122, 124, 125, and 136 authorize EPA to include monitoring and reporting requirements in NPDES permits.

The monitoring requirements included in this permit have been established to yield data representative of the Facility's discharges in accordance with CWA §§ 308(a) and 402(a)(2), and consistent with 40 CFR §§ 122.41(j), 122.43(a), 122.44(i) and 122.48. The Draft Permit specifies routine sampling and analysis requirements to provide ongoing, representative information on the levels of regulated constituents in the discharges. The monitoring program is needed to enable EPA and the State to assess the characteristics of the Facility's effluent, whether Facility discharges are complying with permit limits, and whether different permit conditions may be necessary in the future to ensure compliance with technology-based and water quality-based standards under the CWA. EPA and/or the State may use the results of the chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to CWA § 304(a)(1), State water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including, but not limited to, those pollutants listed in Appendix D of 40 CFR Part 122.

NPDES permits require that the approved analytical procedures found in 40 CFR Part 136 be used for sampling and analysis unless other procedures are explicitly specified. Permits also include requirements necessary to comply with the *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Rule*.[2] This Rule requires that where EPA-approved methods exist, NPDES applicants must use sufficiently sensitive EPA-approved analytical methods when quantifying the presence of pollutants in a discharge. Further, the permitting authority must prescribe that only sufficiently sensitive EPA-approved methods be used for analyses of pollutants or pollutant parameters under

[2] Fed. Reg. 49,001 (Aug 19, 2014).

the permit. The NPDES regulations at 40 CFR § 122.21(e)(3) (completeness), 40 CFR § 122.44(i)(1)(iv) (monitoring requirements) and/or as cross referenced at 40 CFR § 136.1(c) (applicability) indicate that an EPA-approved method is sufficiently sensitive where:

- The method minimum level[3] (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or

- In the case of permit applications, the ML is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or parameter in the discharge; or

- The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.

2.4.2 Reporting Requirements

The Draft Permit requires the Permittee to report monitoring results obtained during each calendar month to EPA and the State electronically using NetDMR. The Permittee must submit a Discharge Monitoring Report (DMR) for each calendar month no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool enabling regulated CWA permittees to submit DMRs electronically via a secure internet application to EPA through the Environmental Information Exchange Network. NetDMR has eliminated the need for participants to mail in paper forms to EPA under 40 CFR §§ 122.41 and 403.12. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/. Further information about NetDMR can be found on EPA's NetDMR support portal webpage.[4]

With the use of NetDMR, the Permittee is no longer required to submit hard copies of DMRs and reports to EPA and the State unless otherwise specified in the Draft Permit. In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR. Certain exceptions are provided in the permit, such as for providing written notifications required under the Part II Standard Conditions.

2.5 Standard Conditions

The standard conditions, included as Part II of the Draft Permit, are based on applicable regulations found in the Code of Federal Regulations. *See generally* 40 CFR Part 122.

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[3] The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL). Minimum levels may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a lab, by a factor. EPA is considering the following terms related to analytical method sensitivity to be synonymous: "quantitation limit," "reporting limit," "level of quantitation," and "minimum level." *See* Fed. Reg. 49,001 (Aug. 19, 2014).

[4] https://netdmr.zendesk.com/hc/en-us/articles/209616266-EPA-Region-1-NetDMR-Information

2.6 Anti-backsliding

The CWA's anti-backsliding requirements prohibit a permit from being renewed, reissued or modified to include with less stringent limitations or conditions than those contained in a previous permit except in compliance with one of the specified exceptions to those requirements. *See* CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). Anti-backsliding provisions apply to effluent limits based on technology, water quality and/or state certification requirements.

All proposed limitations in the Draft Permit are at least as stringent as limitations included in the 2006 Permit unless specific conditions exist to justify relaxation in accordance with CWA § 402(o) or § 303(d)(4). Discussion of any less stringent limitations and corresponding exceptions to anti-backsliding provisions is provided in the sections that follow.

3.0 Description of Facility and Discharge

3.1 Location and Type of Facility

The location of the treatment plant and the outfall 001 to the French Stream are shown in Figure 1. The longitude and latitude of the outfall is 42º 08' N, 70º 55' W.

The Rockland Wastewater Treatment Facility (WWTF) is an advanced wastewater treatment facility that is engaged in the collection and treatment of municipal and commercial wastewater. Currently, the Facility serves approximately 18,000 residents in the Town of Rockland (all of the town's population) and 350 residents in the Town of Abington (approximately 5% of the Town's population) with the collection system primarily focused in the town center (Hanover St corridor).

The Facility has a design flow of 2.50 MGD, the annual average daily flow reported in the 2011 application was 2.66 MGD and the average for the last 5 years has been 2.43 MGD. The system is a separate system with no combined sewers. Wastewater is comprised of mostly domestic sewage with some commercial sewage and some septage.

There is 1 industrial user that discharges to the POTW: Serono Incorporated, consisting of process (2,500 gpd) and non-process wastewater (16,000 gpd) which contributes an average of 18,500 gallons per day. Pollutants introduced into POTWs by a non-domestic source shall not pass through the POTW or interfere with the operation or performance of the treatment works.

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the permittee from June 2016 through May 2021 is provided in Appendix A of this Fact Sheet.

3.1.1 Treatment Process Description

The facility is an advanced secondary treatment plant with seasonal phosphorus removal and nitrification. Raw wastewater enters the plant through an influent pump station followed by an aerated grit chamber. Flow then goes to a splitter box and to 4 primary settling tanks. From the settling tanks, it flows to 8 nitrification tanks and two nitrification settling tanks. Flow bypasses 2 secondary aeration tanks and two secondary settling tanks. Many older plants with similar designs have been reconfigured to accomplish both secondary treatment and nitrification in the

same units, rather than in two stages. After nitrification and secondary treatment, flow goes to two chlorine contact tanks followed by dechlorination. Chlorination is by sodium hypochlorite, with dechlorination by sodium bisulfite. The effluent is reaerated by passing over a cascade, and then flows to a 700-foot man-made channel which, in turn, flows into the French Stream.

When flow to the treatment plant exceeds the range of 6 to 6.5 MGD, excess flow is diverted by portable pumps to the surplus secondary aeration tanks and secondary settling tanks. The excess influent is fed back into the headworks when the high flows abate. During high flow events when this storage capacity is exceeded, the flow is directed from the headworks and/or the manhole prior to the headworks and is sent directly to the chlorine contact chamber. Such bypasses are not permitted and must be reported pursuant to federal bypass regulations at 40 CFR §122.41(m).

Waste sludge is pumped from the clarifiers' return sludge lines to an aerated sludge holding tank and then dewatered following chemical addition. The dried sludge is transported under contract with a private hauler for incineration. The mass of sludge shipped for incineration in 2010 was 286.9 dry metric tons.

3.1.2 Collection System Description

The Rockland WWTF is served by a separate sewer system. A separate sanitary sewer conveys domestic, industrial and commercial sewage, but not stormwater. It is part of a "two pipe system" consisting of separate sanitary sewers and storm sewers. The two systems have no interconnections; the sanitary sewer leads to the wastewater treatment plant and the storm sewers discharge to a local water body.

4.0 Description of Receiving Water and Dilution

4.1 Receiving Water

The Rockland WWTF discharges through Outfall 001 into a man-made channel that feeds into the French Stream, a tributary of the North River, within Segment MA94-03. This segment is 5.8 miles in length and travels from the southeast side of South Weymouth Naval Air Station to the confluence with Drinkwater River in Hanover, MA. The Drinkwater River then flows into the North River. The North River is part of the South Coastal Watershed, which discharges to Massachusetts Bay.

French Stream is classified as a Class B warm water fishery in the Massachusetts WQSs, 314 Code of Massachusetts Regulations ("CMR") 4.05(4)(a). The MA WQS at 314 CMR 4.05(3)(b) state that Class B "*waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. They shall be a source of public water supply (i.e., where designated and with appropriate treatment). They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. They shall also have consistently good aesthetic value."*

French Stream is listed in the final *Massachusetts Year 2016 Integrated List of Waters* ("303(d) List") as a Category 5 "Waters Requiring a TMDL."[5] The pollutant requiring a TMDLs are dissolved oxygen, E. Coli, Fecal Coliform, Fish Bioassessments, Total Phosphorus, and Whole Effluent Toxicity. A TMDL[6] has been developed for E. Coli and Fecal Coliform, but no TMDL has been developed for this segment for any of the other listed impairments.

4.2 Ambient Data

A summary of the ambient data collected in the receiving water in the vicinity of the outfall that is referenced in this Fact Sheet can be found in Appendix A of this Fact Sheet.

4.3 Available Dilution

To ensure that discharges do not cause or contribute to violations of WQS under all expected conditions, WQBELs are derived assuming critical conditions for the receiving water.[7] The critical flow in rivers and streams is some measure of the low flow of that river or stream. State WQSs require that for rivers and streams, the lowest condition is the lowest mean flow for seven consecutive days, recorded once in 10 years, or 7-day 10-year low flow ("7Q10"). *See* 314 CMR 4.03(3)(a).

MassDEP calculated the 7Q10 for the French Stream by using the USGS StreamStats[8] for Massachusetts watershed delineation tool.[9] The 7Q10 flow immediately upstream of the discharge was determined to be 0.18 cfs. The dilution factor (DF) was calculated using the design flow (Q_d) and the critical 7Q10 flow in the receiving water upstream of the discharge (Q_s) as follows:

$$DF = (Q_s + Q_d)/Q_d$$

Where:

Q_s = 7Q10 flow, in cfs
Q_d = Design flow, in cfs

Therefore:

DF = (0.18 cfs + 3.9 cfs) / 3.9 cfs = 1.05

EPA notes that this is slightly higher than the dilution factor of 1.01 used in the 2006 Permit.

5.0 Proposed Effluent Limitations and Conditions

The proposed effluent limitations and conditions derived under the CWA and State WQSs are described below. These proposed effluent limitations and conditions, the basis of which are discussed throughout this Fact Sheet, may be found in Part I of the Draft Permit.

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[5] *Massachusetts Year 2016 Integrated List of Waters,* MassDEP Division of Watershed Management Watershed Planning Program, Worcester, Massachusetts, December 2019.
[6] Final Pathogen TMDL for the South Coastal Watershed, August 2014, Mass DEP, https://ofmpub.epa.gov/waters10/attains_impaired_waters.show_tmdl_document?p_tmdl_doc_blobs_id=67200
[7] EPA Permit Writer's Manual, Section 6.2.4
[8] See Appendix C – Rockland WWTP 7Q10 Summary
[9] USGS StreamStats for Massachusetts Interactive Map: http://water.usgs.gov/osw/streamstats.massachusetts.html

5.1 Effluent Limitations and Monitoring Requirements

In addition to the State and Federal regulations described in Section 2, data submitted by the permittee in its permit application, in monthly discharge monitoring reports (DMRs) and in WET test reports from June 2016 to May 2021 (the "review period") were used to identify the pollutants of concern and to evaluate the discharge during the effluent limitations development process (*See* Appendix A).The reasonable potential analysis is included in Appendix B and results are discussed in the sections below.

5.1.1 Effluent Flow

The effluent flow limit in the 2006 Permit is 2.5 MGD, as a 12-month rolling average flow, based on the Facility's design flow.

EPA issued Administrative Order, Docket No. 06-33 ("2006 AO"), to the Town on September 29, 2006, in response to violations of flow limitations in the 2006 Permit and a previous NPDES permit, issued in 1999. On February 15, 2007, EPA issued a modification to the 2006 Permit that changed the permitted flow limitation from a 12-month rolling average to a monthly average limitation ("2007 Permit Modification"), in order to maintain tighter monitoring and limits on possible flow violations. In the review period for this permit (June 2016 – May 2021), the Rockland WWTP reported monthly average flow violations in 28 of the 60 months. EPA also notes that the rolling 12-month average flows presented in Appendix A show 13 out of the 60 months in the review period had values above the 2.5 MGD design flow. Therefore, regardless of the averaging period, the facility is experiencing significant I/I, which results in ongoing exceedances of the facility's design flow. As noted by the MA Department of Fish and Game in the Response to Comments on the 2007 Permit Modification at 6:

> "Maintaining an actual monthly average limit will prove to be a valuable tool to mark progress on reducing surges in flow to the plant associated with wet weather events. The monthly limitation provides a truer measure of the advancements being made to bring [down] influent flows than an annual averaging method to calculate a monthly average. It is our belief the monthly average will better facilitate the plant reaching a reasonable influent level during wet weather/melt water events thus enabling the facility to treat flows effectively."

Given that I/I continue to be ongoing issues at the facility resulting in flow violations, the Draft Permit continues the 2.5 MGD monthly average flow limit from the 2006 Permit. The Draft Permit requires that flow be measured continuously and that the rolling annual average flow, as well as the average monthly and maximum daily flow for each month be reported. The rolling annual average flow is calculated as the average of the flow for the reporting month and 11 previous months.

5.1.2 Biochemical Oxygen Demand (BOD_5)

5.1.2.1 BOD_5 Concentration Limits

The summer BOD_5 limits in the 2006 Permit (effective May 1 through September 30) were included in the 1987 Rockland permit as state certification requirements under Section 401 of the CWA; the average monthly limit is 6 mg/L, the weekly average limit is 6 mg/L, and the daily maximum limit is 10 mg/L. The winter BOD_5 limits in the 2006 Permit (effective October 1

through April 30) were introduced in the 1993 permit; the average monthly limit is 20 mg/L, the weekly average limit is 20 mg/L, and the daily maximum limit is 30 mg/L.

The DMR data during the review period shows that there have been no violations of BOD_5 concentration limits.

The Draft Permit proposes the same BOD_5 concentration limits as in the 2006 Permit, in accordance with anti-backsliding and antidegradation requirements. The monitoring frequency remains twice per week.

5.1.2.2 BOD_5 Mass Limits

The winter and summer mass-based BOD_5 limits in the 2006 Permit of 125 lb/day (average monthly), 125 lb/day (average weekly), and 209 lb/day (daily maximum) were based on the 1987 permitted concentration limits and the design flow of the Facility. The winter mass-based limits of 417 lb/day (average monthly), 417 lb/day (average weekly), and 626 lb/day (daily maximum) were based on the permitted concentration limits in the 1993 permit and the design flow of the facility.

The DMR data from the review period shows that there have been no exceedances of BOD_5 mass limits.

BOD_5 Mass Loading Calculations:

$$L = C_d * Q_d * 8.34$$

Where:

L = Maximum allowable load in lb/day
C_d = Maximum allowable effluent concentration, in mg/L
Q_d = Annual average design flow of Facility, in MGD
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lb/day

Summer Limits:

Average Monthly:	6 mg/L * 2.50 MGD * 8.34 = 125 lb/day
Average Weekly:	6 mg/L * 2.50 MGD * 8.34 = 125 lb/day
Daily Maximum:	10 mg/L * 2.50 MGD * 8.34 = 209 lb/day

Winter Limits:

Average Monthly:	20 mg/L * 2.50 MGD * 8.34 = 417 lb/day
Average Weekly:	20 mg/L * 2.50 MGD * 8.34 = 417 lb/day
Daily Maximum:	30 mg/L * 2.50 MGD * 8.34 = 626 lb/day

The mass limits and the sampling frequency of twice per week are carried forward into the Draft Permit.

5.1.3 Total Suspended Solids (TSS)

5.1.3.1 TSS Concentration Limits

The summer TSS limits in the 2006 Permit (effective May 1 through September 30) were included in the 1987 Rockland permit as state certification requirements under Section 401 of the

CWA; the average monthly limit is 10 mg/L, the weekly average limit is 10 mg/L, and the daily maximum limit is 15 mg/L. The winter TSS limits in the 2006 Permit (effective October 1 through April 30) were introduced in the 1993 permit; the average monthly limit is 20 mg/L, the weekly average limit is 20 mg/L, and the daily maximum limit is 30 mg/L.

The DMR data during the review period shows that there have been no violations of TSS concentration limits.

The Draft Permit proposes the same TSS concentration limits as in the 2006 Permit, in accordance with anti-backsliding and antidegradation requirements. The monitoring frequency remains twice per week.

5.1.3.2 TSS Mass Limits

The winter and summer mass-based TSS limits in the 2006 Permit of 209 lb/day (average monthly), 209 lb/day (average weekly), and 313 lb/day (daily maximum) were based on the 1987 permitted concentration limits and the design flow of the Facility. The winter mass-based limits of 417 lb/day (average monthly), 417 lb/day (average weekly), and 626 lb/day (daily maximum) were based on the permitted concentration limits in the 1993 permit and the design flow of the facility.

The DMR data from the review period shows that there has been one exceedance of the TSS mass weekly average limit.

TSS Mass Loading Calculations:

$$L = C_d * Q_d * 8.34$$

Where:
L = Maximum allowable load, in lb/day
C_d = Maximum allowable effluent concentration, in mg/L
Q_d = Annual average design flow of Facility, in MGD
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lb/day

Summer Limits:

Average Monthly:	10 mg/L * 2.50 MGD * 8.34 = 209 lb/day
Average Weekly:	10 mg/L * 2.50 MGD * 8.34 = 209 lb/day
Daily Maximum:	15 mg/L * 2.50 MGD * 8.34 = 313 lb/day

Winter Limits:

Average Monthly:	20 mg/L * 2.50 MGD * 8.34 = 417 lb/day
Average Weekly:	20 mg/L * 2.50 MGD * 8.34 = 417 lb/day
Daily Maximum:	30 mg/L * 2.50 MGD * 8.34 = 626 lb/day

The mass limits and the sampling frequency of twice per week are carried forward into the Draft Permit.

5.1.4 Eighty-Five Percent (85%) BOD_5 and TSS Removal Requirement

In accordance with the provisions of 40 CFR § 133.102(a)(3), and (b)(3), the 2006 Permit requires that the 30-day average percent removal for BOD_5 and TSS be not less than 85%. The

DMR data during the review period shows that the median BOD_5 and TSS removal percentages are 98% and 99%, respectively. There were no exceedances of the 85% removal requirement for BOD_5 or TSS during that period.

The requirement to achieve 85% BOD_5 and TSS removal has been carried forward into the Draft Permit.

5.1.5 pH

Consistent with the requirements of Massachusetts WQS at 314 CMR 4.05(3)(b)(3), the Permit requires that the pH of the effluent is not less than 6.5 or greater than 8.3 standard units at any time. The monitoring frequency is once per day. The DMR data during the review period show that there have been no exceedances of the pH limitations.

The pH requirements in the 2006 Permit are carried forward into the Draft Permit as there has been no change in the WQS with regards to pH. The limitations are based on CWA 301(b)(1)(C) and 40 CFR § 122.44(d).

5.1.6 Bacteria

The 2006 Permit includes effluent limitations for bacteria using fecal coliform bacteria as the indicator bacteria with a monthly limit of 200 colony forming units (cfu)/100 mL and a daily maximum limit of 400 cfu/100 mL. These limits were based on the applicable WQS at the time the permit was issued.

Consistent with the South Coastal Watershed TMDL[10] and Massachusetts' bacteria criteria at 314 CMR 4.05(3)(b)4.a, the bacteria limits proposed in the Draft Permit are 126 colonies *E. coli*/100 ml as a geometric mean and 409 colonies *E. coli*/100 ml maximum daily value (this is the 90% distribution of the geometric mean of 126 colonies/100 ml[11]). The bacteria limits apply year-round and the monitoring frequency is three per week. Due to the 2007 update in the Massachusetts bacteria criteria for freshwaters from fecal coliform to *E. coli*, the fecal coliform limits will be removed in the Draft Permit.

Given that this is a new limit, a one-year compliance schedule has been included in the Draft Permit to allow the Permittee time optimize disinfection at the facility to ensure compliance with the limit. During this first year, the Permittee must comply with interim fecal coliform limits of 200 cfu/100 mL (monthly average) and 400 cfu/100 mL (daily maximum).

5.1.7 Dissolved Oxygen

The 2006 Permit includes a dissolved oxygen minimum limit of 7.4 mg/L, effective May 1 through September 30. This requirement was established to assure that dissolved oxygen levels remain above the state water quality standard of 5.0 mg/L particularly during low flow periods. Mass DEP determined that the minimum effluent DO must be 7.4 mg/L as part of a load allocation for the Rockland STP, as stated in a 1974 memorandum from Glenn Haas to Russell

[10] Final Pathogen TMDL for the South Coastal Watershed, August 2014, Mass DEP, https://ofmpub.epa.gov/waters10/attains_impaired_waters.show_tmdl_document?p_tmdl_doc_blobs_id=67200
[11] MassDEP, "Draft 6/25/2007 Guidance on Implementation of Proposed Primary Contact Recreation Bacteria in Massachusetts Surface Water Quality Standards, 314 CMR 4.00," 2007, p. 11, Table 2.

Issac (See also MassDEP letter to Al Curran of M&E, dated, June 10, 1975). The DMR data during the review period show that there have been no violations of the DO limitations.

The Draft Permit carries forward the seasonal minimum effluent DO limitation of 7.4 mg/L, effective May 1 through September 30.

5.1.8 Total Residual Chlorine

The Permittee uses chlorine disinfection. The 2006 Permit includes effluent limitations for total residual chlorine (TRC) of 11 µg/L (average monthly) and 19 µg/L (maximum daily). The DMR data during the review period show that there have been no exceedances of the TRC limitations.

The TRC permit limits are based on the instream chlorine criteria defined in *National Recommended Water Quality Criteria: 2002*, EPA 822R-02-047 (November 2002), as adopted by the MassDEP into the state water quality standards at 314 CMR 4.05(5)(e). These freshwater instream criteria for chlorine are 11 µg/L (chronic) and 19 µg/L (acute). Because the upstream chlorine is assumed to be zero in this case, the water quality-based chlorine limits are calculated as the criteria times the dilution factor, as follows:

Chronic criteria * dilution factor = Chronic limit
11 µg/L * 1.05 = 11.6 µg/L (average monthly)

Acute criteria * dilution factor = Acute limit
19 µg/L * 1.05 = 20 µg/L (maximum daily)

Although these limits are slightly less stringent that the limits in the 2006 Permit (based on the revised dilution factor), the limits in the 2006 Permit are carried forward based on anti-backsliding requirements discussed in Section 2.6 above.

5.1.9 Ammonia

The 2006 Permit includes the following ammonia effluent limitations:

	Average Monthly	Average Weekly	Maximum Daily
October 1 - March 31	3.3 mg/L	3.3 mg/L	5.7 mg/L
April 1 - May 31	2.5 mg/L	2.5 mg/L	5.7 mg/L
June 1 - September 30	1.0 mg/L	1.0 mg/L	1.5 mg/L

The DMR data during the review period shows there were 6 exceedances of the ammonia limits. The effluent data and ambient data (taken upstream of the Rockland outfall in the French Stream) from within the review period are presented in Appendix A.

The ammonia criteria in EPA's *National Recommended Water Quality Criteria,* 2002 (EPA 822-R-02-047) document are included by reference in the Massachusetts WQS (*See* 314 CMR 4.05(5)(e)). The freshwater acute criterion is dependent on pH and the freshwater chronic criterion is dependent on pH, temperature and whether early life stages of fish are present in the receiving water. The marine water quality criteria are dependent on pH and temperature.

In determining whether the discharge has the reasonable potential to cause or contribute to excursions above the instream water quality criteria for ammonia, EPA used the mass balance equation presented in Appendix B for both warm and cold weather conditions to project the ammonia concentration downstream of the discharge. If there is reasonable potential, this mass balance equation is also used to determine the limit that is required in the permit.

EPA notes that since the 2006 Permit already contained limits for ammonia, the same mass balance equation is used to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (C_d) allowable to meet WQS based on current conditions.

To determine the applicable ammonia criteria, EPA assumes a warm weather (April 1 – September 30) temperature of 25° C and a cold weather (October 1 – March 31) temperature of 5° C. EPA used the ambient pH monitoring shown in Appendix A, which indicates that the median pH is 7.07 S.U.

Based on the information and assumptions described above, Appendix B presents the applicable ammonia criteria, the details of the mass balance equation, the reasonable potential determination, and, if necessary, the limits required in the Draft Permit. As shown, there is no need for more stringent limits to continue to protect WQS so the existing limits are being carried forward for the reasons specified in Appendix B.

Effluent and ambient monitoring for ammonia will continue to be required in the quarterly WET tests.

5.1.10 Nutrients

Nutrients are compounds containing nitrogen and phosphorus. Although nitrogen and phosphorus are essential for plant growth, high concentrations of these nutrients can cause eutrophication, a condition in which aquatic plant and algal growth is excessive. Plant and algae respiration and decomposition reduces dissolved oxygen in the water, creating poor habitat for fish and other aquatic animals. Recent studies provide evidence that both phosphorus and nitrogen can play a role in the eutrophication of certain ecosystems. However, typically phosphorus is the limiting nutrient triggering eutrophication in freshwater ecosystems and nitrogen in marine or estuarine ecosystems. Given that this discharge is to a freshwater ecosystem which also reaches a marine ecosystem farther downstream, both phosphorus and nitrogen are nutrients of concern evaluated below.

5.1.10.1 Total Nitrogen

The Rockland WWTF discharges into a man-made channel that feeds into the French Stream, which flows to the Drinkwater River, then into the North River, which discharges to Massachusetts Bay. The 2006 Permit did not require monitoring for total nitrogen. However, data is necessary to determine whether there is reasonable potential for nitrogen discharges from the Facility to cause or contribute to a violation of the Massachusetts narrative nutrient criteria in Massachusetts Bay, particularly data that characterizes aquatic life designated uses that may be affected in this area so that the narrative criteria can be interpreted numerically. In the meantime,

EPA finds that quantifying the load of total nitrogen from this Facility (as well as all other facilities in the watershed that discharge significant levels of nitrogen) is an important step to understanding the impact of nitrogen loading in the Massachusetts Bay.

The Draft Permit includes new weekly monitoring and reporting requirements for total nitrate plus total nitrite, total Kjeldahl nitrogen (TKN) and total nitrogen from April through October and monthly monitoring and reporting from November through March. The monitoring data will provide additional information on the loading of nitrogen and the impact to Massachusetts Bay.

5.1.10.2 Total Phosphorus

While phosphorus is an essential nutrient for the growth of aquatic plants, it can stimulate rapid plant growth in freshwater ecosystems when it is present in high quantities.

The excessive growth of aquatic plants and algae within freshwater systems negatively impacts water quality and can interfere with the attainment of designated uses by: 1) increasing oxygen demand within the water body to support an increase in both plant respiration and the biological breakdown of dead organic (plant) matter;[12] 2) causing an unpleasant appearance and odor; 3) interfering with navigation and recreation, for instance, by fouling engines and propellers, making waters unappealing to swimmers, and interfering with fishing lures and equipment; 4) reducing water clarity; 5) reducing the quality and availability of suitable habitat for aquatic life; and 6) producing toxic cyanobacteria during certain algal blooms. Cultural (or accelerated) eutrophication is the term used to describe dense and excessive plant growth in a water body that results from nutrients entering the system as a result of human activities. Discharges from municipal and industrial wastewater treatment plants, agriculture runoff, and stormwater are examples of human-derived (*i.e.*, anthropogenic) sources of nutrients in surface waters. See generally, *Nutrient Criteria Technical Guidance Manual – Rivers and Streams*, EPA July 2000 [EPA-822-B-00-002], Chapters 1 and 3.

The MA WQS under 314 CMR 4.05(5)(c) requires that, unless naturally occurring, surface waters must be free from nutrients that cause or contribute to impairment of the existing or designated uses, and the concentration of phosphorus may not exceed site specific criteria developed in a TMDL. Nutrients are also prohibited in concentrations that would cause or contribute to cultural eutrophication. Cultural eutrophication also results in exceedances of other nutrient-related water quality standards such as low dissolved oxygen, decreased water clarity, objectionable odors, and surface scum. The MA WQS at 314 CMR 4.05(3)(b)(1) requires that dissolved oxygen not be less than 6.0 mg/L in cold water fisheries or 5.0 mg/L in warm water fisheries. Further, the MA WQS at 4.05(3)(b)(5), (6) and (8) state that waters must be free from "floating, suspended, and settleable solids," free from "color and turbidity in concentrations or combinations that are aesthetically objectionable…", and have no taste and odor "in such concentrations or combinations that are aesthetically objectionable, that would impair any use

[12] "Algae" includes phytoplankton (microscopic algae measured by levels of chlorophyll a), macroalgae (commonly referred to as seaweed), and other plants stimulated by nutrient over-enrichment. Excessive algal growth contributes to low levels of dissolved oxygen through increased plant respiration and decomposition of dead plant matter. Notably, during the day, algae provide oxygen to the water as a by-product of photosynthesis. At night, however, when photosynthesis ceases but plant respiration continues, dissolved oxygen levels decline. Additionally, as these algae die, they are decomposed by bacteria that consume yet more oxygen. When dissolved oxygen levels are low, aquatic organisms become stressed and die, and overall aquatic health is degraded.

assigned to this Class, or that would cause tainting or undesirable flavors in the edible portions of aquatic life." To prevent cultural eutrophication, the MA WQS at 4.05(5)(c) states that "Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses." Also see Part 2.2.2 of this Fact Sheet above regarding antidegradation and existing uses which may be impacted by nutrient over-enrichment.

When permitting nutrient discharges, EPA analyzes available information from a reasonably conservative standpoint, as it regards one key function of a nutrient limit as preventative. This protective approach is appropriate because, once begun, the cycle of eutrophication can be difficult to reverse due to the tendency of nutrients to be retained in the sediments. For this reason, time is of the essence when permitting for nutrients, so EPA acts on the best information reasonably available when developing the draft permit, and does not generally delay permit issuance pending collection of new data or development of new models. This approach is also consistent with the requirement for NPDES permits to be revisited and reissued at regular intervals, with permit terms not to exceed five years.

When translating narrative phosphorus criteria into numeric values (and establishing WQBELs, if necessary), EPA looks to a wide range of materials, including nationally recommended criteria and other relevant materials, such as EPA nutrient technical guidance and information published under Section 304(a) of the CWA, peer-reviewed scientific literature and site-specific surveys and data to determine instream targets that are protective of water quality. See 40 CFR § 122.44(d)(1)(vi)(A), (B).

EPA has produced several guidance documents, described below, that recommend a range of total ambient phosphorus concentrations that are sufficiently stringent to control cultural eutrophication and other adverse nutrient-related impacts, with 0.1 mg/L representing the upper end of this range. These guidance documents recommend protective in-stream phosphorus concentrations based on two different analytical approaches. An effects-based approach provides a threshold value above which adverse effects (*i.e.*, water quality impairments) are likely to occur. This approach applies empirical observations of a causal variable (*i.e.*, phosphorus) and a response variable (*i.e.*, chlorophyll-a as a measure of algal biomass) associated with designated use impairments. Alternatively, reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregion class. They are a quantitative set of river characteristics (physical, chemical and biological) that represent conditions in waters in that ecoregion that are minimally impacted by human activities (*i.e.*, reference conditions), and thus by definition representative of water without cultural eutrophication. Dischargers in Massachusetts and New Hampshire are located within either Ecoregion VII, Nutrient-Poor, Largely Glaciated Upper Midwest and Northeast or Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criteria for these ecoregions are 10 µg/L and 31.25 µg/L, respectively. While reference conditions reflect in-stream phosphorus concentrations that are sufficiently low to meet the requirements necessary to support designated uses, they may also represent levels of water quality beyond what is necessary to support such uses.

EPA follows an effects-based approach. EPA's 1986 *Quality Criteria for Water* (the "Gold Book") recommends maximum threshold concentrations that are designed to prevent or control adverse nutrient-related impacts from occurring. Specifically, the Gold Book recommends in-stream phosphorus concentrations of no greater than 0.05 mg/L in any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharging directly to lakes or impoundments, and 0.025 mg/L within a lake or reservoir. For this segment of the French Stream, 0.1 mg/L would apply downstream of the discharge.

The Gold Book recommended value of 0.1 mg/L is coterminous with the range of published, peer-review values presented in a more recent EPA technical guidance manual, *Nutrient Criteria Technical Guidance Manual – Rivers and Streams*, EPA July 2000 [EPA-822-B-00-002], Chapter 7 Table 4 (a simplified version of this table is shown as Table 1 below), which contains recommended threshold ambient concentrations (all more stringent than 0.1 mg/L) drawn from the scientific literature that are sufficiently stringent to control periphyton and plankton (two types of aquatic plant growth associated with eutrophication). This guidance indicates that in-stream phosphorus concentrations between 0.01 mg/L and 0.09 mg/L will be sufficient to control periphyton growth and concentrations between 0.035 mg/L and 0.070 mg/L will be sufficient to control plankton.

Table 1: Recommended Nutrient Levels to Prevent Eutrophic Impairment

PERIPHYTON Maximum			
TP (µg/L)	**Chlorophyll a (µg/L)**	**Impairment Risk**	**Source**
38-90	100-200	nuisance growth	Dodds et al. 1997
75	200	eutrophy	Dodds et al. 1998
20	150	nuisance growth	Clark Fork River Tri-State Council, MT
20		*Cladophora* nuisance growth	Chetelat et al. 1999
10-20		*Cladophora* nuisance growth	Stevenson unpubl. Data
PLANKTON Mean			
TP (µg/L)	**Chlorophyll a (µg/L)**	**Impairment Risk**	**Source**
42	8	eutrophy	Van Nieuwenhuyse and Jones 1996
70	15	chlorophyll action level	OAR 2000
35	8	eutrophy	OECD 1992 (for lakes)

The published, peer-reviewed phosphorus targets are thus 0.1 mg/L or below, irrespective of the methodological approach employed. In addition to opting for the less stringent of the available approaches (*i.e.*, effects-based in favor of reference-based), EPA has chosen to apply the upper end of the range of all available published nutrient thresholds. However, as the Gold Book notes, there are natural conditions of a water body that can result in either increased or reduced eutrophic response to phosphorus inputs; in some waters more stringent phosphorus reductions may be needed, while in some others a higher total phosphorus threshold could be assimilated without inducing a eutrophic response. EPA is not aware of any site-specific factors relevant to the receiving water that would result in it being unusually more or less susceptible to phosphorus loading.

Prior to a consideration of site-specific information and data relevant to the discharge, EPA observes that its overall approaches to establishing both phosphorus and nitrogen effluent limitations in NPDES permits have been extensively adjudicated over the past fifteen years, and they have been found to be reasonable and upheld by both the Environmental Appeals Board and the United States Court of Appeals for the First Circuit. Petitions for certiorari have twice been denied by the United States Supreme Court for Region 1 nutrient permitting (total phosphorus and total nitrogen) decisions under 40 CFR § 122.44(d)(1)(vi) in recent years. Should the public wish to review these decisions, they are available here:

City of Taunton v. EPA (EAB and First Circuit, Supreme Court cert. denied)

https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Case~Name/0A045314B61E682785257FA80054E600/$File/Denying%20Review%20Vol-17.pdf
https://yosemite.epa.gov/oa/eab_web_docket.nsf/A568248B44D1C63785258053005AEDD0/$File/Opinion%207.9.2018%20(46%20pages).pdf

Upper Blackstone Water Pollution Abatement Dist. v. EPA (EAB and First Circuit, Supreme Court cert. denied)

https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Case~Name/A44361EC4C211B0685257865006EA1EC/$File/Upper%20Blackstone.pdf
https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/2D0D249E441A18F185257B6600725F04/$File/October%2018%202017.pdf

In re City of Lowell, MA (2020)

https://yosemite.epa.gov/OA/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/6D63DE203BB980D2852585960069906D/$File/City%20of%20Lowell.pdf

In re Town of Newmarket Wastewater Treatment Plant (2013)

https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Case~Name/97CCD304C9B7E58585257C3500799108/$File/Newmarket%20Decision%20Vol%2016.pdf

In re City of Attleboro MA Wastewater Treatment Plant (2009)

https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/NPDES%20Permit%20Appeals%20(CWA)/D506EBEE22A1035E8525763300499A78/$File/Attleboro.pdf

EPA adheres to the overarching decision-making framework for nutrient permitting established by these precedents: administrative and judicial bodies have expressly found EPA's approach to be reasonable under the Act and, for its part, EPA has found the approach in its experience to be workable, expeditious, as well as demonstrably effective in addressing nutrient pollution, in a manner that is neither overly stringent, nor overly lax. While drawing on information from the scientific literature and national and regional EPA guidance, EPA also accounts for site-specific

facts and circumstances surrounding the discharge and receiving waters in arriving at the permit result. EPA acknowledges that there are a range of alternative technical approaches and opinions when permitting for nutrients to ensure that uses for the waters designated by the state for its citizens are achieved; while some of these may have merit, EPA's existing approach has been proven to have merit and provides predictability for the regulated community.

Sampling data from 2006[13], summarized in Table 2, reported five summer in-stream phosphorus concentrations collected at Station W0898 located 4200 feet upstream of the Rockland WWTP.

Table 2: Instream total phosphorus concentrations (mg/L)

	W-0898 4200' upstream of WWTP
6/21/2006	0.024
7/06/2006	0.041
8/02/2006	0.022
9/06/2006	0.030
10/11/2006	0.031

EPA notes that since the 2006 Permit already contained a limit for phosphorus, EPA uses the mass balance equation presented in Appendix B to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (C_d) allowable to meet WQS based on current conditions.

Based on the phosphorus criterion described above, the ambient data presented above, the upstream 7Q10 flow, and the design flow of the Facility, Appendix B presents the details of the mass balance equation, the determination of whether the existing limit needs to be more stringent in order to continue to protect WQS. EPA notes that based on the very low 7Q10 and small dilution factor, the ambient phosphorus data presented above does not have any impact on the calculations. As shown, it was determined that the projected downstream concentration is 190 µg/L, which exceeds the instream target of 100 µg/L. Therefore, 2006 Permit had a limit of 0.2 mg/L and EPA determined that a more stringent limit of 0.1 mg/L (applicable from April 1 through October 31) is necessary to continue to protect WQS for the reasons specified in Appendix B. Additionally, the 2006 permit contains a winter (November 1- March 31) total phosphorus limit of 1.0 mg/l that is being carried forward. However, the 2006 Permit requirement to monitor for orthophosphorus is no longer necessary and has been removed in the Draft Permit.

Based on the phosphorus data during the review period (ranging from 0.1 to 0.2 mg/L), EPA anticipates that the Facility will be unable to achieve the warm weather effluent limit of 0.1 mg/L upon the effective date of the permit. However, given that the effluent data ranges from 0.1 to 0.2 mg/L, EPA anticipates that the Facility may be able to come into compliance through chemical addition and/or optimization efforts and that a major facility upgrade is likely not necessary. Therefore, a 3-year compliance schedule has been included in the Draft Permit, *See* Part I.G.2. The schedule includes one year to evaluate potential treatment process changes (such

[13] https://www.mass.gov/guides/water-quality-monitoring-program-data

as chemical addition), one year to implement any process changes necessary to meet the limit, and an additional year to optimize the facility after those changes have been implemented. A status report is due every 12 months. If it is determined after the first year of evaluation that a major upgrade is necessary or if the Permittee is unable to comply with the limit once it becomes effective, the Permittee should reach out to EPA's Enforcement and Compliance Assurance Division (ECAD) to adjust the schedule to accommodate for additional time to achieve the phosphorus limit through alternate means.

5.1.11 Metals

5.1.11.1 Applicable Metals Criteria

State water quality criteria for cadmium, copper, lead, nickel and zinc are established in terms of dissolved metals. However, many inorganic components of domestic wastewater, including metals, are in particulate form, and differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR § 122.45(c) require, with limited exceptions, that effluent limits for metals in NPDES permits be expressed as total recoverable metals.

The criteria for cadmium, lead, nickel and zinc are hardness-dependent using the equations in EPA's National Recommended Water Quality Criteria: 2002, which are incorporated into the Massachusetts WQS by reference. The estimated hardness of the French Stream downstream of the treatment plant is calculated using the critical low flow (7Q10), the design flow of the treatment plant, and the median hardness for both the receiving water upstream of the discharge and the treatment plant effluent. Effluent and receiving water data are presented in Appendix A. Using the mass balance equation discussed in Appendix B, the resulting downstream hardness is 140.4 mg/L and the corresponding criteria are also presented in Appendix B.

The Massachusetts WQSs at 314 CMR 4.06, Table 28 list site specific criteria for copper in the French Stream from River mile 3.3 to 0.0 (its mouth at the confluence with the Drinkwater River, Hanover). The site-specific criteria listed for the French Stream are an acute copper criterion of 25.7 µg/L and a chronic copper criterion of 18.1 µg/L. These criteria will be applied as presented in Appendix B.

Massachusetts aluminum criteria are not hardness-dependent and are expressed as total recoverable aluminum.

5.1.11.2 Reasonable Potential Analysis and Limit Derivation

To determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for each metal, EPA uses the mass balance equation presented in Appendix B to project the concentration downstream of the discharge and, if applicable, to determine the limit required in the permit.

For any metal with an existing limit in the 2006 Permit, the same mass balance equation is used to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (C_d) allowable to meet WQS based on current conditions.

Based on the information described above, the results of this analysis for each metal are presented in Appendix B.

As shown, there is no reasonable potential to cause or contribute to an excursion of WQS for cadmium, lead, nickel, and zinc, so the Draft Permit does not propose any new limits for these metals.

Additionally, there is no need for a more stringent copper limit to continue to protect WQS, so the existing limits are being carried forward for the reasons specified in Appendix B.

Finally, the 2006 Permit had a chronic aluminum limit of 88 µg/L and EPA determined that a more stringent chronic aluminum limit of 87.2 µg/L is necessary to continue to protect WQS for the reasons specified in Appendix B. EPA notes that the maximum aluminum concentration during the review period was 33 µg/L, so EPA anticipates that the facility will be in compliance with this slightly lower limit and a compliance schedule it not necessary.

Effluent and ambient monitoring for each of these metals will continue to be required in the WET tests.

5.1.12 Whole Effluent Toxicity (WET)

CWA §§ 402(a)(2) and 308(a) provide EPA and States with the authority to require toxicity testing. Section 308 specifically describes biological monitoring methods as techniques that may be used to carry out objectives of the CWA. WET testing is conducted to ensure that the additivity, antagonism, synergism and persistence of the pollutants in the discharge do not cause toxicity, even when the pollutants are present at low concentrations in the effluent. The inclusion of WET requirements in the Draft Permit will assure that the Facility does not discharge combinations of pollutants into the receiving water in amounts that would be toxic to aquatic life or human health.

In addition, under CWA § 301(b)(1)(C), discharges are subject to effluent limitations based on WQSs. Under CWA §§ 301, 303 and 402, EPA and the States may establish toxicity-based limitations to implement the narrative water quality criteria calling for "no toxics in toxic amounts". *See also* 40 CFR § 122.44(d)(1). The Massachusetts WQSs at 314 CMR 4.05(5)(e) state, "All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife."

National studies conducted by EPA have demonstrated that domestic sources, as well as industrial sources, contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Some of these constituents may cause synergistic effects, even if they are present in low concentrations. Because of the source variability and contribution of toxic constituents in domestic and industrial sources, reasonable

potential may exist for this discharge to cause or contribute to an exceedance of the "no toxics in toxic amounts" narrative water quality standard.

In accordance with current EPA guidance and State policy[14], whole effluent chronic effects are regulated by limiting the highest measured continuous concentration of an effluent that causes no observed chronic effect on a representative standard test organism, known as the chronic No Observed Effect Concentration (C-NOEC). Whole effluent acute effects are regulated by limiting the concentration that is lethal to 50% of the test organisms, known as the LC_{50}. This policy recommends that permits for discharges having a dilution factor less than 10 require acute and chronic toxicity testing four times per year for two species. Additionally, for discharges with dilution factors less than 10, the C-NOEC effluent limit should be greater than or equal to 100%/DF and the LC_{50} limit should be greater than or equal to 100%.

The chronic and acute WET limits in the 2006 Permit are C-NOEC greater than or equal to 99% and LC_{50} greater than or equal to 100%, respectively, using the daphnid (*Ceriodaphnia dubia*) as the test species. EPA has previously approved a reduction to one test species. During the review period the facility exceeded the chronic WET limit twice (See Appendix A).

Based on the potential for toxicity from domestic and industrial contributions, the state narrative water quality criterion, the dilution factor of 1.05, and in accordance with 40 CFR § 122.44(d), the Draft Permit continues the effluent limits from the 2006 Permit including the test organism and the testing frequency. EPA notes that the updated DF of 1.05 would result in a C-NOEC limit of 95% (*i.e.*, 100/1.05 = 0.95) but the limit of 99% is carried forward based on anti-backsliding requirements discussed in Section 2.6 above. Toxicity testing must be performed in accordance with the updated EPA Region 1 WET test procedures and protocols specified in Attachments A, *Freshwater Acute Toxicity Test Procedure and Protocol* (February 2011) and Attachment B, *Freshwater Chronic Toxicity Test Procedure and Protocol* (March 2013) of the Draft Permit.

In addition, EPA's 2018 *National Recommended Water Quality Criteria* for aluminum are calculated based on water chemistry parameters that include dissolved organic carbon (DOC), hardness and pH. Since aluminum monitoring is required as part of each WET test, an accompanying new testing and reporting requirement for DOC, in conjunction with each WET test, is warranted in order to assess potential impacts of aluminum in the receiving water.

5.1.13 Per- and polyfluoroalkyl substances (PFAS)

As explained at https://www.epa.gov/pfas, PFAS are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. PFAS manufacturing and processing facilities, facilities using PFAS in production of other products, airports, and military installations can be contributors of PFAS releases into the air, soil, and water. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Exposure to some PFAS above certain levels may

[14] *Massachusetts Water Quality Standards Implementation Policy for the Control of Toxic Pollutants in Surface Waters.* February 23, 1990.

increase risk of adverse health effects.[15] EPA is collecting information to evaluate the potential impacts that discharges of PFAS from wastewater treatment plants may have on downstream drinking water, recreational and aquatic life uses.

Background Information for Massachusetts

On October 20, 2020, MassDEP published final regulations establishing a drinking water standard, or a Maximum Contaminant Level (MCL) of 20 parts per trillion (ppt) for the sum of the following six PFAS. *See* 310 CMR 22.00.

- Perfluorohexanesulfonic acid (PFHxS)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorononanoic acid (PFNA)
- Perfluorooctanesulfonic acid (PFOS)
- Perfluorooctanoic acid (PFOA)
- Perfluorodecanoic acid (PFDA)

Although the Massachusetts water quality standards do not include numeric criteria for PFAS, the Massachusetts narrative criterion for toxic substances at 314 CMR 4.05(5)(e) states:

> All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

The narrative criterion is further elaborated at 314 CMR 4.05(5)(e)2 which states:

> Human Health Risk Levels. Where EPA has not set human health risk levels for a toxic pollutant, the human health-based regulation of the toxic pollutant shall be in accordance with guidance issued by the Department of Environmental Protection's Office of Research and Standards. The Department's goal is to prevent all adverse health effects which may result from the ingestion, inhalation, or dermal absorption of toxins attributable to waters during their reasonable use as designated in 314 CMR 4.00.

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, the Draft Permit requires that the Facility conduct quarterly influent, effluent and sludge sampling for PFAS chemicals and annual sampling of certain industrial users, the first full calendar quarter beginning six months after EPA has notified the Permittee that appropriate, multi-lab validated test methods are made available by EPA to the public.

The purpose of this monitoring and reporting requirement is to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits on a facility specific basis. EPA is authorized to require this monitoring and reporting by CWA § 308(a), which states:

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[15] EPA, *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan,* EPA 823R18004, February 2019. Available at: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf

> "SEC. 308. (a) Whenever required to carry out the objective of this Act, including but not limited to (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition, or effluent standard, pretreatment standard, or standard of performance under this Act; (2) determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; (3) any requirement established under this section; or (4) carrying out sections 305, 311, 402, 404 (relating to State permit programs), 405, and 504 of this Act—
>
> > (A) the Administrator shall require the owner or operator of any point source to (i) establish and maintain such records, (ii) make such reports, (iii) install, use, and maintain such monitoring equipment or methods (including where appropriate, biological monitoring methods), (iv) sample such effluents (in accordance with such methods, at such locations, at such intervals, and in such manner as the Administrator shall prescribe), and (v) provide such other information as he may reasonably require;".

Since an EPA method for sampling and analyzing PFAS in wastewater and sludge is not currently available, the PFAS sampling requirement in the Draft Permit includes a compliance schedule which delays the effective date of this requirement until the first full calendar quarter beginning 6 months after EPA has notified the Permittee that a multi-lab validated method for wastewater and biosolids is made available to the public on EPA's CWA methods program websites. For wastewater see https://www.epa.gov/cwa-methods/other-clean-water-act-test-methods-chemical and https://www.epa.gov/cwa-methods. For biosolids, see https://www.epa.gov/cwa-methods/other-clean-water-act-test-methods-biosolids. EPA expects these methods will be available by the end of 2021. This approach is consistent with 40 CFR § 122.44(i)(1)(iv)(B) which states that in the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR Part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test procedure specified in the permit for such pollutants or pollutant parameters.

5.2 Industrial Pretreatment Program

The Permittee is required to administer a pretreatment program under 40 CFR part 403. *See also* CWA § 307; 40 CFR 122.44(j). The permittee's pretreatment program received EPA approval on September 28, 1990 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit, which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

The Federal Pretreatment Regulations in 40 CFR part 403 were amended in October 1988, in July 1990, and again in October 2005. Those amendments established new requirements for implementation of pretreatment programs. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with current Federal Regulations. The activities that the permittee must address include, but are not limited to, the following: 1) develop and enforce EPA-approved specific effluent limits (technically-based local limits); 2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; 3) develop an enforcement response plan; 4) implement a slug control

evaluation program; 5) track significant noncompliance for industrial users; and 6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

In addition to the requirements described above, the Draft Permit requires the permittee to submit to EPA in writing, within 180 days of the permit's effective date, a description of proposed changes to permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the Draft Permit to ensure that the pretreatment program is consistent and up-to-date with all pretreatment requirements in effect. Lastly, the permittee must continue to submit, annually by October 1st, a pretreatment report detailing the activities of the program for the twelve-month period ending 60 days prior to the due date.

5.3 Sludge Conditions

Section 405(d) of the Clean Water Act requires that EPA develop technical standards regarding the use and disposal of sewage sludge. On February 19, 1993, EPA promulgated technical standards. These standards are required to be implemented through permits. The conditions in the permit satisfy this requirement.

5.4 Infiltration/Inflow (I/I)

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems, and combined sewer overflows (CSOs) in combined systems.

The Draft Permit includes a requirement for the permittee to control infiltration and inflow (I/I) within the sewer collections system it owns and operates. The permittee shall continue to implement an I/I removal program commensurate with the severity of I/I in the collection system. This program may be scaled down in sections of the collection system that have minimal I/I.

The standard permit conditions for ‘Proper Operation and Maintenance,’ found at 40 CFR § 122.41(e), require the proper operation and maintenance of permitted wastewater systems and related facilities to achieve compliance with permit conditions. The requirements at 40 CFR § 122.41(d) impose a ‘duty to mitigate,’ which requires the permittee to “take all reasonable steps to minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment. EPA maintains that an I/I removal program is an integral component of ensuring permit compliance with the requirements of the permit under the provisions at 40 CFR § 122.41(d) and (e).

5.5 Operation and Maintenance of the Sewer System

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.C. and I.D. of the Draft Permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventive maintenance, controlling inflow and infiltration to separate sewer collection systems (combined systems are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent exceedances at the Wastewater Treatment Facility, and maintaining alternate power where necessary. These requirements are included to minimize the occurrence of permit exceedances that have a reasonable likelihood of adversely affecting human health or the environment.

Several of the requirements in the Draft Permit are not included in the 2006 Permit, including collection system mapping and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the collection system and has included schedules in the Draft Permit for completing these requirements.

5.6 Standard Conditions

The standard conditions of the permit are based on 40 CFR §122, Subparts A, C, and D and 40 CFR § 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

6.0 Federal Permitting Requirements

6.1 Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority and imposes requirements on Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (listed species) and any habitat of such species that has been designated as critical under the ESA (a "critical habitat").

Section 7(a)(2) of the ESA requires every federal agency, in consultation with and with the assistance of the Secretary of Interior, to ensure that any action it authorizes, funds or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers section 7 consultations for freshwater species. The National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) administers section 7 consultations for marine and anadromous species.

The Federal action being considered in this case is EPA's proposed NPDES permit for the Rockland WWTF's discharges of pollutants. The Draft Permit is intended to replace the 2006 Permit in governing the Facility. As the federal agency charged with authorizing the discharge from this Facility, EPA determines potential impacts to federally listed species and initiates consultation with the Services when required under § 7(a)(2) of the ESA.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, and plants in the expected action area of the outfall to determine if EPA's proposed NPDES permit could potentially impact any such listed species in this section of the French Stream (MA94-03).

Regarding protected species under the jurisdiction of NOAA Fisheries, a number of anadromous and marine species and life stages are present in Massachusetts waters. Various life stages of protected fish, sea turtles and whales have been documented in coastal and inland waters, either seasonally or year-round. In general, adult and subadult life stages of Atlantic sturgeon (*Acipenser oxyrinchus*) and adult shortnose sturgeon (*Acipenser brevirostrom*) are present in coastal waters. These sturgeon life stages are also found in some river systems in Massachusetts, along with early life stages of protected sturgeon and juvenile shortnose sturgeon. Protected sea turtles, including adult and juvenile life stages of leatherback sea turtles (*Dermochelys coriacea*), loggerhead sea turtles (*Caretta caretta*), Kemp's ridley sea turtles (*Lepidochelys kempii*) and green sea turtles (*Chelonia mydas*) are found in coastal waters and bays in Massachusetts. Adult and juvenile life stages of North Atlantic right whales (*Eubalaena glacialis*) and fin whales (*Balaenoptera physalus*) have also been documented in coastal waters and bays. In addition, this coastal area has been designated as critical habitat for North Atlantic right whale feeding.

In this case, the Facility's outfall and action area are over 15 river miles upstream from Massachusetts coastal waters where protected marine species are found. Also, while Atlantic sturgeon have been documented in the North River, their farthest upstream expected occurrence is over six miles from the Rockland WWTF's discharge and is also separated by obstacles to fish passage in the French Stream. Therefore, there are no known federally listed threatened or endangered species or their critical habitat under the jurisdiction of NOAA Fisheries in the action area of the Rockland WWTF's discharge.[16] Because the action area of the discharge is not expected to overlap with threatened or endangered species or critical habitat, consultation with NOAA Fisheries under section 7 of the ESA is not required for this federal action.

For protected species under the jurisdiction of the USFWS, the dwarf wedgemussel (*Alasmidonta heterodon*), a listed endangered species, has been documented in Massachusetts in the Connecticut River watershed. Information obtained from the USFWS indicates that the dwarf wedgemussel is not found in the French Stream or the North River. The Plymouth redbelly turtle (*Pseudemys rubriventris bangsi*) is an endangered species found in the North River Watershed. However, the expected presence of the Plymouth redbelly turtle does not overlap with the action area of the Rockland WWTF's discharge.

However, one terrestrial listed threatened species, the northern long-eared bat (*Myotis septentrionalis*) was identified as potentially occurring in the action area of the Rockland WWTF's discharge.[17] According to the USFWS, the threatened northern long-eared bat is found in the following habitats based on seasons, "winter – mines and caves; summer – wide variety of forested habitats." This species is not considered aquatic. However, because the Facility's

[16] See §7 resources for NOAA Fisheries at https://www.fisheries.noaa.gov/resource/map/greater-atlantic-region-esa-section-7-mapper.

[17] See §7 resources for USFWS at https://ecos.fws.gov/ipac/.

projected action area in the French Stream in Rockland overlaps with the general statewide range of the northern long-eared bat, EPA prepared an Effects Determination Letter for the Rockland WWTF NPDES Permit Reissuance and submitted it to USFWS. Based on the information submitted by EPA, the USFWS notified EPA by letter, dated August 6, 2021, that the permit reissuance is consistent with activities analyzed in the USFWS January 5, 2016, Programmatic Biological Opinion (PBO).[18] The PBO outlines activities that are excepted from "take" prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.). The USFWS consistency letter concluded EPA's consultation responsibilities for the Rockland WWTF NPDES permitting action under ESA section 7(a)(2) with respect to the northern long-eared bat. No further ESA section 7 consultation is required with USFWS.

At the beginning of the public comment period, EPA notified USFWS and NOAA Fisheries Protected Resources Division that the Draft Permit and Fact Sheet were available for review and provided a link to the EPA NPDES Permit website to allow direct access to the documents.

No ESA consultation is required as a result of this permitting action. However, initiation of consultation is required and shall be requested by the EPA or by USFWS/NOAA Fisheries where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the analysis; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this analysis; or (c) If a new species is listed or critical habitat designated that may be affected by the identified action. No take is anticipated or exempted. If there is any incidental take of a listed species, initiation of consultation would be required.

6.2 Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (*see* 16 U.S.C. § 1801 *et seq.*, 1998), EPA is required to consult with the NOAA Fisheries if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. § 1802(10). "Adverse impact" means any impact that reduces the quality and/or quantity of EFH 50 CFR § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), or site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.
EFH is only designated for fish species for which federal Fisheries Management Plans exist. *See* 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

[18] USFWS Event Code: 05E1NE00-2021-E-13247, August 6, 2021.

Based on available EFH information, including the NOAA Fisheries EFH Mapper,[19] EPA has determined that the French Stream is not covered by the EFH designation for coastal or riverine systems at latitude 42º 08' N, longitude 70º 55' W. Therefore, consultation with NOAA Fisheries Habitat and Ecosystem Services Division under the Magnuson-Stevens Fishery Conservation and Management Act is not required.

At the beginning of the public comment period, EPA notified NOAA Fisheries Habitat and Ecosystem Services Division that the Draft Permit and Fact Sheet were available for review and provided a link to the EPA NPDES Permit website to allow direct access to the documents.

7.0 Public Comments, Hearing Requests and Permit Appeals

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to:

Douglas MacLean
EPA Region 1
5 Post Office Square, Suite 100 (06-4)
Boston, MA 02109-3912
Telephone: (617) 918-1608
Email: maclean.douglas@epa.gov

Prior to the close of the public comment period, any person, may submit a written request to EPA for a public hearing to consider the Draft Permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held if the criteria stated in 40 CFR § 124.12 are satisfied. In reaching a final decision on the Draft Permit, EPA will respond to all significant comments in a Response to Comments document attached to the Final Permit and make these responses available to the public at EPA's Boston office and on EPA's website.

Following the close of the comment period, and after any public hearings, if such hearings are held, EPA will issue a Final Permit decision, forward a copy of the final decision to the applicant, and provide a copy or notice of availability of the final decision to each person who submitted written comments or requested notice. Within 30 days after EPA serves notice of the issuance of the Final Permit decision, an appeal of the federal NPDES permit may be commenced by filing a petition for review of the permit with the Clerk of EPA's Environmental Appeals Board in accordance with the procedures at 40 CFR § 124.19.

8.0 Administrative Record

Following U.S. Centers for Disease Control and Prevention (CDC) and U.S. Office of Personnel Management (OPM) guidance and specific state guidelines impacting our regional offices, EPA's workforce has been directed to telework to help prevent transmission of the coronavirus. While in this workforce telework status, there are practical limitations on the ability of Agency personnel to allow the public to review the administrative record in person at the EPA Boston

[19] NOAA EFH Mapper available at http://www.habitat.noaa.gov/protection/efh/efhmapper/

office. However, any documents relating to this draft can be requested from the individual listed above.

The administrative record on which this Draft Permit is based may be accessed at EPA's Boston office by appointment, Monday through Friday, excluding holidays from Douglas MacLean, EPA Region1, 5 Post Office Square, Suite-100 (06-4), Boston, MA 02109-3912 or via email to maclean.douglas@epa.gov.

August 2021
Date

Ken Moraff, Director
Water Division
U.S. Environmental Protection Agency

Figure 1: Location of the Rockland WWTP

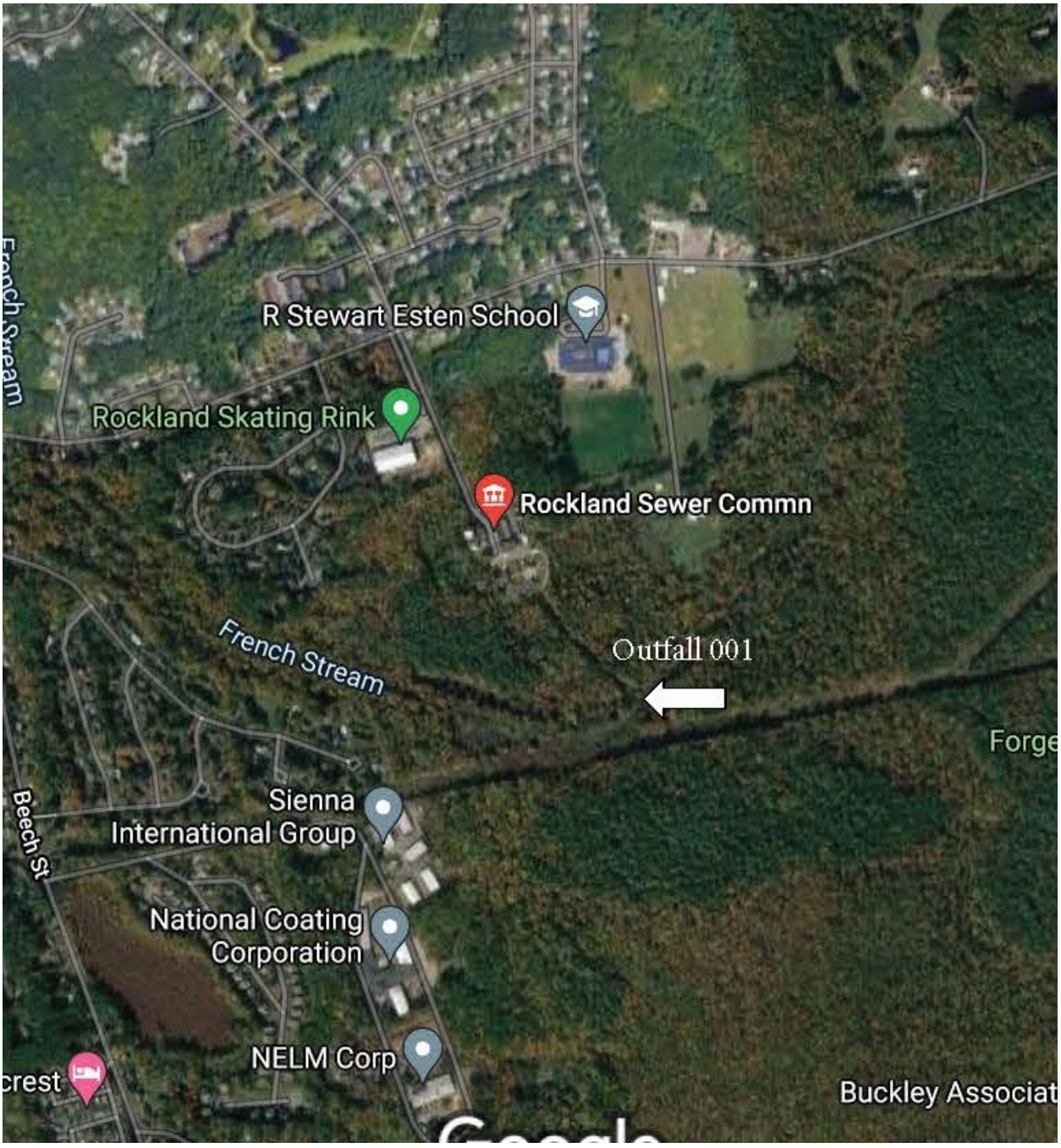
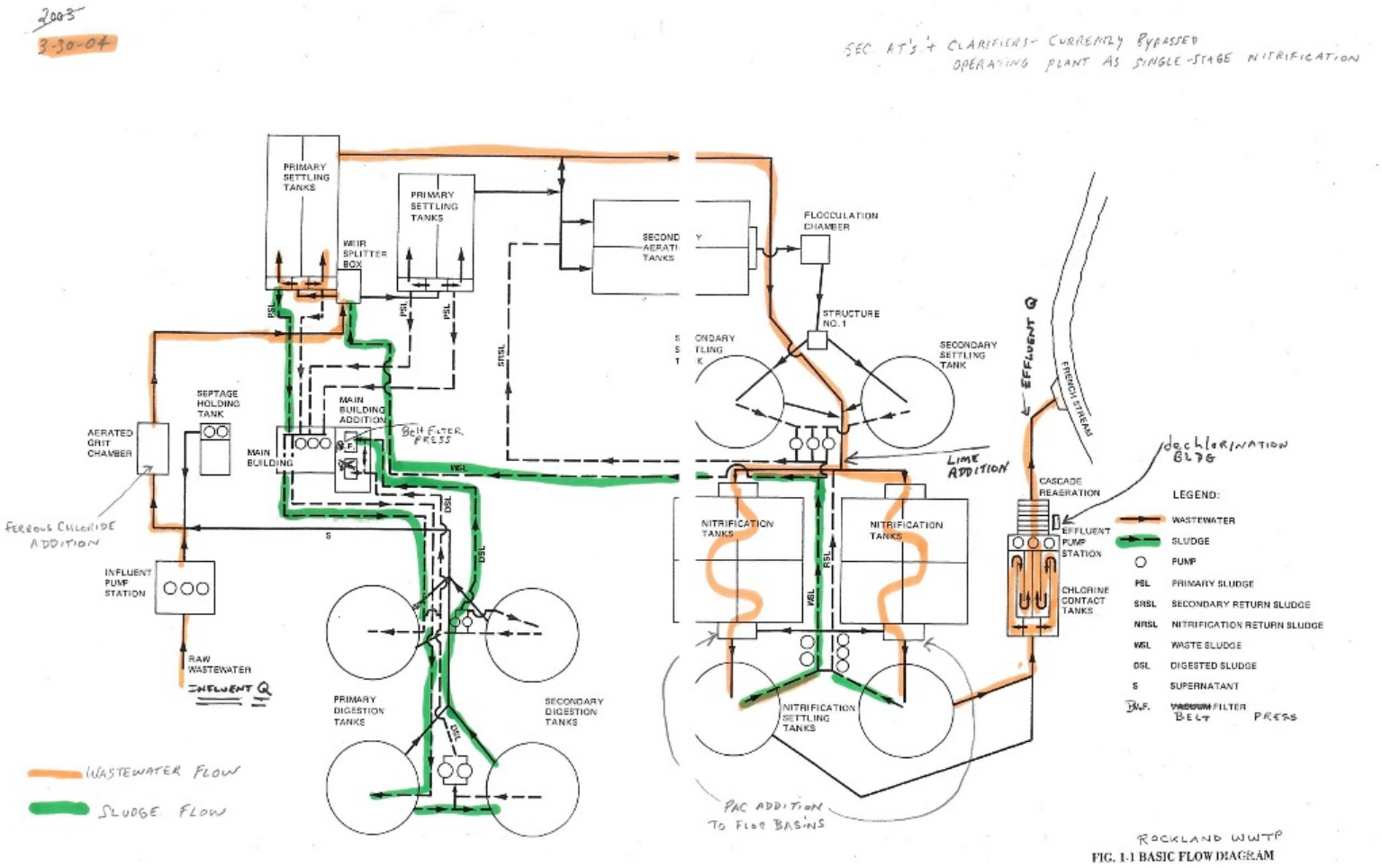


Figure 2: Flow diagram



Outfall 001

Parameter	Flow	Flow	Flow	BOD5	BOD5	BOD5	BOD5	BOD5
	Annual Rolling Ave	Monthly Ave	Daily Max	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Weekly Ave
Units	MGD	MGD	MGD	lb/d	lb/d	mg/L	mg/L	lb/d
Effluent Limit	Report	2.5	Report	125	417	20	6	125
Minimum	2	1.3	1.5	28	35	2	2	27
Maximum	2.8	4.3	6.1	95	204	7	4	107
Median	2.4	2.5	3.2	35	103	4	2	48
No. of Violations	N/A	28	N/A	0	0	0	0	0
6/30/2016	2.2	1.7	2	35			2	71
7/31/2016	2.2	1.4	1.6	38			3	53
8/31/2016	2.1	1.4	1.5	36			3	46
9/30/2016	2.1	1.3	1.5	39			3	59
10/31/2016	2.1	1.5	1.8		53	4		
11/30/2016	2.1	1.6	1.8		62	4		
12/31/2016	2.1	1.9	2.2		64	4		
1/31/2017	2.1	3	4.7		106	4		
2/28/2017	2	3	3.5		109	4		
3/31/2017	2	2.8	3.6		107	5		
4/30/2017	2.1	3.6	6.1		82	3		
5/31/2017	2.2	2.7	3.5	55			2	62
6/30/2017	2.2	2.5	4	43			2	63
7/31/2017	2.3	1.8	2.1	34			2	44
8/31/2017	2.3	1.5	1.7	34			3	63
9/30/2017	2.3	1.4	1.7	33			3	44
10/31/2017	2.3	1.6	2.2		50	4		
11/30/2017	2.3	2	2.4		37	2		
12/31/2017	2.3	2.1	2.4		85	5		
1/31/2018	2.3	2.9	5.4		158	7		
2/28/2018	2.3	3.1	3.9		110	4		
3/31/2018	2.4	4.1	5.7		204	6		
4/30/2018	2.4	3.1	3.8		142	5		
5/31/2018	2.4	2.4	3.1	77			4	87
6/30/2018	2.3	1.7	2.1	33			2	107
7/31/2018	2.3	1.5	1.9	29			2	32
8/31/2018	2.3	1.5	1.6	28			2	40
9/30/2018	2.3	1.8	2.7	50			3	78
10/31/2018	2.4	2.8	4.3		103	5		
11/30/2018	2.6	4.3	5.5		103	3		

Outfall 001

Parameter	Flow	Flow	Flow	BOD5	BOD5	BOD5	BOD5	BOD5
	Annual Rolling Ave	Monthly Ave	Daily Max	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Weekly Ave
Units	MGD	MGD	MGD	lb/d	lb/d	mg/L	mg/L	lb/d
Effluent Limit	Report	2.5	Report	125	417	20	6	125
12/31/2018	2.7	3.1	4.3		118	5		
1/31/2019	2.7	3.3	4.8		148	5		
2/28/2019	2.7	3	3.7		118	5		
3/31/2019	2.7	3.2	4.2		117	4		
4/30/2019	2.7	3.3	4.9		125	4		
5/31/2019	2.7	2.7	3.6	61			3	101
6/30/2019	2.7	2.1	2.5	51			3	71
7/31/2019	2.8	1.9	2.4	37			2	48
8/31/2019	2.8	1.6	1.9	31			2	44
9/30/2019	2.7	1.6	1.8	35			3	46
10/31/2019	2.7	1.9	2.5		37	2		
11/30/2019	2.5	2.5	3.6		67	3		
12/31/2019	2.6	3.9	5.7		197	6		
1/31/2020	2.5	2.7	3.8		80	4		
2/29/2020	2.5	2.5	2.8		137	6		
3/31/2020	2.5	2.7	3.8		90	4		
4/30/2020	2.5	4.1	6.1		115	3		
5/31/2020	2.5	3.1	4.3	95			4	99
6/30/2020	2.5	2	2.5	34			2	35
7/31/2020	2.5	1.6	1.8	28			2	28
8/31/2020	2.5	1.5	1.7	28			2	27
9/30/2020	2.5	1.5	1.7	31			2	32
10/31/2020	2.5	1.7	2.2		35	3		
11/30/2020	2.5	2.2	2.7		42	2		
12/31/2020	2.4	3.4	5.4		91	3		
1/31/2021	2.4	2.8	3.3		103	4		
2/28/2021	2.5	3.3	4.5		160	5		
3/31/2021	2.5	2.7	3.6		78	3		
4/30/2021	2.4	3.1	4.6		58	2		
5/31/2021	2.4	2.6	3.3	42			2	45

Outfall 001

Parameter	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5
	Weekly Ave	Weekly Ave	Weekly Ave	Daily Max	Daily Max	Daily Max	Daily Max	Monthly Ave Min
Units	lb/d	mg/L	mg/L	lb/d	lb/d	mg/L	mg/L	%
Effluent Limit	**417**	**20**	**6**	**209**	**626**	**10**	**30**	**85**
Minimum	**42**	**3**	**2**	**30**	**50**	**2**	**3**	**94**
Maximum	**302**	**12**	**6**	**164**	**468**	**7**	**19**	**99**
Median	**138**	**5**	**3**	**60**	**172**	**4**	**6**	**98**
No. of Violations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
6/30/2016			5	55		4		99
7/31/2016			5	76		7		99
8/31/2016			4	47		4		99
9/30/2016			5	73		6		99
10/31/2016	106	8			183		14	98
11/30/2016	73	5			96		7	98
12/31/2016	87	6			126		8	98
1/31/2017	138	5			172		6	98
2/28/2017	128	5			154		6	97
3/31/2017	166	6			199		8	97
4/30/2017	110	3			119		3	98
5/31/2017			3	78		3		99
6/30/2017			2	71		2		99
7/31/2017			3	47		3		99
8/31/2017			5	79		6		99
9/30/2017			4	48		4		99
10/31/2017	66	5			76		6	99
11/30/2017	42	3			53		3	99
12/31/2017	133	7			152		8	98
1/31/2018	195	12			223		14	95
2/28/2018	160	7			177		7	94
3/31/2018	275	8			468		11	94
4/30/2018	190	7			220		9	96
5/31/2018			4	125		7		98
6/30/2018			6	42		3		99
7/31/2018			2	42		3		99
8/31/2018			3	38		3		99
9/30/2018			5	106		7		99
10/31/2018	224	10			324		15	96
11/30/2018	146	4			183		5	98

Outfall 001

Parameter	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5
	Weekly Ave	Weekly Ave	Weekly Ave	Daily Max	Daily Max	Daily Max	Daily Max	Monthly Ave Min
Units	lb/d	mg/L	mg/L	lb/d	lb/d	mg/L	mg/L	%
Effluent Limit	**417**	**20**	**6**	**209**	**626**	**10**	**30**	**85**
12/31/2018	178	8			195		8	97
1/31/2019	189	6			210		7	95
2/28/2019	166	6			195		7	97
3/31/2019	144	5			183		6	97
4/30/2019	231	6			320		8	97
5/31/2019			3	97		4		98
6/30/2019			4	105		6		98
7/31/2019			2	60		3		99
8/31/2019			3	47		3		99
9/30/2019			3	65		5		99
10/31/2019	43	3			50		3	99
11/30/2019	97	4			108		5	98
12/31/2019	302	9			450		13	96
1/31/2020	155	5			133		6	98
2/29/2020	253	12			420		19	96
3/31/2020	130	4			139		6	98
4/30/2020	140	4			175		5	97
5/31/2020			5	164		6		97
6/30/2020			2	47		3		99
7/31/2020			2	30		2		99
8/31/2020			2	38		3		99
9/30/2020			4	63		5		99
10/31/2020	48	3			70		5	99
11/30/2020	48	3			61		4	99
12/31/2020	97	4			134		5	97
1/31/2021	131	5			130		6	97
2/28/2021	239	7			287		8	95
3/31/2021	133	5			149		5	97
4/30/2021	71	3			73		3	98
5/31/2021			2	50		2		99

Outfall 001

Parameter	TSS	TSS	TSS	TSS	TSS	TSS	TSS	TSS
	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Weekly Ave	Weekly Ave
Units	lb/d	lb/d	mg/L	mg/L	lb/d	lb/d	mg/L	mg/L
Effluent Limit	**209**	**417**	**10**	**20**	**209**	**417**	**10**	**20**
Minimum	**31**	**47**	**2**	**3**	**44**	**54**	**3**	**3**
Maximum	**123**	**231**	**5**	**7**	**280**	**272**	**8**	**10**
Median	**45**	**92**	**3**	**4**	**59**	**146**	**4**	**5**
No. of Violations	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
6/30/2016	35		2		104		7	
7/31/2016	41		4		50		4	
8/31/2016	45		4		49		4	
9/30/2016	58		5		84		8	
10/31/2016		52		4		65		5
11/30/2016		62		5		69		5
12/31/2016		77		5		79		5
1/31/2017		92		4		112		4
2/28/2017		113		5		145		5
3/31/2017		136		6		161		6
4/30/2017		152		5				7
5/31/2017	91		4		111		5	
6/30/2017	60		3		92		4	
7/31/2017	46		3		48		3	
8/31/2017	38		3		69		5	
9/30/2017	47		4		66		6	
10/31/2017		57		4		59		5
11/30/2017		53		3		71		5
12/31/2017		70		4		136		7
1/31/2018		122		5		166		6
2/28/2018		168		6		182		7
3/31/2018		223		7		263		7
4/30/2018		124		5				6
5/31/2018	59		3		82		4	
6/30/2018	39		3		57		3	
7/31/2018	31		2		45		3	
8/31/2018	42		3		47		4	
9/30/2018	65		4		108		6	
10/31/2018		80		4		147		7
11/30/2018		91		3		154		4

Outfall 001

Parameter	TSS	TSS	TSS	TSS	TSS	TSS	TSS	TSS
	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Weekly Ave	Weekly Ave
Units	lb/d	lb/d	mg/L	mg/L	lb/d	lb/d	mg/L	mg/L
Effluent Limit	209	417	10	20	209	417	10	20
12/31/2018		78		3		90		4
1/31/2019		156		6		272		10
2/28/2019		138		5		164		6
3/31/2019		132		5		256		10
4/30/2019		112		4				5
5/31/2019	76		3		128		4	
6/30/2019	43		2		81		4	
7/31/2019	48		3		59		4	
8/31/2019	37		3		47		4	
9/30/2019	36		3		50		4	
10/31/2019		50		3		64		5
11/30/2019		65		3		74		4
12/31/2019		127		4		174		5
1/31/2020		81		3		158		5
2/29/2020		95		5		183		9
3/31/2020		110		4		195		6
4/30/2020		231		7				8
5/31/2020	123		5		280		8	
6/30/2020	45		3		45		4	
7/31/2020	43		3		46		4	
8/31/2020	47		4		45		5	
9/30/2020	45		3		44		4	
10/31/2020		52		4		68		5
11/30/2020		47		3		54		3
12/31/2020		76		3		79		3
1/31/2021		70		3		122		4
2/28/2021		121		4		148		5
3/31/2021		102		4		218		8
4/30/2021		85		3				6
5/31/2021	56		3		62		4	

Outfall 001

Parameter	TSS	TSS	TSS	TSS	TSS	pH	pH	Fecal Coliform
	Daily Max	Daily Max	Daily Max	Daily Max	Monthly Ave Min	Minimum	Maximum	Monthly Ave
Units	lb/d	lb/d	mg/L	mg/L	%	SU	SU	#/100mL
Effluent Limit	**313**	**626**	**15**	**30**	**85**	**6.5**	**8.3**	**200**
Minimum	**53**	**65**	**3**	**4**	**95**	**6.5**	**7.2**	**4**
Maximum	**205**	**357**	**10**	**15**	**99**	**7.5**	**8.2**	**107**
Median	**72**	**183**	**5**	**7**	**99**	**7**	**7.6**	**27.5**
No. of Violations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
6/30/2016	72		5		99	7.5	7.9	46
7/31/2016	54		5		99	7.3	7.8	84
8/31/2016	60		5		99	7.1	7.8	45
9/30/2016	110		10		99	7.2	7.8	25
10/31/2016		65		5	99	7.2	7.6	18
11/30/2016		73		5	99	7.3	7.7	19
12/31/2016		88		6	98	7.4	7.7	37
1/31/2017		129		4	98	7.2	7.6	18
2/28/2017		203		7	98	7.1	7.6	13
3/31/2017		178		7	98	7	7.6	9
4/30/2017		279		7	98	7	7.3	8
5/31/2017	137		6		98	7	7.5	12
6/30/2017	129		6		99	7.2	7.6	14
7/31/2017	65		4		99	7.2	7.6	30
8/31/2017	72		6		99	7	7.8	63
9/30/2017	75		7		99	7	7.6	40
10/31/2017		86		5	99	7.1	7.7	38
11/30/2017		94		6	99	7.1	7.6	21
12/31/2017		174		9	98	7.1	7.7	11
1/31/2018		207		8	97	7	7.7	47
2/28/2018		212		8	95	6.7	7.3	44
3/31/2018		274		10	95	6.5	7.5	19
4/30/2018		295		10	98	6.9	7.4	9
5/31/2018	96		4		99	6.9	7.5	4
6/30/2018	53		4		99	7.2	7.7	12
7/31/2018	58		5		99	6.9	7.9	64
8/31/2018	60		5		99	6.5	7.9	59
9/30/2018	112		6		99	6.9	7.5	107
10/31/2018		188		9	99	6.9	8.2	63
11/30/2018		158		5	99	6.9	7.5	37

Outfall 001

Parameter	TSS	TSS	TSS	TSS	TSS	pH	pH	Fecal Coliform
	Daily Max	Daily Max	Daily Max	Daily Max	Monthly Ave Min	Minimum	Maximum	Monthly Ave
Units	lb/d	lb/d	mg/L	mg/L	%	SU	SU	#/100mL
Effluent Limit	**313**	**626**	**15**	**30**	**85**	**6.5**	**8.3**	**200**
12/31/2018		104		4	99	6.8	7.5	48
1/31/2019		330		14	98	6.9	7.2	81
2/28/2019		309		11	97	6.8	7.3	15
3/31/2019		239		10	97	6.8	7.4	14
4/30/2019		174		6	98	6.9	7.3	15
5/31/2019	120		5		98	7	7.5	12
6/30/2019	58		3		99	7.3	7.7	20
7/31/2019	67		4		99	7	7.8	58
8/31/2019	56		4		99	6.9	7.8	84
9/30/2019	61		5		99	6.7	7.9	88
10/31/2019		75		6	98	7.1	7.7	45
11/30/2019		87		4	99	7.1	7.5	28
12/31/2019		208		6	99	6.9	7.4	32
1/31/2020		176		6	99	7	7.4	11
2/29/2020		304		15	98	7	7.7	8
3/31/2020		211		7	97	6.9	7.4	4
4/30/2020		357		10	95	6.8	7.3	27
5/31/2020	205		7		97	6.9	7.5	9
6/30/2020	80		5		99	6.8	7.4	17
7/31/2020	70		5		99	6.8	7.4	68
8/31/2020	76		6		99	6.6	7.6	52
9/30/2020	53		4		99	7	7.9	91
10/31/2020		85		6	99	7	7.8	70
11/30/2020		72		4	99	7.3	7.7	28
12/31/2020		183		6	98	7.3	7.6	27
1/31/2021		118		5	98	7.2	7.7	25
2/28/2021		183		7	97	6.9	7.5	32
3/31/2021		250		9	97	7.1	7.5	8
4/30/2021		244		10	98	7.2	7.5	25
5/31/2021	80		4		98	7.2	7.6	28

Outfall 001

Parameter	Fecal Coliform	TRC	TRC	DO	Ammonia	Ammonia	Ammonia	Ammonia
	Daily Max	Monthly Ave	Daily Max	Minimum	Monthly Ave	Monthly Ave	Monthly Ave	Weekly Ave
Units	#/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Effluent Limit	**400**	**0.011**	**0.019**	**7.4**	**1**	**2.5**	**3.3**	**1**
Minimum	**14**	**0**	**0**	**7.4**	**0.2**	**0.2**	**0.2**	**0.2**
Maximum	**398**	**0**	**0**	**9.4**	**0.7**	**1.1**	**1.7**	**1.6**
Median	**158**	**0**	**0**	**8**	**0.45**	**0.6**	**0.6**	**0.8**
No. of Violations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
6/30/2016	324	0	0	8.1	0.5			1
7/31/2016	384	0	0	7.5	0.5			0.8
8/31/2016	396	0	0	7.7	0.4			0.7
9/30/2016	396	0	0	7.6	0.7			1
10/31/2016	142	0	0				0.4	
11/30/2016	228	0	0				0.9	
12/31/2016	394	0	0				0.4	
1/31/2017	110	0	0				0.4	
2/28/2017	22	0	0				0.6	
3/31/2017	144	0	0				0.5	
4/30/2017	37	0	0			0.3		
5/31/2017	36	0	0	9.4		0.4		
6/30/2017	46	0	0	9.1	0.3			0.5
7/31/2017	164	0	0	8.2	0.4			0.5
8/31/2017	362	0	0	7.8	0.5			0.8
9/30/2017	398	0	0	7.5	0.6			0.7
10/31/2017	82	0	0				0.8	
11/30/2017	58	0	0				0.5	
12/31/2017	24	0	0				0.9	
1/31/2018	382	0	0				0.7	
2/28/2018	286	0	0				0.2	
3/31/2018	266	0	0				0.5	
4/30/2018	39	0	0			1.1		
5/31/2018	46	0	0	9.4		0.9		
6/30/2018	34	0	0	8.6	0.2			1
7/31/2018	378	0	0	8.1	0.5			1.6
8/31/2018	290	0	0	7.7	0.6			0.9
9/30/2018	368	0	0	7.8	0.3			1
10/31/2018	358	0	0				0.9	
11/30/2018	366	0	0				0.3	

Outfall 001

Parameter	Fecal Coliform	TRC	TRC	DO	Ammonia	Ammonia	Ammonia	Ammonia
	Daily Max	Monthly Ave	Daily Max	Minimum	Monthly Ave	Monthly Ave	Monthly Ave	Weekly Ave
Units	#/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Effluent Limit	400	0.011	0.019	7.4	1	2.5	3.3	1
12/31/2018	348	0	0				0.6	
1/31/2019	362	0	0				0.5	
2/28/2019	87	0	0				0.8	
3/31/2019	44	0	0				0.9	
4/30/2019	220	0	0			0.7		
5/31/2019	44	0	0	9.4		0.7		
6/30/2019	55	0	0	9	0.6			1.2
7/31/2019	322	0	0	8	0.6			0.9
8/31/2019	326	0	0	7.6	0.3			0.8
9/30/2019	232	0	0	7.5	0.6			0.9
10/31/2019	166	0	0				0.3	
11/30/2019	57	0	0				0.3	
12/31/2019	142	0	0				1.2	
1/31/2020	62	0	0				0.8	
2/29/2020	48	0	0				1.4	
3/31/2020	14	0	0				1.3	
4/30/2020	312	0	0			0.5		
5/31/2020	31	0	0	9.3		1		
6/30/2020	39	0	0	8.6	0.2			0.3
7/31/2020	204	0	0	7.7	0.2			0.2
8/31/2020	92	0	0	7.4	0.4			0.8
9/30/2020	324	0	0	7.6	0.3			0.5
10/31/2020	152	0	0				0.3	
11/30/2020	152	0	0				0.4	
12/31/2020	92	0	0				0.6	
1/31/2021	374	0	0				1.7	
2/28/2021	380	0	0				0.8	
3/31/2021	27	0	0				0.5	
4/30/2021	202	0	0			0.3		
5/31/2021	123	0	0	8.7		0.2		

Outfall 001

Parameter	Ammonia	Ammonia	Ammonia	Ammonia	TP	TP	TP	TP
	Weekly Ave	Weekly Ave	Daily Max	Daily Max	Monthly Ave	Monthly Ave	Monthly Ave	Daily Max
Units	mg/L	mg/L	mg/L	mg/L	lb/d	mg/L	mg/L	lb/d
Effluent Limit	2.5	3.3	1.5	5.7	Report	0.2	1	Report
Minimum	0.4	0.4	0.2	0.2	1.3	0.1	0.2	2
Maximum	3.8	2.2	3.1	7.3	22	0.2	0.8	47
Median	0.95	1.2	1.1	1.4	4	0.2	0.5	5
No. of Violations	1	0	2	1	N/A	0	0	N/A
6/30/2016			1.1		2	0.14		2
7/31/2016			1.2		2	0.14		2
8/31/2016			1		2	0.15		3
9/30/2016			1.2		2	0.2		3
10/31/2016		0.8		1	2	0.2		3
11/30/2016		1.4		1.5	3		0.2	4
12/31/2016		0.8		1.2	6		0.4	7
1/31/2017		0.6		1.1	17		0.6	47
2/28/2017		0.8		1.3	15		0.6	20
3/31/2017		1.2		1.8	11		0.4	17
4/30/2017	0.6			0.8	7	0.2		12
5/31/2017	0.6			0.9	4	0.2		5
6/30/2017			0.7		3	0.13		4
7/31/2017			0.8		2	0.1		2
8/31/2017			1.1		2	0.14		2
9/30/2017			1		2	0.2		3
10/31/2017		1.3		2.4	2	0.2		3
11/30/2017		1.2		1.4	3		0.2	4
12/31/2017		1.7		3.1	5		0.3	7
1/31/2018		1.4		1.7	9		0.4	13
2/28/2018		0.4		0.3	12		0.4	15
3/31/2018		1.4		1.6	16		0.5	21
4/30/2018	1.5			1.6	6	0.2		8
5/31/2018	1			2.1	3	0.2		4
6/30/2018			0.2		3	0.2		4
7/31/2018			3.1		2	0.2		3
8/31/2018			1.2		2	0.2		3
9/30/2018			1.1		4	0.2		4
10/31/2018		2.2		3.3	3	0.1		5
11/30/2018		0.4		0.5	6		0.2	8

Outfall 001

Parameter	Ammonia	Ammonia	Ammonia	Ammonia	TP	TP	TP	TP
	Weekly Ave	Weekly Ave	Daily Max	Daily Max	Monthly Ave	Monthly Ave	Monthly Ave	Daily Max
Units	mg/L	mg/L	mg/L	mg/L	lb/d	mg/L	mg/L	lb/d
Effluent Limit	2.5	3.3	1.5	5.7	Report	0.2	1	Report
12/31/2018		1.2		1.4	11		0.4	13
1/31/2019		0.7		0.8	16		0.6	21
2/28/2019		0.9		1.2	12		0.5	15
3/31/2019		1.2		1.8	15		0.6	40
4/30/2019	1.2			1.5	4	0.2		7
5/31/2019	1			1.3	3	0.12		4
6/30/2019			2.2		2	0.13		2
7/31/2019			1.3		2.9	0.2		4
8/31/2019			0.5		2.7	0.2		4.1
9/30/2019			1.4		2.4	0.2		3.2
10/31/2019		0.6		0.6	3	0.2		4
11/30/2019		0.6		0.8	9		0.4	15
12/31/2019		1.7		2.4	19		0.5	24
1/31/2020		1.4		2.3	15		0.7	18
2/29/2020		1.9		2.8	17		0.8	20
3/31/2020		2		3.6	12		0.5	14
4/30/2020	0.9			1.5	7	0.2		10
5/31/2020	3.8			7.3	4.3	0.2		7.7
6/30/2020			0.4		2.7	0.2		4.1
7/31/2020			0.2		2.9	0.2		4.2
8/31/2020			1.4		2.2	0.2		2.6
9/30/2020			0.8		1.5	0.1		2
10/31/2020		0.5		0.8	2	0.2		3
11/30/2020		0.5		1	5		0.3	10
12/31/2020		0.7		0.9	13		0.5	14
1/31/2021		2.1		2.8	18		0.8	19
2/28/2021		1.2		2.2	22		0.7	32
3/31/2021		0.8		0.9	13		0.5	24
4/30/2021	0.6			0.6	4	0.14		6
5/31/2021	0.4			0.2	1.3	0.1		2.8

Outfall 001

Parameter	TP	Copper	Copper	Aluminum, total (as Al)	Phosphorous, in total orthophosphate	Solids, settleable	Aluminum, total (as Al)	Phosphorous, in total orthophosphate
	Daily Max	Monthly Ave	Daily Max	Monthly Ave	Monthly Ave	Weekly Ave	Daily Max	Daily Max
Units	mg/L	ug/L	ug/L	ug/L	mg/L	mL/L	ug/L	mg/L
Effluent Limit	Report	12	19	88	Report	Report	Report	Report
Minimum	0.11	1	1	6	0.05	0	6	0.05
Maximum	1.4	10	10	33	0.7	0.1	33	0.82
Median	0.25	6	6	11	0.3	0	11	0.4
No. of Violations	N/A	0	0	0	N/A	N/A	N/A	N/A
6/30/2016	0.16	4	4	8		0	8	
7/31/2016	0.18	3	3	7		0	7	
8/31/2016	0.24	7	7	7		0	7	
9/30/2016	0.24	6	6	17		0	17	
10/31/2016	0.23	5	5	11		0	11	
11/30/2016	0.26	4	4	13	0.05	0	13	0.05
12/31/2016	0.5	6	6	12	0.14	0	12	0.18
1/31/2017	1.2	5	5	9	0.53	0	9	0.82
2/28/2017	0.9	7	7	31	0.37	0	31	0.4
3/31/2017	0.7	6	6	33	0.24	0	33	0.38
4/30/2017	0.3	5	5	17		0	17	
5/31/2017	0.2	5	5	12		0	12	
6/30/2017	0.14	6	6	9		0	9	
7/31/2017	0.13	1	1	8		0	8	
8/31/2017	0.18	4	4	14		0	14	
9/30/2017	0.24	4	4	10		0	10	
10/31/2017	0.2	6	6	11		0	11	
11/30/2017	0.2	5	5	12	0.7	0	12	0.13
12/31/2017	0.4	4	4	8	0.09	0	8	0.14
1/31/2018	0.6	4	4	11	0.21	0	11	0.29
2/28/2018	0.5	5	5	15	0.26	0	15	0.37
3/31/2018	0.6	9	9	15	0.2	0	15	0.3
4/30/2018	0.3	7	7	17		0	17	
5/31/2018	0.2	5	5	12		0	12	
6/30/2018	0.22	6	6	12		0	12	
7/31/2018	0.25	6	6	10		0	10	
8/31/2018	0.24	10	10	11		0	11	
9/30/2018	0.28	9	9	13		0	13	
10/31/2018	0.2	6	6	18		0	18	
11/30/2018	0.24	6	6	8	0.05	0	8	0.07

Outfall 001

Parameter	TP	Copper	Copper	Aluminum, total (as Al)	Phosphorous, in total orthophosphate	Solids, settleable	Aluminum, total (as Al)	Phosphorous, in total orthophosphate
	Daily Max	Monthly Ave	Daily Max	Monthly Ave	Monthly Ave	Weekly Ave	Daily Max	Daily Max
Units	mg/L	ug/L	ug/L	ug/L	mg/L	mL/L	ug/L	mg/L
Effluent Limit	Report	12	19	88	Report	Report	Report	Report
12/31/2018	0.5	6	6	30	0.3	0	30	0.37
1/31/2019	0.8	7	7	14	0.4	0	14	0.6
2/28/2019	0.6	6	6	14	0.34	0.1	14	0.4
3/31/2019	1.4	8	8	33	0.16	0.1	33	0.3
4/30/2019	0.2	6	6	8		0.1	8	
5/31/2019	0.15	6	6	10		0.1	10	
6/30/2019	0.14	6	6	8		0.1	8	
7/31/2019	0.23	4	4	10		0.1	10	
8/31/2019	0.26	4	4	10		0.1	10	
9/30/2019	0.25	7	7	10		0.1	10	
10/31/2019	0.22	6	6	10		0.1	10	
11/30/2019	0.5	7	7	10	0.31	0.1	10	0.4
12/31/2019	0.6	5	5	15	0.38	0.1	15	0.47
1/31/2020	0.8	8	8	14	0.6	0.1	14	0.8
2/29/2020	0.9	6	6	14	0.7	0.1	14	0.8
3/31/2020	0.7	6	6	11	0.3	0.1	11	0.5
4/30/2020	0.3	3	3	16		0.1	16	
5/31/2020	0.25	5	5	15		0.1	15	
6/30/2020	0.22	6	6	8		0.1	8	
7/31/2020	0.3	7	7	6		0.1	6	
8/31/2020	0.21	6	6	7		0.1	7	
9/30/2020	0.15	5	5	10		0.1	10	
10/31/2020	0.2	5	5	8		0.1	8	
11/30/2020	0.5	6	6	8	0.2	0.1	8	0.39
12/31/2020	0.6	7	7	11	0.4	0.1	11	0.4
1/31/2021	0.8	5	5	11	0.6	0.1	11	0.68
2/28/2021	0.9	5	5	16	0.56	0.1	16	0.6
3/31/2021	0.8	7	7	28	0.3	0.1	28	0.67
4/30/2021	0.19	6	6	14		0.1	14	
5/31/2021	0.11	6	6	19		0.1	19	

Outfall 001

Parameter	Solids, settleable
	Daily Max
Units	mL/L
Effluent Limit	Report
Minimum	0
Maximum	0.2
Median	0.1
No. of Violations	N/A
6/30/2016	0.1
7/31/2016	0.1
8/31/2016	0.2
9/30/2016	0
10/31/2016	0.1
11/30/2016	0
12/31/2016	0
1/31/2017	0.1
2/28/2017	0
3/31/2017	0
4/30/2017	0.2
5/31/2017	0.1
6/30/2017	0
7/31/2017	0
8/31/2017	0
9/30/2017	0
10/31/2017	0
11/30/2017	0
12/31/2017	0
1/31/2018	0
2/28/2018	0
3/31/2018	0
4/30/2018	0.1
5/31/2018	0
6/30/2018	0
7/31/2018	0.1
8/31/2018	0.1
9/30/2018	0.1
10/31/2018	0.1
11/30/2018	0

Outfall 001

Parameter	Solids, settleable
	Daily Max
Units	mL/L
Effluent Limit	Report
12/31/2018	0
1/31/2019	0.1
2/28/2019	0.1
3/31/2019	0.1
4/30/2019	0.1
5/31/2019	0.1
6/30/2019	0.1
7/31/2019	0.1
8/31/2019	0.1
9/30/2019	0.1
10/31/2019	0.1
11/30/2019	0.1
12/31/2019	0.1
1/31/2020	0.1
2/29/2020	0.1
3/31/2020	0.1
4/30/2020	0.1
5/31/2020	0.1
6/30/2020	0.1
7/31/2020	0.1
8/31/2020	0.1
9/30/2020	0.1
10/31/2020	0.1
11/30/2020	0.1
12/31/2020	0.1
1/31/2021	0.1
2/28/2021	0.1
3/31/2021	0.1
4/30/2021	0.1
5/31/2021	0.1

WET Effluent

Parameter	LC50 Acute Ceriodaphnia	C-NOEC Chronic Ceriodaphnia	Ammonia	Aluminum	Cadmium	Copper	Lead
	Minimum	Minimum	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max
Units	%	%	mg/L	mg/L	mg/L	mg/L	mg/L
Effluent Limit	100	99	Report	Report	Report	Report	Report
Minimum	100	12.5	0	0	0	0.001	0
Maximum	100	100	1.5	0.056	0	0.081	0.0001
Median	100	100	0.395	0	0	0.00425	0
No. of Violations	0	2	N/A	N/A	N/A	N/A	N/A
7/31/2016	100	100	1.4	0	0	0.001	0
10/31/2016	100	100	0.38	0	0	0.0038	0
1/31/2017	100	100	0.27	0	0	0.0032	0
4/30/2017	100	100	0	0.024	0	0.0043	0
7/31/2017	100	100	0.56	0	0	0.0029	0
10/31/2017	100	100	0.29	0	0	0.0072	0
1/31/2018	100	99	1.5	0.056	0	0.0097	0
4/30/2018	100	100					
7/31/2018	100	100	0.12	0.016	0	0.003	0
10/31/2018	100	100	0.52	0	0	0.0035	0
1/31/2019	100	12.5	0.56	0	0	0.0042	0
4/30/2019	100	100	0.62	0	0	0.0044	0
7/31/2019	100	100	0.15	0	0	0.0035	0
10/31/2019	100	100					
1/31/2020	100	100	0.2	0	0	0.0048	0
4/30/2020	100	50	0	0	0	0.004	0
7/31/2020	100	100	0.11	0	0	0.0056	0
10/31/2020	100	100	0.54	0.039	0	0.0047	0
1/31/2021	100	100	0.41	0	0	0.0047	0
4/30/2021	100	100	0.6	0.009	0	0.081	0.0001

WET Effluent

Parameter	Nickel	Zinc	Hardness
	Daily Max	Daily Max	Daily Max
Units	mg/L	mg/L	mg/L
Effluent Limit	Report	Report	Report
Minimum	**0.0018**	**0.017**	**92**
Maximum	**0.007**	**0.035**	**200**
Median	**0.0041**	**0.0225**	**145**
No. of Violations	N/A	N/A	N/A
7/31/2016	0.005	0.017	200
10/31/2016	0.0051	0.026	190
1/31/2017	0.0019	0.022	150
4/30/2017	0.0029	0.027	120
7/31/2017	0.0057	0.019	150
10/31/2017	0.0052	0.021	200
1/31/2018	0.0036	0.035	170
4/30/2018			
7/31/2018	0.0046	0.021	190
10/31/2018	0.0033	0.026	130
1/31/2019	0.0018	0.023	93
4/30/2019	0.0042	0.024	140
7/31/2019	0.0043	0.02	180
10/31/2019			
1/31/2020	0.0021	0.025	130
4/30/2020	0.0018	0.021	92
7/31/2020	0.0057	0.023	130
10/31/2020	0.007	0.021	200
1/31/2021	0.002	0.025	110
4/30/2021	0.004	0.022	130

WET Ambient

Parameter	Ammonia	Aluminum	Cadmium	Copper	Lead	Nickel	Zinc
	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Effluent Limit	Report	Report	Report	Report	Report	Report	Report
Minimum	**0**	**0.023**	**0**	**0.0014**	**0**	**0**	**0.0049**
Maximum	**0.6**	**0.21**	**0.0002**	**0.014**	**0.0013**	**0.0016**	**0.083**
Median	**0**	**0.0825**	**0**	**0.002**	**0.0006**	**0.0011**	**0.0155**
7/31/2016	0	0.069	0	0.002	0.001	0	0.011
10/31/2016	0	0.04	0	0.0022	0.0004	0	0.015
1/31/2017	0.1	0.083	0	0.0016	0.0006	0.0012	0.021
4/30/2017	0	0.15	0	0.0022	0.0008	0.0011	0.028
7/31/2017	0	0.054	0	0.0017	0.0005	0	0.0077
10/31/2017	0	0.028	0	0.0014	0.0002	0	0.0053
1/31/2018	0.12	0.068	0	0.0017	0.0005	0.0014	0.019
4/30/2018							
7/31/2018	0	0.032	0	0.0019	0.0004	0.0012	0.083
10/31/2018	0	0.091	0	0.0023	0.0006	0.0013	0.014
1/31/2019	0	0.19	0	0.0028	0.0012	0.0011	0.016
4/30/2019	0	0.082	0.0002	0.0018	0.0005	0.0011	0.014
7/31/2019	0	0.055	0	0.0019	0.0007	0	0.0089
10/31/2019							
1/31/2020	0	0.15	0	0.0022	0.0008	0.0016	0.02
4/30/2020	0	0.21	0	0.0027	0.0012	0.0012	0.02
7/31/2020	0	0.088	0	0.0024	0.0013	0.0013	0.011
10/31/2020	0	0.023	0	0.0014	0	0.001	0.0049
1/31/2021	0	0.12	0	0.002	0.0008	0.0013	0.019
4/30/2021	0.6	0.094	0	0.014	0.0006	0.0009	0.017

WET Ambient

Parameter	Hardness	pH
	Daily Max	Daily Max
Units	mg/L	S.U.
Effluent Limit	Report	Report
Minimum	**28**	**6.87**
Maximum	**59**	**7.46**
Median	**41.5**	**7.07**
7/31/2016	51	7.1
10/31/2016	51	7.46
1/31/2017	55	6.88
4/30/2017	37	6.96
7/31/2017	39	7.07
10/31/2017	47	7.13
1/31/2018	59	6.89
4/30/2018		
7/31/2018	48	7.33
10/31/2018	43	7.09
1/31/2019	30	6.93
4/30/2019	38	7.07
7/31/2019	44	7.08
10/31/2019		
1/31/2020	40	7.01
4/30/2020	28	6.88
7/31/2020	33	7.1
10/31/2020	43	7.19
1/31/2021	40	7.03
4/30/2021	37	6.87

A reasonable potential analysis is completed using a single set of critical conditions for flow and pollutant concentration that will ensure the protection of water quality standards. To determine the critical condition of the effluent, EPA projects an upper bound of the effluent concentration based on the observed monitoring data and a selected probability basis. EPA generally applies the quantitative approach found in Appendix E of EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD)[1] to determine the upper bound of the effluent data. This methodology accounts for effluent variability based on the size of the dataset and the occurrence of non-detects (i.e., samples results in which a parameter is not detected above laboratory detection limits). For datasets of 10 or more samples, EPA uses the upper bound effluent concentration at the 95th percentile of the dataset. For datasets of less than 10 samples, EPA uses the maximum value of the dataset.

EPA uses the calculated upper bound of the effluent data, along with a concentration representative of the parameter in the receiving water, the critical effluent flow, and the critical upstream flow to project the downstream concentration after complete mixing using the following simple mass-balance equation:

$$C_s Q_s + C_e Q_e = C_d Q_d$$

Where:

C_s = upstream concentration (median value of available ambient data)
Q_s = upstream flow (7Q10 flow upstream of the outfall)
C_e = effluent concentration (95th percentile or maximum of effluent concentration)
Q_e = effluent flow of the facility (design flow)
C_d = downstream concentration
Q_d = downstream flow ($Q_s + Q_e$)

Solving for the downstream concentration results in:

$$C_d = \frac{C_s Q_s + C_e Q_e}{Q_d}$$

When both the downstream concentration (C_d) and the effluent concentration (C_e) exceed the applicable criterion, there is reasonable potential for the discharge to cause, or contribute to an excursion above the water quality standard. *See* 40 C.F.R. § 122.44(d). When EPA determines that a discharge causes, has the reasonable potential to cause, or contribute to such an excursion, the permit must

contain WQBELs for the parameter. *See* 40 C.F.R. § 122.44(d)(1)(iii). Limits are calculated by using the criterion as the downstream concentration (C_d) and rearranging the mass balance equation to solve for the effluent concentration (C_e).

For any pollutant(s) with an existing WQBEL, EPA notes that the analysis described in 40 CFR § 122.44(d)(1)(i) has already been conducted in a previous permitting action demonstrating that there is reasonable potential to cause or contribute to an excursion of WQS. Given that the permit already contains a WQBEL based on the prior analysis and the pollutant(s) continue to be discharged from the facility, EPA has determined that there is still reasonable potential for the discharge of this pollutant(s) to cause or contribute to an excursion of WQS. Therefore, the WQBEL will be carried forward unless it is determined that a more stringent WQBEL is necessary to continue to protect WQS or that a less stringent WQBEL is allowable based on anti-backsliding regulations at CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). For these pollutant(s), if any, the mass balance calculation is not used to determine whether there is reasonable potential to cause or contribute to an excursion of WQS, but rather is used to determine whether the existing limit needs to be more stringent in order to continue to protect WQS.

From a technical standpoint, when a pollutant is already being controlled as a result of a previously established WQBEL, EPA has determined that it is not appropriate to use new effluent data to reevaluate the need for the existing limit because the reasonable potential to cause or contribute to an excursion of WQS for the uncontrolled discharge was already established in a previous permit. If EPA were to conduct such an evaluation and find no reasonable potential for the controlled discharge to cause or contribute to an excursion of WQS, that finding could be interpreted to suggest that the effluent limit should be removed. However, the new permit without the effluent limit would imply that existing controls are unnecessary, that controls could be removed and then the pollutant concentration could rise to a level where there is, once again, reasonable potential for the discharge to cause or contribute to an excursion of WQS. This could result in an illogical cycle of applying and removing pollutant controls with each permit reissuance. EPA's technical approach on this issue is in keeping with the Act generally and the NPDES regulations specifically, which reflect a precautionary approach to controlling pollutant discharges.

The table below presents the reasonable potential calculations and, if applicable, the calculation of the limits required in the permit. Refer to the pollutant-specific section of the Fact Sheet for a detailed discussion of these calculations, any assumptions that were made and the resulting permit requirements.

Pollutant	Q_s	C_s [1]	Q_e	C_e [2]		Q_d	C_d		Criteria		Reasonable Potential		Limits	
	cfs	mg/L	cfs	Acute (mg/L)	Chronic (mg/L)	cfs	Acute (mg/L)	Chronic (mg/L)	Acute (mg/L)	Chronic (mg/L)	C_e & C_d > Acute Criteria	C_e & C_d > Chronic Criteria	Acute (mg/L)	Chronic (mg/L)
Ammonia (April 1-May 31)	0.18	0.0	3.87	5.7	2.5	4.05	5.4	2.4	33.8	2.9	**Y**	**Y**	**5.7**	**2.5**
Ammonia (June 1-September 30)		0.0		1.5	1.0		1.4	1.0	33.8	2.9	**Y**	**Y**	**1.5**	**1.0**
Ammonia (October 1-March 31)		0.0		5.7	3.3		5.4	3.2	33.8	9.3	**Y**	**Y**	**5.7**	**3.3**
Phosphorus		0.03		N/A	0.20		N/A	0.19	N/A	0.100	N/A	**Y**	N/A	**0.1**
		µg/L		**µg/L**	**µg/L**		**µg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/L**	**µg/L**
Aluminum		82.5		23.1	88.0		25.7	87.8	750	87	N	**Y**	N/A	**87.2**
Cadmium		0.0		0.0	0.0		0.0	0.0	3.0	0.3	N	N	N/A	N/A
Copper		2.0		19.0	12.0		18.2	11.6	25.7	18.1	**Y**	**Y**	**19.0**	**12.0**
Lead		0.6		0.0	0.0		0.0	0.0	125.8	4.9	N	N	N/A	N/A
Nickel		1.1		7.5	7.5		7.2	7.2	625.2	69.5	N	N	N/A	N/A
Zinc		15.5		29.8	29.8		29.2	29.2	159.7	159.7	N	N	N/A	N/A

[1]Median concentration for the receiving water just upstream of the facility's discharge taken from the WET testing data during the review period (see Appendix A).
[2]Values represent the 95th percentile (for $n \geq 10$) or maximum (for $n < 10$) concentrations from the DMR data and/or WET testing data during the review period (see Appendix A). If the pollutant already has a WQBEL (for either acute or chronic conditions), the value represents the existing limit.

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Executive Office of Energy & Environmental Affairs

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Martin Suuberg
Commissioner

TO: File
FROM: Xiaodan Ruan, MassDEP
SUBJECT: Rockland WWTP NPDES Permit (MA0101923) 7Q10 Flow Analysis
DATE: July 6, 2021

7Q10 Streamflow Analyses:

The 7Q10 flow of the French Stream at the Rockland Wastewater Treatment Plant was calculated by using the U.S. Geological Survey (USGS) StreamStats v4.5.3 application. The calculated 7Q10 is 0.18 cfs.

Dilution Factor

The dilution factor was calculated as follows:

7Q10 Dilution Factor= (Qs + Qd)/Qd

Where:
Qs= 7Q10 flow of French Stream at the Rockland WWTP = 0.18 cfs
Qd= Design flow of the Rockland WWTP = 2.5 MGD = 3.9 cfs

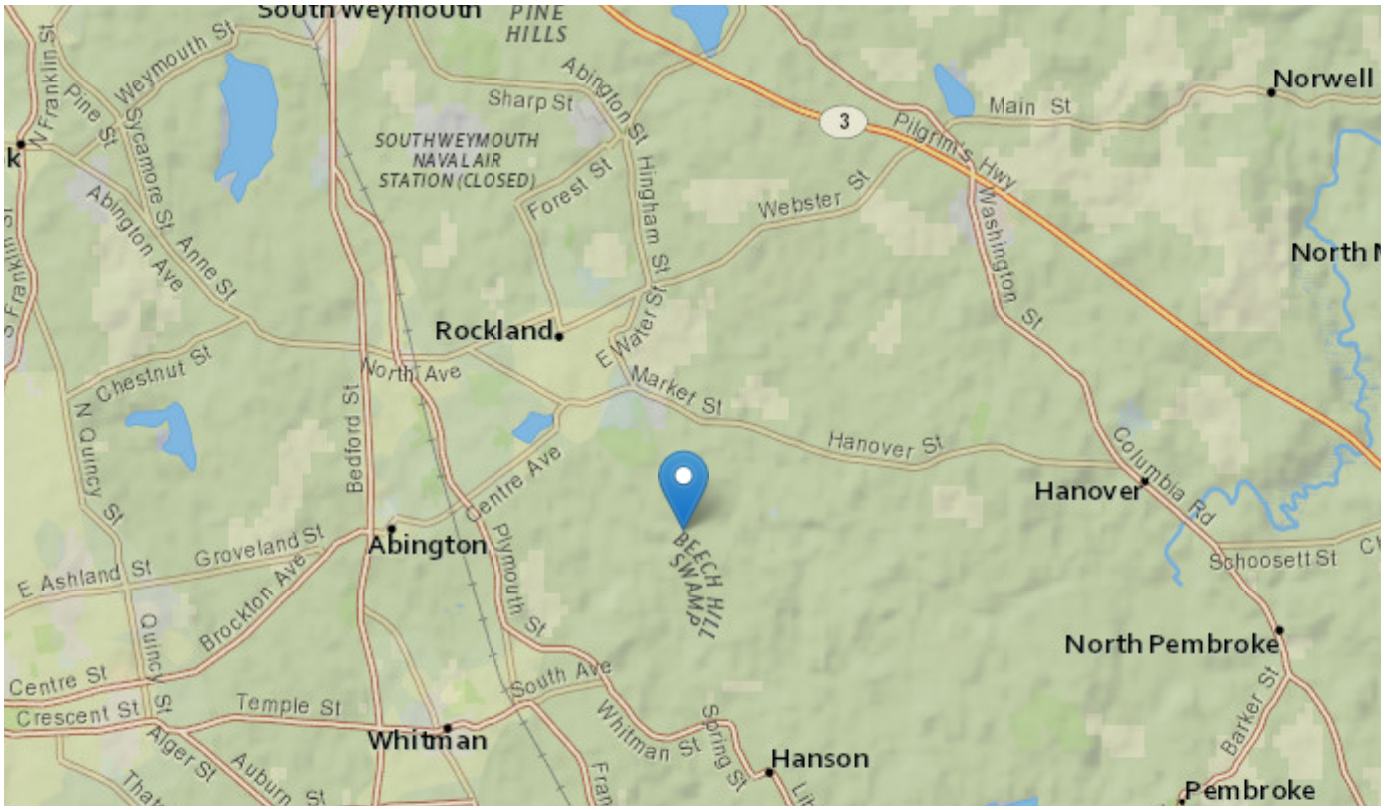
7Q10 Dilution Factor= (0.18 cfs + 3.9 cfs) / 3.9 cfs = **1.05**

Note that a majority of the Rockland WWTP discharge (Qd) is derived from water sources (groundwater/surface water withdrawals) from within the Rockland WWTP watershed.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep
Printed on Recycled Paper

StreamStats Report for French Stream at Rockland WWTP

Region ID: MA
Workspace ID: MA20210706155647153000
Clicked Point (Latitude, Longitude): 42.10578, -70.89518
Time: 2021-07-06 11:57:05 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	7.55	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	0.667	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.22	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	7.55	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	0.667	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.22	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SE	SEp
7 Day 2 Year Low Flow	0.572	ft^3/s	0.152	2.07	49.5	49.5
7 Day 10 Year Low Flow	0.18	ft^3/s	0.0377	0.801	70.8	70.8

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.5.3

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1 (EPA)
WATER DIVISION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP)
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

EPA PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTION 402 OF THE CLEAN WATER ACT (CWA), AS AMENDED, AND MASSDEP PUBLIC NOTICE OF EPA REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CWA.

PUBLIC NOTICE PERIOD: **August 25, 2021 – September 23, 2021**

PERMIT NUMBER: **MA0101923**

PUBLIC NOTICE NUMBER: MA-23-21

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Rockland
242 Union St.
Town Hall
Rockland, MA 02370

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Rockland Wastewater Treatment Plant
South End of Concord St.
Rockland, MA 02370

RECEIVING WATER AND CLASSIFICATION:

French Stream (Class B)

PREPARATION OF THE DRAFT PERMIT AND EPA REQUEST FOR CWA § 401 CERTIFICATION:

EPA is issuing for public notice and comment the Draft NPDES Permit for the Rockland WWTP, which discharges treated municipal wastewater. Waste thickened sludge is trucked to a privately-owned company in Woonsocket, RI for incineration. The effluent limits and permit conditions have been drafted pursuant to, and assure compliance with, the CWA, including EPA-approved State Surface Water Quality Standards at 314 CMR 4.00. MassDEP cooperated with EPA in the development of the Draft NPDES Permit. MassDEP retains independent authority under State law to publish for public notice and issue a separate Surface Water Discharge Permit for the discharge, not the subject of this notice, under the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53.

In addition, EPA has requested that MassDEP grant or deny certification of this Draft Permit pursuant to Section 401 of the CWA and implementing regulations. Under federal regulations governing the NPDES program at 40 Code of Federal Regulations (CFR) § 124.53(e), state certification shall contain conditions that are necessary to assure compliance with the applicable provisions of CWA sections 208(e), 301, 302, 303, 306, and 307 and with appropriate requirements of State law, including any conditions more stringent than those in the Draft Permit that MassDEP finds necessary to meet these requirements. Furthermore,

MassDEP may provide a statement of the extent to which each condition of the Draft Permit can be made less stringent without violating the requirements of State law.

INFORMATION ABOUT THE DRAFT PERMIT:

The Draft Permit and explanatory Fact Sheet may be obtained at no cost at https://www.epa.gov/npdes-permits/massachusetts-draft-individual-npdes-permits or by contacting:

Doug MacLean
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (06-4)
Boston, MA 02109-3912
Telephone: (617) 918-1608
Email: maclean.douglas@epa.gov

Following U.S. Centers for Disease Control and Prevention (CDC) and U.S. Office of Personnel Management (OPM) guidance and specific state guidelines impacting our regional offices, EPA's workforce has been directed to telework to help prevent transmission of the coronavirus. While in this workforce telework status, there are practical limitations on the ability of Agency personnel to allow the public to review the administrative record in person at the EPA Boston office. However, any electronically available documents that are part of the administrative record can be requested from the EPA contact above.

PUBLIC COMMENT AND REQUESTS FOR PUBLIC HEARINGS:

All persons, including applicants, who believe any condition of this Draft Permit is inappropriate must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by September 23, 2021**,** which is the close of the public comment period. Comments, including those pertaining to EPA's request for CWA § 401 certification, should be submitted to the EPA contact at the address or email listed above. Upon the close of the public comment period, EPA will make all comments available to MassDEP. All commenters who want MassDEP to consider their comments in the state decision-making processes (i.e., the separate state permit and the CWA § 401 certification) must submit such comments to MassDEP during the state comment period for the state Draft Permit and CWA § 401 certification. For information on submitting such comments to MassDEP, please follow the instructions found in the state public notice at: https://www.mass.gov/service-details/massdep-public-hearings-comment-opportunities.

Any person, prior to the close of the EPA public comment period, may submit a request in writing to EPA for a public hearing on the Draft Permit under 40 CFR § 124.10. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice if the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this Draft Permit, the Regional Administrator will respond to all significant comments and make the responses available to the public.

Due to the COVID-19 National Emergency, if comments are submitted in hard copy form, please also email a copy to the EPA contact above.

FINAL PERMIT DECISION:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and notify the applicant and each person who has submitted written comments or requested notice.

KEN MORAFF, DIRECTOR
WATER DIVISION
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY – REGION 1

LEALDON LANGLEY, DIRECTOR
DIVISION OF WATERSHED MGMT
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MEDIUM WASTEWATER TREATMENT FACILITY GENERAL PERMIT

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§ 1251 et seq.; the "CWA"),

Town of Rockland, Massachusetts

is authorized to discharge from the facility located at

Rockland Wastewater Treatment Plant
587R Summer Street
Rockland, MA 02370

to receiving water named

French Stream
South Coastal Watershed

in accordance with effluent limitations, monitoring requirements and other conditions set forth in this authorization and the Medium WWTF GP (General Permit No. MAG590000).

This authorization shall become effective on _____.

For applicable attachments see the complete version of the Medium WWTF General Permit:

Part VII – Standard Conditions
Attachment A – Freshwater Acute Toxicity Test Procedure and Protocol, February 2011
Attachment B – Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013
Attachment C – Marine Acute Toxicity Test Procedure and Protocol, July 2012
Attachment D – Marine Chronic Toxicity Test Procedure and Protocol, November 2013
Attachment E – List of Eligible Facilities
Attachment F – Reassessment of Technically Based Industrial Discharge Limits
Attachment G – NPDES Permit Requirement for Industrial Pretreatment Annual Report
Attachment H – PFAS Analyte List
Attachment I – Facility-Specific Permit Terms
Attachment J – Pretreatment Program Development Requirements

I. Applicability and Coverage of the WWTF GP

Supplementary information provided in the complete version of the Medium WWTF GP.

II. General Permit Requirements

A. Effluent Limitations and Monitoring Requirements

During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the French Stream. The discharge shall be limited and monitored as specified below at the end of all treatment processes, including disinfection or dechlorination, or at an alternative representative location approved by EPA and the Massachusetts Department of Environmental Protection (MassDEP), that provides a representative sample of the effluent. The receiving water and the influent shall be monitored as specified below.

Table 1. Effluent Limitations and Monitoring Requirements

Effluent Characteristic	**Discharge Limitation**			**Monitoring Requirement[1,2]**	
Parameter	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[3]**
Effluent Flow [4,10]	2.5 MGD	---	Report MGD	Continuous	Recorder
BOD_5 (May 1 – September 30)	6 mg/L 125 lb/day	6 mg/L 125 lb/day	10 mg/L 209 lb/day	1/Week	Composite
BOD_5 (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	1/Week	Composite
BOD_5 Removal	≥ 85 %	---	---	1/Month	Calculation
TSS (May 1 – September 30)	10 mg/L 209 lb/day	10 mg/L 209 lb/day	15 mg/L 313 lb/day	1/Week	Composite
TSS (October 1 – April 30)	20 mg/L 417 lb/day	20 mg/L 417 lb/day	30 mg/L 626 lb/day	1/Week	Composite
TSS Removal	≥ 85 %	---	---	1/Month	Calculation
pH Range[7]	6.5 – 8.3 S.U.			5/Week	Grab
Escherichia coli[8]	126 colonies/ 100 mL	---	409 colonies/100 mL	1/Week	Grab
Total Residual Chlorine[9]	11 µg/L	---	19 µg/L	5/Week	Grab
Total Recoverable Aluminum	87.2 µg/L	---	Report µg/L	1/Month	Composite
Total Recoverable Copper	12 µg/L	---	19 µg/L	1/Month	Composite
Total Phosphorus[10] (April 1 – October 31)	0.1 mg/L	---	---	1/Week	Composite

Effluent Characteristic	**Discharge Limitation**			**Monitoring Requirement[1,2]**	
Parameter	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[3]**
Total Phosphorus (November 1 – March 31)	1.0 mg/L	---	---	2/Month	Composite
Ammonia Nitrogen (April 1 – May 31)	2.5 mg/L	2.5 mg/L	5.7 mg/L	2/Month	Composite
Ammonia Nitrogen (June 1 – September 30)	1.0 mg/L	1.0 mg/L	1.5 mg/L	2/Month	Composite
Ammonia Nitrogen (October 1 – March 31)	3.3 mg/L	3.3 mg/L	5.7 mg/L	2/Month	Composite
Dissolved Oxygen	≥ 7.4 mg/L			1/Day	Grab
Total Kjeldahl Nitrogen[11] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	 Composite Composite
Nitrate + Nitrite[11] (April 1 – October 31) (November 1 – March 31)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	 Composite Composite
Total Nitrogen[11]	Report mg/L Report lb/day	---	Report mg/L	1/Month	Calculation
PFAS Analytes[12]	---	---	Report ng/L	1/Quarter	Composite
Whole Effluent Toxicity (WET) Testing[14,15]					
Acute (LC_{50}) (Test Species: *Ceriodaphnia dubia*)	---	---	≥ 100%	4/Year	Composite
Chronic (C-NOEC) (Test Species: *Ceriodaphnia dubia*)	---	---	≥ 99%	4/Year	Composite
Hardness (as $CaCo_3$)	---	---	Report mg/L	Same as WET Measurement Frequency and Sample Type	
Ammonia Nitrogen	---	---	Report mg/L		
Total Aluminum	---	---	Report mg/L		
Total Cadmium	---	---	Report mg/L		
Total Copper	---	---	Report mg/L		
Total Lead	---	---	Report mg/L		
Total Nickel	---	---	Report mg/L		

Effluent Characteristic	Discharge Limitation			Monitoring Requirement[1,2]	
Parameter	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[3]**
Total Zinc	---	---	Report mg/L		
Total Organic Carbon	---	---	Report mg/L		

Ambient Characteristic[16]	Reporting Requirements		Monitoring Requirements[1,2,3]		
	Average Monthly	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[4]**
Hardness	---	---	Report mg/L	Same as WET Monitoring Frequency	Grab
Ammonia Nitrogen	---	---	Report mg/L		Grab
Total Aluminum	---	---	Report mg/L		Grab
Total Cadmium	---	---	Report mg/L		Grab
Total Copper	---	---	Report mg/L		Grab
Total Nickel	---	---	Report mg/L		Grab
Total Lead	---	---	Report mg/L		Grab
Total Zinc	---	---	Report mg/L		Grab
Total Organic Carbon	---	---	Report mg/L		Grab
Dissolved Organic Carbon[17]	---	---	Report mg/L		Grab
pH[18]	---	---	Report S.U.		Grab
Temperature[18]	---	---	Report °C		Grab

Influent Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[4]**
BOD_5	Report mg/L	---	---	2/Month	Composite
TSS	Report mg/L	---	---	2/Month	Composite
PFAS Analytes[12]	---	---	Report ng/L	1/Quarter	Composite

Sludge Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
PFAS Analytes[20]	---	---	Report ng/g	1/Quarter	Composite[21]

Footnotes to Part II.A. Table 1:

1. All samples shall be collected in a manner to yield representative data. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented as an electronic attachment to the applicable discharge monitoring report. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and MassDEP of any additional testing above that required herein, if testing is in accordance with 40 CFR Part 136.

2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: they may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

   When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" to all non-detects for that reporting period and report the average of all the results.

3. A "grab" sample is an individual sample collected in a period of less than 15 minutes.

   A "composite" sample is a composite of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportional to flow.

4. The limit is a monthly average, reported in million gallons per day (MGD).

5. N/A

6. N/A

7. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.). Continuous monitoring also fulfills the 5/week monitoring frequency.

8. The monthly average limits for bacteria are expressed as a geometric mean.

   Bacteria monitoring shall be conducted concurrently with TRC monitoring, if TRC monitoring is required.

   For samples tested using the Most Probable Number (MPN) method, the units may be expressed as MPN. The units may be expressed as colony forming units (cfu) when using the Membrane Filtration method.

9. For total residual chlorine (TRC) limitations and other related requirements, see Part II.B.9 of this permit.

10. See Part III.F below for applicable compliance schedules.

11. Total Kjeldahl nitrogen and nitrate + nitrite samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen, as follows.

    Total Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) + Nitrate + Nitrite (mg/L)

    Total Nitrogen (lbs/day) = [(average monthly Total Nitrogen (mg/L) * total monthly effluent flow (Millions of Gallons (MG)) / # of days in the month] * 8.34

12. Report in nanograms per liter (ng/L). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter after the effective date of the authorization to discharge under the General Permit. Until there is an analytical method approved in 40 CFR Part 136 for PFAS in wastewater, monitoring shall be conducted using Draft Method 1633.

    Additionally, report in NetDMR the results of all other PFAS analytes required to be tested as part of the method as shown in Attachment H. Any parameters that are removed from the method based on multi-lab validation of the method will not be required for reporting and the Permittee may report “NODI: 9” for any such parameters.

13. N/A

14. The Permittee shall conduct acute toxicity tests (LC50) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in **Attachments A and B** of this permit. LC50 and C-NOEC are defined in Part VII.E. of this permit. The Permittee shall test the daphnid (*Ceriodaphnia dubia*). Toxicity test samples shall be collected during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the DMR submittal which includes the results for that toxicity test.

15. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachments A and B**,

Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS.

16. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachments A and B**. Minimum levels and test methods are specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS.

17. Monitoring and reporting for dissolved organic carbon (DOC) are not requirements of the Whole Effluent Toxicity (WET) tests but are additional requirements. The Permittee may analyze the WET samples for DOC or may collect separate samples for DOC concurrently with WET sampling.

18. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

19. N/A

20. Report in nanograms per gram (ng/g). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter after the effective date of the authorization to discharge under the General Permit. Until there is an analytical method approved in 40 CFR Part 136 for PFAS in sludge, monitoring shall be conducted using Draft Method 1633.

    Additionally, report in NetDMR the results of all other PFAS analytes required to be tested as part of the method, as shown in Attachment H. Any parameters that are removed from the method based on multi-lab validation of the method will not be required for reporting and the Permittee may report "NODI: 9" for any such parameters.

21. Sludge sampling shall be as representative as possible based on guidance found at https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf.

B. Other Requirements

1. The discharge shall not cause a violation of the water quality standards of the receiving water.

2. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

3. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical or chemical nature of the bottom, interfere with the propagation of fish or shellfish, or adversely affect populations of non-mobile or sessile benthic organisms..

4. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

5. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

6. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

7. The Permittee must provide adequate notice to EPA-Region 1 and MassDEP of the following:

   a. Any new introduction of pollutants into the facility from an indirect discharger which would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 CFR Part 122 Appendix A as amended) discharging process water; and

   b. Any substantial change in the volume or character of pollutants being introduced into that facility by a source introducing pollutants into the facility at the time of issuance of the permit.

   c. For purposes of this paragraph, adequate notice shall include information on:

      (1) The quantity and quality of effluent introduced into the facility; and

      (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility.

8. Pollutants introduced into the facility by a non-domestic source (user) shall not pass through the POTW or facility or interfere with the operation or performance of the works.

9. Total Residual Chlorine (TRC) limitations and related requirements are specified below:

a. N/A

b. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. TRC monitoring and limitations only apply to discharges which have been previously chlorinated or which contain residual chlorine. If bacteria limits do not apply during a particular monitoring period and, therefore, chlorine is not utilized, TRC monitoring is not necessary and the Permittee may enter "NODI" code 9 (*i.e.*, conditional monitoring) in the relevant discharge monitoring report.

c. Additionally, Permittees authorized to conduct disinfection using an alternative to chlorine as the disinfectant are only subject to the TRC limitations and monitoring requirements whenever chlorine is added to the treatment process for disinfection or for other purpose. For the months in which chlorine is not added to the treatment process and the Permittee may enter "NODI" code 9 (*i.e.*, conditional monitoring) in the relevant discharge monitoring report.

d. Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

e. The Permittee may request authorization to conduct disinfection of the discharge on a seasonal basis. If approved, upon receipt of written authorization from EPA and MassDEP to conduct seasonal disinfection, TRC limitations, monitoring, and reporting requirements apply only during the specified disinfection period and whenever chlorine is added to the treatment process outside of the specified disinfection period.

C. Unauthorized Discharges

1. This permit authorizes discharges only from the outfall(s) listed in the authorization to discharge from EPA in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit. The Permittee must provide verbal notification to EPA within 24 hours of becoming aware of any unauthorized discharge and a report within 5 days, in accordance with Part VII.D.1.e (24-hour reporting). Providing that it contains the information required in Part VII.D.1.e, submission of the MassDEP SSO Reporting Form (described in Part II.C.3 below) may satisfy the requirement for a written report. See Part V below for reporting requirements.

2. The Permittee must provide notification to the public within 24 hours of becoming aware of any unauthorized discharge, except SSOs that do not impact a surface water or the public, on a publicly available website, and it shall remain on the website for a minimum of 12 months. Such notification shall include the location and description of the discharge; estimated

volume; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue.

3. Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification.

D. Notification Requirements

The Permittee shall notify all downstream community water systems (if any) of any emergency condition, plant upset, bypass, or other system failure which has the potential to impact the quality of the water to be withdrawn by that community for drinking water purposes. This notification should be made as soon as possible but within four (4) hours, and in the anticipation of such an event, if feasible, without taking away from any response time necessary to alleviate the situation. The Permittee shall follow up with written notification within five (5) days. This notification shall include the reason for the emergency, any sampling information, any visual data recorded, a description of how the situation was handled, and when it would be considered to no longer be an emergency.

III. Additional Limitations, Conditions, and Requirements

A. Operation and Maintenance of the Sewer System

Operation and maintenance (O&M) of the sewer system shall be in compliance with the Standard Conditions of Part VII and the following terms and conditions. The Permittee shall complete the following activities for the collection system which it owns:

1. Maintenance Staff

   The Permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Provisions to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section III.A.5. below.

2. Preventive Maintenance Program

   The Permittee shall maintain an ongoing preventive maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. Plans and programs to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section III.A.5. below.

3. Infiltration/Inflow

   The Permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs

to control I/I shall be described in the Collection System O&M Plan required pursuant to Section III.A.5. below.

4. Collection System Mapping

By August 2024, the Permittee shall prepare a map of the sewer collection system it owns. The Permittee shall continue to maintain a map of the sewer collection system it owns. The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;

b. All combined sewer lines, related manholes, and catch basins;

c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);

d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;

e. All pump stations and force mains;

f. The wastewater treatment facility(ies);

g. All surface waters (labeled);

h. Other major appurtenances such as inverted siphons and air release valves;

i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j. The scale and a north arrow; and

k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System O&M Plan

a. N/A

b. N/A

The Permittee shall update and implement the Collection System O&M Plan they have previously submitted to EPA and the State in accordance with Part (c) below. The plan shall be available for review by federal, state, and local agencies upon request.

c. The Plan shall include:

(1) A description of the collection system management goals, staffing, information management, and legal authorities;
(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities;
(3) A preventive maintenance and monitoring program for the collection system;
(4) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
(5) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
(6) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(7) A description of the Permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts;
(8) An educational public outreach program for all aspects of I/I control, particularly private inflow; and
(9) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The Permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31st. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;

c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;

d. A map with areas identified for investigation/action in the coming year;

e. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit; and

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's design flow, or there have been capacity-related overflows, the report shall include items in (1) and (2) below.

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and
(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

B. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the Permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works it owns and operates, as defined in Part VII.E.1 of this permit.

C. Industrial Users

N/A

D. Industrial Pretreatment Programs

1. The Permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of the authorization to discharge under the General Permit, the Permittee shall prepare and submit a written technical evaluation to EPA analyzing the need to revise local limits. As part of this evaluation, the Permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the Permittee shall complete and submit the attached form (see **Attachment F –** *Reassessment of Technically Based Industrial Discharge Limits*) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the Permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

2. The Permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the Permittee's approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR Part 403.

At a minimum, the Permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

a. Carry out inspection, surveillance, and monitoring procedures which will determine independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

b. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

c. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

d. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

3. The Permittee shall provide EPA and MassDEP with an annual report describing the Permittee's pretreatment program activities for the twelve (12) month period ending 60 days prior to the due date in accordance with 40 CFR § 403.12(i). The annual report shall be consistent with the format described in **Attachment G** (*NPDES Permit Requirement for Industrial Pretreatment Annual Report*) of this permit and shall be submitted by **March 1** of each year.

4. The Permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR § 403.18(c).

5. The Permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR § 405 et seq.

6. The Permittee must modify its pretreatment program, if necessary, to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program. Within 180 days of the effective date of the authorization to discharge under the General Permit the Permittee must provide EPA in writing, proposed changes, if applicable, to the Permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the Permittee must address in its written submission the following areas: (1) Enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The Permittee will implement these proposed changes pending EPA Region 1's approval under 40 CFR § 403.18. This submission is separate and distinct from any local limits analysis submission described in Part III.D.1.

7. Beginning the first full calendar year after the effective date of the authorization to discharge under the General Permit, the Permittee shall commence annual sampling of the following types of industrial discharges into the POTW:

- Commercial Car Washes
- Platers/Metal Finishers
- Paper and Packaging Manufacturers
- Tanneries and Leather/Fabric/Carpet Treaters
- Manufacturers of Parts with Polytetrafluoroethylene (PTFE) or teflon type coatings (i.e. bearings)
- Landfill Leachate
- Centralized Waste Treaters
- Known or Suspected PFAS Contaminated Sites
- Fire Fighting Training Facilities
- Airports
- Any Other Known or Expected Sources of PFAS

Until there is an analytical method approved in 40 CFR Part 136 for PFAS, monitoring shall be conducted using Draft Method 1633. Sampling shall be for the PFAS analytes required to be tested in Method 1633, as shown in Attachment H.

The industrial discharges sampled and the sampling results (including the full lab report) shall be summarized and included in the annual report (see Part III.D.3).

E. Sludge Conditions

1. The Permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR Part 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the Permittee's sludge use and/or disposal practices, the Permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices:

    a. Land application - the use of sewage sludge to condition or fertilize the soil
    b. Surface disposal - the placement of sewage sludge in a sludge only landfill
    c. Sewage sludge incineration in a sludge only incinerator

4. The requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR Part 503 requirements include the following elements:

    - General requirements
    - Pollutant limitations

- Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
- Management practices
- Record keeping
- Monitoring
- Reporting

Which of the 40 CFR Part 503 requirements apply to the Permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the Permittee to assist it in determining the applicable requirements.[1]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year, as follows:

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR § 503.8.

7. Under 40 CFR § 503.9(r), the Permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the Permittee contracts with *another* "person who prepares sewage sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the Permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the Permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48

[1] This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf

(incineration)) by February 19 (see also "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

F. Schedules of Compliance

1. The warm-weather monthly average phosphorus limit of 0.1 mg/L (April 1 – October 31) shall become effective on February 1, 2025 (*i.e.*, compliance beginning April 2025). During the compliance schedule, the Permittee shall comply with an interim limit of 0.2 mg/L.

2. By February 1, 2023, the Permittee shall submit to EPA and MassDEP a status report relative to the process improvements necessary to achieve the permit limit. By February 1, 2024, the Permittee shall complete any process changes necessary to achieve the total phosphorus limit and submit a progress report to EPA and MassDEP detailing these changes. By February 1, 2025, the Permittee shall complete optimization of the plant to comply with the phosphorus limit and submit a final report that summarizes the process changes and plant optimization efforts.

3. The Permittee shall install an effluent flow meter which shall be operational by Feb 1, 2023. During this compliance period, the Permittee may continue to report values from the influent flow meter.

G. Additional Requirements for Facilities Discharging to the Long Island Sound Watershed, the Blackstone River Watershed, the Taunton River Watershed, as well as the Plymouth WWTP and Fairhaven WPCF

N/A

H. Submittal of Facility-Specific Information

Each permittee shall perform three full pollutant scans consistent with the requirements of NPDES Form 2A, Tables B and C, using a representative composite sample once per quarter in the final 3 full calendar quarters of the 5-year permit term. The results for all three scans shall be summarized and submitted as a single electronic attachment to the DMR for the final full calendar quarter before the expiration date of the General Permit (in accordance with Part V.2 below). This submittal shall also include the following information that EPA has deemed necessary for development of the next reissuance of this General Permit:

- Provide the current average daily volume of inflow and infiltration (I/I)
- Provide an updated Flow Diagram or Schematic for the WWTF
- Provide a summary and schedule for any ongoing or planned facility upgrades
- Provide a list of Significant Industrial Users and Categorical Industrial Users contributing flow to the system (including average volume contributed from each)
- Provide a summary of sewage sludge treatment and disposal practices (including disposal method, disposal amount in dry metric tons, name and address of any third-party contractor, etc.).

I. State 401 Certification Conditions

This Permit has received state water quality certification issued by the State under § 401(a) of the CWA and 40 CFR § 124.53. EPA incorporates the following state water quality certification requirements into the Final Permit:

1. Notwithstanding any other provision of the 2022 Federal NPDES Permit to the contrary, monitoring results of the influent, effluent, and sludge for PFAS compounds shall be reported to MassDEP electronically, at **massdep.npdes@mass.gov**, or as otherwise specified, within 30 days after they are received.

2. Pursuant to M.G.L. c. 21, §§ 26-53, and 314 CMR 3.00 and 4.00, including 314 CMR 3.11(2)(a)6., and in order to ensure the maintenance of surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, in accordance with 314 CMR 4.05(5)(e), MassDEP has determined that it is necessary that the permittee commence annual monitoring of all Significant Industrial Users[2,3] discharging into the POTW consistent with the 2022 NPDES General Permit in accordance with the table below. Notwithstanding any other provision of the 2022 NPDES General Permit to the contrary, monitoring results shall be reported to MassDEP electronically at massdep.npdes@mass.gov within 30 days after they are received.

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/L	Annual	24-hour Composite
Perfluoroheptanoic acid (PFHpA)	ng/L	Annual	24-hour Composite
Perfluorononanoic acid (PFNA)	ng/L	Annual	24-hour Composite
Perfluorooctanesulfonic acid (PFOS)	ng/L	Annual	24-hour Composite
Perfluorooctanoic acid (PFOA)	ng/L	Annual	24-hour Composite
Perfluorodecanoic acid (PFDA)	ng/L	Annual	24-hour Composite

[2] Significant Industrial User (SIU) is defined at 40 CFR part 403: All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subpart N; **and** any other industrial user that: discharges an average of 25,000 GPD or more of process wastewater to the POTW, contributes a process wastestream that makes up 5% or more of the average dry weather hydraulic or organic capacity of the POTW, or designated as such by the POTW on the basis that the industrial users has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standards or requirement.

[3] This requirement applies to all Significant Industrial Users and not just those within the sectors identified by EPA in the NPDES permit.

IV. Obtaining Authorization to Discharge

N/A

V. Monitoring, Record-Keeping, and Reporting Requirements

Unless otherwise specified in this permit, the Permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

   The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month electronically using NetDMR. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA and MassDEP as NetDMR attachments rather than as hard copies. See Part V.5 for more information on State reporting. Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the report due date specified in this permit.

3. Submittal of Industrial User and Pretreatment Related Reports

   a. Prior to 21 December 2025, all reports and information required of the Permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Pretreatment Coordinator in EPA Region 1 Water Division (WD). Starting on 21 December 2025, these submittals must be done electronically as NetDMR attachments and/or using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/. These requests, reports and notices include:

      (1) Annual Pretreatment Reports,

      (2) Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,

      (3) Revisions to Industrial Discharge Limits,

      (4) Report describing Pretreatment Program activities, and

      (5) Proposed changes to a Pretreatment Program

b. This information shall be submitted to EPA WD as a hard copy at the following address:

U.S. Environmental Protection Agency
Water Division
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (06-03)
Boston, MA 02109-3912

4. Submittal of Biosolids/Sewage Sludge Reports

By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

5. Submittal of Requests and Reports to EPA Water Division (WD)

a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

(1) Transfer of permit notice;
(2) Request for changes in sampling location;
(3) Request for reduction in testing frequency;
(4) Request for change in WET testing requirement; and
(5) Report on unacceptable dilution water / request for alternative dilution water for WET testing.
(6) Report of new industrial user commencing discharge
(7) Report received from existing industrial user
(8) Request for extension of compliance schedule

b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

6. Submittal of Sewer Overflow and Bypass Reports and Notices

The Permittee shall submit required reports and notices under Part VII.B.4.c, for bypasses, and Part VII.D.1.e, for sanitary sewer overflows (SSOs) electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

7. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management

8 New Bond Street
Worcester, Massachusetts 01606

8. Verbal Reports and Verbal Notifications

   a. Any verbal reports or verbal notifications, if required in Parts I through VII of this General Permit, shall be made to both EPA and to MassDEP. This includes verbal reports and notifications which require reporting within 24 hours (e.g., Part VII.B.4.c.(2), Part VII.B.5.c.(3), and Part VII.D.1.e).

   b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1510
and
MassDEP's Emergency Response at 888-304-1133

VI. Administrative Requirements

A. Notice of Termination (NOT) of Discharge or Change of Owner/Operator

Permittees shall notify EPA and the appropriate State agency in writing upon the termination of any discharge(s) authorized by this General Permit. The NOT shall include the name, mailing address, phone number, and the location of the facility for which the notification is being submitted, the NPDES permit number of the discharge identified by the notice, and an indication of whether the discharge has been eliminated or if the owner/operator of the discharge has changed. The NOT shall be signed in accordance with the signatory requirements of 40 CFR § 122.22. Completed and signed NOTs shall be submitted to EPA at R1NPDESReporting@epa.gov and to MassDEP at MassDEP.NPDES@mass.gov.

B. Continuation of this General Permit After Expiration

If this General Permit is not reissued prior to its expiration date, it will be administratively continued in accordance with the Administrative Procedures Act (5 U.S.C. 558(c)) and 40 CFR § 122.6 and remain in full force and in effect for discharges covered prior to its expiration.

Coverage under this permit will not be available to any facility that is not authorized to discharge under the General Permit before the expiration date.

Any Permittee whose authorization to discharge under this General Permit was administratively continued will automatically remain covered by the continued General Permit until the earlier of:

1. Authorization to discharge under a reissued permit or a replacement of this permit; or

2. The Permittee's submittal of a Notice of Termination; or

3. Issuance of an individual permit for the Permittee's discharge; or

4. A formal permit decision by EPA not to reissue this General Permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an

alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.

Appendix D
Sewer Rate Study

427 Main Street, Suite 400, Worcester, MA 01608
Tel: 508.762.1676

MEMORANDUM

TO:	Chuck Heshion, Chairman, Rockland Board of Sewer Commissioners
FROM:	Frank E. Occhipinti, PE, Weston & Sampson
DATE:	May 5, 2023
SUBJECT:	Sewer Rate Study Summary Memo

In September 2021, The Town of Rockland retained Weston & Sampson to perform and complete a Sewer Rate Study. Weston & Sampson is pleased to present this memorandum, which summarizes the result of the analysis. This study was performed to provide the Town with estimated sewer rate increase options that will generate sufficient revenue to fund the operational costs, indirect costs, debt service costs, and capital improvements.

Background

The Town of Rockland consists of primary residential and urban commercial with a population of approximately 17,800, according to the 2020 U.S Census. The Sewer Department, managed by the elected Board of Sewer Commissioners, provides services to approximately 5,830 commercial, residential, industrial, and institutional accounts. The water system is managed separately under the Abington-Rockland Joint Water Works.

Sewer Utility

The Town's sewer system consists of approximately 340,000 linear feet (lf) of sanitary sewers. The Town owns a Wastewater Treatment Plant (WWTP) which services the Town of Rockland and some sewer users from the Town of Abington. The WWTP receives and treats an average daily flow of approximately 2.5 million gallons per day (MGD).

Existing Rate Structure and Charges

Sewer Enterprise Revenue relies solely on user fees and charges. The Town's sewer rates are billed quarterly (every three months) based on usage (per 100 cubic feet, or 1 ccf) and a basic charge with a $55 combined minimum. Table 1 on the next page show examples of current sewer charges.

Table 1 - Example of Sewer User Bills (Effective January 1, 2023)

User Type	Usage	Current Bill
Low-End User	500	$55.00
Small User	1,000	$84.10
Average Residential User	2,075	$163.76
Large User #1	5,000	$380.50
Large User #2	10,000	$751.00
Very Large User	100,000	$7,420.00

Existing Rate Structure and Charges

The Town's current sewer rates are lower than most neighboring communities' and communities with similar populations. Weston & Sampson compared the Town's sewer rates to rates in neighboring communities (Abington, Braintree, Weymouth, Holbrook, and Hingham), and communities with similar populations (Amesbury, Bellingham, Concord, Foxborough, Millbury, and Westborough). It should be noted that some of the communities are MWRA-served communities. Table 4 below contains a comparison of typically average residential user sewer bills, assuming usages of 2,075 cubic feet or 20.75 ccf per quarter. Figure 1 on the next page shows the comparison in graphical format.

Table 2 - Average Sewer Bill (Based on average usage of 2,075 cubic feet)

Community	Sewer Rate (per ccf)	Service/Basic Charge (per bill)	Sewer Bill (per quarter)
Rockland	$7.41	$10.00	$163.76
Abington	$5.00	$35.00	$138.75
Braintree	$8.00	$21.25	$187.25
Holbrook	$6.60 for 1-2,000 cubic feet $10.04 for over 2,000 cubic feet	$50.00	$189.53
Hingham	$14.06	-	$291.75
Weymouth	$8.97	$7.50	$186.13
Amesbury	$7.25	-	$150.44
Bellingham (1)	$6.92	$42.60	$186.17
Concord	$12.36	-	$256.47
Foxborough	$10.44 (for usage over 750 gallons)	$97.94 (minimum charge)	$236.27
Millbury	$9.95	-	$206.43
Westborough	$8.96	-	$148.00

Note:

(1) Assume 3/4" meter size

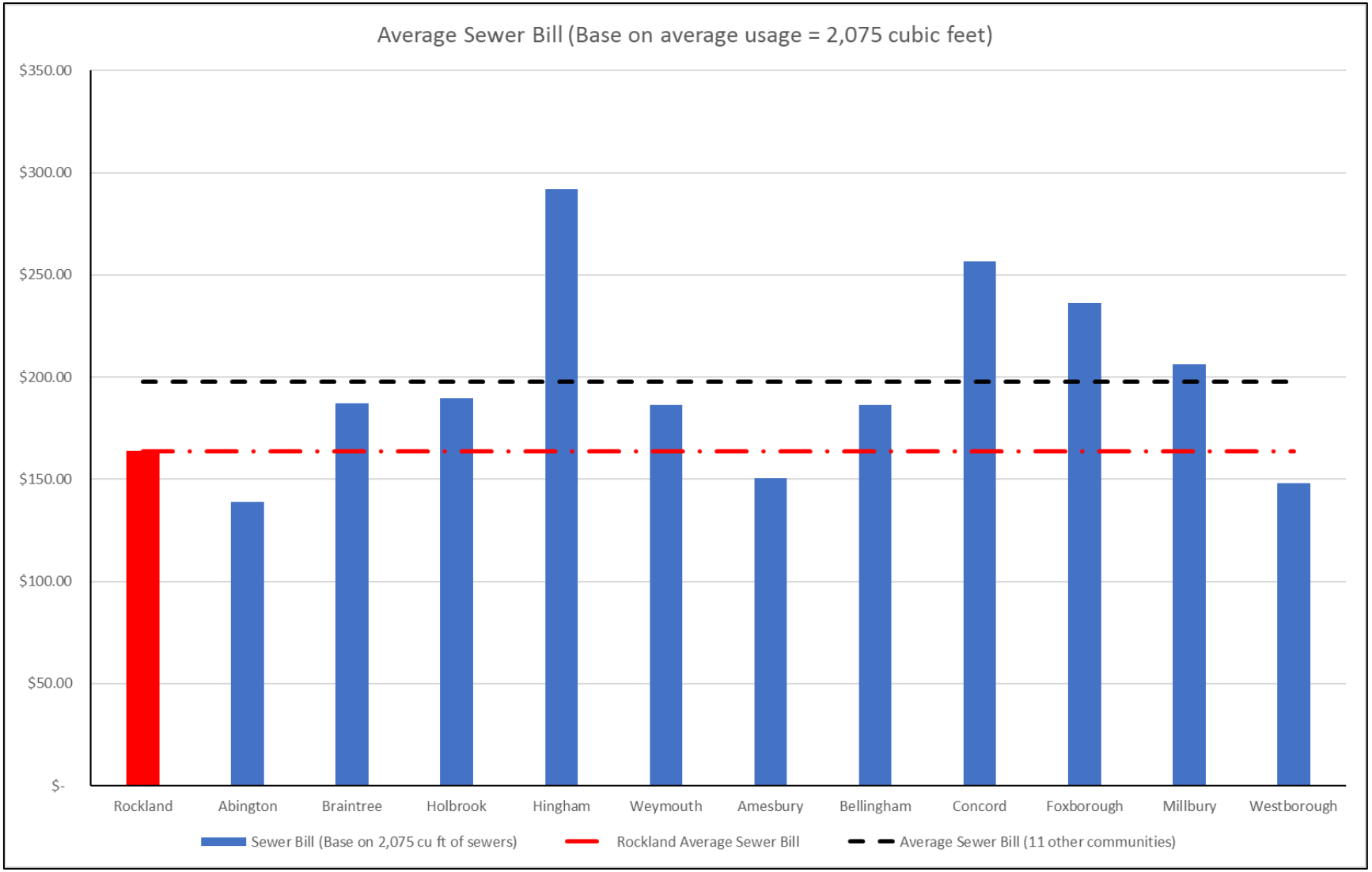


Figure 1 - Average Sewer Bill for Rockland and 11 Communities

Existing Expenses and Revenues

The Town's FY 2023 sewer budget was provided by the Town for this study. The voted budget for the Town's Sewer Department is $3,006,470 with an additional $552,553 for capital outlay totaling $3,505,333 for FY 2023. The single largest expense for the Sewer Enterprise Fund is the contract between the Town and Veolia (formerly Suez Water Environment Services) to operate and maintain the Town's Wastewater Treatment Facility (WWTF) with $2,100,000 budgeted for FY2023, approximately 60% of the total fiscal year budget.

Without any changes in revenue, as presented in the baseline financial analysis, total projected sewer revenues for FY 2023 are $3,325,604 and projected expenditures are $3,505,333, leaving a deficit of $233,420 for FY 2023. However, since the Town has maintained strong retained earnings, the deficit does not negatively impact the Town's overall finances for this fiscal year.

The Sewer Department plans to begin a multi-year WWTF improvement/upgrade project, which is mandated as part of the Town's consent decree with the Environmental Protection Agency (EPA). The project is estimated at approximately $80 million dollars, with design phase starting in FY 2024 and construction ending in FY 2033. The Sewer Enterprise is expecting to experience budgetary shortfalls because current projected revenue recovered from rates will not be sufficient to cover future expenditures. The Town should strongly consider rate action for FY 2023 and beyond to ensure sufficient revenue is realized from rates.

Capital Improvement Plan and Funding Sources

A Capital Improvement Plan (CIP) is a long-term planning document that outlines the Town's sewer infrastructure spending needs and priorities. The purpose of a CIP is to identify and prioritize capital projects, such as constructing new facilities, upgrading existing infrastructure, or purchasing new equipment, over a multi-year period.

The CIP typically covers a period of 3 to 5 years and serves as a roadmap for capital spending decisions. It helps the Town to allocate resources in an efficient and effective way, and to align their capital investments with their strategic goals and objectives. The CIP typically includes information about the estimated cost of each project, the timeline for completion, and the source of funding for each project.

For Rockland, the single most important and costly capital improvement project on the CIP is the WWTF upgrade as mentioned earlier. The cost for the upgrade, including design and construction, is estimated at approximately $80 million dollars over 10 years. The last upgrade to the WWTF was done in 1977 and the planned upgrade is necessary for the Town to meet federal and state requirements. Another crucial capital improvement project on the CIP is Infiltration and Inflow (I/I) Remediation Projects, which include investigating, locating, and removing I/I from the Town's collection system.

The majority of the projects on the CIP will be funded by the Sewer Enterprise Fund. The State Revolving Fund (SRF) loan program is planned to be utilized to provide the Town with a low interest rate loan option, currently providing at 2% or lower for 20 years. Funding from the American Rescue Plan Act (ARPA) will also support some of projects on the CIP.

A draft CIP is provided below summarizing the Town's infrastructure spending needs, estimated costs, and funding sources. A more detailed CIP with cost breakdown is provided in Appendix A.

Table 3 - Town of Rockland Capital Improvement Plan

Project	Estimated Total Cost	Funding Source	Project Start Year	Project End Year
Inflow & Infiltration Remediation System	$2,200,000	Sewer Enterprise Fund	Ongoing	
Inflow & Infiltration Annual Control Plan (I&I Investigation)	$2,241,000	Sewer Enterprise Fund	FY2023	FY 2037
Inflow & Infiltration Reoperation	$330,000	ARPA	FY 2023	FY 2023
Digester Building Gas Lines	$350,000	Sewer Enterprise Fund ARPA	FY2023	FY 2024
Digester Recirculation Pumps	$50,000	Sewer Enterprise Fund	FY 2025	FY 2025
New Heating System (WWTF Office Building)	$150,000	Sewer Enterprise Fund Grant (up to $50,000)	FY 2025	FY 2025
Generator	$500,000	ARPA	FY 2024	FY 2024
Spruce Street Ejector Station	$100,000	Sewer Enterprise Fund	FY 2024	FY 2024
Inflow & Infiltration Rehabilitation (I&I Removal, Every 4 Years)	$6,000,000	SRF Loan	FY 2028	FY 2038
Pump Station Upgrade	$200,000	SRF Loan	FY 2025	FY 2028
WWTF Upgrade Design & Bidding	$2,500,000	Conventional Loan ($1.5M) ARPA ($1M)	FY 2023	FY 2024
Phosphorus/Tertiary Treatment Upgrade	$12,500,000	SRF Loan	FY 2025	FY 2025
WWTP Upgrades	$65,000,000	SRF Loan	FY 2026	FY 2033

Recommended Option for Rate Change

Upon reviewing the Town's CIP, the projections of this rate study expanded from a 5-year to a 15-year outlook to take into consideration future debt accumulated from the WWTF upgrade project. The recommended option for updated rates included in this report was designed to address the urgency to build up reserve in the Sewer Enterprise Fund to fund the WWTF upgrade project and repay future debt. In addition, the recommended rate change would ensure that retained earnings are not depleted by FY2038, the end of the study period. While Industry standards for retained earnings balance is between 10% and 25%, the recommended option targeted a retained earnings balance of 15% of total expenditures by the end of the 15-year period.

Since the analysis was a 15-year look-ahead, rates are presented for the next fifteen fiscal years, starting FY 2024. The recommended option aims to help the Town to achieve its goals of covering actual costs of services, maintaining healthy retained earnings, and ensuing long-term fiscal stability.

Baseline ("Do Nothing") Option

A baseline "do nothing" option is provided as a hypothetical scenario where no action or rate change is taken, and the Sewer Department continues to operate as it currently does and performs the capital improvement work as planned. It is used as a comparison point for evaluating the effectiveness of the recommended rate change.

Figure 2 on the next page shows the projected retained earnings in the baseline "do nothing" scenario. As shown in Figure 2, under the baseline "do nothing" scenario, retained earnings remains healthy, reaching nearly 50% of total expenditures in FY 2024. However, as some of the CIP projects begin to take place, such as the WWTF upgrade project, retained earnings are exhausted by the end of FY 2025. Table 4 below presents the projected Sewer Enterprise Fund and Retained Earnings from FY 2023 to FY 2027 under this baseline scenario.

Table 4 - Projected Sewer Enterprise Fund and Retained Earnings (FY 2023 to FY 2027)

Baseline Scenario	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Surplus/Deficit	$(233,420)	$345,518	$76,483	$(630,704)	$(1,503,091)
Projected Retained Earnings	$1,276,547	$1,622,065	$1,067,844	$(435,247)	$(2,573,739)
Retained Earnings as % of Budget	35.9%	48.4%	29.5%	-10.1%	-49.5%
Target Retained Earnings as % of Budget	15.0%	15.0%	15.0%	15.0%	15.0%

As shown above, by FY 2026, both the Sewer Enterprise Fund and Retained Earnings are in deficit and would be unable to cover costs of services. The baseline "do nothing" option appears to be unacceptable.

Rate Change Option

Through careful evaluation and analysis, the recommended 15-year rate increase plan is as follows: the first 8-year period, a 10% increase per year is recommended, followed by a slower 7-year period increase. Increases to rates are presented in Table 5 below. This recommended plan is tailored to meet the Town's needs. The higher increases during the first 8-yearr period is designed to build up reserve in order to fund the upcoming CIP projects. The slower rate increases during the latter 7-year period is expected to keep projected retained earnings from depleting and to show retained earnings trenching towards the targeted balance of 15% of total expenditures by the end of FY 2038. Figure 3 on page 8 presents the projected retained earnings in the recommended rate increases scenario.

Table 5 - Recommended Rate Increases

Fiscal Year	FY 2024 – FY 2031	FY 2032 – FY 2033	FY 2034	FY 2035 – FY 2038
Recommended Rate Increase	10%	7%	5%	2%

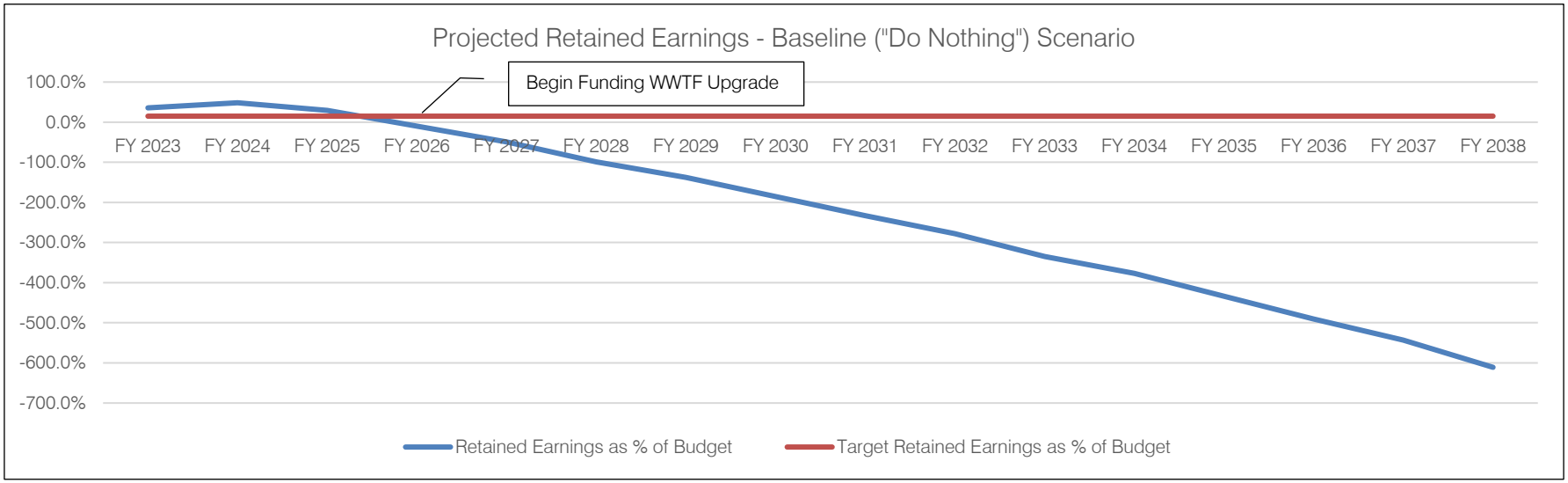


Figure 2 - Projected Retained Earnings (Baseline "Do Nothing" Scenario)

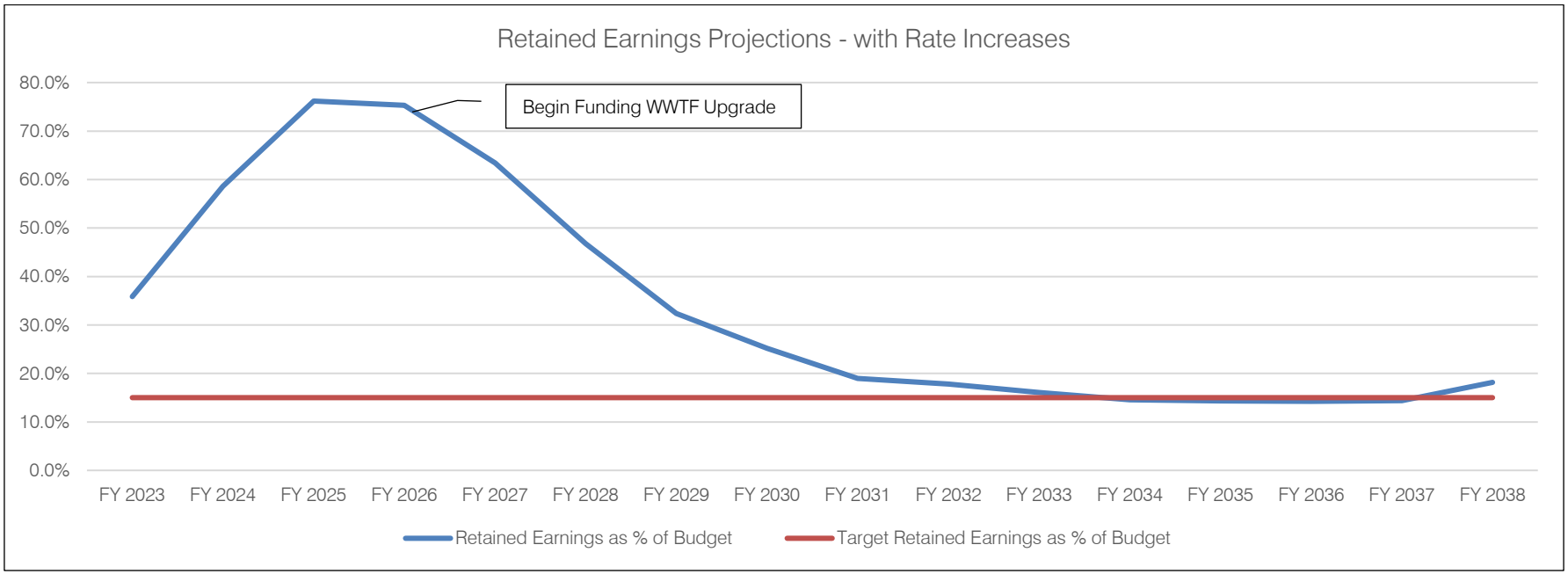


Figure 3 - Projected Retained Earnings (with Recommended Rate Increases)

Table 6 below presents the quarterly and annual sewer bill impact for average users after recommended rate increases from FY 2024 to FY 2028.

Table 6 - Bill Impacts for Average Customers (quarterly and annually)

User Impact (per bill) – Sewer Bills Only			Bill Increase Compared to Previous Year				
Bill Type	Usage (cubic feet)	Current Bill	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Average Residential User Quarterly Bill	2,075	$163.76	+ $15.38	+ $16.91	+ $18.60	+ $20.47	+ $22.51
Average Residential User Annual Bill	8,300	$655.03	+ 61.52	+ $67.64	+ $74.40	+ $81.88	$ 90.04

Summary

The results of this rate study can be summarized in a chart and is provided in Appendix B. The chart, which presents the actual and projected sewer cash flow with recommended rate changes from FY 2020 to FY 2038, includes several financial parameters, such as targeted retained earnings, operating expenses, sewer enterprise funded capital, debt, and revenue.

It should be noted that revenues and expenses are likely to change over time. Currently, the Town is unable to accept additional sewer flows due to capacity limitations in the collection system. However, as the Town implements and performs I/I reduction projects to address capacity issues, new connections and developments may be accepted by the Town in the future, which would lead to increase in revenue.

It is important for the Town to continue to fund the projects on its Capital Improvement Plan (CIP). The Town will undoubtedly benefit from continued capital investment, including the wastewater treatment facility upgrade and I/I reduction projects. The projects provided in this study are based on many assumptions. We recommend that the sewer analyses conducted for the Town are reviewed and updated each year. Assumptions, for example, planned expenditures and consumption trends, change year-to-year and it is important to capture the changes to ensure the rate plans presented are based on the most accurate information available at the time.

APPENDIX A

TOWN OF ROCKLAND
SANITARY SEWER SYSTEM
CAPITAL IMPROVEMENT PLAN (CIP)

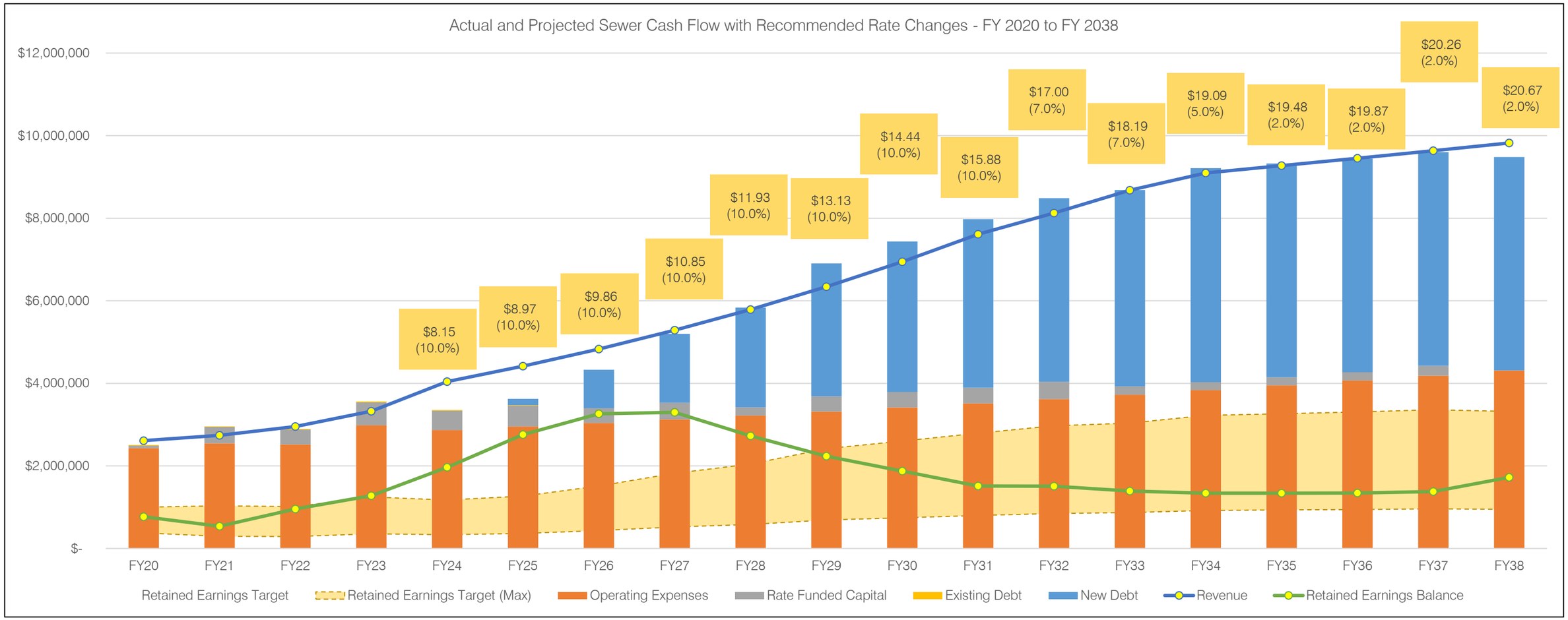
Capital Improvement Plan - Sanitary Sewer System (Rate Study, FY 2023 - FY 2038)
Town of Rockland, Massachusetts

Item	Description	Funding Source	Estimated Cost	Project Start Year	Project End Year	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038
Collection System Items																					
1	Inflow & Infiltration Remediation System	Sewer Enterprise Fund	$ 2,200,000.00	Ongoing		$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00					
2	Inflow & Infiltration Annual Control Plan (I&I Investigation)	Sewer Enterprise Fund	$ 2,241,000.00	FY 2023	FY 2037	$ 150,000.00		$ 155,000.00	$ 160,000.00	$ 200,000.00		$ 170,000.00	$ 175,000.00	$ 180,000.00	$ 220,000.00		$ 191,000.00	$ 197,000.00	$ 203,000.00	$ 240,000.00	
3	Inflow & Infiltration Reoperation	ARPA	$ 330,000.00	FY 2023	FY 2023	$ 330,000.00															
4	Inflow & Infiltration Rehabilitation (I&I Removal, Every 4 Years)	SRF Loan	$ 6,000,000.00	FY 2028	FY 2038						$ 2,000,000.00					$ 2,000,000.00					$ 2,000,000.00
Sewer Pump Station Items																					
1	Spruce Street Ejector Station	Sewer Enterprise Fund	$ 100,000.00	FY 2024	FY 2024		$ 100,000.00														
2	Pump Station Upgrade - Phase 2	SRF Loan	$ 50,000.00	FY 2025	FY 2025			$ 50,000.00													
3	Pump Station Upgrade - Phase 3	SRF Loan	$ 50,000.00	FY 2026	FY 2026				$ 50,000.00												
4	Pump Station Upgrade - Phase 4	SRF Loan	$ 50,000.00	FY 2027	FY 2027					$ 50,000.00											
5	Pump Station Upgrade - Phase 5	SRF Loan	$ 50,000.00	FY 2028	FY 2028						$ 50,000.00										
Wastewater Treatment Plant Item																					
1	Digester Building Gas Lines	Sewer Enterprise Fund + ARPA	$ 350,000.00	FY2023	FY 2024	$ 330,000.00	$ 20,000.00														
2	Digester Recirculation Pumps	Sewer Enterprise Fund	$ 50,000.00	FY 2025	FY 2025			$ 50,000.00													
3	New Heating System (WWTF Office Building)	Sewer Enterprise Fund + Grant (up to $50,000)	$ 150,000.00	FY 2025	FY 2025			$ 150,000.00													
4	Generator	ARPA	$ 500,000.00	FY 2024	FY 2024			$ 500,000.00													
5	WWTF Upgrade Design & Bidding	SRF Loan	$ 1,500,000.00	FY 2023	FY 2024		$ 1,500,000.00														
6	Phosphorus/Tertiary Treatment Upgrade	SRF Loan	$ 12,500,000.00	FY 2025	FY 2025			$ 12,500,000.00													
7	WWTP Upgrades	SRF Loan	$ 65,000,000.00	FY 2026	FY 2033				$ 12,000,000.00	$ 12,000,000.00	$ 11,000,000.00	$ 7,000,000.00	$ 7,000,000.00	$ 6,000,000.00	$ 5,000,000.00	$ 5,000,000.00					
		Total =	$ 91,121,000.00			$ 1,010,000.00	$ 1,820,000.00	$ 13,605,000.00	$ 12,410,000.00	$ 12,450,000.00	$ 13,250,000.00	$ 7,370,000.00	$ 7,375,000.00	$ 6,380,000.00	$ 5,420,000.00	$ 7,200,000.00	$ 191,000.00	$ 197,000.00	$ 203,000.00	$ 240,000.00	$ 2,000,000.00

Updated 5/4/2023

APPENDIX B

ACTUAL AND PROJECTED SEWER CASH FLOW WITH RECOMMENDED RATE CHANGES FY 2020 TO FY 2038


Actual and Projected Sewer Cash Flow with Recommended Rate Changes - FY 2020 to FY 2038
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$-
$8.15 (10.0%)
$8.97 (10.0%)
$9.86 (10.0%)
$10.85 (10.0%)
$11.93 (10.0%)
$13.13 (10.0%)
$14.44 (10.0%)
$15.88 (10.0%)
$17.00 (7.0%)
$18.19 (7.0%)
$19.09 (5.0%)
$19.48 (2.0%)
$19.87 (2.0%)
$20.26 (2.0%)
$20.67 (2.0%)
FY20
FY21
FY22
FY23
FY24
FY25
FY26
FY27
FY28
FY29
FY30
FY31
FY32
FY33
FY34
FY35
FY36
FY37
FY38
Retained Earnings Target
Retained Earnings Target (Max)
Operating Expenses
Rate Funded Capital
Existing Debt
New Debt
Revenue
Retained Earnings Balance