
APPENDIX B
CLEAN WATER STATE REVOLVING FUND
ENGINEERING REPORT

N+P Engineering, Architecture & Land Surveying PLLC, March 2024

HAMLET OF RIVERSIDE

SEWER DISTRICT FORMATION

MAP & PLAN

REPORT

TOWN OF SOUTHAMPTON
RIVERSIDE, SUFFOLK COUNTY, NEW YORK

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Section 1 Executive Summary

1.1 General

The Town of Southampton is looking to revitalize the hamlet of Riverside. The community has seen a lack of interest from developers in all sectors of development for years. Much of the usable land is vacant, abandoned or underdeveloped. The hamlet is within the US Census Bureau's Riverside Census Designated Place (CDP), which has been documented as the most economically distressed community in both Suffolk and Nassau counties. Many underutilized and vacant properties that exist presently contribute to the ongoing disinvestment and blight in the community. The lots' on-site conventional sewage disposal systems discharge effluent into the ground. The portion of the community located within the Central Pine Barrens has been found to be discharging effluent with nitrogen concentration nearly double the recommended maximum concentration level allowed by the Pine Barrens Guidelines (Guideline 5.3.3.1.3). This directly affects the Pine Barrens as it is an important resource that recharges the sole source aquifer utilized by Suffolk and Nassau Counties for their drinking water supply.

For these reasons, the Town has entered into a Public-Private Partnership (PPP) with a master developer, Renaissance Downtowns (RD), to develop a plan to revitalize the community, while considering all of the potential challenges such a task may face for this particular community. In partnership with the Town and the community, RD developed the Riverside Revitalization Action Plan (RRAP)¹ which was then approved and adopted by the Town. The overall goals of the RRAP are to:

- Position Riverside as a Gateway of the Town, retain and attract a diverse and multicultural population that includes young professionals and members of the innovation and knowledge economies to promote the Town as a preeminent regional destination.
- Create a true sense of place, utilizing smart growth and sustainable development principles that meets the needs of current residents and attract future residents and businesses.
- Facilitate the creation of a mixed use and walkable Gateway Center to enhance the vibrancy of the Riverside Hamlet Center and create a diversity of uses (to live, work, shop, learn, and play).
- Complement Riverhead's downtown area and leverage the proximity of the Long Island Railroad station and availability of bus service.
- Reinforce a sense of community and neighborhood identity.
- Enhance the character and overall visual environment of the community.
- Promote housing choices with a broad range of housing types and price points including attainable and market-rate housing options.
- Expand the property tax base and provide additional employment opportunities.
- Incorporate municipally owned property located within the community to achieve an effective redevelopment strategy; and provide an avenue for private property owners to partner with the public sector and RD to foster the redevelopment of underutilized assets for the benefit of both themselves and the community.
- Leverage existing assets and proximity to maritime resources along the Peconic waterfront, natural assets, recreation areas, preserved open spaces of the Pine Barrens region, and proximity to Riverhead's downtown area.
- Attract business, residents and visitors to stimulate the local economy and position Riverside as a tourist destination with access to both the north and south forks and the many assets they possess.

¹ Referenced reports (e.g. RRAP, ROD, BOA, etc.) can be found at the Town of Southampton website at: <http://www.southamptontownny.gov/960/Riverside-Revitalization-Action-Plan-RRAP>

It has been noted by several studies conducted for the hamlet, as well as the RRAP, that one of the key features required for the community to achieve these goals is a collection system ultimately discharging to a centrally located Sewage Treatment Plant (STP) which will help protect groundwater and public health.

This report will lay out in detail the various elements plaguing the community and its natural resources as well as a detailed description of the proposed method for wastewater conveyance and treatment from the community to spark redevelopment and begin the revitalization process.

There are two major aspects when considering the necessary infrastructure for conveyance of the proposed wastewater. The first aspect is a wastewater collection system throughout the entire community. The collection system will need to be extended to the farthest points of the community in order to serve all the properties within the community and allow the entire community to benefit from the proposed revitalization. Due to the size and topography of the community, the collection system will likely need to be broken into several sections and/or sub-sections. Each sub-section will be served by a gravity collection system and if necessary, a satellite pump station and force main to pump to one of the three main pump stations to be directly connected to the proposed STP. The locations of the collection system, pump station, and the force main for each sub-section will be selected strategically such that connecting a new sub-section to the main pump station can be done without interrupting the operation of the active pump station. The pumping stations and force main network will allow the wastewater collected by gravity pipes to be routed from the low point of each sub-section to a designated location, in this case the proposed treatment facility. Both the satellite pump stations and main pump stations will be designed with available capacity for future connections.

The proposed pumping stations will need to be located in dedicated areas that will be owned and controlled by the Town. It is estimated that each pump station will require approximately 1,225 square feet of area for all equipment, controls and accessories. Four Pump Stations and associated force main systems will need to be constructed to relay the sanitary flow to the proposed treatment facility. There will be two pump stations directly connected to the proposed STP, each of which will serve individual sub-sections. The third pump station will be connected directly to the STP. The fourth pump station will be a satellite station of the third pump station and will serve the remaining sub-sections. The Pump Stations will be located on the lots designated as Suffolk County Tax Map (SCTM) Numbers 0900-138-02-29.1, 0900-118.1-1-4, 0900-139-02-70.1, and 0900-140-02-57.1. Since these lots are not currently owned by the Town, the required areas will need to be assessed for taking.

The proposed wastewater treatment facility, hereinafter referenced as the Riverside STP, is proposed to be designed to accept flow from the entire community via the collection and pump station systems. After treatment, the flow will be conveyed and discharged into a leaching pool system for ground discharge. The total sanitary flow used is the anticipated average total of 800,000 GPD from the project area which produces a proposed design population of 10,667 per the Great Lakes – Upper Mississippi River Board (GLUMRB) Standards, also known as the 10-states standards. The proposed STP will be located on a dedicated area consisting of seven lots totaling 10.82 acres and designated as the Suffolk County Tax Map (SCTM) Numbers 0900-141-01-9.14, 9.17, 9.25, 9.29, 9.30, 9.31 & 9.32. The lots are currently undeveloped and unimproved. Descriptions of the system and locations will be described later in this report.

The Town of Southampton and RD have worked together to collaborate on a vision that complements the community's vision as well as the Town's goals while meeting the strict regulatory standards subjected to the project. Regulatory standards limit the amount of sewage generation of new developments per parcel to be served by conventional system(s). While the regulatory restrictions are intended to protect the community's health and natural resources, it deters redevelopment of the area. For this reason, the ROD was created and adopted by the Town to entice development. Since the hamlet of Riverside currently does not have infrastructure in place for wastewater collection and large-scale treatment of sewage flow, the existing developed areas are forced to utilize conventional on-site sewage disposal systems such as cesspools and/or septic tank and leaching pool systems. This limits the size of new developments per lot, which also deters redevelopment in this area.

It has been determined, as was mentioned earlier and will be discussed in greater detail later in this report, that the existing nitrogen levels being introduced to the pine barrens/aquifer exceed maximum allowable quantities. This is due in large part to the conventional on-site sewage disposal systems currently installed throughout the community. The ability to reduce or reverse the existing negative impact on the County's

aquifer would be significantly more attainable with the construction of a STP system capable of treating the flow for the entire community with a nitrogen reduction program in the treatment process.

Over the years several evaluations for the community have been developed to guide the Town in the revitalization process. Two of the most recent evaluations include the RRAP, which is the Town's adopted Action Plan, prepared by RD and the Riverside Brownfield Opportunity Area Study (BOA) prepared by Nelson, Pope, & Voorhis (NP&V), an environmental planning and land use consulting firm. The RRAP directly resulted in the creation and Town's adoption of the ROD. Performed in congruence with the ROD was the GEIS by NP&V which describes relevant conditions, impacts, mitigations and findings the outlined actions may have on the environment.

Below is a list of the numerous public policy planning documents that were commissioned by the Town with other agencies, to identify the various challenges the hamlet is facing and suggested means by which to address them. Each of the previously conducted studies have indicated infrastructure as a barrier preventing redevelopment of the community. Specifically, the lack of a sanitary collection system and a centralized STP was indicated as a primary barrier. These planning studies include but are not limited to:

- The Town of Southampton 1999 Comprehensive Plan Update
- The 2004 Flanders/ Riverside/ Northampton Revitalization Study
- The 2006 Blight Study; the 2008 Riverside Hamlet Plan
- The 2008 Draft GEIS for the Riverside Hamlet Plan
- The 2009 Riverside Urban Renewal Plan
- The 2013 Flanders Riverside Corridor Sewer Feasibility Study
- A Suffolk County Department of Public Works traffic circle assessment and redesign study.

The overall goal of these studies has been to revitalize the community with uses that would restore the character and functionality of the hamlet, promote economic development, provide housing and employment opportunities, and ensure adequate capital infrastructure, in order to revitalize the hamlet center.

The 2013 Flanders-Riverside Corridor Sewer Feasibility Study addressed sewage collection, treatment and effluent discharge requirements, associated capital and operational costs, as well as the economic and environmental benefits associated with sewerage the Flanders-Riverside Corridor. The Study also concluded that there was not an existing STP within a mile of the Community that had the additional capacity to serve the Hamlet and instead suggested that a new facility with advanced nitrogen removal capability be constructed. Several potential sites for a proposed STP were identified. However, this report utilizes a separate location not considered by the 2013 study.

The DGEIS explored a Theoretical Development Scenario (TDS) that examined the potential buildout of the Study Area over a period of ten (10) years. The FGEIS stated in Section 3.0 Comments and Responses, that the TDS estimated that new development would generate 538,065 GPD and 171,072 GPD of existing flow would remain. Therefore, total sanitary wastewater estimated by the TDS is 709,137 GPD. However, it has since been determined that the average anticipated flow generated by the community is approximately 800,000 GPD. This flow would need to be collected and piped to the proposed STP for tertiary level treatment. The new sanitary conveyance system and treatment facility must be capable of accommodating the total estimated 800,000 GPD of average sewage flow (2.344 Million Gallons per Day (MGD) – Peak) and comply with Suffolk County siting, design operation, and all applicable public health standards and environmental regulations. The siting of the STP and leaching area will also be based upon the space required to expand the plant for an additional 100% of sanitary flow. Based on the anticipated flow requirements a new plant would require a footprint of 232 feet by 165 feet (i.e., 38,280 SF or 0.88 of an acre) and approximately 207,360 sf (4.76 acres) of land which accounts for 200% of the effluent leaching structures required by the regulatory agencies to operate the system. Land area required for 100% future expansion of the STP and leaching system would be 0.88 acre and 2.38 acres respectively. So, the total land area of the system footprint inclusive of the 100% future expansion would be 8.92 acres. Siting the system in this community is constrained by numerous factors, such as:

- High groundwater
- Groundwater contributory areas to surface waters (with associated travel times)
- Public wellfield capture zone.
- Pine Barrens Compatible Growth Area regulations
- General site needs (minimum area requirements, setbacks).

The County requires a minimum setback of 200 feet around a proposed STP to protect adjacent habitable space and 150 feet to the nearest property boundary. Considering 150 ft. of the required setback from the property lines, the total land area needed for the new STP and leaching system including the required future expansion is estimated to be approximately 11 acres. The STP and the leaching system will be housed on the same property.

Generally, based on Article 6 of the Suffolk County Sanitary Code, new conventional septic systems may be installed on sites if not more than 300 GPD of sewage density load is discharged per acre on that land in the Community south of SR 24, while 600 GPD/acre is the threshold in the Community north of SR 24. Also, nitrogen treatment at proposed facilities must comply with all SPDES discharge permit requirements, Central Pine Barrens, and Peconic Estuary TMDL standards unless variances are granted and any associated mitigations are implemented. If STP's are not constructed or not available for service or do not have the capacity to serve future development, there can be no development in the community within the ROD.

The attached Proposed Overall Site Plan and Proposed STP Site Plan shows the proposed location of the new STP and leaching area within the Community. The STP is shown with a 200-foot buffer as well as the proposed on-site leaching field location. The STP and leaching field is proposed to be located in the Enterprise Zone industrial subdivision site. Figure 3-14 from the BOA report depicts areas with a depth to groundwater of ± 12 feet. The location for the proposed STP is in an area where depth to groundwater is greater than 12 feet. Actual depths to groundwater and soil analyses would have to be determined to further verify these assessments prior to construction. Also, the proposed STP location is in undisturbed Pine Barrens which would necessitate additional clearing that may need to be offset.

The attached Proposed Overall Collection System Site Plan shows the proposed location of the collection system main layouts, pump stations, and force main layouts. Three of the total four proposed pump stations are located in RPL zones and the fourth is located in Zone RO-3. Zone types are described in greater detail later in this report. Three of the four PS locations are in areas where depth to groundwater is greater than 12 feet. In all locations, buoyancy will need to be considered, with actual measurements of depth to groundwater.

As shown, there has already been considerable investment in the area and a commitment to revitalization by the Town which has culminated in the current partnership with RD, preparation of the RRAP and Riverside Overlay District (ROD), a rezoning plan of the area, to entice redevelopment of the area, and support for redevelopment through interagency coordination to achieve partnerships and buy-in that is necessary to achieve the level of redevelopment appropriate for ensuring future success.

Since the current codes and restrictions for sanitary disposal has hindered any development, the most plausible solution to promote growth within the community is the construction of a centrally located STP. In order to benefit from a STP, infrastructure must first be laid in to accept the sanitary flow from the community. The creation of a wastewater conveyance system and STP would benefit the Riverside community in numerous ways. The combined utilities would be able to process larger volume of wastewater than septic systems so development would not be limited because of restrictions on the wastewater. The addition of both facilities is expected to have economic benefits by allowing more development and environmental benefits by reducing the amounts of contaminants and nitrogen released into groundwater.

Constructing a wastewater conveyance system and STP will benefit the local community as well as the rest of the island. It is the recommendation of this report for the construction of a gravity collection system combined with localized pumping stations ultimately discharging to a Sequencing Batch Reactor (SBR) STP to service the entire community. Later in this report, the conveyance system location and STP location, as well as the benefits to its construction, will be described in more detail.

Section 2 Project Background & History

2.1 General – Site Information

The Riverside Hamlet (Riverside CDP) encompasses a total land area of 5.2 square miles of which 5.1 square miles is uplands and 0.1 square miles is underwater land. A significant portion of its area is preserved as open space. The hamlet of Riverside is located in the northwestern portion of the Town of Southampton, in Suffolk County, New York. Riverside is an older, moderately dense suburban community consisting primarily of single family neighborhoods, three mobile home parks, a scattered mix of mostly small one to two story commercial and industrial buildings, several scattered institutional uses (churches, police barracks, an elementary school, and a head start facility), and parklands and nature preserves. Most of the commercial/business uses in the hamlet are located along SR 24 (also known as Flanders Road) or near the Riverside/Riverhead traffic circle where five State and County arterial roads and one local residential street intersect. The area is generally flat and slopes towards the existing Peconic River to the north.

The Community is located south of the Peconic River, east of Little Peconic River, and north of the David A. Sarnoff Preserve - a designated Bird Conservation Area which is one of the largest undisturbed Pine Barrens on Long Island. To the southwest of the Community is the Cranberry Bog Nature Preserve, a wooded area with trails surrounding Swezey Pond and a former cranberry bog. All of these nearby resources suggest an environmentally complex and beautiful natural setting. The setting that surrounds the community is idyllic and yet, the community of Riverside is economically depressed, blighted, and home to a community that is dealing with a variety of negative social issues. While some members of the community work hard to maintain their properties, many homes and businesses are in disrepair and yards and vacant properties are strewn with debris and refuse. Numerous buildings are boarded up and some have been vacant for many years.

The hamlet is within the US Census Bureau's Riverside Census Designated Place (CDP), which has been documented as the most economically distressed community in both Suffolk and Nassau counties. The entire service area is located within the areas designated as being part of the NYS DEC Disadvantaged Communities (DAC). There are only two lots within the service area that are identified as being part of the NYS DEC Designated Potential Environmental Justice Areas (PEJA). These lots are located west of Peconic Ave, north of the traffic circle. These designations applied to the Hamlet reinforce the need for revitalization. There will be no negative impacts to these areas caused by the wastewater conveyance and treatment systems.

2.1.1 Location

It is suggested that the gravity collection system trunk lines be located within the road right of ways and the pump stations be located on dedicated portions of existing lots. Each dedicated area will require approximately 1,225 square feet of area for all equipment, controls and accessories. The Pump Stations will be located on the lots designated as Suffolk County Tax Map (SCTM) Numbers 0900-138-02-29.1, 0900-118.1-1-4, 0900-139-02-70.1, and 0900-140-02-57.1. Since these lots are not currently owned by the Town, the required areas will need to be assessed for taking.

It is suggested that the proposed STP be located on a dedicated area consisting of the following lots totaling 10.82 acres and designated as the Suffolk County Tax Map (SCTM) Numbers 0900-141-01-9.14, 9.17, 9.25, 9.29, 9.30, 9.31 & 9.32. The lots are currently undeveloped and unimproved.



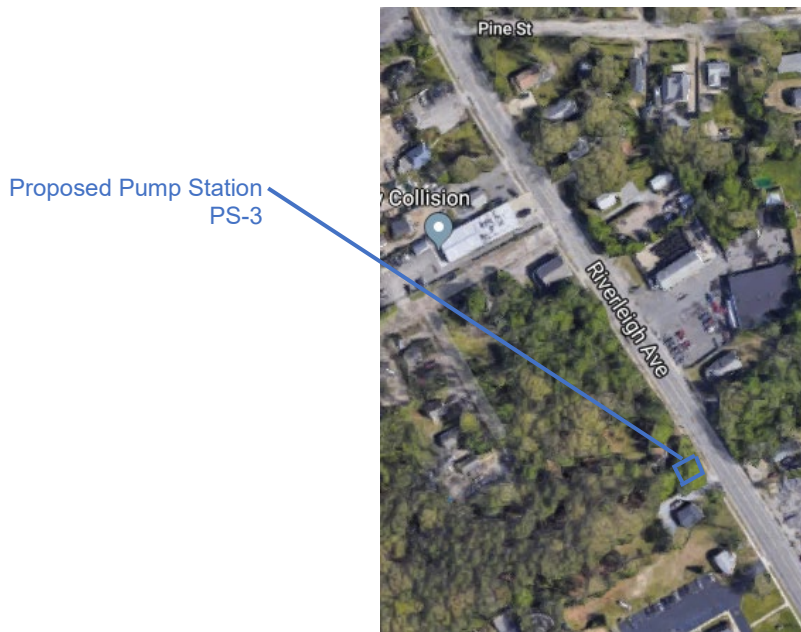
Source: Google Aerial view (accessed September 7, 2018)



Source: Google Aerial view (accessed May 4, 2018)



Source: Google Aerial view (accessed May 4, 2018)



Source: Google Aerial view (accessed May 4, 2018)

2.1.2 Geologic Conditions

The proposed pump stations elevations vary, PS-1 is at elevation 16, PS-2 is at elevation 7, PS-3 is at elevation 20.5, and PS-4 is at elevation 21. Pump stations 1, 3 & 4 are located in areas where the depth to groundwater is more than 12 feet. The proposed STP location is at approximately elevation 20, where the depth to groundwater is more than 12 feet. According to the USGS Water-Table and Potentiometric-Surface Altitudes in the Upper Glacial, Magothy, and Lloyd Aquifers of Long Island, New York, April-May 2013² (USGS Groundwater Contour Map), the groundwater is approximately at elevation five (5).

The soil type at the proposed STP location is classified as primarily Carver and Plymouth sands with zero to three percent (0% - 3%) slopes (CpA). Further sub-soils investigation is required to determine the exact classification of the existing soil at both locations. This will also be required for the formal design report as enforced by the SCDHS.

2.1.3 Environmental Resources

The Riverside hamlet is surrounded by significant natural resources including the Peconic River and protected open space contained in the nearby Central Pine Barrens. Much of the land surrounding the hamlet is protected open space, including lands held by the Town of Southampton, Suffolk County and the State of New York. These natural assets provide various benefits but can also present constraints to redevelopment due to their unique qualities, importance to the community, and vulnerability to impacts. Regulations and conditions related to development in proximity to wetlands and surface water bodies present limitations. Development is complicated by the goals and regulations of special overlay districts and general restrictions related to wastewater treatment, aquifer protection and Wild, Scenic and Recreational River Corridors. Each of these programs or special districts and the related implications for future redevelopment are described in this report and more detailed in the RRAP and BOA.

² See USGS Water-Table and Potentiometric-Surface Altitudes in the Upper Glacial, Magothy, and Lloyd Aquifers of Long Island, New York, April-May 2013 Map - Exhibit A

The Central Pine Barrens has a significant presence in the hamlet and other area communities and represents the last significant wilderness area on Long Island. It is an important resource that must be protected as it provides the recharge of the sole source aquifer which is used as Long Island's exclusive drinking water supply. The "Central Pine Barrens Comprehensive Land Use Plan" outlines numerous techniques to protect and preserve this important natural resource. The construction of a centralized treatment facility would reduce possible sources of contamination and help to preserve the integrity of the Central Pine Barrens and its many natural functions and resources.

Below is a summary inventory and analysis of the existing natural resources and environmental features for the community as well as the anticipated impacts due to the proposed conveyance and treatment systems.

2.1.3.1 Surface Waters

The Community is bordered by the Peconic River, Little Peconic River, and Black Creek Pond and contains three small freshwater ponds, as well as several small freshwater and tidal wetlands (Figure 3-8 from the BOA report depicts designated New York State Wild, Scenic and Recreational Rivers Areas and Figure 3-9 from the BOA report shows NYSDEC designated wetlands and Figure 3-10 from the BOA report shows National Wetland Inventory wetlands). These features are important natural resources that are or may be vulnerable to contamination from sanitary discharges or other unresolved environmental conditions. Surface waters and wetlands and their adjacent areas are regulated by federal, state and local laws administered by the US Army Corps of Engineers (Section 10 of the Rivers and Harbors Act), NYSDEC (Articles 24 and 25 of the Environmental Conservation Law and NYS Wild, Scenic and Recreational Rivers Act), and/or the Town of Southampton (Chapter 325 of the Town Code). Various policies, guidelines, and consistency reviews are also required pursuant to the Central Pine Barrens Comprehensive Land Use Plan, Peconic Estuary Comprehensive Conservation and Management Plan, and other resource protection plans and policies to protect these resources from degradation to support their many important functions and uses. (See also DGEIS, October 8, 2015, Pages 4-1 thru 4-19.). The protection, mitigation of impacts, and/or restoration of valued natural resources will help to ensure a healthy, well balanced and sustainable community.

The closest down gradient open surface water from the proposed STP is the Peconic River Estuary which is 1,130± feet due north of the proposed STP leaching area. Groundwater time of travel to the river from the STP is between 2-5 years, and depth to groundwater varies at the project site. The proposed STP will provide tertiary level wastewater treatment far exceeding the current effluent quality of septic systems and cesspools operating in the area, including some areas that are densely developed and have a relatively shallower depth to groundwater. All stormwater at the STP site will be controlled and recharged into the ground and stormwater and erosion and sedimentation controls will be consistent with Town standards.

2.1.3.2 Groundwater

Near the Peconic River, groundwater flow is generally north toward the river; therefore, on the south side of the river within the Community, flow is generally to the north or north-northeast and the time of travel of groundwater to the Peconic River ranges between days in areas immediately adjacent to the river to as much as 10 to 25 years at the south end of the Community near the intersection of Ludlam Avenue and Pebble Way (Figure 3-13, Groundwater Travel Time Plan, from the BOA report). Depth to groundwater from the ground surface is variable within the Community depending on surface elevations and how near or far from the river depth to water is measured due to increased ground surface elevations to the south with distance from the river. Based on available water table data compiled by the County, depth to groundwater in the Community ranges from near zero at a few locations near the river to approximately 35 feet at the south end of the Community between Oak Court and Elm Court in the Riverwoods Community. General depth to groundwater zones are shown in Figure 3-14 from the BOA³ report and are discussed in greater detail in the DGEIS.

³ See Figure 3-14 of the BOA by NP&V – Exhibit C

Long Island's freshwater aquifers (primarily the Upper and Magothy Aquifers) are generally considered to contain a significant volume of potable water, especially within deep recharge areas in the Central Pine Barrens, the Town's Aquifer Protection Overlay District (APOD) and the region's Special Groundwater Protection Area (SGPA), where the underlying groundwater reservoirs are very thick and contain considerable uncompacted coarse grained sand and gravel with significant storage capacity.

All of Nassau and Suffolk Counties' businesses and residents rely on groundwater for potable water. Since groundwater is the only source of potable water on Long Island, the EPA has designated the Island's groundwater supply as a "sole source aquifer" pursuant to the Federal Safe Drinking Water Act. This designation, along with burgeoning population growth, increasing water demands, and threats to groundwater quality from land activities, all point to the need to protect this vital resource for future generations. For these reasons, various state, regional, and county agencies have expended considerable effort in identifying the best ways to protect groundwater resources, and in so doing so have commissioned numerous studies that have culminated in a variety of plans, policies, laws and standards for regulating activities that may jeopardize groundwater quality (CPBJPPC, 1995; Long Island Regional Planning Board (LIRPB), 1992; Nassau-Suffolk Regional Planning Board (NSRPB), 1978; and SCDHS, 2008, 2004 and 1987.). Substantial planning and regulatory efforts have also been undertaken by the Town of Southampton to ensure the protection of groundwater resources.

Land located south of the SR 24 (with the exception of a small area of land located north of SR 24 and west of Peconic Avenue) in the Community is within several groundwater management areas:

- Central Pine Barrens Compatible Growth Area (CPBJPPC, 1996);
- Town of Southampton Aquifer Protection Overlay District (APOD);
- Town of Southampton Central Pine Barrens Overlay District (CPBOD) (which serves to implement the regional Central Pine Barrens Plan in the Town of Southampton);
- Central Suffolk Special Groundwater Protection Area (South) (LIRPB, 1992); and
- Suffolk County Groundwater Management Zone III (SCDHS, 2004).

Land located north of SR 24 is within Groundwater Management Zone IV and is not within any special groundwater protection areas. (See also DGEIS, October 8, 2015, Pages 4-1 thru 4-19.)

The area of Long Island under which the largest volume and highest quality of potable groundwater is found is the pine barrens area, which occupies much of the east-central portion of Suffolk County, an area dominated by lesser amounts of development and extensive tracts of natural forest. The forest composition of the area which has adapted to the unique soil properties of the area provides treatment of water entering the aquifer. The Long Island Pine Barrens Protection Act (the Act), signed into New York State law in 1993, established a State-assisted process to preserve those portions of the pine barrens so that the public potable water supply and overlying natural areas would be protected.

Pursuant to the Act, the CPB Joint Planning & Policy Commission (the Commission) was established, to prepare and administer the Comprehensive Land Use Plan (CLUP) to regulate future growth in the CPB. This plan was prepared and adopted in 1995 and was added to the NYS Environmental Conservation Law as Article 57. As intended by the Act, the CLUP provides procedures for the review of development applications in the Pine Barrens Compatible Growth Area (CGA), based on a set of specific guidelines and standards. It is noted that, with few exceptions, development opportunities in the CPA are limited. Standards and guidelines for compatible development were established for areas located in the CGA in order to sustain habitat and unique ecosystems and preserve the quality of groundwater recharge in the region.

In addition to setting the standards and guidelines by which the Commission would review development applications, the CLUP allows for local municipalities to administer and conduct review of applications in the CPB. Such review must be performed under a locally-enacted ordinance that would be subject to the review and approval of the Commission. For applications undergoing local review, the CLUP standards are required to be incorporated into local land use and development procedures and ordinances, whereas the CLUP guidelines could be utilized by municipalities on a discretionary basis. The Town of Southampton adopted the standards of the CLUP into Article XXIV, Chapter 330 of its Town Code, and established Overlay Districts to implement many of the guidelines suggested in the CLUP.

The area located south of SR 24 is also located within the Long Island Regional Planning Board's Central Suffolk Special Groundwater Protection Area (SGPA) (South) and borders the County's "Peconic Bay and Environs" Critical Environmental Areas (CEA) which includes the lower Peconic River, Flanders Bay and the greater Peconic Estuary, which are County designated "Critical Environmental Areas." Like the Town, the County also considers the Long Island Central Pine Barrens to be a CEA. CEAs are discussed in detail in the GEIS⁴.

The specific area designated for the construction of the Riverside Revitalization STP is located within the area where the groundwater travel time is between 2-5 years.

Overall, in terms of water quality, the Proposed Action is expected to provide improved water resource management based on current technologies and existing land use requirements. All sanitary waste from future development will be conveyed to the STP and therefore will not be discharged to onsite sanitary systems for disposal. Fertilizer dependent vegetation will be restricted throughout the proposed Sewer District and natural areas will be retained to the maximum extent possible. Finally, the proposed Sewer District is not within 1,600± feet of a public supply well or within the groundwater contributing area of public supply wells and is therefore not expected to adversely affect these facilities.

2.1.3.3 Vegetation, Wildlife & Habitats

The Riverside Community is mostly comprised of suburban and commercial development but some vacant and undisturbed lands remain. Lands that are vacant fall into one of four categories: freshwater wetlands, tidal wetlands, preserved lands, or vacant lands (many of which are publicly owned) surrounded by development. A general map of natural habitats located within the Community is provided in Figure 3-15 from the BOA report.

Upland communities are generally comprised of Pitch Pine-Oak forest, Successional Southern Hardwood forest, Maritime Oak Forest, Successional Shrubland, Maritime Heathland and Successional Old Field (Edinger et al, 2014). The Sarnoff Preserve, located in the southwest portion of the Community is comprised of Pitch Pine-Oak forest, Successional Old Field, and freshwater wetlands habitats. The preserve adjoins a vacant parcel of land that is comprised of Pitch Pine-Oak forest. Two other large parcels of Pitch Pine-Oak forest remain which consist of a narrow parcel of vacant woodland located in the central portion of the Community and portions of the industrial subdivision that remain undeveloped.

Deciduous forest is the primary community located in the upland portion of the community north of Flanders Road. It is surmised that this forested area is a remnant of a Maritime Oak forest. Maritime Oak forests are defined as "an oak-dominated forest that borders salt marshes or occurs on exposed bluffs and sand spits within about 200 meters of the seacoast" (Edinger, et al., 2014). Areas where inspection was possible revealed highly disturbed woodland which is primarily comprised of invasive species (Norway maple, tree of heaven); however, remnant oaks were visible within the forested area. Due to access limitations, the area depicted as Maritime Heathland is surmised from aerial photography; field inspection of this area was not completed. All other upland habitats within the Community are either successional in nature or are landscaped and impervious areas associated with suburban development.

⁴ See DGEIS by NP&V Pages 6-1 thru 6-28 – Exhibit D

Wildlife within the majority of the Community is anticipated to consist of species that are adapted to suburban habitats, such as raccoons, squirrels, deer, rabbits, robins, mockingbirds, grackles and starlings. The exception to this assumption is areas of forested upland, vegetated tidal wetlands, and freshwater wetlands, where a greater diversity of wildlife may inhabit, including interior forest birds, salamanders, shore birds, turtles, bivalves, and reptiles adapted for living in wetland habitats.

The New York Natural Heritage Program (NYNHP) was contacted to determine the presence/absence of rare, threatened endangered species or significant natural communities within the Community. Six significant natural communities are located within or adjacent to the Community and are:

- Red Maple-Blackgum Swamp
- Coastal Plain Atlantic White Cedar Swamp
- Coastal Plain Poor Fen
- Coastal Plain Pond Shore
- Pitch Pine-Oak-Heath Woodland
- Pitch Pine-Oak Forest

The NYNHP has also identified a number of rare, threatened or endangered plants and wildlife within or in the vicinity of the Community. Species identified include one endangered amphibian, one endangered butterfly, one threatened damselfly, one threatened fish, two special concern damselflies, two special concern moths, two unlisted damselflies, six unlisted moths, fifteen endangered plants, and fifteen threatened plants. It is also noted that the eastern tiger salamander has been identified as occurring within a half mile of the Community. Correspondence with the NYSDEC indicates that there are no documented breeding ponds within 1,000 feet of the Community, however, there are ponds in proximity to the Community that represent suitable habitat that have not been surveyed.

Figure 3-16 from the BOA report also depicts NYS Significant Coastal Fish & Wildlife Habitats (SCF&WH) located in the vicinity of the Community. The Peconic River and Cranberry Bog County Park SCF&WH are the only ones located along the Community shoreline.

As previously mentioned, the Town, Army Corps and NYSDEC regulate activities in and/or adjacent to wetlands. NYSDEC also regulates rare, threatened and endangered wildlife through Article 11 of the ECL as implemented under 6 NYCRR Part 182. As indicated by the NYNHP, several threatened and endangered wildlife species are located in the vicinity of the Community. As a result, disturbance to sites that contain or may affect habitat of the endangered or threatened wildlife species would be subject to regulation under Article 11 of the ECL. The GEIS contains additional information about ecological issues and conditions. (See also DGEIS, October 8, 2015, Pages 5-1 thru 5-14.)

Impacts on common local wildlife will result due to clearing of sewer facilities and future anticipated growth, resulting in the temporary or permanent displacement of wildlife in that area. As the proposed Sewer District is largely developed, wildlife anticipated to utilize the area are those that are typically adapted to or tolerant of suburban environments. As such, wildlife utilizing the vacant wooded areas within the Sewer District and on the proposed Sewer infrastructure site are expected to adapt to the suburban environment or relocate to the expansive natural areas outside of the Sewer District in the Central Pine Barrens and various parks and reserves. It is noted that the Study Area is surrounded to the south and southeast by thousands of acres of high-quality habitat in the form of woodlands, ponds, streams, creeks, and wetlands which have already been acquired by the Town, County, State, and private land preservation groups and been dedicated for open space preservation in perpetuity. These off-site areas provide significant opportunity for wildlife relocations, although some wildlife may be lost due to habitat competition. As a result, impacts to wildlife as a result of the proposed Sewer District, sewer infrastructure, and economic growth are expected to be minimal.

2.1.3.4 Freshwater Wetlands

Freshwater wetlands are important ecological communities. These habitats are generally more productive than upland habitats and are typically high in both plant and animal diversity.

NYSDEC tidal wetlands located along the shoreline of the Community east of the Peconic Avenue Bridge include High Marsh (HM), Intertidal Marsh (IM), Dredge Spoil (DS) and Littoral Zone (LZ). The tidal wetlands within the Community are located where the shoreline intersects and interfaces with tidal waters. These wetlands contain saline waters, which originate from the ocean-fed surface waters associated with Peconic Bay. These features are formed by coastal processes and, with the exception of formerly connected tidal wetlands, are subject to tidal influence. These areas are not only vital to the ecological systems to which they serve, but also function to control storm surges during flood and major storm events which may impact sensitive watershed areas. Tidal wetlands within the Community were presented earlier in Figure 3-9 from the BOA report.

The National Wetlands Inventory categorizes wetlands regardless of their size and regulatory status. As illustrated on Figure 3-10 from the BOA report, the wetlands within the Community are characterized as "Estuarine" (where fresh and saline waters mix) north of CR 24, indicating that these wetlands are tidally influenced, while wetlands south of CR 24 are characterized as "Palustrine," indicating these wetlands are freshwater in nature. Vegetation within Estuarine wetlands would consist of that adapted to tidal wetland environments, while freshwater wetland vegetation would generally be comprised of plants that have a lower salt tolerance.

The closest down gradient NYSDEC freshwater wetland is 610± feet north of this location. Again, groundwater time of travel to the river from the STP is between 2-5 years, and depth to groundwater varies at the project site. As noted above, the proposed STP will provide tertiary level wastewater treatment far exceeding the current effluent quality of septic systems and cesspools operating in the area, including some areas that are densely developed and have a relatively shallower depth to groundwater. All stormwater at the STP site will be controlled and recharged into the ground and stormwater and erosion and sedimentation controls will be consistent with Town standards.

2.1.3.5 Critical Environmental Areas

The portion of the Community located south of SR 24 is situated within a Central Pine Barrens Compatible Growth Area (CGA) and development under the subject zoning amendments will be assessed as a "Development of Regional Significance" in order to provide a comprehensive review of the project in consideration of the Central Pine Barrens CLUP (see Figure 3-17, Pine Barrens Plan, from the BOA report).

Parts of the Community are also located within the Town's Aquifer Protection Overlay District (APOD) and/or contain freshwater wetlands and associated upland adjacent areas that are currently subject to regulatory review by the Town pursuant to Chapter 157 of the Town Code as well as the NYSDEC per Article 24 of the Environmental Conservation Law of the State of New York. The Central Pine Barrens CGA, APOD, and NYSDEC designated freshwater wetlands and adjacent areas are considered "critical areas" under Section 157-10, "Critical areas," of the Southampton Town Code.

The above-described Critical Environmental Areas (CEA) and the policies that have been assigned to them are very thorough and address the typical concerns that could be raised regarding the proposed sewer infrastructure and future land development and redevelopment activities in or adjacent to them. Impacts will occur if and as future development and operational activities fail to conform to them, except as such projects may be exempt, waived or modified pursuant to regulatory authority and procedures allowing such relaxation after careful examination and implementation of any necessary mitigation measures. The portion of the proposed sewer conveyance and treatment system located south of SR 24 is within a Central Pine Barrens Compatible Growth Area/Central Pine Barrens Overlay District (CPBOD), APOD, and Central Suffolk Special Groundwater Protection Area (SGPA) but also contains 47.5 acres that have been duly designated as pine barrens transfer of development rights (TDR) receiving areas. Based on this designation and the potential for at least double density on this land without necessarily connecting to an STP, it appears that past planning and environmental assessments associated with the Central Pine Barrens Comprehensive Land Use Plan (CLUP), as well as the Town's adoption of implementing regulations under its CPBOD, that some additional development density in the area is appropriate and acceptable after

consideration and balancing of multiple environmental, social and economic factors, including installation of an advanced STP to minimize impacts.

2.1.3.6 Community Drainage and FEMA Flood Zones

Natural drainage, including overland runoff and underflow from natural infiltration or by direct recharge of water through dry wells and leaching pools, is expected to flow in a north to north-northeasterly direction toward the Peconic River. Drainage is an important factor in protecting surface waters and wetlands as well as in the prevention of flooding. Drainage issues are regulated by the Town through State and local laws and Site Plan, SEQRA, and Town Engineering review processes. Sub-watersheds are shown in Figure 3-11 from the BOA report.

Based on a review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), approximately 44 acres of the Community are located along the south bank of the Peconic River, north of SR 24, are within a FEMA-designated AE (100-year) Special Flood Hazard Area (SFHA). A narrow band of X500 (500-year flood zone) is also present adjacent and to the south and inland of the AE zone including near the traffic circle, around the Suffolk Federal Credit Union and in the area containing old dredge spoil deposits (FEMA flood zones are depicted in Figure 3-12 from the BOA report). The X500 zones comprise areas that are at minimal risk due to flooding from a principal water body in the area (i.e., the Peconic River). Nevertheless, land and structures at these locations can be affected by rare but extremely severe storms, particularly if the area is poorly drained and stormwater controls, building siting, and other factors are inadequate. A narrow "A" Flood Zone exists along the Little Peconic River. This zone generally follows the western boundary of the Community and affects only a very small portion of the Community within the rear setback of a few of the existing developed single-family lots and poses no significant issues or concerns. All other land within the Community is within FEMA's X (upland or non-flood zones) and is therefore very unlikely to ever be affected by surface water flooding.

The specific location selected for the construction of the proposed STP and leaching system is located within FEMA-designated X flood zone.

The Draft Generic Environmental Impact Statement (DGEIS), prepared by NP&V, notes that stormwater best management practices (BMPs) such as green infrastructure (landscaped buffers, rain gardens, green roofs, vegetated swales, etc.) should be utilized on future development sites that are adjacent to surface waters and 100-year flood zones where practicable to help reduce impervious surfaces, provide a level of flood storage, buffer and protect development from flooding, and provide a degree of community resiliency. Zoning several properties along the riverbank as RO-7 ("Parkland") pursuant to the ROD zone changes also helps to ensure that construction on land having the potential for flooding is properly sited. Moreover, future buildings and other impervious structures, as indicated in the DGEIS, should be located upland of the 100-year flood zone where possible, be properly constructed or on land that has already been filled, to avoid flooding and/or any significant loss of flood storage capacity. BMP's such as green infrastructure (landscaped buffers, rain gardens, green roofs, vegetated swales, etc.) should be also considered in areas that may flood during a major storm. Some of the shoreline in the Community adjacent to the River is currently bulkheaded, thereby, providing some protection to these existing developed sites. Additional bulkheading and use of pervious surfaces are other strategies that may be employed where practicable to address flooding concerns in accordance with any required Town, NYSDEC or US Army Corp of Engineers permits. The DGEIS for the BOA Study, RRAP and ROD Code Amendments provides extensive information and analyses on stormwater and flood control (DGEIS, October 8, 2015, Pages 4-14 thru 4-18 and 15-2).

It is anticipated that the proposed project will not result in any significant increases in impervious surface areas other than at the proposed STP site and pump station sites and therefore are not expected to generate a significant volume of stormwater runoff that could not be easily controlled.

Most of the proposed STP site will be vegetated pervious ground including lawn or reseeded land and natural woodlands perimeter buffer. The estimate of proposed impervious surfaces including the STP building, site paving, and the replacement section of Enterprise Zone Drive will be served by drainage structures as needed to capture and recharge runoff from in accordance with Town standards and prevent drainage related issues. The Town is also responsible for implementing minimum control measures under the State's Separate Storm Sewer System (MS4) requirements to help reduce the discharge of pollutants

into Town waterways from stormwater that may adversely affect critically important natural resources such as the Peconic River and Estuary.

Sea levels are expected to rise, and in the future, storms may become more powerful and occur more frequently than in the past due to the long-range effects of climate change and sea level rise. Therefore, potential impacts associated with flooding from sea level rise and storm activity are assessed. According to the 6 NYCRR, Part 490, "Projected Sea-level Rise," a medium level estimate of sea level rise relative to 2000-2004 baseline data for Long Island is 34 inches by 2100. Such conditions, in conjunction with coastal storms, can affect the long-term viability and sustainability of critical infrastructure such as drinking water supplies or sewage treatment systems in coastal areas if not properly sited and/or protected. Based on estimates of a three foot sea level rise during a 500 year storm event, the proposed STP would still be above flood levels. Only part of one pump station would be affected, suggesting the possible need to elevate and/or floodproof this structure, to ensure continued operation during an extreme weather event from future sea level rise. These factors would need to be considered during the pump station design process.

2.2 Ownership & Service Area

2.2.1 General

Development along SR 24 (Flanders Road) and portions of several other major roads that merge at the traffic circle in Riverside include mixed commercial, industrial, residential, and institutional land uses, vacant land, and vacant/boarded-up buildings. Since development along the SR 24 corridor is scattered rather than compact, is inconsistent in terms of use (e.g., commercial building next to a single-family home, next to a vacant lot, next to a vacant building, etc.), consists of single-story rather than two, three or multiple-story structures, and does not have a major business anchor, the business district does not function as a dense, walkable, vibrant and successful downtown or mixed use hamlet center.

Developed land outside the immediate corridor area consists primarily of a dispersed mix of medium to high density/small lot single-family residential neighborhoods and mobile home parks, vacant lots or buildings, light industrial development, and scattered institutional or community service facilities.

AREA OF LAND COVERAGE BY LAND USES

Land Use	Existing Area (Acre)
Commercial	38.17
Industrial	8.82
Institutional	28.87
High Density Residential	96.99
Medium Density Residential	96.12
Low Density Residential	18.11
Recreational	57.82
Transportation	15.77
Vacant	86.04
Total	446.71

Single-family residential zoning districts regulate more land than any other zoning classification in the area and are found along the eastern (R-15), western, (R-20 and R-15), and southern (MHS-40 and R-15) area boundaries, as well as near the center of the area (R-15), and in the northeastern corner of the area (R-80 along the river and R-15 along SR 24). The R-15 and R-20 zoning districts allow lots as small as 15,000 and 20,000 square feet, respectively, and are the highest density single-family residential density zones in the Town, while the CR-40 requires lots to be 40,000 square feet. The MHS-40 district requires a minimum lot size for a manufactured home park of 40,000 square feet, but the zoning regulations require ~~only~~ that the units be separated only a distance of 15 feet, therefore resulting in a higher density of residential units than other zoning districts. The area zoned CR-40 has been acquired by the State and preserved as open space and wildlife habitat. Commercial zones in the area are found near the traffic circle, along the north ends of Lake Avenue and Riverleigh Avenue, and along SR 24. The RWB zone is located on the north side of SR 24 along the Peconic River. Land within the area that is within the RWB is owned by Suffolk County. Industrially zoned land (LI-40, Light Industry) is found along Enterprise Zone Drive and the south side of SR 24 near the center of the area and includes land occupied by the Southampton Enterprise Zone industrial subdivision, Peconic Mini Storage, Suffolk Federal Credit Union (SFCU) and Southampton Head Start. Open Space Conservation (OSC) zoned land is located at the south end of the area, north of the intersection of Ludlam Avenue and Old Quogue Road at the site of Ludlam Avenue Park.

Approximately 212 acres of the area is in residential use. An additional 19 percent of the area is vacant. Eight percent (8%) consists of commercial uses, and the remainder of the area consists of streets and rights-of-way, industrial, institutional, parks and recreation, and surface waters. The general land use and development pattern in the hamlet is summarized as follows:

2.2.1.1 Single-Family Residential Neighborhoods

Single-family residential neighborhoods are present primarily south of SR 24 along the eastern and western boundaries of the hamlet as well as some areas adjacent to the southern boundary. These areas include:

- Woodhull Avenue, Pegs Lane, Lake Avenue (CR 63), and Maynard Street to the west
- Ladlam Avenue, Pebble Way, Phillips Avenue, White Brook Drive, Brown Street, and Goodridge Avenue to the east
- Old Quogue Road, Vail Avenue and Pine Street
- Small pockets of single-family development or individual isolated residential lots are otherwise scattered throughout the area.

2.2.1.2 Manufactured Home Parks

Manufactured home parks are found at the south end of the community off of Riverleigh Avenue (CR 104) and on the north side of SR 24 along the Peconic River, opposite Enterprise Zone Drive and the Peconic Mini Storage facility. In total, there are three mobile home parks in the hamlet. The largest is the Riverwoods/MacLeod community located at the south end of the hamlet on the west side of Riverleigh Avenue. The two smaller mobile home parks are located adjacent to one another along the Peconic River, one of which has been identified as the Parkview community.

2.2.1.3 Commercial Developments

Commercial developments exist primarily around the traffic circle, along Riverleigh Avenue and Lake Avenue (near the traffic circle) and at intermittent sites along SR 24. Commercial uses include but are not limited to several gasoline filling stations, convenience stores, a beverage distributor, hotel, credit union, a fast food restaurant, deli, a graphics business, billiard table sales and service business, antique shop, hair salon, barber shop, barber shop, scuba diving equipment retailer, auto sales, auto repair, and other small miscellaneous retail and personal services businesses. A few vacant commercial buildings were also noted.

2.2.1.4 Industrial Land

Industrial land uses are very limited and are relatively dispersed in the area. The three largest developed industrial sites in the area are located within or adjacent to the Southampton Enterprise Zone subdivision, the largest of which is used as a mini storage facility, and the other two are undetermined industrial uses. Other industrial uses in the area include a glass and mirror shop (south side of SR 24), an auto salvage yard and junk yard (along Old Quogue Road) and a few small sites that now contain vacant buildings. Several industrial lots remain undeveloped. Auto repair is also sometimes considered an industrial use.

All known and proposed industrial developments would need to adhere to the most recent standards prior to connection to the proposed sewage conveyance and treatment systems. These sites would need, at a minimum, properly sized and located separation and interceptor structures prior to discharging into the proposed sewer system. Further consideration of the industrial properties will need to be made during the design phase for the conveyance and treatment systems.

2.2.1.5 Institutional Land

Institutional land uses are widely dispersed throughout the area and include: Phillips Avenue Elementary School (off of Phillips Avenue south of the Southampton Enterprise Zone subdivision) which is the largest institutional use in the area; Southampton Head Start (off of SR 24, west of Suffolk Federal Credit Union); several places of worship (one on the west side of Riverleigh Avenue, one on the west side of Old Quogue Road, and another on the north side of SR 24); a social/fraternal lodge (Masonic Temple) (on the north side of SR 24 and west side of the State recharge basin), and a State Police barracks (Riverleigh Avenue, approximately 500 feet southeast of the traffic circle).

2.2.1.6 Vacant Land

Vacant land is located primarily north of SR 24 and adjacent to the river, within the Southampton Enterprise Zone industrial subdivision, on a long wooded parcel (SCTM: 900-139-3-10.2) adjacent to the west of the subdivision which extends between SR 24 and Old Quogue Road, and within an undeveloped six-lot residential subdivision. In addition, there are a number of small vacant lots scattered throughout the single-family residential neighborhood at the center of the area. Vacant lots are publicly or privately-owned and several appear to be owned by the same property owner of adjacent residential lots to make a larger usable lot. The current and future disposition of some of the vacant publicly-owned land in the area is unknown or not currently available and therefore is not classified as parks or open space. Vacant buildings are also present in the area, including but not limited to, a former gasoline station, what appears to have been a warehouse, and miscellaneous former commercial uses.

2.2.1.7 Parks, Open Space, and Wildlife Preserves

Parks, open space, and wildlife preserves are prevalent throughout the Riverside community especially outside and adjacent to the community and serve to create well-defined boundaries for the hamlet. Several properties within the area comprising of an estimated 57.64 acres have been preserved for one or more of these purposes. Preserved land within the area includes two large Town-owned parcels located north of SR 24 on the east side of the area; Town-owned land at the northeast corner of the intersection of Ludlam Avenue and Old Quogue Road (Ludlam Avenue Park); County-owned land situated southeast of the intersection of Maynard Street and Lake Avenue (CR 63) which contains a freshwater pond and is contiguous to the David A Sarnoff Pine Barrens Preserve; and Town-owned land located at the northeast corner of the traffic circle between Peconic Avenue and Nugent Drive (CR 94).

2.2.1.8 Transportation Land

Transportation land uses include State and County arterial highways and Town streets as well as three lots containing or designated as stormwater recharge basins, including two Town-owned lots, one located on the west side of the Southampton Enterprise Zone Subdivision and one located off of Pebble Way, and a NYS DOT recharge basin on the north side of SR 24, adjacent to the Masonic Temple. The Riverside portion of SR 24 is an important multifunctional roadway. The road is a regional arterial serving the area's local commercial and residential uses and facilities waterfront access. Development along this road has faced many challenges, particularly in light of the recent recession, which in turn has resulted in a high number of vacant and derelict buildings throughout the corridor and surrounding area.

2.2.1.9 Existing Zoning Districts

Thirteen "base" zoning districts regulate land use within the hamlet, including five single-family residence, six commercial, one light industry, and one open space conservation district as follows⁵:

Residential and Open Space Zoning Districts:

Residence-15 (R-15)

Residence-20 (R-20)

Country Residence 40 (CR-40)

Mobile Home Subdivision (MHS-40)

Residence-80 (R-80)

Open Space and Conservation (OSC)

Business and Industrial Zoning Districts

Highway Business (HB)

Village Business (VB)

Shopping Center Business (SCB)

⁵ See Official Town of Southampton Zoning Map, Figure 405.A of the ROD – Exhibit E

Resort Waterfront Business (RWB)

Office Business (OD)

Motel Business (MTL)

Light Industry (LI-40)

Land located south of SR 24 is also within two Town overlay districts: the “Aquifer Protection Overlay District” (APOD) and the “Central Pine Barrens Overlay District” (CPBOD). The overlay zoning district superimposes an additional “layer” of standards or regulations ~~in addition~~ to the existing “underlying” zoning requirements. These districts are defined geographic areas shown on a zoning map and are commonly applied to locations that need an additional measure of protection, such as areas containing important environmental resources (e.g., groundwater supplies, wetlands, agricultural soils), or in areas that compel additional consideration due to potential development issues (e.g., steep slopes, wetlands, etc.). A third overlay district, the Tidal Wetlands and Ocean Beach Overlay District (TWOBOD), regulates activities that may occur within or adjacent to the tidal wetlands on the north side of SR 24 along the tidal portion of the Peconic River (see “high marsh,” “intertidal marsh,” and “littoral zone”)⁶.

2.2.2 Industrial Discharges or Hauled Waste

There are six facilities listed on the EPA’s Facility Registry Service (FRS) data for the hamlet of Riverside. Of the six two are located within the Suffolk County Center and outside the community area to be revitalized. The facilities and their respective FRS ID numbers are listed as follows:

- Suffolk County Sheriffs Photo Lab –110004316080
- Charlies Quality Collision Inc. – 110004411574
- S C D H – Riverhead Health Crt – 110008041840
- McDonly Motors Property – 110019424880
- Riverhead Shell – 110019522300
- Verhead Precision – 110030000512.

Three of these facilities have Air ID numbers and four facilities have RCRA ID numbers. Of all facilities listed, there have been no compliance criteria violations or enforcement actions within the past five years.

2.2.3 Population Trends and Growth

The hamlet is within the US Census Bureau’s Riverside Census Designated Place (CDP), which has been documented as the most economically distressed community in both Suffolk and Nassau counties. Economic distress indicators include data on poverty level, educational achievement, unemployment, median income and median housing values. In Suffolk County, Riverside has the lowest median home value and median household income of the 157 communities (census places), has the 2nd lowest percentage of high school graduates, and the 3rd highest number of families living below the poverty level.

Based on the data from the Economic Distress Indicators study from 2008-2012 in Suffolk County, Riverside has significantly higher unemployment (nearly 4% higher than Gordon Heights) and a substantially lower median income (over \$20,000 less than Wyandanch), but comparatively fewer residents receive public assistance income. The Riverside CDP is the only community within Suffolk County with a median home value below \$200,000. The median home value reported in the economic distress indicators data was \$73,900. The community with the second lowest median housing value in Suffolk County was Mastic Beach, which at the time had a median home value of \$224,900, or more than three times that of Riverside.

⁶ See DGEIS by NP&V Pages 7-1 thru 7-37 – Exhibit F

EXCERPT OF ECONOMIC DISTRESS INDICATORS, 2008-2012, SUFFOLK COUNTY

Economically Distressed Communities	% w/public Assistance Income	% High School Graduates	% Below Poverty Level	Median Household Income	% Unemployment	Median Housing Value	Overall Rank
Riverside	7.05%	63.34%	24.59%	\$33,308	18.39%	\$73,900	1
Gordon Heights	8.65%	85.17%	22.18%	\$56,157	14.46%	\$281,600	2
Wyandanch	11.78%	75.75%	13.99%	\$53,948	9.93%	\$270,000	3

Source: U. S. Census Bureau (2008-2012 American Community Survey) and Suffolk County Planning

This section will discuss the current and proposed population for the community. Problems with the current community layout and reasons related to the hamlet being classified as a CDP as well as possible solutions will be outlined herein. One of the purposes of the RRAP was to identify the areas that could benefit from rezoning and promote development. The ROD was then created as a base to begin the process of revitalizing. These items are explained in greater detail below.

The Riverside Community is home to a total of 4,912 people living in 570 households. As noted, the Riverside CDP area is the most economically distressed community according to the Suffolk County Department of Economic Development and Planning analysis. According to the American Community Survey 5-year estimates⁷, the median home value within the Community is just \$70,400 (as compared to the median of \$381,700 for all of Suffolk County). The population is generally less educated than the residents of the County, with 46.9% not having graduated from High School or received an equivalency degree and relatively few (2.7%) having a bachelor’s degree. In comparison, 9.6% of Suffolk County’s population does not have a High School diploma. The median income for a household within the Community, at \$39,571 is significantly lower than that of Suffolk County at \$92,933. In 2013, Riverside had an unemployment rate of 14.6% which was much greater than the County (at 7.4% during that period). Riverside also has a very low labor force participation rate. Labor force participants are classified as individuals who are either working or looking for work. Those who are not participating in the labor force may be retired or prevented from doing so by disability or school attendance, or they may have been out of work for so long that they have given up on seeking regular employment. In 2015, the labor force participation rate was 13.9% (as compared to 65.3% in Suffolk County). This speaks not only to the need for jobs, but also a diversification of the area to revitalize existing commercial markets. These factors provide indicators of an economically distressed community, where availability of benefits related to the revitalization of the area will provide significant tangible benefits to elevate the community as a whole.

Development patterns in Riverside have remained relatively stagnant with the exception of the construction of the Suffolk Federal Credit Union at the corner of SR 24 and Enterprise Zone Drive approximately eight to nine years ago, a redevelopment that involved the construction of a convenience store along Flanders Road near the east end of the hamlet, and more recent development on two lots within the Southampton Enterprise Zone industrial subdivision that are now developed with light industrial uses. Several other lots within the Enterprise Zone subdivision remain vacant, which may be due in part to the recent recession and a general decline in industrial development in the Town and throughout the northeastern United States. The State Police barracks at 234 Riverleigh Avenue is also a relatively recent addition to the area and provides a greater police presence in the community. Many lots in the area remain vacant, some of which are publicly owned as described previously. The State acquired land on the north side of SR 24 approximately 10 years ago for use as a stormwater recharge basin and the County acquired other nearby land along the river for parkland or open space preservation. The more recent County land acquisitions along the river were once part of a proposal for a large hotel, catering facility and restaurant which never came to fruition.

⁷ See United States Census Bureau Data – Exhibit G

2.2.3.1 Planned Development

The recently adopted ROD Zoning identifies the permitted land uses within the Community. The DGEIS analyzed the potential for environmental impacts of a theoretical development program which was created for the overlay area. See Tables 4-4 and 4-5 of the BOA that summarize the permissible uses for each strategic site. The concept plan shown below illustrates a possible future land use pattern as envisioned based upon the Theoretical Development Program, assuming an STP is constructed to serve the Community.

The primary redevelopment area is concentrated around the Riverside traffic circle and extends outward from this location. The majority of the development would occur along Flanders Road and Riverleigh Avenue, especially in the area generally north of Pine Street. Development is also anticipated within the Enterprise Zone Drive area and other locations. The DGEIS estimates a theoretical development program that would consist of the following future land uses shown in the table below:

THEORETICAL DEVELOPMENT PROGRAM

Land Use	Additional Square Feet, Rooms, and Dwelling Units
Retail	133,517 Square Feet
Office	62,000 Square Feet
Hotel	97 Hotel Rooms
Apartments	2,267 Dwelling Units
Adult Care/Nursing Home	63,910 Square Feet
Artisan Lofts/Production	30,900 Square Feet
Cultural	11,032 Square Feet
Parking Garage	550 Spaces
Surface Parking Lots	1,602 Spaces
On-Street Parking Spaces	1,107 Spaces
Indoor Ice Skating/Hockey Rink	100,000 SF, plus parking

Source: SEQRA 12-17-15, NP&V

Seven new Overlay Districts were adopted, and are described in the ROD, to regulate land use within the planned development of the hamlet. These Districts consist of the following⁸:

Residential and Open Space Zoning Districts:

- Hamlet Center (RO-1)
- Hamlet Neighborhood (RO-2)
- Special District (RO-3)
- Gateway District (RO-4)
- Suburban District (RO-5)
- Waterfront District (RO-6)
- Riverside Parkland (RPL (RO-7))

A total of 20 percent of the residential units would be marketed toward working class individuals and households. Fifty percent of the apartments would be one-bedroom and 50 percent would be two-bedroom units. Also, 50 percent of the units would be renter-occupied and 50 percent would be owner-occupied. Workforce housing would be marketed toward households having an annual income ranging between \$40,000 and \$96,000 based on 37% to 88% of the median Suffolk County household income determined by HUD to be \$109,000/year (see RRAP).⁹

⁸ See Riverside Overlay District Map (COLOR), Figure 407.H.(2) of the ROD – Exhibit H
⁹ Referenced reports (e.g. RRAP, ROD, BOA, etc.) can be found at the Town of Southampton website at: <http://www.southamptontownny.gov/960/Riverside-Revitalization-Action-Plan-RRR>

Another component aspect of the planning process that was conducted in the creation of the RRAP was the preparation of a preliminary market study which identified the amount of floor space and dwelling units that could reasonably be accommodated within the reclaimed brownfield sites, as determined by NP&V, and revitalized Riverside community. The preliminary market study was reviewed separately by Urbanomics, Inc. Economic and market trends inform and assist in determining future uses which could be accommodated in the Community; uses were identified that also had community support.

Retail demand was based on an examination of sales leakage - economic activity that should remain within a community's local economy but occurs elsewhere due to factors such as a void within a certain business type, lack of infrastructure to support development, or a lack of an attractive retail environment that captures interest and market demand. Riverside exhibits significant leakage due to the relative lack of places for residents to shop, dine and play. Accounting for the combined existing incomes of Riverside, Flanders and Northampton, there is a substantial opportunity for local entrepreneurs to capture spending that currently takes place outside of these communities, bringing in additional income and job creation.

The table below summarizes the amount of nonresidential floor space and residential dwelling units that could be supported in Riverside, based on the market analysis conducted for the BOA.

STUDY AREA PRELIMINARY MARKET DEMAND

Store Type	Floor Space Demand (SF)	Dwelling Units
Full Service Restaurant	7,897	
Grocery Store	10-12,000	
Hobby, Sport Goods, Music Instruments	5,451	
Clothing and Shoes	14,797	
Electronics and Appliances	1,948	
Health and Personal Care	6,870	
Office	80,796	
Hotel Space	---	
Light Industry	---	
Rental Dwelling Units		3,115
Assisted Living		600 beds

Sources: BOA, NP&V

Specific findings are as follows:

- A food market needs assessment concluded that there is a need for a medium sized supermarket to serve the Riverside community.
- The most untapped retail opportunities include: full service restaurants, furniture and home furnishings, clothing and shoe stores, health and personal care stores, sporting goods, hobby and musical instrument stores, and electronics and appliance stores.
- Based on employment estimates projected to the year 2030 and using a 10 percent capture rate for the Riverside market, approximately 81,000 square feet of office space could be supported. The fastest growing sectors include "health care and social assistance" and "educational services".
- If planned amenities, including construction of a boardwalk and new bridge come to fruition, market demand would support a waterfront-oriented hotel.
- Between the Towns of Southampton and Riverhead there are approximately 3,000 seniors classified as having a "self-care" or "independent living" difficulty. A conservative estimate of 20% of this population yields a demand for approximately 600 beds.
- Artisan production facilities for local artists and craftsmen can be supported.
- In terms of residential dwellings, an age cohort analysis estimates that there will be new demand for 3,115 dwelling units by 2030 within the Towns of Southampton and Riverhead. This estimate does not account for demand within the Towns of Southold, East Hampton or Shelter Island, all of which are experiencing the same general trends.

While there is market demand for the uses identified above, the Town must pursue implementation strategies that provide the regulatory framework and infrastructure support to capture same.

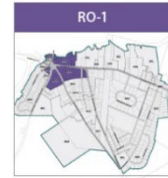
The land use pattern (and zoning intended to implement the RRAP) is described in accordance with a series of overlay zones. Recommended projects and improvements for each overlay zone are described in the RRAP and summarized below. These projects and the theoretical development program are also identified according to “blocks” set forth in the proposed zoning that would be implemented to promote revitalization.

Riverside Hamlet Center (RO-1):

The Riverside Hamlet Center is situated around the Traffic Circle and SR 24 and provides the opportunity for the greatest vibrancy in Riverside. By utilizing best place making strategies and leveraging adjacency to Peconic River waterfront, this district is intended to support the greatest variety and mix of uses, promoting a range of residential, retail, hospitality, cultural and entertainment uses. It will allow the highest densities and promotes compact design with vertically and horizontally integrated residential and non-residential uses. Pedestrian amenities required in this district reflect the need for active frontages and an easy access to the waterfront that support place making and destination creation. Parking standards reflect the creation of a walkable hamlet center and transit opportunities within walking distance.

**Implementation Strategies
Riverside Hamlet Center (RO-1)**

*"Let's meet at the Nugent's Clock Tower, stroll the promenade, experience WaterFire! Maybe we can have a dinner outdoors overlooking river, cross over to Riverhead for the opening of the new show, walk over the bridge and stroll along the park while listening to music along the way. Walking home is nice, it's just down the block. Tomorrow morning the business meeting is starting early, but it is at the Innovation Center, and luckily, since it is here in Riverside, I can do the gym and get a coffee on my way in!"
Potential conversation with Riverside resident a few years from now.*



Source: RRAP, July 2015, Page 22

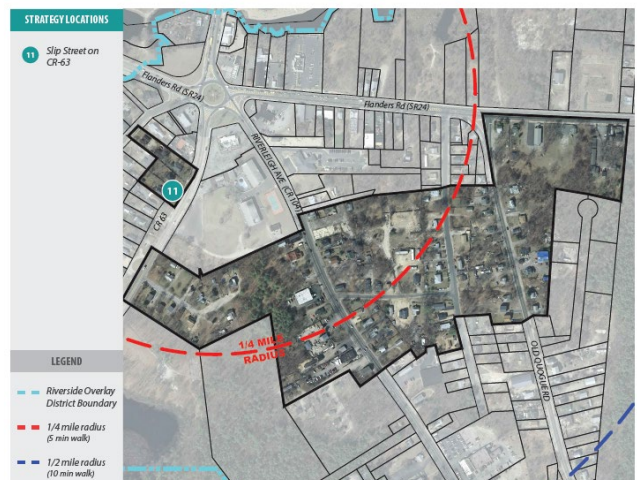
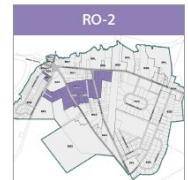
Riverside Hamlet Neighborhood (RO-2):

The Riverside Hamlet Neighborhood is located within walking distance of the Hamlet Center and Downtown Riverhead and is a mixed use hamlet neighborhood that includes restaurants with outdoor seating, shopping, offices, hospitality uses, upper floor apartments, and community utility and food production areas, up to 4 stories in height. The purpose of this zone is to support a compact mix of uses with significant residential development, including a range of residential, retail, hospitality, and entertainment uses.

It promotes compact design with vertically and horizontally integrated residential and non-residential uses. Parking standards and pedestrian amenities in this zone reflect its access to the existing walkable downtown and non-automotive transportation options.

**Implementation Strategies
Riverside Hamlet Neighborhood (RO-2)**

*"Substandard housing should be replaced with new, reasonably priced townhouses or other residential units. The new residences should be offered to existing residents and workers. New dwellings bring investment, customers for businesses and an overall more vibrant downtown or Hamlet Center community. The new condos will add life to the streets and much needed tax revenues for our schools and municipalities!"
Vincent Taldone, President, Flanders Riverside, Northampton Civic Association*



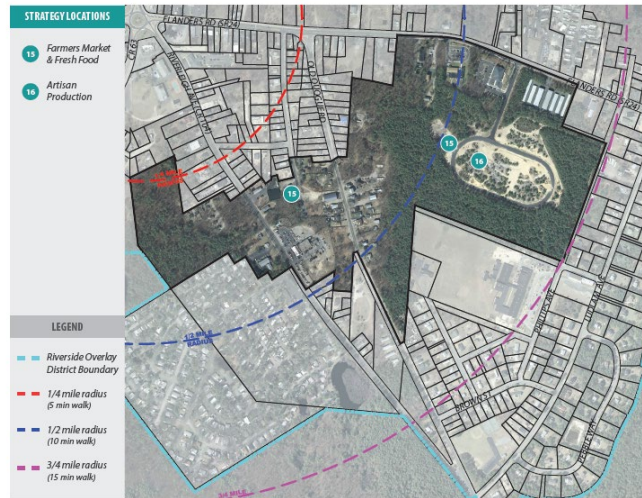
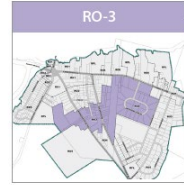
Source: RRAP, July 2015, Page 24

Riverside Special District (RO-3):

The Riverside Special District is located mostly between 1/2-mile and 3/4-mile of Downtown Riverhead and Riverside traffic circle and is intended to support a variety of uses with employment in focus and variety of housing choices. It will be a place of living and working - residential neighborhoods provide a place to live without the hustle and bustle of the Hamlet center while still retaining easy access to places to eat, work and play. Artisan production spaces will provide an interesting mix and well-paying careers for residents. It promotes a lower intensity of uses while continuing to promote compact design with vertically and horizontally integrated residential and non-residential uses. Parking standards and pedestrian amenities support proximity of the Hamlet Center.

**Implementation Strategies
Riverside Special District (RO-3)**

The RO-3 Special district is a place of living and working. Residential neighborhoods provide a place to live without the hustle and bustle of the Hamlet center while still retaining easy access to places to eat, work and play. Artisan production spaces provide an interesting mix and well paying careers for residents.



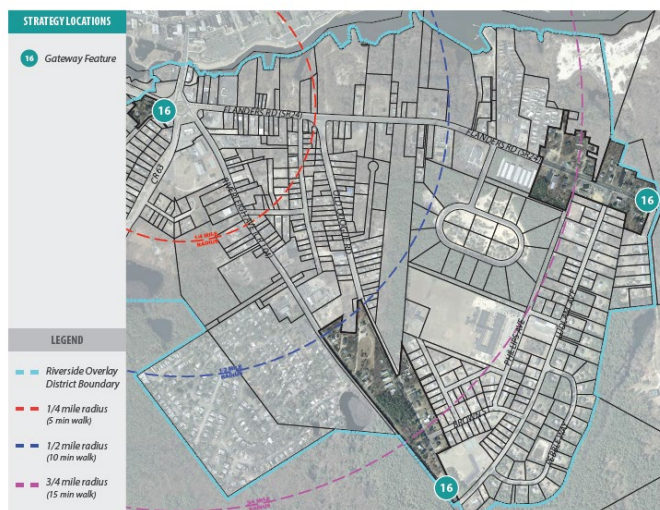
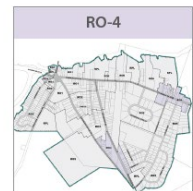
Source: RRAP, July 2015, Page 26

Riverside Gateway (RO-4):

The intent of the Riverside Gateway is to create a transition in vehicular approach to Riverside along major routes, with a wider range of uses than the preceding districts. A local shuttle with connections to the Hamlet Center, Riverhead Downtown, LIRR, Suffolk County Community College, and other local and regional destinations would enter the community on main routes through this district. Apartments above stores, and assisted living could be accommodated in the Gateway locations. Landscaped, architectural or artistic gateway features (e.g., sculptures) would be incorporated to provide a sense of entering the Riverside hamlet along the primary transportation corridors into and out of the hamlet.

**Implementation Strategies
Riverside Gateway District (RO-4)**

"Create a high frequency local shuttle bus service to connect all the various business, entertainment, recreation and residential places in Riverside and Downtown Riverhead. In addition to a standard route or loop through Downtown Riverhead and Riverside's hamlet center, the shuttle should offer flexible route service to ensure safe and convenient trips between the central business district and local residential and hospitality centers." Vincent Taldone, member of Riverside Rediscovered, December 9, 2014 (President FRNCA)



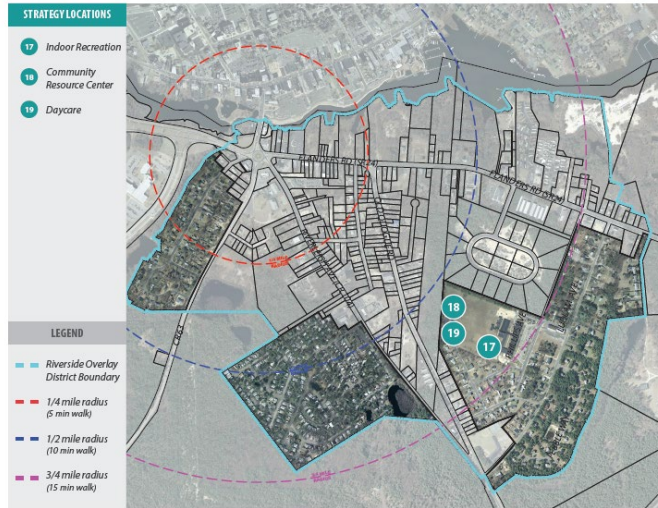
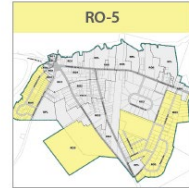
Source: RRAP, July 2015, Page 28

Riverside Suburban District (RO-5):

The intent of the Riverside Suburban district is to maintain the suburban character of existing neighborhoods while allowing higher densities than the underlying zoning districts permit. The intent is to introduce new connector streets to link the various residential neighborhoods with the intended hamlet center. Public improvements would include sidewalks, greenways and pedestrian ways to connect with other areas of the hamlet. Indoor recreation, a community resource center, and daycare services should be programmed for this area. The Riverside Suburban district would allow granny flats.

**Implementation Strategies
Riverside Suburban District (RO-5)**

The best way to preserve single family neighborhoods is to densify centers within walking distance to those single family homes. To increase connectedness, there has to be a repair of Riverside's street grid, currently made up of just a few heavily travelled roads fanning from the traffic circle and The Gateway on Old Quogue Road. With the insertion of new streets, pedestrian networks and greenways parallel to NY 24, a new walkable Riverside would emerge.



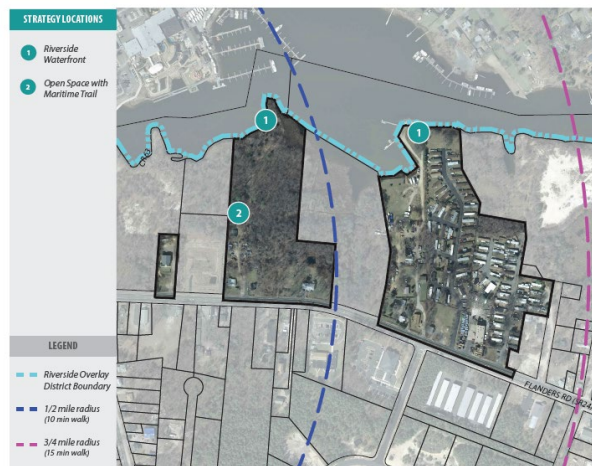
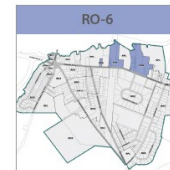
Source: RRAP, July 2015, Page 30

Riverside Waterfront District (RO-6):

The intent of this district is to accentuate Riverside's maritime character while allowing a greater mix of uses and waterfront related businesses than the underlying zoning districts permit. This district would allow a hotel, residences, marina, and other retail and service uses. Properties are privately-owned, and the intent is to create public access to the waterfront through these parcels and create a waterfront promenade and boardwalk connections.

**Implementation Strategies
Riverside Waterfront District (RO-6)**

One advantage of living on Long Island is the presence of large bodies of water open to fishing, watersports, boating, kayaking and canoeing. Besides the obvious Long Island Sound and the Great Sound Bay, there are several rivers that can be explored. One such river is the Peconic River. It is one of Riverside's natural treasures.



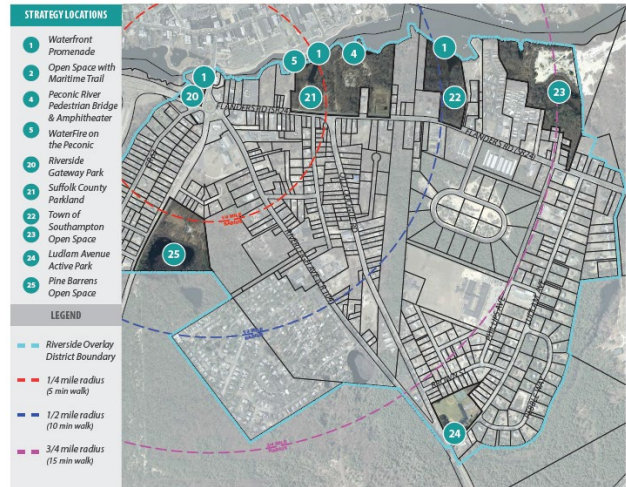
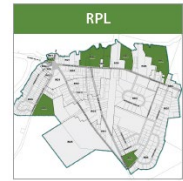
Source: RRAP, July 2015, Page 32

Riverside Parkland (RO-7):

The Riverside Parkland district is to accentuate Riverside’s maritime character while allowing a greater mix of uses and waterfront related businesses than the underlying zoning districts permit. Much of the land identified as Riverside parkland is Pine Barrens, Suffolk County, or Town of Southampton lands. Tourism related uses will be promoted or will otherwise benefit from public improvements within these parcels. Improvements would include: a waterfront promenade and boardwalk, pedestrian trails and greenways, active parks with supporting facilities, including educational uses. A marina is also contemplated.

**Implementation Strategies
Riverside Parkland (RPL)**

"[a raised] boardwalk alongside the Peconic River that mirrors the walk on the Riverhead side. It would begin at the Peconic Avenue bridge area, perhaps fronting a restaurant row while also allowing WaterFire viewing, and continue East along the river, through the wetlands and future park areas."
Terri H., member of Riverside Rediscovered, January 15, 2015



Source: RRAP, July 2015, Page 34

AREA OF LAND COVERAGE BY ROD ZONE

ROD ZONE	AREA (Acre)
RO-1	26.60
RO-2	32.27
RO-3	99.52
RO-4	35.77
RO-5	192.44
RO-6	32.38
RPL	37.84

2.2.3.2 Riverside Market Trends

The Economic Market Study identifies numerous challenges under current conditions and opportunities in the redevelopment of Riverside. There are several potential challenges for retail development in Riverside including the lack of on-street and off-street public parking options for through traffic on NY SR24, the current socioeconomic climate and high crime rate in Riverside, and a lack of diverse offerings. Additionally, there are many opportunities for retail development in Riverside including but not limited to Riverside’s location as a gateway area for the East End, cultural diversity which can differentiate the available retail offerings, history of locally owned businesses that suggests a healthy foundation for entrepreneurship, the need for a fresh start and will for a new identity, County Center, and strong mass transit bus connections.

2.2.3.3 Housing Trends

Current trends among the Millennial and baby boomer generations have demonstrated a growing demand for rental units in recent years. At its current rate of growth, the Towns of Southampton and Riverhead are likely to add a demand of over 3,100 new rental units between 2010 and 2030. Given the growing propensity of Millennials and boomers to rent and the smaller household sizes of Millennials, this number could be even greater. The demand for rental housing is quickly growing and is not likely to stop soon. More rental units, and more types of rental units beyond single family homes, are a must if the Riverside community is to meet the challenges of the next generation.

2.2.3.4 Retail Trends

To best understand the commercial uses that are viable in Riverside, RD prepared a retail gap analysis study in order to determine which uses are likely to have sufficient market demand necessary to be viable. The focus has been on market niches that might complement, rather than compete with, independently owned businesses in Riverhead Downtown, the extent to which existing businesses in the project area might absorb additional sales, and the tools and resources that might be helpful in stimulating new business development and growth of existing businesses.

The potential for local retail sales is determined through the estimation of potential consumer expenditures (purchasing power) of resident households based upon their income, which is then compared to local retail sales. If local retail sales are less than the aggregate buying power of local households, there is “leakage” (i.e., local residents are spending money outside of the local area). If local sales are greater than local spending potential, there is an “injection” of spending from other areas.

2.2.3.5 Retail Sales Leakage

The economy of Riverside currently suffers from a retail sales leakage, that is, local residents are spending their money outside of Riverside. This loss to a community’s local economy may occur due to factors such as a void within a certain business type or a lack of an attractive retail environment such as a walkable, mixed use hamlet center. Based upon the retail gap analysis prepared for the RRAP dated July 27, 2015, approximately \$8.2 million in consumer spending “leaks out of” the primary market area alone every year. When looking at the larger Riverside, Flanders and Northampton market area, total leakage is \$44.3 million per year. New development can leverage this lost spending by tapping into undersupplied sectors. Riverside exhibits significant leakage due to the relative lack of places for residents to shop, dine and recreate. Community mapping exercises conducted as a part of the Crowdsourced Place making process revealed that residents often travel far to spend their money at stores and restaurants outside the community. Accounting for the combined existing incomes of Riverside, Flanders and Northampton, there is a substantial opportunity for local entrepreneurs to capture spending that currently takes place outside of these communities, bringing in additional income and job creation. Residents of the community would easily be able to support additional commercial space, assuming that retailers cater to the types of goods and services that are currently underrepresented in the local economy. This will ensure that future businesses fulfill an existing consumer demand while targeting sales of those goods and services that are currently underserved in the target market area. Recommended uses are shown in the table below.

RETAIL OPPORTUNITIES

Store Type	Leakage	Sales (PSF)	Floor space Demand (SF)
Full Service Restaurant	\$2,369,011	\$300	7,897
Grocery Store	\$8,989,409	\$400	10-12 K
Hobby, Sport Goods, Music Instruments	\$1,362,684	\$250	5,451
Clothing and Shoes	\$3,699,230	\$250	14,797
Electronics and Appliances	\$1,947,829	\$1,000	1,948
Health and Personal Care	\$2,747,801	\$400	6,870

Sources: BOA, NP&V

The greatest untapped potential in Riverside include: full service restaurants, furniture and home furnishings, clothing and shoe stores, health and personal care stores, sporting good, hobby and musical instrument stores, and electronics and appliance stores. The neighboring Town of Riverhead is a major hub for consumer spending, home to the Tanger Outlets and a plethora of big box retail establishments. New business development in Riverside must differentiate itself from Riverhead's offerings by focusing on smaller, independent establishments and restaurants that fill a niche beyond the chain stores and restaurants in Riverhead. This way both centers can complement, rather than detract from, one another.

2.2.3.6 Grocery Store / Food Market

A food market needs assessment conducted by the Town of Southampton concluded that there is a need for a medium sized supermarket to serve the Riverside community. The study cited the lack of accessible food options within the community, a strong desire from residents, Riverside's geographic position as a gateway, stable population growth, high vehicular traffic, and a customer base in nearby Flanders and Northampton as drivers of demand for a food market.

2.2.3.7 Full Service Restaurant

Riverside, Flanders and Northampton are all sorely underserved in this area and limited service restaurant options are relatively sparse as well. While the existing income levels of the community in general are not conducive to a strong restaurant market, these are largely offset by the near complete lack of options. There is therefore a strong market for full-service restaurants, particularly those that take advantage of the community's existing resources by tying into the riverfront and the local Farm-to-Table Movement.

2.2.3.8 Hobby, Sporting Goods, Music Instruments

There is a demand for nearly 5,500 square feet of retail space in this category such as a fishing establishment that could offer both fresh and salt water same day guided tours, lunch provided at on-site restaurant, shore, kayak and motorboat fishing, gear rental and sales.

2.2.3.9 Electronics and Appliances

The Riverside-Flanders-Northampton area has a sales gap of nearly \$2 million on electronics and appliances which could yield a roughly 2,000 square foot small format retailer such as a small computer, camera, cell phone, video game or accessories store.

2.2.3.10 Clothing and Shoes

Demand for nearly 15,000 square feet of retail space for apparel could be filled by a variety of vendors including shoe stores, clothing boutiques and other retailers. Given the proximity to the Tanger Outlets in Riverhead, a smaller footprint, niche product would serve to differentiate the Riverside market from nearby competition.

2.2.3.11 Health and Personal Care

A sales leakage of over \$2.7 million reveals the opportunity for a small health and personal care store. This could be an opportunity for a small format pharmacy, beauty supply store, or health products store. Additionally, the community involvement process demonstrated community support for these types of health and personal care establishments.

2.2.3.12 Office

It is imperative that Riverside be positioned to tap into the employment growth occurring in the region. An analysis of the projected need for office space in the future reveals an opportunity to bring employment centers to Riverside, providing much needed economic development, commercial activity and job opportunities to the community, particularly for those residents who lack access to reliable transportation. The analysis projects the growth of office users in a 10-mile radius of Riverside in each industry sector. Assuming each worker occupies 150 SF of space, this analysis yields a total demand for nearly 810,000 SF of office space. Among the fastest growing sectors in this region (in terms of absolute number of jobs) are "Health Care and Social Assistance" and "Educational Services". Attracting employers in these industries would be particularly feasible.

2.2.3.13 Hotel

Riverside's scenic natural amenities and strategic position as the gateway to tourist attractions on both forks make it a prime location for a hotel. A hotel that ties into the existing waterfront, planned boardwalk and proposed new bridge could capitalize on the community's local assets and proximity to regional destinations as well as increase job opportunities for Riverside residents. Community support for a "Hotel Hospitality Center" and "The Gateway Center", which includes visitor and tourist services could successfully be integrated with the hotel.

2.2.3.14 Assisted Living

There is a significant market opportunity for an assisted living or similar facility. The closest assisted living facility to Riverside is over 10 miles away in Center Moriches. Between the Towns of Southampton and Riverhead there are approximately 3,000 seniors classified as having a “self-care” or “independent living” difficulty. Assuming that many of these people do and will continue to reside outside of assisted care facilities, a conservative estimate that 20% of this population can be tapped into yields a demand for roughly 600 beds. Such establishments would provide an important service for a growing demographic in the region and provide significant well-paying career opportunities to local residents.

2.2.3.15 Light Industrial / Production Space

A measure of job creation and economic development can be attained through certain light industrial uses. Artisan production facilities for local artists and craftsmen to create specialty items to sell online or locally, for example, could generate opportunities for entrepreneurial ventures and local employment while attracting creative and artistic people to live and work in Riverside.

2.2.3.16 Branding Strategies

As the geographic gateway to the North and South Forks of Long Island, Riverside is well positioned to take advantage of the many attractions of the East End.

Riverside has numerous natural resource assets. The local beaches promote Riverside as a place for beachgoers to shop, dine, stay, and play while the access to the Riverfront and planned boardwalk provide an excellent venue for water-based recreation. Trails offer opportunities for hiking, nature walks, exercise and exploration which makes Riverside an incredible prospect for ecotourism and nature-based recreation.

Local food growing would provide economic, social and health benefits to Riverside while shaping its unique identity as a place where food, community, nature and culture intersect. Riverside’s proximity to wineries on the North and South Forks offers excellent opportunities to tap into viticulture and viticulture for tourism, recreation and education.

Riverside can also utilize nearby East End Arts to act as a powerful catalyst for economic and cultural revitalizations. There is significant community support for a Riverside Children’s Museum which would make Riverside a unique place to visit while also providing an important educational opportunity for underprivileged children who typically lack access to quality educational offerings. Another attraction to promote Riverside as a unique destination is WaterFire, a public art installation and community arts event that could bring new interest and investment to Riverside.

By leveraging its existing assets and potential opportunities, Riverside can brand itself as a unique and attractive destination. A wealth of natural resources as well as community inspired events and establishments can make Riverside a truly incredible place to be. Renaissance Downtowns and Riverside Rediscovered have been working with art organizations and local artists to leverage on existing creating powers and initiatives, community location and waterfront amenity.

The Town has adopted the Riverside Revitalization Action Plan (RRAP) as prepared by Renaissance Downtowns (RD) to revitalize the community and develop the currently undeveloped and underdeveloped areas. The proposed action of constructing a centrally located STP is to help encourage outside investors, companies, and residents to come to Riverside and improve growth of the entire community. For more information on the planned development, see the RRAP report.

As stated above, the overall vision of the RRAP is as follows:

- Position Riverside as a Gateway of the Town, retain and attract a diverse and multicultural population that includes young professionals and members of the innovation and knowledge economies to promote the Town as a preeminent regional destination.
- Create a true sense of place, utilizing smart growth and sustainable development principles that meet the needs of current residents and attract future residents and businesses.
- Facilitate the creation of a mixed use and walkable Gateway Center to enhance the vibrancy of the Riverside Hamlet Center and create a diversity of uses (to live, work, shop, learn, and play).

- Complement Riverhead's downtown area and leverage the proximity of the Long Island Railroad station and availability of bus service.
- Reinforce a sense of community and neighborhood identity.
- Enhance the character and overall visual environment of the community.
- Promote housing choices with a broad range of housing types and price points including attainable and market-rate housing options.
- Expand the property tax base and provide additional employment opportunities.
- Incorporate municipally owned property located within the community to achieve an effective redevelopment strategy; and provide an avenue for private property owners to partner with the public sector and RD to foster the redevelopment of underutilized assets for the benefit of both themselves and the community.
- Leverage existing assets and proximity to maritime resources along the Peconic waterfront, natural assets, recreation areas, preserved open spaces of the Pine Barrens region, and proximity to Riverhead's downtown area.
- Attract business, residents and visitors to stimulate the local economy and position Riverside as a tourist destination with access to both the north and south forks and the many assets they possess.

2.3 Existing Facilities & Present Conditions

There is a lack of sufficient infrastructure for treating wastewater in Riverside, which is a major obstacle to redevelopment since the level of development permitted is dramatically limited without advanced wastewater treatment. Constraints relate to the required sanitary design flow limitations of the Suffolk County Sanitary Code (SCSC) as well as the physical and environmental constraints in this area. In order to prevent and reduce adverse effects of wastewater on the underlying aquifer and nearby Peconic River Estuary, limits have been placed on the amount of untreated wastewater that can be contributed by development. As mentioned earlier, there is no central sewage treatment facility for the community. Instead, each developed lot has its own dedicated conventional treatment system. Since there is no central treatment facility for the community, there is no existing data such as flow, energy consumption, layout, history of damage, capacity, age, conveyance, treatment, storage, disposal capabilities of each unit process, or failure history. The proposed sewage disposal development scenario would be designed for 800,000 gallons per day (GPD) average inflow and will be located on various lots with various stages of development.

It is important to note that since the proposed service area is serviced by decentralized septic systems, they are primarily developed to SCSC Article 6 density. Although conventional sanitary systems generally provide some level of nitrogen removal, they are highly ineffective compared to full scale sewage treatment plants. From the Center for Watershed Protection's Watershed Treatment Model (WTM) performed for the DGEIS by NP&V, the existing service area contributes approximately 5,976 lbs./year of nitrogen to the Peconic River.

There has been a collective effort by federal, state, county, and local agencies as well as participation from within the community to help preserve the Peconic Estuary. The result of this collaborative effort is the creation of the Peconic Estuary Program (PEP)¹⁰. The program was created to help protect and help the Peconic ecosystem thrive. One of the key goals of this Program is to minimize the total nitrogen (TN) being discharged into the waters while maintaining the state minimum concentration of dissolved oxygen (DO). One of the actions that has been proposed due to the PEP, is to modify the Riverhead STP and possibly reuse the discharge for irrigation or agricultural applications.

The PEP was set up to achieve a goal of 0.45mg/l TN guideline in all waters and 0.40mg/l TN in shallow waters¹¹. According to the study conducted by NP&V as part of their BOA study, the community has a total nitrogen concentration in recharge of 4.58 mg/l, since conventional onsite treatment systems can only provide limited nitrogen treatment and reduction. In order to help improve the health of the estuary and its ecosystem, there needs to be a focus on the quality of discharge to the surface waters. The PEP provides more evidence as to the necessity of nitrogen reduction in the community and its impact on the surrounding areas.

¹⁰ The PEP Comprehensive Conservation and Management Plan can be found at:
<https://www.peconicestuary.org/protect-the-peconic/ccmp/>

¹¹ See Peconic Estuary Program Chapter 3 Management Strategy, Pages 3-15 thru 3-19 – Exhibit I

2.4 Definition of the Problem

There are several problems that exist for the community as a whole. First, the nitrogen concentration was analyzed from a portion of the existing community and has been determined to almost double the guideline set forth by the Pine Barrens Guideline (Guideline 5.3.3.1.3), which is used for evaluating a Development of Regional Significance (DRS). The guideline suggests a maximum concentration of 2.5 mg/l which is nearly half of the current measured concentration of 4.83 mg/l. Aside from the existing conditions exceeding the current guidelines for nitrogen concentration, additional development (as proposed by the adopted RRAP) will not be allowed to continue to utilize conventional sewage treatment systems as outlined in the ROD.

Another issue is the current restrictions placed on the area that hinder development. Since the goal of the Town is to develop and revitalize the community, as expressed in the RRAP, the Town has also adopted the Riverside Overlay District (ROD) plan which rezones the areas to encourage development. However, since the SCSC enforces a range of sanitary flow from 300 to 600 gallons per day per acre in the community, the new district lots will be unable to develop to their highest building code potential without the benefit of sewage collection, treatment and disposal. At this time, sewage collection, treatment and disposal is not available and densification as outlined within the ROD can only be attained with the connection to an STP.

As stated in the 2013 Flanders Riverside Corridor Sewer Feasibility Study, there are no existing STP's within a mile of the community that are capable of treating the anticipated flow from the area. Therefore, in order for the RRAP to succeed and to protect the existing natural resources, it was determined that a collection system and a centrally located STP needs to be constructed.

Since there is no existing sanitary infrastructure within the community, it is proposed to connect separate portions of the community to the STP in phases. The entire community will be broken into several sub-districts for the purposes of collecting and transporting sanitary sewerage to the proposed STP. Each sub-district will have dedicated sewer system that collects to its own designated remote sanitary pumping station. The STP will need to be designed to accommodate the varying inflow from the multiple pumping stations.

As noted above, all of the major mechanical equipment associated with the proposed infrastructure will be located within lots that are designated FEMA Zone X with the exception of one of the pump station locations, which is within FEMA Zone X 0.2%. The design of this pump station will need to incorporate the possibility of a 500-year flood as Zone X 0.2% indicates. This area estimates the possibility of a 2' to 3' flood. All other infrastructure locations are proposed to be in lots designated as uplands and are therefore less likely to be susceptible to flooding. Also noted above, based on estimates of a three-foot sea level rise during a 500-year storm event, the proposed STP would still be above flood levels. Only part of one pump station would be affected, suggesting the possible need to elevate and/or floodproof this structure, to ensure continued operation during an extreme weather event from future sea level rise. These factors would need to be considered during the pump station design process.

2.5 Financial Status

Over the past several years, the Town has developed sound budgeting practices that have not only strengthened the Town financially but have led to the Town receiving the highest possible credit rating (AAA) from Standard and Poor's (S&P) and, in 2017, from Moody's as well. The 2018 Budget will for the second year reduce the tax rate. In this case, a rate reduction of approximately 1%. The ability to provide a tax rate reduction stems from several factors all best described by Moody's Rating Report which indicates the Town of Southampton as having "strong financial management practices and policies." Included in that description is the Town's ability to maintain and grow its fund balance (reserves) which has increased over 40% over the past 10 years and this year stands at \$29.5 million. Of equal importance to our strong financial position is the aggressive approach the Town has taken over the past several years to reduce its outstanding debt. In this case, a nearly \$5 million debt reduction last year alone. From 2014 to 2018, the outstanding long-term debt has decreased by approximately 13%. Debt reduction, conservative budgeting, maintaining a strong and healthy fund balance are all important factors in the Town's financial profile. Each of these critical factors is made stronger by the consistent growth throughout the Town as measured by the total assessed value. Since 2013 that value has increased 15% from \$55 billion to \$63.7 billion.

Attached to this report is the original Town of Southampton Comprehensive Annual Financial Report For The Year Ended December 31, 2022. This financial report was provided by the Town and has not been modified in any way by this office¹².

¹² See Town of Southampton Comprehensive Annual Report for the Year Ended December 31, 2022 – Exhibit J

Section 3 Alternatives Analyses

3.1 General – Description

The intent of the project is to construct the necessary sanitary infrastructure and a centralized sanitary treatment facility to service the entire community of Riverside. The infrastructure would consist of a gravity collection system as well as pump stations and force mains. The STP would need to be capable of secondary treatment. All of the systems would need to be designed and constructed according to the SCSC as well as the local guidelines put into place such as the PEP. The conveyance systems would collect sanitary flow from the entire community and ultimately discharge into the proposed STP. Since there is no current sanitary infrastructure or centralized treatment facility in place for the community, the only options are to either build or not build. Therefore, after a brief description of alternatives, one was selected and is the focus of this report to be utilized for the community. Since there is no municipal facility in place currently, there will be no impact by the construction of the one proposed.

As stated above and in the DGEIS by NP&V, the existing concentration of nitrogen in recharge within the study area is estimated to be 4.58 mg/l, and the concentration within the Central Pine Barrens portion is 4.83 mg/l. Per the study conducted by NP&V and their proprietary model (SONIR) the concentrations in the study area and Central Pine Barrens portion of the study area with a centralized wastewater treatment facility would be approximately 4.12 mg/l and 4.55 mg/l respectively. That relates to a 10.04% reduction of nitrogen concentration in the overall study area and 5.80% reduction of nitrogen concentration in the Central Pine Barrens portion of the study area. This further illustrates the positive environmental impact that the construction of the infrastructure and STP will have.

Also, due to available site area, the most feasible discharge type available is to install a leaching pool system contiguous to the STP which will be consisted of clusters of precast concrete sanitary leaching pools. A standard ten-foot (10') diameter leaching pool with appropriate setbacks would require approximately 324 square feet of space. In accordance with the regulations of the Suffolk County Department of Public Works (SCDPW) and Suffolk County Department of Health Services (SCDHS) 200% for leaching pools would need to be installed for the system operation and 100% of space needs to be reserved for future expansion, the design flow for the community would require approximately three hundred twenty (320) 10' by 8' effective depth leaching pools which would require 207,360 sf (4.76 acres) at construction and 103,680 sf. (2.38 acres) of land area for future expansion. This area would need to be removed from the proposed revitalization area and secured for the sole purpose of effluent leaching.

The different options available to consider that will allow some level of revitalization within the community include conventional disposal systems, collection and pump station system to a nearby existing treatment facility, and collection and pump station system to a new treatment facility within the community. The different process technologies that were investigated to treat the wastewater from the community include the Biologically Engineered Single Sludge treatment, Membrane Bioreactor treatment and Sequencing Batch Reactor treatment technologies. In addition, two supplemental sludge reduction facilities were considered. Below is a brief description of each and their respective advantages.

3.1.1 Conventional Disposal Systems

Conventional disposal systems consist of septic tanks, leaching structures and any associated interconnecting piping. Conventional systems are strictly located onsite of the wastewater source. They also do not have any active or mechanical components to provide treatment or supplemental filtration.

Some of the advantages of conventional disposal systems include the following:

- Low cost of maintenance
- Responsibility of maintenance falls to the property owner

3.1.2 Collection and Pump Station Systems to a Nearby Existing Treatment Facility

Collection systems convey wastewater from the properties to discharge point, either a treatment facility or a pumping station. They consist of precast concrete manhole structures and gravity pipe. The size of the gravity pipe depends on the quantity of wastewater anticipated to be conveyed through the segment or main line. Due to the topography and size of the community, it is anticipated that several pump stations will be required. Pump stations are large precast concrete structures equipped with pumps and valves. The structures are sized to accept and retain a portion of the wastewater before the pumps turn on to send the flow to a treatment facility. Downstream of the pumping stations are networks of force mains, which consist of pressure pipe and concrete structures at the high and low points in the pipeline.

Some of the advantages of this option are as follows:

- Low cost of maintenance
- Treatment and operations are the responsibility of the facility owner
- Small footprint
- With variable frequency drives, pumping rate can be easily adjustable
- Ability to grow with the community

3.1.3 Collection and Pump Station System to a Treatment Facility Within the Community

The descriptions from Section 3.1.2 apply except for the terminating point being a centralized treatment facility within the community.

Some of the advantages this option includes the following:

- The items listed in Section 3.1.2
- Self-dependence for treatment, not dependent on other facilities having sufficient capacity
- Minimize the force main routing, since the network will not leave the community

3.1.4 Biologically Engineered Single Sludge (BESST)

The Biologically Engineered Single Sludge Treatment (BESST) system is a type of continuous flow modification of a conventional activated sludge system. The BESST system equipment is typically fitted and installed directly into newly constructed concrete tanks.

Typical effluent concentration levels that can be expected with the BESST system are as follows:

- BOD Levels – Capable of producing an effluent with less than 30 mg/l BOD₅.
- TSS Levels – Capable of producing an effluent with less than 30 mg/l suspended solids.
- Nitrogen Levels – Capable of producing an effluent with less than 30 mg/l BOD₅ and suspended solids, and less than 10 mg/l of total nitrogen.

The BESST process utilizes multiple trains to evenly separate the influent flow. Within each train would be a dedicated equalization tank, anoxic tank and a common aeration / clarifier tank. The aeration tank is fitted with the BESST clarifier that sits on a concrete bench. Post-clarifier flow is typically directed to drum filters before being discharged by gravity to the leaching field.

The BESST process is designed to have 100% backup of all equipment and failsafe controls to ensure mechanical reliability. The prefabricated triangle shape clarifier enables the process to utilize the upward velocity gradient. This allows the clarifier to be designed for up to three times the design flow, allowing for a higher hydraulic flexibility.

Some of the advantages of the BESST process system include the following:

- Mechanical reliability
- Single sludge treatment

- High operating Mixed Liquor Suspended Solids (MLSS) concentration
- Reduced capital costs due to single tank design
- Little to no odor
- Hydraulic flexibility

3.1.5 Membrane Bio-Reactor (MBR)

The Membrane Bioreactor (MBR) technology is a type of activated sludge system which uses membrane filtration as a tertiary treatment process. The MBR system equipment units would be installed into new concrete tanks.

Some of the advantages of employing the MBR system are as follows:

- Exceptional Effluent Quality – The membrane filtration provides complete BOD, Ammonia and TSS removal. Suits BNR requirements as coagulated metal salts and phosphorous is removed. The system exceeds most tertiary treatment disinfection requirements as membranes reduce Giardia and Cryptosporidium concentrations by more than 99.99%
- Reduction in Sludge Production – Since the plant can operate at sludge ages in excess of 30 days, MBR can produce 40% less solid waste than conventional facilities
- Smaller Plant Footprint – Elimination of Sedimentation processes and operation at high solids concentrations can enable the square footage of the plant to be reduced by an estimated 30% to 50%

The actual membrane is used as a type of filter, rejecting the solid materials which are developed by the biological process, which results in a highly clarified and disinfected effluent. The MBR process uses a higher solids retention time which results in a better quality effluent. Also, the high solids retention relates to higher concentrations in the biomass which relates to a smaller overall footprint.

Some of the advantages of a MBR type process system include the following:

- Smaller overall footprint
- Higher biomass concentrations for higher quality treatment
- Longer retention times with less sludge production
- Longer retention times and higher concentrations of the biological elements results in a highly efficient treatment process
- High quality effluent

3.1.6 Single Batch Reactor (SBR)

The Sequencing Batch Reactor (SBR) technology is a type of activated sludge system which treats the influent wastewater in batches within the same tank. A combination of air diffusers and mixers allow for aerobic and anoxic treatment in the same tank using a controlled and timed batch for the process. The use of the single basin eliminates the need to recycle the process flow as required for the other processes mentioned. The typical process stages include a fill cycle, a react cycle, a settle cycle, a decant cycle, and an idle cycle.

Some of the advantages of an SBR type process system include the following:

- The entire process occurs in a single tank which excludes the need for a separate clarifier
- Hydraulic flexibility, cycles are easily adjusted with the controller
- Easily upgradeable to include secondary and tertiary treatment by installing mixers and filters respectively
- High quality effluent

3.1.7 Janicki Bioenergy

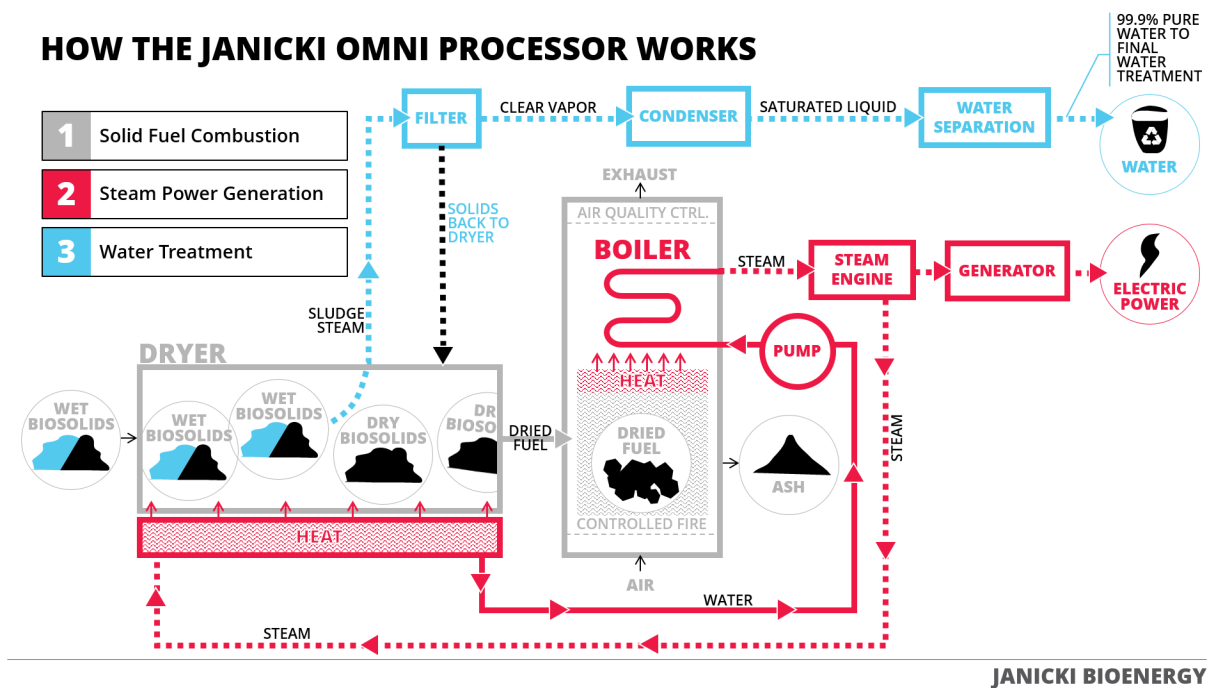
There were two separate processes considered from Janicki Bioenergy, the patented Omni Processor (OP) S200 unit and the Vapor Recompression Distillation (VRD) processes. Each has its own advantage but both produce pathogen-free outputs.

The S200 is an all in one unit that takes in the sludge waste from a proposed STP and processes it to usable resources. The unit was designed and is manufactured by Janicki Bioenergy and utilizes a patented system known as the Omni Processor (OP). It will take in the sewage sludge and convert it, through a series of various mechanical equipment units, to electricity/heat, clean water, ash, and fertilizer. Once the unit is operational, it generates its own energy required to remain operational. All of the available outputs can be collected and used without any detrimental effects or harm being caused to the environment or to the community.

The S200 Processor is a stationary combined heat and power (CHP) plant that can convert dry and wet waste streams into electricity, thermal energy (steam and heat), pathogen-free reuse water (potable water possible with additional equipment) and ash. It can be easily configured to process wet or dry waste, or a combination of both, generated from a variety of sources.

The unit is completely computer controlled and can be maintained with just a single onsite operator. Being computer operated also allows the unit to be monitored by the manufacturer at all times, which allows for quicker and more comprehensive technical support if requested.

Below is a schematic layout of the S200 process:



Source: Janicki Bioenergy Website (Accessed 4-12-17) (<https://www.janickibioenergy.com/omni-processor/how-it-works/>)

The specifications of the S200 unit include the following:

- S200 Processor and Dryer Configurations
 - Boiler Capacity (2.1MW output continuous) – 10 dry tons per day (dtpd)
 - Single-Stage Dryer Capacity (25% solids content) – 40 wet tons per day (wtpd)
 - Multi-Stage Dryer (15% solids content) – up to 67 wtpd
- Electrical Generation – up to 250 kW excess
- Water Production – up to 19,500 gallons per day

The VRD system separates liquid waste streams, typically 2% to 8% solids, into distinct byproducts using proprietary technologies. Liquid waste stream is sent through an evaporation process to remove the solids. From there, it is further processed for vapor recovery and water treatment before being sent to phase separators. The stream is then processed to a point where the water is clean enough for direct discharge and the liquid/solid portion can be used as fertilizer.

Each of the two options considered present possible revenue sources. Energy and water are potential revenue sources from the S200. Water and nutrient-rich organic fertilizer are potential revenue sources from the VRD. Both of these options are alternatives to the traditional treatment option available.

3.1.8 Renewable Energy Options

There were two renewable energy options considered for the STP area, wind and solar energy. Each will produce energy that will reduce the operating costs of the plant but at differing rates. Three layouts were considered, rooftop solar panel coverage, rooftop wind turbine farm, and a combination of solar panel layout with wind turbine perimeter.

The size of the proposed STP building will allow for approximately 1,450 panels to be installed on the roof. Taking into consideration the location of the plant, the average daily sun hours that would be available is quite low for the entire year. At the time this option was evaluated the average electrical cost was approximately \$0.22 per kilowatt-hour. We estimated that it would take a little more than five years for the panels to generate enough energy to cover the cost of the panels themselves. This does not take into consideration construction, maintenance and servicing costs.

The market for rooftop wind turbines are not as fully established as solar panels. There are many different designs that proclaim they optimize the efficiency of the turbine. To allow for adequate spacing for wind flow, it was estimated that approximately forty eight turbines can be installed on the roof in an offset layout. Based on an average energy generation and the current electrical cost, it was estimated that the wind turbine layout would take a little more than eleven years to generate enough energy to cover the cost of the turbines. Again, this did not take into consideration construction, maintenance and servicing costs.

The third option was to combine the wind turbine and solar panel layouts. The solar panel rooftop option was kept the same only with wind turbines around the perimeter of the rooftop only. This layout was estimated to take approximately eight years to cover the cost of the materials, again without additional expenses taken into consideration.

It is important to note that none of the options would generate enough energy to make any of the STP process options be self-sustaining. A connection to the electric grid will be required despite any installation of renewable energy sources. Therefore, the renewable energy sources' installation will not affect the construction of the STP. The panels or turbines can be installed at any point after the building has been constructed and should have no impact of the treatment process.

3.1.9 Centralized vs. De-Centralized

The advantage of de-centralized treatment is to provide tailored treatment to small areas within the community. Each small area would be monitored and operated differently based on the characteristics of the area and the loading of the influent flow. Also, each facility that has a design inflow of 1,000GPD or more will be required to obtain a State Pollutant Discharge Elimination System (SPDES) permit. This will not only increase the time necessary to receive approvals to construct but will also put a burden on the Town to adhere to and be held accountable to conform to its regulations for each individual small scale treatment facility.

However, there are several items that do not make this a feasible option. Available land to be dedicated for smaller scaled treatment facilities will greatly reduce the degree of revitalization desired for the community. A centrally located STP, although will have a much larger footprint, will maximize the area around the community to be used for revitalization. Operations and maintenance costs will also be easier and cheaper with a centralized STP. Land topography presents an issue with regards to installing a collection system. Instead, it is intended to collect the sanitary flow locally throughout the community and as best suited with the grade of the area and pump the flow to the STP.

3.1.10 Constructed Wetlands

Constructed Wetlands (CW) can be built for processing effluent leaching if properties with adequate land area and ambience conducive to the proper functioning of CW is available to house the leaching system.

Constructed wetlands provide denitrification through the process of plant absorption and can provide additional water quality benefits after initial treatment at the STP. This would help further reduce nitrogen related impacts on the Estuary, potentially lessen dissolved oxygen concentrations, and protect aquatic species. The effectiveness of nitrogen removal by constructed wetlands is, however, reduced in the winter when wetlands plant species are dead or dormant, and are unable to absorb nitrogen. Furthermore, as a point of comparison, the proposed STP itself can be equipped with filters that remove nitrogen as part of the treatment process.

Some of the advantages to the use of Constructed Wetlands include:

- Opportunity to restore an area of dredge spoils to a more natural previous wetland condition
- Denitrifies effluent naturally with no mechanical parts.
- Eliminate leaching area clearing and disturbances at STP site.
- Provides habitat for some species of wildlife.
- Constructed wetlands do not require the use of energy and therefore would not require energy once operating, except for some possible periodic maintenance activities.

3.1.11 Hauled Scavenger Waste

Sewage Treatment Plants can be utilized to process hauled waste from scavenger waste trucks. The proposed STP would need to be designed to accommodate the additional flow from scavenger waste trucks as well as to be equipped with the necessary facilities for proper processing of the hauled waste. Typically, the waste from the scavenger truck would be dumped into a pretreatment basin. The hauled waste would need to flow to sediment and grease separators. The separated flow would then flow to the proposed STP for treatment, and the separated wastes would be hauled offsite for final treatment and disposal.

In order to maintain the level of redevelopment and revitalization within the Hamlet, the only option to allow the acceptance of the scavenger waste flow is to increase the size of the proposed STP. The addition of the required pretreatment area as well as the larger treatment tanks will result in an increase in the overall footprint of the STP building. Also, the area reserved for the proposed leaching field will need to be reassessed for the required leaching pools that will need to be installed to accommodate the additional flow. It should also be noted that the additional equipment and pretreatment services will also increase the operations and maintenance costs for the facility.

Some Advantages to the acceptance of hauled scavenger waste include:

- Source of income for the Town
- Additional disposal option for scavenger waste haulers

3.2 Non-Monetary Factors

The construction of a sewage conveyance system and a centrally located STP will help revitalize the Riverside community. With the addition of the needed infrastructure leading to a STP, the community will be able to develop the remaining areas that are currently vacant and redevelop the areas that have previously been developed but are no longer in operation. There are several vacant and abandoned lots that can only benefit from redevelopment if sanitary conveyance and centralized sewage treatment is provided.

In conjunction with the RRAP and ROD, the Town will be able to mold the community into a gateway community, attract new businesses and residents, and convert some of the unused areas into aesthetically pleasing park and waterfront areas. The revitalization will increase revenue and attract new and modern developers to redevelop the area and convert the community into a focal point in the region. The sewage conveyance system and treatment plant concept becomes the vanguard for the waterfront redevelopment. All of these items will together bring the overall economic status and give the existing community the sense of place and identity it has been craving.

Section 4 Recommended Alternative

4.1 General

N+P evaluated several technologies currently available for wastewater treatment such as SBR, MBR, and BESST and concluded that the SBR technology would be the best fit for the project from the standpoint of operation flexibility and cost assessment. Our research regarding the Janicki processes proved that the proposed STP plant would not produce enough sludge to make the S200 unit self-sustainable. Furthermore, the proposed STP would not generate enough sludge to optimally operate either the S200 or VRD unit, which would make installation of either of the units not economically feasible. More traditional methods of sludge treatment that were considered (gravity belt thickeners) are not cost effective at this flow rate. Thus conventional aerobic digestors are proposed.

The proposed system would be a continuous feed system called ICEAS and not a true batch system which uses plug loading, so the system will not experience hydraulic overflow. The system will be designed such that variations in the quantity of inflow from the development will be equalized prior to entering the process tanks. Each process phase is programmed to last for set time period within each cycle allowing steady and consistent system performance once the incoming flow characteristics are determined by the operator and the program logic controller is adjusted accordingly.

The recommended solution is a wastewater treatment plant (WWTP) utilizing the Sequencing Batch Reactor (SBR) Technology. The plant will be designed in accordance with Suffolk County Department of Health Services, Suffolk County Department of Public Works, New York State Department of Environmental Conservation and the U.S. Environmental Protection Agency regulations.

Due to the lack of existing sanitary infrastructure and since the majority of the community is not currently developed to its fullest potential, the existing sanitary flow is considerably less than what is expected for revitalization. The closest existing treatment facility is the Riverhead STP, which does not have the capacity to accept the full flow of the revitalized community. To install a force main network beyond this location will greatly increase the price of construction and maintenance costs. Therefore, it is recommended that the best course of action for the community to begin the revitalization process is to construct sanitary infrastructure which terminates at a new sewage treatment facility.

The community will be broken into several sanitary sub-districts which will collect the flow via the gravity system to the local pumping stations. The pump stations will be designed to handle the full flow of the sub-district with a peaking factor. Since the revitalization process will take place over time, it is recommended to equip the pump stations with variable frequency drives to adjust the flow rate of the pumps as the community develops. Also, since it is in the best interest of the community to discharge the sanitary wastewater to a facility within the community, the overall cost of the pump stations and force mains will be minimized.

The SBR technology is highly adaptive to various flow scenarios, and therefore can be easily adjusted from the controller to accommodate the different flows that the proposed STP will see throughout the revitalization process of the community. Some of the equipment output will need to be optimized at the controller in accordance with the change in influent flow as the development advances to accommodate the newly developed areas while maintaining effluent concentration criteria.

Also, the proposed STP layout was considered such that only a portion of the plant would be required at the time of initial construction. The layout considers the use of four treatment trains to handle the full 800,000 GPD flow. The Town could entertain the concept of phasing the construction of the STP in line with the advancement of revitalization of the community. Only two of the four basins would be required for the initial influent flow, and the second pair of tanks could be constructed at a later time when the community would require additional capacity. The layout of the four tanks has been placed in such a way so as to allow for the construction of two trains at a later date without interrupting daily operation of the existing system. The system must be sized and designed for full treatment in the event one train is offline during all phases of construction, as per 10-States Standards. See Exhibit M for proposed STP building and tank layout.

Below is a summary of the design process for the proposed STP. A separate Basis of Design Report (BODR) will be provided for review during the design phase of the proposed project.

4.1.1 Wastewater Design Parameters

Design Flow:

All analyses performed in conjunction with this report will use a design flow of 800,000 gallons per day.

Influent Characteristics:

The influent characteristics are based on Suffolk County Department Health Services (SCDHS) recommended design criteria and are provided in Table 1 below.

Characteristic	Concentration	Units
Biochemical Oxygen Demand (BOD ₅)	272	mg/l
Total Kjeldahl Nitrogen (TKN)	65	mg/l
Total Suspended Solids (TSS)	320	mg/l

Table 1: Design Influent Characteristics.

Note: These parameters assume that offsite industrial pretreatment will be implemented as necessary in the sewer district.

Effluent Characteristics:

The effluent characteristics are designed to meet the requirements of SCDHS and the New York State Department of Environmental Conservation Ground Water Class GA standards prior to discharge. The design effluent limitations are shown in Table 2 below.

Characteristic	Concentration	Units
pH	5.5 - 8.5	-
Total Nitrogen (TN)	< 10	mg/l
Biochemical Oxygen Demand (BOD ₅)	< 30	mg/l
Total Suspended Solids (TSS)	< 30	mg/l

Table 2: Design Effluent Characteristics.

4.1.2 WWTP Description

All process tanks, controls, and influent pump station for the proposed sewage treatment plant will be fully enclosed inside a single sixteen foot high, 29,850 SF masonry block building. The building will house the influent pump station with controls, a laboratory, a mechanical room, an electrical room, and a four train SBR treatment system that discharges to a leaching field. All process tanks will be made of reinforced concrete. A generator will be included within the site for emergency electrical back up should there be a power failure. The building will be located with the appropriate setbacks to adjacent properties. Due to the size and location of the STP, every effort would be made to minimize the impact on residential and commercial properties to the North and East, but it was necessary to be within approximately fifty feet of the westerly vacant property which is zoned for industrial use.

4.1.3 Sequencing Batch Reactor System Description

The SBR System will be a four-train system consisting of the following:

- An Influent Pump Station to convey raw sewage to the mechanical screen
- One (1) Mechanical Fine Screen
- Two (2) 122,216 gallon Equalization Tank
- One (1) Influent Splitter Box
- Four (4) 300,744 gallon Sequencing Batch reactors
- Four (4) 87,935 gallon Sludge Holding Tanks,
- Two (2) 123,525 gallon Intermediate Surge Tanks
- One (1) Effluent Flow Metering Chamber
- SBR Aeration System consisting of three (3) aeration tank blowers, three (3) sludge holding tank blowers, two (2) influent equalization tank blowers, and all associated diffusers and piping.
- Electrical Equipment
- Chemical Feed System for pH control and supplemental carbon
- An effluent Pump Station to convey the treated wastewater to the on-site leaching system.
- One (1) Stand-by Generator

4.1.4 WWTP Location

The proposed STP will be located on a dedicated area consisting of seven (7) lots totaling 10.82 acres and designated as the Suffolk County Tax Map (SCTM) Numbers 0900-141-01-9.14, 9.17, 9.25, 9.29, 9.30, 9.31 & 9.32. The lots are currently undeveloped and unimproved. See the attached Overall Site Plan and STP Site Plan for the property layout.

4.1.5 Discharge Permit Requirements

Every STP constructed in Suffolk County must apply for and comply with the State Pollutant Discharge Elimination System (SPDES) requirements. The SPDES permit program is designed to eliminate pollution of state waters. Monitoring wells locations will be planned in accordance with the requirements of the New York State Department of Environmental Conservation (NYSDEC) to monitor the impact of the discharge facility on the local groundwater quality. Both the STP plant itself and the discharge monitoring wells will be required to be inspected on a quarterly basis by the regulatory agency.

After discussions with the NYSDEC Regional Office, the SPDES Permit limits for the effluent proposed to be discharged into the ground will be as listed below:

- Flow: 0.8 MGD
- Total Nitrogen (TN): 10 mg/l
- Total Dissolved Solids (TDS): 1,000 mg/l
- pH: 6.5 – 8.5
- TKN: monitor
- Temperature: monitor

Additional limits may be added in the future, the need for which would be based on sampling results from the facility once it is operational.

4.1.6 Considerations for Impacts from Inflow and Infiltration (I&I)

The proposed conveyance system and STP must be designed with proper consideration from potential Inflow and Infiltration (I&I). Inflow refers to the amount of added flow to the system caused by groundwater conditions. Infiltration refers to the amount of added flow to the system caused by a rain event. The facilities should be designed to account for potential added flow caused by I&I, and proper operation of the facilities need to be established to accurately analyze the flow data and environmental conditions to determine the extent of I&I. If excessive I&I is determined to exist, actions must be performed to extend the life of the equipment and minimize the financial impact to the Town and property owners for conveying and treating the excessive flow. The potential of I&I will increase over the life of the proposed systems. Accounting for the potential I&I during the design phase is crucial for minimizing future impacts and extending the life of the proposed systems.

4.1.7 Next Steps

There are several additional steps that need to be taken for this project. These additional steps and anticipated timetable are represented in the preliminary project schedule below. Each milestone includes the associated regulatory review, permitting process, and or public hearings required for each.

4.1.8 Preliminary Project Schedule

A preliminary Project Schedule is provided below. This schedule takes an aggressive approach to the tasks needed to be accomplished. The assumption is made that the Town would be able to procure the necessary funding, grants and/or loans prior to the commencement of the project advertisement and bid processes. Additionally, the time allotted for any municipal review and approval has been assumed and is represented in an aggressive timetable.

Preliminary Project Schedule

Milestone	2024	2025	2026	2027	2028	2029
Map & Plan Finalized	█					
SEQRA and SHPO Completed (Assumes EIS not required)	█					
Public Hearings / Referendum to Establish the Sewer District (May be Required)	█					
Engineering Design Report Preparation (Includes State Review & Approval)*	█	█				
New York State Comptroller Approval Process (Sewer District Formed)	█	█				
Project Funding, Grants and Loan Process		█	█	█		
Plans & Specifications Prepared for Construction		█	█	█		
Suffolk County & NYSDEC Review of Construction Documents			█			
Project Advertisement, Bidding, Award & Contract Execution				█		
Construction				█	█	█
Procure Contract Operator					█	
Start-up & Training						█

*Time is allotted in the schedule for municipal review and approval

4.2 Cost Estimate

4.2.1 Sewage Conveyance System Cost Estimate

The table below represents the estimated cost of construction for the construction of the proposed sanitary collection and pump station systems. The construction estimate represents preliminary budget pricing at the date of the report to construct the utilities. These estimates may not reflect market conditions at the time of construction of the utilities.

Sewage Conveyance System Construction Cost Estimate:

Item	Phase I			Phase II		
	Unit	Qty	Cost	Unit	Qty	Cost
Force Main	LF	7,725	\$2,101,038	LF	4,100	\$1,115,114
Pump Stations	Each	3	\$1,395,000	Each	1	\$465,000
Collection System / State Road	LF	3,750	\$1,019,921	LF	1,325	\$360,372
Collection System / County Road	LF	4,650	\$1,264,702	LF	950	\$258,380
Collection System / Town Road	LF	26,925	\$7,323,035	LF	15,575	\$4,236,073
Legal, Engineering, CM, etc Cost			\$2,751,776			\$1,351,337
30% Contingency			\$3,931,109			\$1,930,482
Estimated Construction Cost			\$19,786,581			\$9,716,758
Total Infrastructure Cost						\$29,503,339

NOTE: See Updated CWSRF Report at the following link: <https://www.southamptontownny.gov/2071/Riverside-STP-Supplemental-FINAL-Generic>

4.2.2 STP Cost Estimate

The table below represents the estimated cost of construction for the construction of the proposed SBR Treatment system. The construction estimate represents preliminary budget pricing at the date of the report to construct the plant. These estimates may not reflect market conditions at the time of construction of the plant.

STP Construction Cost Estimate:

Item	Phase I Cost	Phase II Cost
SBR Equipment	\$2,490,600	\$2,490,600
Mechanical Fine Screen	\$205,400	\$205,400
FRP Handrail & Grating	\$410,800	\$410,800
Process Pumps	\$331,796	\$194,495
Standby Generator With Automatic Transfer Switch	\$792,000	\$0
SBR Installation	\$1,978,600	\$1,500,000
Piping & Mechanical (Internal to the STP only)	\$1,415,000	\$1,130,600
Electrical	\$1,688,700	\$985,700
Concrete	\$2,895,500	\$2,579,809
STP Building (CMU Block Walls, Concrete Roof, etc.)	\$675,000	\$506,600
Leaching System	\$524,750	\$524,750
Legal, Engineering, CM, etc Cost	\$2,815,711	\$2,211,038
30% Contingency	\$4,022,444	\$3,158,626
Estimated Construction Cost	\$20,246,300	\$15,898,419
Total STP Cost		\$36,144,719

4.2.3 Operation and Maintenance Cost Estimate

Typical annual operations cost for this type of facility at a design flow rate of 800,000 GPD would be between \$1,800,000 and \$2,700,000. Operations for this type of facility include maintenance and upkeep of the equipment, required laboratory testing, general monitoring of influent and effluent, etc.

Annual Operations and Maintenance Cost Estimate:

Item	Phase I Cost	Phase II Cost
STP Operations		
STP Contract Operations	\$440,000	\$200,000
STP Accounting	\$35,000	\$35,000
Insurance Cost	\$25,000	\$25,000
Energy Cost	\$80,800	\$80,800
Sampling and Testing	\$12,500	\$12,500
Process Chemicals	\$7,500	\$7,500
Consumables	\$5,000	\$5,000
Sludge Hauling	\$185,000	\$185,000
Engineering Cost	\$7,500	\$7,500
10%Contingency	\$79,830	\$55,830
Phase Cost	\$878,130	\$614,130
Total Cost		\$1,492,260
Collection System Operations		
PS Contract Operations	\$75,000	\$25,000
PS Accounting	\$12,000	\$3,000
Insurance Cost	\$10,000	\$2,500
Energy Cost	\$6,700	\$2,200
Consumables	\$2,500	\$750
Engineering Cost	\$2,500	\$1,000
10%Contingency	\$10,870	\$3,445
Phase Cost	\$119,570	\$37,895
Total Cost		\$157,465

4.2.4 Capital Cost

The total cost an average household will be responsible for is determined by adding the capital cost distribution to the operating cost for the sewer district. The Town is seeking funding from various sources and therefore it is expected that the average household will not need to be responsible for the capital costs of construction associated with the District. Therefore, the average costs will only be the operating costs that will be paid via a sewer bill as outlined in the table below. As shown in the table below, the total Cost of Construction for Phase I is approximately \$44,605,706.

Project Phase I Total Cost

Item	Cost
Infrastructure Construction	\$19,786,581
STP Construction Cost	\$20,246,300
Land Acquisition	\$3,302,825
Cost for Connection	\$904,500
Price Escalation	\$365,500
Total Cost	\$44,605,706

The table below identifies the potential project financing sources for the Phase I.

Project Financing Sources Phase I

Funding Source	Funding Amount
Suffolk County	\$250,000
Suffolk County Federal Infrastructure Funding	\$5,000,000
Federal Member Item Grant	\$5,000,000
NYS EFC Grant @ 50% of Project Costs up to \$19,242,000* (BIL Funding)	\$19,242,000
CPF @ 27% Existing Flow	\$6,000,000**
Current CPF Allocation (Remaining Balance)	\$4,907,563
CPF Funds for Land Acquisition (100%)	\$3,302,825
CPF Funds for Hook Ups (100%)	\$904,500
Total Outside Funding	\$44,606,888
Balance Needed to be Funded	\$0
Projected Debt Service to be paid with tax levy (per year) (30 year 0% interest bond)	\$0
Tax Rate (per dollar assessed)	0.00

*Funding amount assumed

**The total existing flow is calculated at the equivalent of \$7,500,000 with \$6,000,000 currently allocated

The majority of the lots within the proposed District are currently one- or two-family homes. Therefore, it was determined that the best way to calculate the cost to the typical property was to equate all properties to single family equivalents (SFE's). The proposed District total flow of 400,000gpd equates to approximately 1,778 SFE's. The total cost of construction for the district, after the committed funding amounts and anticipated EFC funding amount shown in **Table 5**, would be \$4,907,563. Distributing this cost over the total SFE's for the district gives \$2,759.49 per SFE. As stated in the table above, it is anticipated that the Debt Service will be interest free over a period of 30 years. Therefore, the typical property of one SFE would have a cost burden of approximately \$91.98 per year for 30 years.

Notwithstanding the above, it is the intention of the Town of Southampton to have the entirety of the cost of construction to be fully funded by the funding sources stated in the table above. Therefore, the average costs for the typical property will only be the operating costs that will be paid via a sewer bill as outlined the table below.

Summary of Average Household Costs with Operating Subsidy Only

Capital Cost Item	Capital Cost Amount
Total Capital Costs Paid Via Tax Bill	\$0.00
Total Operating Costs Paid Via Sewer Bill ¹³	\$225.00
Total Average Homeowner Costs	\$225.00

It is the intent of the Town of Southampton to seek additional financial funding sources for the construction of Phase II. To maintain the above mentioned average cost for the typical property, the Town will seek to secure sufficient funding for the entirety of the cost of construction for Phase II.

NOTE: SEE REVISED APRIL 2024 CWSRF REPORT AT THE FOLLOWING LINK:
<https://www.southamptontownny.gov/2071/Riverside-STP-Supplemental-FINAL-Generic>

¹³ Subsidized by CPF Funding

NOTE: See updated April 2024 CWSRF Report at the following link:
<https://www.southamptontownny.gov/1835/Riverside-STP>