Preliminary Engineering Report

Town of Sandy Creek North & South Sandy Pond Sewer Project

Prepared for

Town of Sandy Creek

1992 Harwood Drive

Sandy Creek, New York

August 2019

Barton&Loguidice

North & South Sandy Pond Sewer Project

Town of Sandy Creek, Oswego County, New York

Preliminary Engineering Report

August 2019

Prepared for:

Town of Sandy Creek
1992 Harwood Drive
P.O. Box 52
Sandy Creek, New York 13145

Prepared by:

Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, New York 13088

TABLE OF CONTENTS

Section Page

EXECUTIVE SUMMARY iv
ABBREVIATIONS vi
1.0 INTRODUCTION 8
1.1. Authorization 8
1.2. Background 8
1.3. Scope of Work 8
2.0 PROJECT BACKGROUND AND HISTORY 10
2.1. Site Information 10
2.1.1. Location 10
2.1.2. Geographic Conditions 10
2.1.3. Environmental Resources 10
2.1.4. Floodplain Considerations 11
2.2. Ownership and Service Area 11
2.2.1. Facility Ownership 11
2.2.2. Presence of Outside Users 11
2.2.3. Industrial Users 11
2.2.4. Population Trends and Projected Growth 11
2.2.5. Anticipated Development 12
3.0 EXISTING FACILITIES 13
3.1. Description and History 13
3.2. (V) Pulaski Wastewater Treatment Plant 13
3.3. Felix Schoeller Paper Company Wastewater Treatment Plant 14
4.0 Proposed service area and estimated wastewater flows and loads 15
4.1. Need for Project 15
4.1.1. Health and Safety 15
4.1.2. Environmental Protection 15
4.1.3. Residential Need 16
4.1.4. Summary of Need 16
4.2. Proposed Project Area 17
4.3. Service Area Equivalent Dwelling Unit (EDU) Assessment 17
4.4. Estimated Wastewater Flows and Loads 18
5.0 De-Centralized Sewer System Alternatives 19
5.1. On-Site Treatment Systems 19
5.2. Cluster Systems 19
5.3. Multiple Project Phases 20
6.0 Sanitary Sewer Collection System Alternative 21
6.1. Gravity Collection System Alternative 21
6.2. Low Pressure Sewer Collection System Alternative 21
6.3. Impact on Existing Facility 22

TABLE OF CONTENTS

Section Page

6.4. Land Requirements 22
6.5. Environmental Impacts and Mitigation Measures 22
6.5.1. SEQR/SERP Compliance and Overview 22
6.5.2. Wetlands and Surface Waters 23
6.5.3. Threatened and Endangered Species 23
6.5.4. Cultural and Historic Resources 23
6.5.5. Environmental Permit Summary 23
6.5.6. Noise Level Impacts 24
6.5.7. Air Pollution Impacts 24
6.6. Water and Efficiency Measures 24
6.7. Schedule and Constructability 24
6.8. Opportunities for Green Infrastructure 24
6.9. Project Capital Cost 24
6.10. Anticipated O&M Cost(s) 25
6.11. Short-Lived Asset Costs 25
7.0 WWTP Alternatives 26
7.1. Village of Pulaski Alternative 26
7.2. Felix Schoeller Technical Papers Alternative 26
7.3. New WWTP 26
8.0 Recommended WWTP Alternative 28
8.1. WWTP Proposed Treatment System 28
8.2. Impact on Existing Facility 28
8.3. Storm and Flood Resiliency 28
8.4. Land Requirements 28
8.5. Environmental Impacts and Mitigation Measures 29
8.6. Discharge Permit Requirements 29
8.7. Water and Energy Efficiency Measures 29
8.8. Schedule and Constructability 29
8.9. Opportunities for Green infrastructure 29
8.10. Project Capital Cost 29
8.11. Anticipated O&M Cost(s) 29
8.12. Short-Lived Asset Costs 30
9.0 Recommended Project financing 31
9.1. Basis of Selection 31
9.2. Total Project Cost Estimate 31
9.3. Preliminary Plan of Finance 31
9.3.1. Core Funding - NYSEFC 32
9.3.2. Core Funding – NYSEFC Water Infrastructure Improvement Act (WIIA) 32

TABLE OF CONTENTS

Section Page

9.3.3. Core Funding – NYSDEC Water Quality Improvement Program (WQIP)..... 32
9.3.4. Core Funding – Rural Development..... 32
9.3.5. NYS Resiliency and Economic Development Initiative (REDI) Grant..... 33
9.4. Summary of Preliminary Funding Plan..... 33
9.5. Supplemental Funding – Consolidated Funding Application (CFA)..... 34
10.0 Recommended Steps to Proceed..... 36

Tables
Table 2-1: Population Data Taken from U.S. Census..... 12
Table 3-1: Permitted Discharge Facilities Near Project Area..... 13
Table 4-1: Proposed Town of Sandy Creek Sewer District EDU Assessment..... 17
Table 4-2: Estimated Flows and Loads (2019)..... 18
Table 6-1: Estimate of Probable Construction Cost – Collection System..... 25
Table 6-2: Collection System Anticipated O&M..... 25
Table 8-1: Estimate of Probable Construction Cost – WWTP Improvements..... 29
Table 8-2: WWTP Anticipated O&M..... 30
Table 9-1: Estimate of Probable Cost..... 31
Table 9-2: First Year User Cost..... 34
Table 9-3: Summary of Key Funding Programs..... 35
Table 10-1: Proposed Project Schedule Milestones..... 36

Appendices
Appendix A: Project Area Maps
Appendix B: USGS Soil Survey and Soils Map
Appendix C: Project Area Wetlands Information
Appendix D: NYSDEC Environmental Resources Mapper
Appendix E: Additional Project Maps and Information
Appendix F: EDU Assessments for Proposed Project Area and Other Areas of Interest
Appendix G: Proposed Project Area Estimated Flows and Loading
Appendix H: Estimated Project Cost
Appendix I: Estimated Short-Lived Asset Costs
Appendix J: Estimated Costs for WWTP Alternatives
Appendix K: Proposed Sandy Creek Sewer Project

EXECUTIVE SUMMARY

The western portion of the Town of Sandy Creek is a densely populated and environmentally significant area that encompasses North Sandy Pond, South Sandy Pond as well as approximately 4.6 miles of Lake Ontario shoreline. In 2017, Lake Ontario rose to record and dangerously high levels. The resulting flooding compromised homes and structures along the lake and connected pond shores as well as surrounding low-lying areas, necessitating a local state of emergency. In addition to the devastating and obvious surficial impacts from the high lake levels, the flooding had less noticeable but no less devastating impact on residential septic systems in the area. Thousands of private septic systems were flooded, resulting in untreated waste entering the groundwater and surface water and contaminating surrounding private wells and waterways.

Municipal water was installed to serve a majority of the lake/pond areas in 2016, and the remainder of the lake/pond areas within the Town will be served municipal water by 2021. Municipal water; however, does not solve larger problems such as the contamination of the watersheds in the area, nutrient impacts to the water bodies and threats to public health due to septic contamination. According to NYSDEC Water Inventory/Priority Waterbodies (WI/PWL) listing, North Pond is assessed as needing verification of impacts and on-site septic systems are listed as a probable cause of negatively impacting the water body. Recreational uses of North and South Sandy Pond may be impaired by nitrogen and phosphorus and resulting algal blooms and plant growth in the shallow waters. The Lake Ontario/Little Sandy Creek Watershed WI/PWL listing revised in 2016 is included as Appendix A to this report.

In 2017, The Town of Sandy Creek received an Engineering Planning Grant (EPG) and has spent the past two (2) years attempting to identify solutions to the failing and inadequate on-site septic systems. There has been public informational meeting to gauge public interest and help select the greatest areas of need, interest surveys and regular discussions at Town Board meetings. Based on the community feedback, the desire and understanding of the importance of a municipal sewer system is strong. However, a significant portion of interest survey respondents and meeting attendees expressed their concern over user costs and affordability. This community feedback has vital to develop a proposed service area along the shorelines of Lake Ontario, South Sandy Pond, and North Sandy Pond – serving the population that needs and wants municipal sewers. Results of the interest survey are on display at the Town of Sandy Creek offices and continues to be a topic of discussions throughout the Town. Public feedback will continue to be sought as the project develops.

Several alternatives were evaluated to provide municipal sewer to the target service area. Alternatives for de-centralized sewer systems, gravity collection main, low-pressure collection main, and multiple centralized treatment alternatives were considered. Through a comprehensive evaluation of available information, it was determined that a low-pressure collection system to a new centralized wastewater treatment plant is the most feasible, preferred and recommended alterative to meet the project needs.

The project is estimated to cost $50,084,000 and could likely begin construction in 2024 with receipt of sufficient funding. A number of funding opportunities are available and are being actively pursued by the Town of Sandy Creek in order to help protect the environment and provide resiliency and safety to the community at an affordable cost.

ABBREVIATIONS

ADD	Average Daily Demand
BMP	Best Management Practice
C	Celsius
CCI	Construction Cost Index (ENR)
cfs	Cubic feet per second
CT	concentration x time
DEC	New York State Department of Environmental Conservation
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
DOT	New York State Department of Transportation
DWSRF	Drinking Water State Revolving Fund
ECL	Environmental Conservation Law
EDU	Equivalent Dwelling Unit
EFC	New York State Environmental Facilities Corporation
ENR	Engineering News-Record
EPA	United States Environmental Protection Agency
F	Fahrenheit
fps	Feet per second
gpd	Gallons per day
GML	General Municipal Law
gpm	Gallons per minute
HGL	Hydraulic Grade Line
hp	Horsepower
HPGN	High Precision Geodetic Network (1998)
IUP	Intended Use Plan
ISO	Insurance Services Office
LF	linear feet
MHI	Median Household Income
MGD	Million gallons per day
NAD83	North American Datum (1983)
NAVD88	North American Vertical Datum (1988)
NPSHa	Net positive suction head available
NPSHr	Net positive suction head required
NYSCC	New York State Canal Corporation

ABBREVIATIONS (cont'd)

NYSDOH	New York State Department of Health
NYSOPRHP	New York State Office of Parks, Recreation, and Historic Preservation
OCHD	Oneida County Health Department
OIN	Oneida Indian Nation
OMB	Office of Management and Budget
PAC	Powdered activated carbon
PACl	Polyaluminum chloride
PER	Preliminary Engineering Report
PHF	Peak Hourly Flow
ppm	parts per million
psig	Pounds per square inch (gauge)
Q	Volumetric flow rate (gpm, MGD)
scfm	Standard cubic feet per minute (68 degrees F and 1 atmosphere)
SEQR	State Environmental Quality Review
SPDES	State Pollutant Discharge Elimination System
SWPPP	Storm Water Pollution Prevention Plan
TDH	Total dynamic head
THM	Trihalomethane
TSS	Total suspended solids
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

1.1. Authorization

In 2017, the Town of Sandy Creek received an Engineering Planning Grant (EPG) from NYS Environmental Facilities Corporation (EPG # 76039) to evaluate the feasibility of installing a municipal sewer system in the Town of Sandy Creek. In January 2018 the Town of Sandy Creek retained the services of Barton & Loguidice, D.P.C. (B&L) to prepare the evaluation. This report describes different options for the Town to form a sewer district with a collection and treatment system to serve residents of the Town of Sandy Creek.

1.2. Background

In recent history, properties along Lake Ontario, North Sandy Pond and South Sandy Pond in the Town of Sandy Creek have experienced increasingly high water levels during the spring and early summer, in response to the increased melting of winter snows and increased spring rainfall totals. These shoreline properties are generally smaller properties; many of which were multi-generational seasonal homes that have since been converted to year-round residences. On-site sewage treatment/septic systems are therefore stressed during normal lake levels. The high lake levels have caused groundwater levels to rise above underground septic tanks and septic systems rendering them useless. In response, the Town has begun to seek a long-term solution for these problems, such as a municipal sewer system.

A municipal sewer system can resolve these health and safety issues by collecting the sewage from the residents in the threatened areas, conveying it to a treatment facility, and properly treating the wastewater. This would reduce contamination to the North and South Sandy Ponds and protect thousands of residents in the Town from the many harmful effects of inadequate septic systems.

The Town does not currently contain any municipal wastewater infrastructure. This study includes an evaluation of alternatives for the Town to both collect and treat its residents' wastewater.

1.3. Scope of Work

This study examines alternatives for the sewer system and wastewater treatment and the associated implementation costs. This report also assesses the feasibility of the various alternatives for the Town. The scope of services for this Preliminary Engineering Report are outlined below. Each component is discussed in further detail in the remainder of the report.

- Identify and review available data, information, reports, facilities plans, and site evaluations such as, but not limited to, soils information, Health Department/NYSDEC reports, tax maps, proposed zoning maps, aerial/GIS images, agricultural district maps, floodplain maps, wetland maps and interest surveys
- Estimate future design flows and loads
- Evaluate potential alternative solutions for municipal sewers in the Town

- Study and evaluate the potential solutions to meet the Town's requirements
- Recommend to the Town the solution that meets the requirements of the Town
- Provide a financial analysis and project outline for the recommended alternative
- Preparation of PER in accordance with the NYSEFC Engineering Report Outline for New York State Wastewater Infrastructure Projects, Effective October 1, 2017

2.0 PROJECT BACKGROUND AND HISTORY

2.1. Site Information

2.1.1. *Location*

The Town of Sandy Creek is located in the Northwestern quadrant of Oswego County, New York along the eastern coastline of Lake Ontario. An initial Town-wide interest survey and Public Informational Meetings were conducted in 2017 in an attempt to solicit feedback from Town residents and identify areas of need and interest in municipal sewers in the Town. Based on that feedback, the collection system focus area generally includes the parcels west of NYS Route 3 including the communities along South Sandy Pond and North Sandy Pond.

Nearby communities consist of the Town of Richland to the south, Villages of Sandy Creek and Lacona to the east, and Town of Ellisburg in Jefferson County to the north. In Appendix A, the project location can be seen in Figure 2-1 and a land cover map of the project location is included as Figure 2-2.

2.1.2. *Geographic Conditions*

The United States Department of Agriculture's Web Soil Survey was used to determine the various soils located in the proposed service area. The most common types of soil among those in the service area of North Pond is Scriba gravelly fine sandy loam and Ira gravelly fine sandy loam. Slopes in the area begin at 0 to 3 percent and range up to 25 to 50 percent. In the extended service area including the surrounding villages, Scriba gravelly fine sandy loam is still the most prominent, followed by Ira and Sodus very stony soils. A soil map for the sewer district, Figure 2-3, and the USGS Soil Survey can be found in Appendix B.

2.1.3. *Environmental Resources*

Preliminary screening through the New York State Department of Environmental Conservation Environmental Resource Mapper has identified that the project is located within the vicinity of significant natural communities, rare plants and animals, and state regulated wetlands. The proposed service area is located along the shorelines of Lake Ontario, South Sandy Pond, and North Sandy Pond. A number of wetlands mapped by the NYSDEC and USFWS National Wetlands Inventory are located within and near the project area. Mapped NYSDEC and NWI resources are illustrated in Figure 2-4 and Figure 2-5 located in Appendix C. A copy of the Environmental Resource Map is included in Appendix D. It also includes a map of the eastern lake Ontario basin and a list of nearby waterbodies. Due to the close proximity of these significant natural communities, rare plants and animals, wetlands and other environmental resources, the district boundary will be created and finalized in consultation with the NYSDEC.

2.1.4. *Floodplain Considerations*

Much of the proposed sewer collection system area is located in low lying areas along the shore of Lake Ontario primarily consisting of small lots lacking adequate septic separation as per requirements by NYSDEC Appendix 75-A. Many of these areas are located in the FEMA designated 100-year and 500-year floodplains zones of Lake Ontario, South Sandy Pond, and North Sandy Pond, as well as multiple tributaries to these waterbodies. Figure 2-6 in Appendix E shows the FEMA Flood Zone designations for the area. Additionally, there are no agricultural districts in the project area, as shown in Figure 2-7 also locate in Appendix E.

2.2. Ownership and Service Area

2.2.1. *Facility Ownership*

Currently there are no existing municipal sanitary sewer collection systems or wastewater treatment plants within the proposed service area in the Town of Sandy Creek. There are two (2) wastewater treatment plants in nearby communities; the nearest one being the Village of Pulaski WWTP located about six (6) miles southeast of the project area.

The proposed municipal sewer system would be owned, operated and maintained by the Town of Sandy Creek.

2.2.2. *Presence of Outside Users*

There are currently no public sewer systems in the Town of Sandy Creek so there are no outside users. If a wastewater collection and treatment system were to be installed to serve the western portion of the Town of Sandy Creek, it is possible that the Village of Sandy Creek and the Village of Lacona would form new or additional sewer districts in the future that could be conveyed to the proposed wastewater treatment plant. If a WWTP were to be constructed for this project, it would be designed such that it could be expanded to incorporate these additional flows.

2.2.3. *Industrial Users*

Currently, there are no industrial properties in the proposed sewer district. The project area consists mainly of residential and light commercial properties. Light commercial properties generally consist of restaurants, marinas, campgrounds and small stores – supporting the residential population and visitors to the region.

2.2.4. *Population Trends and Projected Growth*

Census data indicates that the Town of Sandy Creek has seen an 11.8% growth rate between 1990 and 2000, and a 2.0% increase from 2000 to 2010. This data is summarized in Table 2-1. Based on this information, the anticipated population growth rate in the Town of Sandy Creek is 14.0% over the next 20 years (2039). The estimated Town population in Year 2039 is therefore 4,766.

Table 2-1: Population Data Taken from U.S. Census

	Population			
Town	1990	2000	2010	2039 Estimate
Sandy Creek	3,454	3,863	3,939	4,766
		(+11.8%)	(+2.0%)	
Note: Estimated 2039 population based on growth rate from 1990 to 2010				

2.2.5. *Anticipated Development*

The Town of Sandy Creek is anticipating modest growth of 10% in the form of light commercial and residential development over the next 20 years.

3.0 EXISTING FACILITIES

3.1. Description and History

Currently there are no existing public sewer facilities within the service area however there are several permitted small treatment facilities, which are listed below in Table 3-1. The Village of Pulaski WWTP and Felix Schoeller Technical Papers WWTP are located adjacent to the project area and are larger facilities with the potential to accept additional flows.

Table 3-1: Permitted Discharge Facilities Near Project Area

NPDES ID	Facility Name	Address	Permit Issued Date	Permit Expired Date
NY0213705	Corner Laundry	Main & Lake St Sandy Creek, NY 13145	02-24-2014	05-31-2024
NY0213748	The Snackery	Route 11 North Sandy Creek, NY 13145	12-14-1999	08-01-2005
NY0155195	Bears Sleepy Hollow Park	7081 Scenic Highway Pulaski, NY 13142	07-08-1991	08-01-1996
NY0216321	Brennan Beach RV Resort LLC	80 Brennan Beach Road Pulaski, NY 13142-2231	04-03-2013	08-31-2018
NY0020257	Pulaski (V) WWTP	48 Riverview Drive Pulaski, NY 13142	04-30-2014	11-30-2019
NY0231673	Pulaski Bulk Station	Po Box 25 Pulaski, NY 13142	12-31-1991	02-01-1997
NY0000515	Felix Schoeller Technical Papers, Inc.	179 County Route 2A Pulaski, NY 13142	05-01-2011	04-30-2016
NY0213845	Green Haven Community	332 Ellisburg Road Oswego, NY 13126	04-01-2015	08-31-2020

3.2. (V) Pulaski Wastewater Treatment Plant

The Village of Pulaski Wastewater Treatment Plant is located on Riverview Drive in the Village of Pulaski, about six (6) miles southeast of the project area and operates under SPDES permit number NY-002-0257. This 0.65 MGD wastewater treatment facility treats all the wastewater from the residents of the Village of Pulaski. Current flows to the WWTP meet regulatory requirements. However, estimated flows and loads for the proposed project area are almost double the current capacity of this plant, therefore any significant additional flows would require an expansion to the facility. The current WWTP site is very space constrained, therefore an expansion of the site would be a significant undertaking.

3.3. Felix Schoeller Paper Company Wastewater Treatment Plant

The wastewater treatment plant for the Felix Schoeller Paper Company is located on Centerville Road in the Town of Richland, about 10 miles southeast of the project area and operates under SPDES permit number NY-0000-515. This wastewater treatment plant formerly treated in excess of 2 MGD when the facility was in full operation, however the facility no longer produces paper and now treats primarily sanitary-only flows of less than 40,000 gpd. Current flows to the WWTP are treated with a series of wastewater treatment ponds or lagoons following solids removal within the septic tank. The facility is very aged and a complete overhaul would be required in order to treat significant flows again, however it could be a good opportunity to repurpose the facility for municipal use.

4.0 PROPOSED SERVICE AREA AND ESTIMATED WASTEWATER FLOWS AND LOADS

4.1. Need for Project

4.1.1. *Health and Safety*

In recent years, the communities along the shoreline of Lake Ontario have received increasing public attention because of the significant flooding during the early spring months and lingering throughout the summer. High water levels have threatened homes, businesses, and multiple fragile environments and ecosystems along the shoreline of Lake Ontario which have caused residents to ask what can be done to protect their homes, businesses, and above all, their health and safety. This area does not currently have a centralized sewer collection and treatment system so many of the homes use on-site sanitary sewer collection and treatment systems, buried below the surface of the ground. When flooding occurs, these systems become submerged in groundwater and begin to leak out into the groundwater and eventually into the nearby South Sandy Pond, North Sandy Pond, and Lake Ontario. This threatens the health and safety of not only the residents living in the community, but tourists, fishermen, and other people who use the nearby waters for recreational or commercial purposes. There is a need for a solution to this problem in order to protect all of these people from diseases caused by inappropriate collection and treatment of wastewater.

4.1.2. *Environmental Protection*

The project area is known for a number of unique and important species and ecosystems. Land along the coastline is part of a unique dune ecosystem home to a number of threatened or endangered dune grasses, other plants, and animals and birds like the Piping Plover. This is a unique ecosystem that can only be found in a few locations around the country. Multiple government agencies and other organizations have dedicated time and funds towards the protection of these unique environments and the threatened and endangered species they support. These efforts will be considered a waste if no efforts are taken to protect the land and waters around them from inadequate wastewater treatment and collection systems. Removing untreated sewage from the ponds in the area would further support these efforts to restore and improve the ecosystem and environmental health of the ponds and surrounding areas.

Additionally, the rising number of pollutants in the waters in the project area will increase the number of harmful algal blooms experienced in the area. These represent an imbalance in the nutrients and pollutants found in the water and can endangered the health and safety of the residents in the area and all of the wildlife that depend on those ecosystems for their water and food needs. There have already been an increasing number of incidents of harmful algal blooms caused by an increase of nutrients in the ponds, for which leaching from failing on-site septic systems is a likely cause or a significant contribution.

4.1.3. *Residential Need*

Increased flooding in recent years has raised public interest in solutions that protect the homes, businesses, and health and safety of the residents in the area. Efforts have been made to provide more resilient infrastructure to protect the residents of the area. Recently, a public drinking water project for the Town of Sandy Creek installed drinking water mains throughout the proposed project area. This project successfully provided safe and reliable drinking water to the residents in these communities, protecting them from rising floodwaters and other environmental concerns. However, now that the project has provided the residents with safe and reliable drinking water, the residents in the area have now begun requesting a public sewer system to better protect their health and safety and provide a reliable manner of wastewater collection and treatment. As mentioned, existing on-site sewer systems are inadequate to properly treat the wastewater from the residents, both during flooding events and after. The small property size of each of the residential parcels along the lakefront is insufficient for adequate treatment of wastewater for the on-site septic systems. An interest survey and a public information meeting in 2017 showed that the residents in the area have an outstanding need for safe and reliable collection and treatment of their wastewater in order to protect their health, safety and their environment but are sensitive to user costs and affordability of a municipal sewer system.

4.1.4. *Summary of Need*

Clearly there is a dire need for a public sanitary sewer collection and treatment system to protect the health and safety of the public and the number of fragile ecosystems in the project area. The residents of the area have established their need for such a system and have shown great interest in a project to help meet these goals. Rather than implementing multiple projects to serve smaller portions of the larger service area, it is important to complete one large project to implement a public wastewater collection and treatment system. There is a great need *now* for the project, and splitting the large project into multiple smaller projects will only increase the length of time it would take to implement a solution and meet the needs of the residents and the environment. As will be discussed further, it would be difficult to determine which areas would receive the benefits of a public system now and which would have to wait longer for a solution to protect their health and safety. Multiple smaller projects would increase the total cost of implementing a solution, would increase the length of time until final completion, and would increase the difficulty for the Town to coordinate each project then operate and maintain multiple districts. Completing one large project meets the goals of the project with the most efficiency, decreasing the time for implementation and total cost of the project, making it easier for all stakeholders to coordinate and communicate, and provide a solution for the residents now. One large project would protect the health and safety of the residents and visitors and improve the resiliency of the area while providing increased opportunities for economic development.

4.2. Proposed Project Area

The Town of Sandy Creek has held several public information meetings and has performed extensive interest surveys throughout the proposed collection area. Based on estimated project size, interest survey results, public informational meetings and outreach and review of evaluations and alternatives considered in the past, the Town of Sandy Creek has established the target service area for the new sewer system. The proposed sewer service area includes parcels along the shoreline of Lake Ontario, South Sandy Pond, and North Sandy Pond and surrounding areas. As previously discussed, the actual sewer district boundaries will be determined in coordination with the Town, public and review agencies. However, for the purposes of this report, collection system and treatment plant alternatives discussed in the subsequent sections will be sized appropriately for the flows and loads for this proposed service area.

4.3. Service Area Equivalent Dwelling Unit (EDU) Assessment

2018 Oswego County Parcel data was utilized for the proposed Town of Sandy Creek Sewer District service area, and as summarized to show; Parcel ID, primary owner, local street address, property classification code with brief description, and the estimated EDU assessment. Based on this estimate, there are approximately 1,145 total parcels representing 1,113 EDUs. An expanded table of EDU assessments for each parcel is included in Appendix F. A summary of the property classes, parcels, and associated EDUs is shown as Table 4-1 below.

Future districts could include areas of the Village of Sandy Creek and the Village of Lacona, which have associated EDUs of 390 and 270, respectively. For the purposes of this report, these potential additional users are not included. The WWTP would be located and constructed with these potential additional flows in mind such that the WWTP could be readily expanded to accommodate.

Table 4-1: Proposed Town of Sandy Creek Sewer District EDU Assessment

Property Type	Number of Parcels	Number of EDUs
Agricultural (100s)	1	2
Residential (200s)	892	899
Vacant (300s)	222	112
Commercial (400s)	9	68
Rec & Entertainment (500s)	12	24
Community Services (600s)	1	2
Industrial (700s)	0	0
Public Services (800s)	0	0
Public Parks (900s)	8	6
Total	1145	1113

4.4. Estimated Wastewater Flows and Loads

Actual flow data for the proposed service area is unknown since each is treated by private sewage collection and treatment systems. However, the estimated flows and loads from the proposed Town of Sandy Creek sewer district was calculated considering; service area water using EDUs, average household size, and Ten States Standards typical loading coefficients. According to the 2015 U.S. Census, the average household size in the Town of Sandy Creek was 2.44. The flow was calculated assuming the average household would produce approximately 100 gpd per capita of sanitary wastewater flow. Table 4-2 below provides the Basis of Design for the flows and loads. Appendix G includes a detailed table with current and future estimated flows and loads.

Table 4-2: Estimated Flows and Loads (2019)

Number EDU[1]	Projected Wastewater Flows (gpd)		Projected Waste Loads (lbs/day)	
	Avg. Daily[2]	Peak Hourly[3]	BOD_5[4]	TSS[5]
1,113	271,600	944,900	462	543

[1]Includes all developed parcel EDUs (including residential, vacant, and commercial).
[2]Calculated as (# EDU) x (100 gpd/capita) x (2.44 persons/EDU).
[3]Calculated as (Avg. daily flow) x (3.50 peak factor) - Peaking factor according to Ten States Standards.
[4]Calculated as (#EDU) * (2.44 persons/EDU) x (0.20 lb BOD_5/capita-day).
[5]Calculated as (#EDU) * (2.44 persons/EDU) x (0.25 lb TSS/capita-day).

Table 4-3: Estimated Flows and Loads (future)

Number EDU[1]	Projected Wastewater Flows (gpd)		Projected Waste Loads (lbs/day)	
	Avg. Daily[2]	Peak Hourly[3]	BOD_5[4]	TSS[5]
1224	298,700	1,028,800	508	597

[1]Initial EDU + 10% for future area growth.
[2]Calculated as (# EDU) x (100 gpd/capita) x (2.44 persons/EDU).
[3]Calculated as (Avg. daily flow) x (3.40 peak factor) - Peaking factor according to Ten States Standards.
[4]Calculated as (#EDU) * (2.44 persons/EDU) x (0.20 lb BOD_5/capita-day).
[5]Calculated as (#EDU) * (2.44 persons/EDU) x (0.25 lb TSS/capita-day).

5.0 DE-CENTRALIZED SEWER SYSTEM ALTERNATIVES

Decentralized sewer systems can serve smaller populations and can be located to serve similar service areas as the proposed service area. There are three (3) possible de-centralized sewer system alternatives to consider; (1) On-site treatment systems, (2) Small, cluster collection/treatment systems, and (3) Project phasing.

5.1. On-Site Treatment Systems

On-site treatment systems are the current method of wastewater collection and treatment for a number of residents in the proposed project area. There are a number of systems available to homeowners on the market; however, these systems generally cost between $20,000 and $40,000. These systems are typically only installed in isolated instances and are not typically used to serve a regional need. These systems require regular maintenance, without which they can cause a significant additional burden. Additionally, decentralized sewers are not nearly as resilient as a municipal collection and treatment system where trained and qualified staff are responsible around the clock to keep the system functioning properly.

Historically, the Town of Sandy Creek lakeshore and Sandy Pond areas have experienced high groundwater and lakeshore flooding. This flooding is significantly contributing to failure of on-site treatment systems – many of which do not meet current design standards. This is a major premise of the need for this study and project. Following review of the USDA Natural Resources Conservation Service Web Soil Survey soil characteristics for the service area, the identified soils are not conducive for subsurface disposal systems. For these reasons, the use of on-site treatment systems is not a preferred alternative for this project and therefore will not be considered further.

5.2. Cluster Systems

Small collection and treatment systems, also known as cluster systems, are a form of decentralized sewer systems that treat small areas or neighborhoods, each individually with their own system. These systems are popular for small, isolated areas where there is a small cluster of homes with a need for wastewater collection and treatment. Similar to the on-site treatment systems, this is not a popular method to collect and treat wastewater for a larger regional area due to the inefficiency and high cost of operating and maintaining several smaller systems. Additionally, the increased number of facilities to operate and maintain increases the risk of failure compared to a centralized, municipally controlled and operated facility. Responsibility for the construction, operation and maintenance of such facilities at multiple locations would fall on the Town. For the reasons of inefficiency, cost, and size of proposed project area, this alternative is not preferred, is not considered feasible to meet the project needs, and therefore will not be considered further.

5.3. Multiple Project Phases

Another decentralized alternative would be to split the proposed service area into multiple projects and project phases thereby decreasing the project area for each project into smaller pieces of the community. However, as previously discussed in Section 4.1.4, this would significantly increase the time required to fully meet the needs of the entire proposed service area and address the environmental and health concerns of the public. Additionally, the cost of completing multiple smaller projects would be much higher than the cost of completing one larger project due to the number of fixed costs associated with multiple phases of a project, including funding, permitting, design, and construction. There would also be uncertainty for funding for the future projects and phases because funding is not always guaranteed. A number of smaller projects is also difficult to implement and coordinate between lawmakers, residents, and contractors. There is a need for the project now in order to protect the health and safety of the residents as well as protecting the number of important ecosystems in the area. It would be difficult to decide which residents and which areas would benefit first and which areas would have to wait to receive such benefits from a sewer system. Multiple projects would require multiple sewer districts in such a small area which would increase the administrative difficulty for the Town to operate and maintain multiple small districts and systems. For the reasons of inefficiency, cost, and size of proposed project area, this alternative is not preferred, is not considered feasible to meet the project needs, and therefore will not be considered further.

6.0 SANITARY SEWER COLLECTION SYSTEM ALTERNATIVE

6.1. Gravity Collection System Alternative

Gravity sewers are typically manhole-to-manhole sections of pipe that have a constant slope downward to a discharge point. Typically this discharge point is either a pump station or WWTP. Because of the constant downward slope, if topography is constantly changing or flat (e.g., along lakeshore areas such as this), gravity sewers require extremely deep excavation. In place of the deeper excavation, gravity sewer systems will have intermediate pump stations to lift sewage up and discharge it to gravity sewers that continue to slope downward. This continues until the next discharge point, either another pump station or WWTP. This type of system requires additional pump stations and contributes to a higher capital cost when compared to a low-pressure collection system.

Based on the following design, cost, and operational considerations, a gravity sewer system is not considered feasible for this project and therefore will not be considered further:

- Project area topography would require an excessive number of pump stations;
- Excessive depth of excavation would be required near the lakeshore for long runs of gravity sewer;
- Potential for future infiltration and inflow in an area of high ground water;
- Excessively deep laterals would be required to serve homes along the proposed sewer alignments;
- Higher capital cost of gravity sewer, and
- Additional operating costs of the associated pump stations.

6.2. Low Pressure Sewer Collection System Alternative

Low-pressure sewer systems are characterized by small diameter low –pressure force mains. Mains can be installed via traditional open cut or trenchless technologies at minimum depths sufficient to prevent freezing. The depth or lack of excavation reduces the extents of disturbance and minimizes installation costs and environmental disturbance. Additionally, low-pressure systems minimize costs to homeowners whose homes are an excessive distance from the main, which is typically located in the highway right-of-way. The success of low-pressure sewers is proven in lakeshore communities and has been shown to be a more economical solution for providing wastewater collection in similar service areas.

To develop the low pressure alternative, B&L will use the design assistant software developed by Environment One. The design assistant software uses the theory of simultaneous operation of grinder pumps as the basis for the preliminary design of the low-pressure system. This method optimizes the velocity within the low-pressure mains while keeping total dynamic head within the operating range of the Environment One grinder pump. The low pressure model will be developed assuming the installation of a grinder pump at each parcel in the proposed Sewer District, including vacant parcels. This assumption takes into consideration future growth in the District and appropriately sizes the low pressure system to handle increased flows as

development occurs throughout the 30-year design life of the system. The model will be developed for the entirety of the Sandy Creek Sewer District. This is anticipated to be completed in the future alternative and design phases.

The sanitary sewer collection alternative could generally include the installation of a low-pressure collection system consisting of 2-inch, 3-inch, 4-inch, 6-inch, 8-inch, and 10-inch HDPE low-pressure main. The low-pressure sewer system would collect wastewater within the proposed Town of Sandy Creek Sewer District Boundary and would convey flows to whichever treatment plant is chosen. For occupied properties within the Sewer District, the project would include installation of a grinder pump and a discharge force main (typically 1-1/4-inch HDPE), connecting the grinder pump to the low-pressure collection system, and installation of the electrical improvements and grinder pump control panel required to power each grinder pump. Upon connection to the new sewer collection system, existing septic tanks will be decommissioned. In summary, the proposed improvements provides a "turn-key" project whereby all connections and connection costs are included.

6.3. Impact on Existing Facility

There are currently no existing municipal sewer systems in the Town of Sandy Creek. The construction of this public sewer collection system will also include the decommissioning of existing private septic tanks.

6.4. Land Requirements

The Town of Sandy Creek Sewer District will be constructed within the State, County, and Town road Right-of-Way (ROW) as much as practicable. In locations where the ROW is unfit for construction, easements will be required to construct the collection system on privately owned property.

6.5. Environmental Impacts and Mitigation Measures

The proposed sewer collection system is not expected to have any permanent impact on floodplains as all sewer main will be located below-ground. As mentioned, the project includes the decommissioning of existing private septic systems. Many of these systems lack appropriate space requirements and are constructed along the banks of the shore of Lake Ontario, North Sandy Pond, or South Sandy Pond. The construction of the collection system will eliminate improper leaching of septic systems into the lake and ponds, thus improving water quality.

6.5.1. *SEQR/SERP Compliance and Overview*

The project would be reviewed as Type 1 Action under SEQRA. This process would involve completion of the Full Environmental Assessment Form and coordinated review with all potentially involved or interested agencies.

6.5.2. *Wetlands and Surface Waters*

The proposed project area crosses multiple NYSDEC-mapped streams, many of which are protected by the NYSDEC under Article 15, Protection of Waters. These streams are also likely to meet the criteria for federal regulation. In addition, the project area is located in the vicinity of multiple wetlands mapped by the NYSDEC and USFWS National Wetlands Inventory. Permits from the NYSDEC (Article 15, Article 24) and USACE (Section 404, Nationwide Permit 12) may be required if wetlands, streams, or the 100-foot adjacent areas of state-regulated wetlands will be disturbed by the project. Disturbances to wetlands and streams associated with the project are anticipated to be temporary in nature.

6.5.3. *Threatened and Endangered Species*

The proposed project is within the range of a number of federally listed northern long-eared bat (*Myotis septentrionalis*, threatened), piping plover (*Charadrius melodus*, endangered), and bog turtle (*Clemmys muhlenbergii*, threatened), as well as a number of additional state-listed threatened and endangered species. The project area is also partially within designated critical habitat for the piping plover. Wetland delineations and habitat assessments will be completed during project design to document whether suitable habitat for threatened and endangered species is within the project area. Potential impacts to these threatened species or their habitats would be reviewed in detail during design. Timing restrictions may be implemented during construction in order to minimize potential adverse impacts to these species.

6.5.4. *Cultural and Historic Resources*

The project area is partially located within an archaeologically sensitive area designated by the NYS Historic Preservation Office (SHPO). In addition, one (1) property (Holyoke Cottage) within the project area is listed on the National Register of Historic Places. Coordination within SHPO would be initiated during project design in order to avoid or minimize potential impacts to cultural and historic resources. The SHPO may request a Phase 1 Cultural Resource investigation for actions that involve ground disturbance in previously undisturbed areas.

6.5.5. *Environmental Permit Summary*

Temporary or permanent disturbance to state jurisdictional streams and wetlands and/or the 100-foot adjacent areas of state wetlands would likely require permits under Article 15 and Article 24 from the NYSDEC. Regulated activities within the Coastal Erosion Hazard Area along Lake Ontario may require an Article 34 permit from the NYSDEC. It is noted that the proposed sewer district boundaries in the vicinity of the Coastal Erosion Hazard Area will be established with concurrence from the NYSDEC. As previously mentioned, the district boundary will be created in coordination with the NYSDEC. In addition, the project would likely require a SPDES General Permit for Stormwater Runoff from Construction Activities from the NYSDEC.

Temporary or permanent disturbances to federally jurisdictional wetlands or waterbodies would likely require a Section 404 Clean Water Act permit from the USACE and associated Section 401 Water Quality Certification from NYSDEC.

6.5.6. *Noise Level Impacts*

During the period of construction there may be a temporary increase in noise pollution associated with the construction vehicles and equipment. These temporary impacts will be mitigated during the design and construction process, by contractually limiting work hours during the construction. No permanent impacts on noise levels are anticipated to result from the project.

6.5.7. *Air Pollution Impacts*

During the period of construction there may be a temporary increase in air pollution associated with the dust and fossil fuel emissions from construction vehicles and equipment. These temporary impacts will be mitigated during the design and construction process. No permanent air pollution impacts are anticipated to result from the project.

6.6. Water and Efficiency Measures

All new individual grinder pumps will be installed with premium efficiency motors to reduce energy consumption. Additionally, the pumps at the pump station will be installed with premium efficiency motors and lighting at the pump station will be LED to reduce energy consumption.

6.7. Schedule and Constructability

The sewer collection system will be constructed offline while home owners remain on their private septic systems. The sewer collection system will be connected to the WWTP. The individual grinder pumps will be installed and the private septic tanks will be decommissioned after the grinder pump system is placed into service. Construction of the collection system is anticipated to occur over 18 months beginning in 2024.

6.8. Opportunities for Green Infrastructure

The water and efficiency measures and environmental impacts sections above speak to the opportunity for green infrastructure. Using energy efficient equipment and eliminating private septic systems provides a great benefit to the quality of life of the users in the new district, and improves water quality of Lake Ontario, North Sandy Pond, and South Sandy Pond for recreation and the ecosystems which inhabit it.

6.9. Project Capital Cost

The estimated construction cost (2024 dollars) of the proposed Town of Sandy Creek Sewer District collection system is summarized in Table 6-2 below. A full itemized cost estimate is included in Appendix H at the conclusion of this report.

Table 6-1: Estimate of Probable Construction Cost – Collection System

Line Item	Associated Cost
Collection System Construction Total	$18,302,000
Subtotal (2024 Dollars) (3% Inflation/year)	$21,217,000

6.10. Anticipated O&M Cost(s)

The anticipated annual O&M for the Town of Sandy Creek Sewer District collection system is approximately $35,500. The annual collection system O&M cost will be split amongst the parcels in the Sewer District, excluding the vacant parcels, with each parcel paying an amount based on their EDU assessment. The collection system O&M is independent of the WWTP O&M which is discussed in the subsequent sections. A summary of the collection system O&M costs is shown in Table 6-2.

Table 6-2: Collection System Anticipated O&M

Line Item	Associated Cost
Collection System Labor	$31,000
Electrical Usage	$4,500
Total Annual Collection O&M	$35,500

6.11. Short-Lived Asset Costs

A table of short-lived assets (SLA) and the anticipated reserve account needed for replacement of the equipment in the collection system is included in Appendix I. The estimated annual short-lived reserve account needed to offset the replacement of the short-lived assets in the collection system is approximately $94,100. The annual collection system SLA reserve account will be split amongst the non-vacant users in the Sewer District with each parcel paying an amount based on their EDU assessment.

7.0 WWTP ALTERNATIVES

The Town of Sandy Creek Sewer District collection system as proposed will require treatment of a significant quantity of wastewater flows. The treatment plant that will treat this wastewater needs to be capable of handling the influent flows, and consistently meet the SPDES Permit Effluent Limits, while keeping capital and O&M costs low. Alternatives considered include:

1. Conveying the wastewater to an expanded and improved Village of Pulaski WWTP,
2. Conveying the wastewater to an improved Felix Schoeller Paper Company WWTP, and
3. Construction of a new WWTP within or immediately adjacent to the proposed service area.

7.1. Village of Pulaski Alternative

As noted above the existing WWTP serving the Village of Pulaski is located approximately six (6) miles from the project service area. Additionally, the facility will require an expansion on the already space constrained site. For the purposes of this report, it is estimated that the project cost for the necessary WWTP improvements is $6 Million. As shown in Appendix J, the total estimated project cost to pump/convey wastewater to an improved/expanded Village of Pulaski WWTP is $12,064,000.

7.2. Felix Schoeller Technical Papers Alternative

As noted above the existing WWTP serving the Felix Schoeller WWTP is also located approximately six (6) miles from the project service area. The facility has ample capacity; however, will require significant improvements to adequately treat the additional flows, including but not limited to, wet well improvements/replacement, new primary clarifiers, biotower media replacement, valve replacements throughout and lagoon cleaning. For the purposes of this report, it is estimated that the project cost for the necessary WWTP improvements is $8 Million. As shown in Appendix J, the total estimated project cost to pump/convey wastewater to an improved Felix Schoeller Technical Papers WWTP is $16,292,000.

7.3. New WWTP

A new WWTP could be constructed within or adjacent to the project area – generally central to the service area around the intersection of County Route 15 and NYS Route 3. For estimation purposes of this report, it is assumed that a flow-through Sequencing Batch Reactor (SBR) is utilized. The discharge for the WWTP would be piped/pumped to a discharge into Lake Ontario or possibly a groundwater injection discharge. The preferred site would be approximately 3- to 4-acres minimum with sufficient space for future expansion. The assumed WWTP would consist of:

- Influent fine screen
- Influent aeration/EQ chamber
- Two-basin, flow-through SBR design
- Aerobic digestion

- Sludge press, storage and haul-out area
- UV effluent disinfection
- Stand-by generator
- Site fencing
- Paving & associated site improvements
- Control building/maintenance facility including:
  - Blowers
  - Electrical/control room
  - Laboratory/work room
  - Bathroom
  - Maintenance garage
  - Chemical room(s)

As shown in Appendix J, the total estimated project cost for a new WWTP that would be capable of treating all current and future flows and loads from the proposed service area would be $10,500,000.00

8.0 RECOMMENDED WWTP ALTERNATIVE

Based on the treatment technology alternative analysis in Section 6, a treatment process alternative has been developed for the proposed new Sandy Creek WWTP.

8.1. WWTP Proposed Treatment System

The proposed treatment process will be designed to treat the estimated flows and loads from the proposed service area. Additionally, the WWTP system and site will be designed for future expansions to treat increased loads from possible future Village of Sandy Creek and Village of Lacona sewer districts. As previously mentioned, the proposed treatment system would generally include the following:

1. Influent fine screen
2. Influent aeration/EQ chamber
3. Two (2)-basin, flow-through SBR design
4. Aerobic digestion
5. Sludge press, storage and haul-out area
6. UV effluent disinfection
7. Stand-by generator
8. Site fencing
9. Paving & associated site improvements
10. Control building/maintenance facility including:
    a. Blowers
    b. Electrical/control room
    c. Laboratory/work room
    d. Bathroom
    e. Maintenance garage
    f. Chemical room(s)

8.2. Impact on Existing Facility

There is currently no existing facility so there will be no impact on such a facility.

8.3. Storm and Flood Resiliency

The proposed WWTP will be located outside of the 100-year flood zone. However, as the entire project area and adjacent land is located within the 500-year flood zone, the WWTP will be constructed within this area. The WWTP will be designed and constructed as to minimize any impacts of severe flooding on the operation of this facility.

8.4. Land Requirements

The Town of Sandy Creek will be required to acquire ownership of a parcel of land. This land will be large enough to construct the proposed WWTP building and operations while leaving more room for future upgrades and expansion.

8.5. Environmental Impacts and Mitigation Measures

The parcel of land for the WWTP will be chosen based on minimization of impacts to floodplains, environmental or cultural resources. Any mitigation measures determined necessary will be completed.

8.6. Discharge Permit Requirements

As previously mentioned, there is no existing system therefore no discharge permit has yet been acquired. This Discharge Permit and requirements will be determined at a future time in coordination with DEC during the facilities design process.

8.7. Water and Energy Efficiency Measures

New pumps and equipment motors will be installed with premium efficiency motors where applicable. Site lighting and building lighting will use LED fixtures to maximize energy efficiency. High efficiency blowers will be utilized with DO control if applicable (air requirements likely to be controlled by mixing air).

8.8. Schedule and Constructability

All buildings and treatment systems for the proposed WWTP will be constructed offline in parallel to the conveyance system work. In general, the new equipment will be able to be commissioned prior to being placed into service. Construction of the WWTP improvements is anticipated to occur over 18 months beginning in 2024.

8.9. Opportunities for Green infrastructure

Most of the treatment plant improvements and energy efficient measures previously discussed will provide opportunities for reducing the WWTP's carbon footprint to the extent possible. Porous paving will be explored for the site to reduce on-site run-off. Plantings will be incorporated into the site to provide shade and aid in stormwater runoff. If sufficient land and budget is available, solar power may be explored to offset the additional energy usage.

8.10. Project Capital Cost

The estimated capital cost 2024 dollars) of the proposed Town of Sandy Creek WWTP is summarized in Table 8-1 below.

Table 8-1: Estimate of Probable Construction Cost – WWTP Improvements

Line Item	Associated Cost
Treatment Plant Construction Total	$10,500,000
Subtotal (2024 Dollars) (3% Inflation/year)	$12,172,000

8.11. Anticipated O&M Cost(s)

The anticipated annual O&M for the WWTP considering all anticipated processes is approximately $142,000. A summary of the O&M costs and breakdown of the first year costs for each service area is shown in Table 8-2.

Table 8-2: WWTP Anticipated O&M

Line Item	Associated Cost
Plant Operator(s) Labor	$66,000
Electrical Usage	$29,000
Chemicals	$7,000
Sludge Disposal	$11,000
Testing/Contractual	$12,000
Equipment Repair/Rehab	$10,000
Miscellaneous	$7,000
Total Estimated Annual WWTP O&M	$142,000

8.12. Short-Lived Asset Costs

A table of short-lived assets and the anticipated reserve account needed for replacement of the equipment at the WWTP is included as Appendix I. The estimated annual short-lived reserve account needed to offset the replacement of the short-lived assets at the WWTP is approximately $21,000. The reserve budget will allow for replacement/rehabilitation of equipment if/when they fail throughout the useful life of the WWTP.

9.0 RECOMMENDED PROJECT FINANCING

9.1. Basis of Selection

The alternatives recommended based on project cost, constructability, and impacts is the creation of a Town of Sandy Creek Sewer District, construction of a low-pressure sewer conveyance system and construction of a new Town of Sandy Creek WWTP. There is a legitimate need for a sewer collection system in the Town of Sandy Creek to eliminate private, on-site septic systems which are a likely pollutant leaching into Lake Ontario, South Sandy Pond, and North Sandy Pond. Construction of the Town collection system and WWTP will ultimately improve the water quality, and quality of life and health for lakeside residents, ecosystems and aquatic life in the Town of Sandy Creek. A figure of the recommended project can be found in Appendix K.

9.2. Total Project Cost Estimate

The estimated project cost and maximum amount to be expended for the Town of Sandy Creek Sewer District and WWTP construction is approximately $50,084,000, as shown in Table 9-1.

Table 9-1: Estimate of Probable Cost

Line Item	WWTP Construction	Collection System	Total
Construction Total (2019)	$10,500,000	$18,302,000	$28,802,000
Construction Total (2024) (3% Inflation/year)	$12,172,000	$21,217,000	$33,389,000
Contingency (20%)	$2,434,500	$4,243,500	$6,678,000
Engineering, Legal, Administration (25%)	$3,652,000	$6,365,000	$10,017,000
Total Estimated Capital Project Cost			$50,084,000

9.3. Preliminary Plan of Finance

There are various funding options available for Town of Sandy Creek Sewer District and WWTP Construction Project. Typically, core funding opportunities from government programs such as the NYSEFC Clean Water State Revolving Fund (CWSRF) or USDA Rural Development (RD) are sought after. Both funding programs provide interest subsidies and grant funding to make municipal sewer improvement projects affordable for the average user. If core funding is not available from these funding agencies, a long-term municipal bond is usually the best option for project financing.

Each Town user served by the sewer system would be charged on an equivalent dwelling unit (EDU) basis. The EDU derives its equity on the basis that a single-family residence is equivalent to one (1) unit. Based on this method of assessment, as summarized in Section 5.1, there are an estimated 1,187 EDUs in the Town of Sandy Creek Sewer District.

9.3.1. *Core Funding - NYSEFC*

The Town of Sandy Creek intends to list the North & South Sandy Pond Sewer Project on the 2019-2020 CWSRF Final Intended Use Plan (IUP) Annual List. To qualify for hardship financing the median household income (MHI) of the Town must be less than 80% of the 2017 statewide adjusted MHI ($62,765), or have an MHI between 80%-100% ($50,212-$62,765) of the 2017 statewide MHI and have a Poverty Rate of greater than 11.3%. According to the U.S. Census data, the Town of Sandy Creek has a 2017 MHI of $58,750 and a 2017 Poverty Rate of 11.4% and therefore qualifies for hardship financing based on the Census data. With sufficient point score, the project therefore appears to be eligible for hardship financing consisting of a 30-year, 0% interest loan for up to $20 million.

9.3.2. *Core Funding – NYSEFC Water Infrastructure Improvement Act (WIIA)*

The NYSEFC administers the WIIA Grant Program which can provide grants for Clean Water projects up to 25% of the net project cost (total cost minus all other grants) – up to $5 Million for projects up to $50M, up to $12.5M for projects between $50M and $100M and up to $25M for projects over $100M. The Town of Sandy Creek is eligible to apply for this grant program. Submission dates vary from year to year but are generally in late-summer/early-fall of the submission year.

9.3.3. *Core Funding – NYSDEC Water Quality Improvement Program (WQIP)*

The NYSDEC administers the WQIP Grant Program which provides grants for implementation projects that directly address documented water quality impairments. Grants can range from $5,000,000 with a max award of $10,000,000 for high priority projects including disinfection equipment, disconnecting combined sewer systems, removing phosphorus and nitrogen, or removing community-wide privately owned septic systems. Applications are due with the annual CFAs, generally in July of each year.

9.3.4. *Core Funding – Rural Development*

Rural Development (RD) has funding available for municipal projects for municipalities with a population of 10,000 or less. The funding determination for RD is based on a Target Service Charge (TSC) that is established by RD based on a percentage of the area's MHI and similar systems costs. RD offers loan financing for 38 years and potentially at a reduced interest rate (estimated at 2.8%). If the resulting user charge with RD loan financing is above the TSC, additional grant dollars are available. Grant dollars may be available to each project to reduce the user charge to the TSC. If the resulting user charge with RD loan financing is below the TSC, no additional grant dollars would be available.

9.3.5. *NYS Resiliency and Economic Development Initiative (REDI) Grant*

The Governor of New York, Andrew Cuomo, announced that $300 million in funding is available to communities impacted by Lake Ontario flooding. The grant is meant to assist local governments in responding to and recovering from the flooding. This project is meant to increase the resiliency of infrastructure in the project area, protect the health and safety of the residents and visitors, and protect the unique and fragile ecosystems found in the area while also promoting and supporting economic development within the region. As previously mentioned, Lake Ontario flooding has placed the ecosystems in the project area in danger of increased harmful algal blooms, for which improper wastewater leaching is most likely a primary cause. These blooms endanger the health and safety of the residents of the area, their pets and animals, and all other animals who live in or travel through the area including the tens, if not hundreds, of thousands of visitors that come to the region annually to enjoy boating, fishing, swimming and the unique ecosystems the area has to offer. This project will help to promote increasing economic development to the areas because increased resiliency will be more attractive to new businesses looking for a location. This project is the best example of everything the Governor is trying to accomplish and protect through this grant program and therefore is a stellar candidate for a grant through the program.

9.4. Summary of Preliminary Funding Plan

User charge ranges are provided for the Sandy Creek Sewer District and WWTP Construction Project in Table 9-2 below which highlights projected Hardship Financing and varying grant subsidies. The corresponding monthly debt service charge would be paid in addition to the O&M costs discussed previously. The target Preliminary Funding Plan includes obtaining Hardship Financing (0% Interest), grant funding through the DEC WQIP program, and the Governor's REDI Grant program. The preliminary funding plan results in an estimated first year user cost of $777.

Table 9-2: First Year User Cost

Funding Scenario	Cost
2024 Estimated Total Project Cost	$50,084,000
Maximum WQIP Grant	$10,000,000
NYSEFC Hardship Loan (30-year Term, 0.0% interest)	$20,000,000
Additional Grant (i.e. REDI Grant, etc.)	$13,250,000
CWSRF/WIIA Grant	$6,708,500
Annualized Hardship Loan (Levelized Payments)	$666,667
Annualized Hardship Loan (50% Rule)	$533,333
Remaining Loan Balance (30-year Term, 3.25%)	$125,500
Annualized Market-Rate Loan (Levelized Payments)	$6,612
Number of Town Users (EDU's)	1113
Annual Debt Service Cost Per Town EDU	$485
Annual SLA Reserve Contribution Cost Per Town EDU	$115
Annual O&M Cost Per Town Occupied EDU	$177
Total First Year User Cost	$777

9.5. Supplemental Funding – Consolidated Funding Application (CFA)

There are various funding opportunities that are available through New York State's Consolidated Funding Application (CFA). The CFA is an avenue where applicants are able to access multiple State funding sources through one (1) application. The eligibility criteria differs between each program, but protection of public health, protection of the environment, energy conservation, and/or economic development are key factors in many applications. The programs, sponsoring agencies and funding types for which this project is or may be eligible are included in the following summary table, Table 9-3.

Table 9-3: Summary of Key Funding Programs

Program Name	Sponsoring Agency(ies)	Funding Type
Clean Water State Revolving Fund (CWSRF) (Base Funding)	New York State Environmental Facilities Corporation (NYSEFC)	Subsidized and Market Rate Financing Grants up to 25% of Net Project Costs
Small Cities Community Development Block Grant Program (CDBG)	Housing and Community Renewal (HRC)	Grants to $750k for public infrastructure projects; up to $1M with co-funding
Rural Utilities Service Water and Wastewater Disposal Loan and Grant Program	U.S. Department of Agriculture – Rural Development (RD)	Low-interest variable rate loans to 38 years; 750k/+ Grants
Government Efficiency-Planning/Implementation	Department of State	Grant with local match
Green Innovations Grant Program (GIGP)	NYSEFC	Grant with local match
Water Quality Grant Program	New York State Department of Conservation (NYSDEC)	Grants, variable dollars Up to 75% of Disinfection Cost and 40% of Comprehensive WWTP Upgrade
Economic Development Waterfront Revitalization	Empire State Development; Appalachian Regional Commission	Grant program with local match

10.0 RECOMMENDED STEPS TO PROCEED

The following are the anticipated steps to proceed and are mostly dependent on grants received and financing provided for the project.

Table 10-1: Proposed Project Schedule Milestones

Milestone Item	Schedule Date
PER Submission to DEC and EFC	Fall 2019
Receive initial funding application results	Winter 2019
Additional public outreach, PIM's	Summer 2020
SEQR, District Formation, Bond Resolution	Fall/Winter 2020
Submit CFA (WQIP) Grant Application	Summer 2021
Submit WIIA Grant Application	Fall 2021
Project Design & Permitting	2022 / 2023
Construction	2024 - 2028