Map, Plan and Report
Outlet and Sagamore Drive Sewer and Water District Extension

Town of Ticonderoga
Essex County, New York

Paid for by the Lake George Association
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Executive Summary

This Map, Plan and Report for Sewer and Water District creation is paid for by the Lake George Association and was initiated through the interest of residents eager to receive public sewer and water service along the western shore of Lake George that is accessed by Outlet and Sagamore Drives from Baldwin Road. This section of the shoreline of Lake George, within the Town of Ticonderoga, is the only remaining significant Lake George shoreline area in the Town that is not served by public sewer and water service except for a few remote dwellings at the Southern end of Baldwin Road. Sewer and Water Districts exist both north and south of this approximately 0.75-mile section of shoreline with sewer and water lines available along Baldwin Road to the west.

Over the past thirty years there has been interest in the formation of sewer and water districts to serve this section of shoreline especially following a district creation to the south which brought the necessary infrastructure down Baldwin Road from the North. In August of 2001, Kestner Engineers was retained by the Town Board to prepare an MPR for a Sewer District to serve Outlet Drive and Sagamore Drive. A State Budget stalemate and the terrorist attacks of September 11, 2001 shifted priorities and funding was not made available. Potential district residents voted down the referendum to form the district in the fall of 2001. Review of Town files and correspondence from residents at that time indicated concerns with the annual $750/unit cost, a desire to also have a water district formed, and frustration from seasonal residents regarding the timing of the vote requiring seasonal residents to have to travel significant distances to cast their vote as potential reasons for the vote failing to create the district.

Currently, most residents rely on individual septic systems in impermeable clay soils. It is well known by Town officials and residents that the systems are substandard and most lack sufficient size and room to meet current NYS Department of Health standards for individual household systems. While there was no sanitary survey completed for this report, it is well known that this problem is pervasive within the Lake George watershed and results in a negative impact on groundwater, Lake George water quality and ultimately downstream waters including the Lachute River and Lake Champlain. The problem is further compounded by the fact that many of the shoreline homes use Lake George as a water source or use wells drilled within the area of influence of the substandard systems where untreated sewage may be present.

This Map, Plan and Report includes:

- Description of the existing conditions affecting wastewater and potable water
- Description and mapping of the proposed sewer and water districts
- Estimate of projected wastewater and water flows
- Description of the proposed water and wastewater infrastructure
- Opinion of probable costs
- Evaluation of debt retirement and operation and maintenance costs
- Proposed permanent easements
Criteria outlined in the Great Lakes-Upper Mississippi River Board (GLUMRB) also known as “Ten State Standards” for Recommended Water Works and Wastewater Facilities have been considered in the development of this report.

The formation of the proposed Water and Sewer Districts will ensure residents have access to clean drinking water and sanitary conditions in and around the lake shore and help to ensure Lake George water quality continues to improve thereby preserving its status as one of the Country’s premier fresh water bodies and drinking water sources which in turn also benefits the Lake Champlain watershed.

Existing Conditions
Outlet and Sagamore Drive are located on the western shore of Lake George approximately one-half mile south of the Lachute Dam forming the northern limits of Lake George. Outlet Drive and Sagamore Drive are dead end roads separated by a private multiple-access drive known as Snapping Turtle Way which originates on Sagamore and runs north along the lake shore to a lot that is separated from Outlet Drive by a single residential lot at the dead end of Outlet Drive. In total, the area is currently characterized by 46 single-family homes with single-family residential properties in districts both to the north and south along the lake. West of the residences is a mix of farm fields interspersed with homes. Baldwin Road forms the primary route accessing the approximately 2.5 miles of shoreline on the western shore of the lake. West of Baldwin Road the land transitions to forest and rises approximately 900 ft in elevation to include Bear Mountain and Cooks Mountain which also form the Lake watershed boundary in this area. The attached mapping shows the location as well as proposed district boundaries.

Soils in the proposed Sewer and Water district consist primarily of Vergennes silt and clay series soils along with portions of Kingsbury silt and clays which are generally unsuitable for conventional Onsite Wastewater Treatment Systems (OWTS). These soils are impermeable and have a high groundwater level typically within 24” of the surface. NRCS soils mapping is attached as Appendix A and includes detailed soil reports typical of the soil series that are present. The topography is generally gently rolling however, there are short undulating steep sections along the shoreline typical of the drainage ways and finger ridges that form in lake plains. The Lake level is approximately 320 feet above sea level and the proposed district rises in elevation to about 350 feet at the northwest boundary at the intersection of Outlet Drive and Baldwin Road.

OWTS are the primary means of managing sanitary waste in the proposed district. Many of these systems are decades old and in need of repair and replacement. However, the unsuitable soils and density of development prevent meeting current DOH standards and the long-term effectiveness in protecting ground water and surface waters. Where possible, some residents have chosen to personally pay to connect to the Town gravity sewer along Baldwin Road using grinder pumps. These residents are charged an annual contract service fee by the Town for service outside of district.

Residents primarily use the lake and wells as a source of water. Because of the concerns of water quality, there are several residents that have personally paid to have waterlines installed in order to acquire water from the Town water main along Baldwin Road. These residents are also charged an annual contract service fee by the Town for water service outside of district.
Existing Facilities

The Town of Ticonderoga has public water and sewer available along Baldwin Road that has the capacity to handle the existing 46 units in the proposed districts as well as the additional 18 units possible based on current property boundaries and subdivisions. Currently there is an 8” pvc gravity sewer that flows to the north along Baldwin Rd., across Alexandria Avenue and down Lord Howe Street, through Downtown and eventually to the WWTP along the Lachute River downstream of Bicentennial Park. This gravity sewer serves homes along Baldwin Road and extends to the intersection with Pine Springs Park Road south of Outlet Drive, which is the geographic high point along Baldwin Road. Sewer service is provided south of this using pumping stations and a 4” force main running along Baldwin Road. Stoughton Drive, located immediately south of Sagamore Drive, is served by a gravity sewer discharging to a pump station at the end of the drive, near the lake shore which then pumps back up to the Baldwin Road force main and along Baldwin to the gravity sewer resulting in about 4,000 linear feet of force main from this station. Town officials have indicated that the 4” force main system and pumping station have operational and maintenance limitations and are also excessively deep.

Water service is provided along Baldwin road by a 12-inch ductile iron pipe (DIP) that runs from Alexandria Ave. south along Baldwin. This line also services water lines to the Pine Springs Park subdivision on the west side of Baldwin road south of Outlet Drive and the developments south of Sagamore drive including a 6” DIP serving the Stoughton Drive development. Water Pressure in the system is 70-80 psi along Baldwin road adjacent to Outlet Drive and increases approximately 10-15 psi along the lake shoreline due to elevation differences.

Proposed Outlet Drive and Sagamore Drive Sewer and Water District

The proposed sewer and water district would include properties as delineated on the attached district map and included as Appendix B. Water service would be provided by an 8” HDPE pipe connection to the 12” DIP at the intersection of Outlet Drive and Baldwin Road. The 8” pipe would be directionally drilled along Outlet Drive crossing private properties through utility easements along Snapping Turtle way then onto Sagamore drive to its end. Good engineering design of water systems makes it desirable to avoid dead ends for water quality and quantity purposes as well as to add redundancy to the system. This would require the line then continue along an easement to the access road to the Sewage pump station at Stoughton to connect with the 6” DIP at the end of Stoughton Drive. In accordance with 10 State Standards, a minimum 8” line is required to provide hydrants which will be placed on average every 400-700 feet along the main to provide additional beneficial fire protection to the district properties.

Sewer service to the district would be provided using Environment One (e one) grinder pumps. The Town of Ticonderoga standardized use of the e one pump systems on May 13, 2010 and has over 300 units in service within its municipal system. The e one systems have been successfully used in the Black Point sewer district serving the eastern shore of Lake George in the Town of Ticonderoga and Town of Putnam. Sewer and Water Department personnel have become proficient with the operation and maintenance of these units which are very robust with relatively steady flows throughout a wide range of head (pressure). These units are manufactured in Niskayuna, NY making parts and repair very timely and economical. In fact, these qualities have made these units very popular throughout New York State
(and in fact globally) especially on lake shore properties facing similar issues and concerns with failing septic systems, high ground water, and variable topography.

The grinder pumps would be placed on each residential lot based on coordination with the home owner with consideration to current house plumbing and location of septic tanks, etc. The homeowner will be required to provide a utility easement to the Town of Ticonderoga for maintenance of the pump stations. The cost to supply and install the pump station will be borne by the district and the stations will be owned by the Town of Ticonderoga. The individual home owners will be responsible for installation of their house plumbing to the station as well as supplying electric service from their home service to the station. The Grinder pumps will pump out to the street to a common force main that will vary from 1.25 inches in diameter up to 3" based on the flows expected. This 3” force main will tie into the 8” pvc gravity sewer at a Manhole on Baldwin Road just north of the Outlet Drive intersection.

The force main will also be installed using horizontal directional drilling (HDD) and will follow along Outlet Drive, Snapple Turtle Way and Sagamore Drive with a 10’ separation from the water line that is planned to be installed. There will be no connection to Stoughton Drive Sewer system as this system will stand on its own and be completely separate from the Stoughton Drive and Baldwin Road force main system. Necessary air relief and flushing valves will be installed along the force main to facilitate operation and maintenance.

**Project Flows**

**Sewer District**

Environment One’s research and development program of the last 40 + yrs has determined average daily usage for dwelling units to be approximately 200 gallons/day. The research has also allowed the development of a statistically sound model to determine peak flows based on the cumulative number of their pump stations along the force main. Based on the potential build out of 64 units in the district, the estimated peak sewage flow would be 77 gpm. Since it is estimated that roughly 50% of the residents are seasonal within the district, this is a conservative estimate for the district at build-out. At 200 gallons per dwelling unit/day the estimated daily average flow is 12,800 gallons/day which equates to 0.0128 million gallons per day (MGD) or 0.75% of the permitted capacity of the WWTP of 1.7 MGD.

The capacity of the receiving 8” pvc gravity sewer along Baldwin Road, even if laid at a minimum slope of 0.4% as allowed by “Ten State Standards” has a capacity of 406 gpm flowing full or 0.59 MGD. Since a force main system does not have inflow and infiltration (I&I) that a gravity sewer system has, the projected flows from the district are lower than if a gravity system were employed within the district.

**Water District**

Based on the information above, it is reasonable to estimate that at full buildout of 64 units, the water demand would be the same at 12,800 gallons per day. The 200 gpd/dwelling unit equates to an annual equivalent dwelling unit (EDU) of 73,000 gallons. While this would be the projected use of the district, the impact to both the sewer and water systems would be less. As previously discussed, there are some proposed district residents currently on a contract service agreement with the Town for sewer and/or water service. By Town law, those properties would become members of the districts and would be required to use the new district infrastructure and pay district fees rather than the contract service fees.
The 8” HDPE waterline supplying the district would have less than 10 psi pressure loss with 500 gpm of fire flow at the most distant point (~5,000 ft) without being looped back to the Stoughton system, which roughly equates to the pressure gain at this point from elevation difference at the tie in to the 12” DIP at Baldwin. The proposed interconnection with Stoughton’s water system would improve pressures and water quality of both systems while providing a level of redundancy as well. Based on these projected flows, the Town of Ticonderoga has no capacity concerns providing sewer or water service to the proposed sewer and water district.

Construction Methods

Evaluation of open cut excavation and horizontal directional drilling (HDD) for installation of water and sewer lines within the district was performed. The benefits of the reduced disturbance and environmental impacts along with the resulting minimal social impact makes HDD very attractive as the construction method of choice in developed areas and environmentally sensitive areas. Only a small sending and receiving pit excavation is required at intervals generally determined by grade and alignment significantly reducing the disturbed surface footprint. As HDD popularity has increased and more providers have entered the market its cost competitiveness has increased. HDD has been proven successful on several projects within the Town of Ticonderoga over recent years, including on the Black Point Sewer project on the eastern shore of Lake George in the Towns of Ticonderoga and Putnam as well as the recent well field source upgrades on the Ticonderoga water system completed in 2018 and 2019. In fact, HDD has become the method of choice along waterbodies as a result of the minimal disturbance and environmental impacts. Significant reduction in disturbance and required restoration of roads, lawns, trees and other vegetation; less of a chance of significant stormwater impacts as well as reduced maintenance and protection of traffic are all valuable benefits of HDD.

Outlet and Sagamore Drive are relatively narrow, dead-end roadways with a relatively high density of homes especially along the lake shore side. This along with the fact that a water and sewer line will be installed with the required 10’ horizontal separation along the roadways would essentially require the entire road system to be excavated, interrupting and potentially closing access off to homes at times resulting in a significant social and potential environmental impact. Furthermore, with the high groundwater that would require excavation dewatering and possible storage or treatment of suspended silts and clays to avoid suspended solids and turbidity impacts to Lake George would likely be required. This would have a significant negative impact to production efficiency and cause an increase in financial and environmental risk. Therefore, Horizontal Directional Drilling (HDD) was chosen as the most cost effective and environmentally and socially acceptable alternative for construction of the water and sewer district. Connection of service laterals from the grinder pumps (GP’s) and water supply services to the individual homes will require a small pit excavation to connect to the mainline systems in or adjacent to the roadway but this disturbance will be minimal and will be restored immediately.

Opinion of Probable Cost

Sewer District

Based on the sewer design discussed above, capital cost estimates have been prepared for the project. These costs include the construction of the waste water collection system including the grinder pumps, force mains and appurtenances, the cost for permanent easements, and applicable engineering, legal, and administrative costs. Costs are provided in more detail in the Appendix C and are estimated to be
approximately $1,298,760. Based on this cost and assuming no grants or other financial assistance, a 30-year bond at 3% results in an annual debt payment of $66,262 for the 64 dwelling units or approximately $1035.34 per dwelling unit.

Water District
Based on the water system design discussed above, capital cost estimates have been prepared for the project. These costs include the construction of the water distribution system including hydrants and appurtenances, the cost for permanent easements, and applicable engineering, legal, and administrative costs. Costs are provided in more detail in the Appendix C and are estimated to be approximately $913,800. Based on this cost and assuming no grants or other financial assistance, a 30-year bond at 3% results in an annual debt payment of $46,621 for the 64 dwelling units or approximately $728.46 per dwelling unit.

Annual User Cost Analysis

Sewer District
The Town of Ticonderoga charges a flat fee of $140 quarterly for sewer service or $560 annually. Operation and Maintenance Cost of the new system will be minimal based on experience and a budgetary number for the district is estimated at $5,000 annually or $78/unit. Given these figures, the unfunded annual cost for the sewer district would be approximately $1673 per dwelling unit. New York State Comptroller approval is required if the first-year cost for 2020 is more than $818.

Currently, the district has 46 users with a potential buildout of 64 users given the current subdivision of lots. Any vacant lots in the district would be subject to the debt service payment and 10% of the sewer flat fee and no O&M charge. Based on this, the vacant lot charge for the sewer district would be $1091.34.

Water District
The Town of Ticonderoga charges a flat fee of $104 quarterly for water service or $416 annually. Operation and Maintenance Cost of the new system will be minimal based on experience and a budgetary number for the district is estimated at $2,500 annually or $39/unit. Given these figures, the unfunded annual cost for the sewer district would be approximately $1183 per dwelling unit. New York State Comptroller approval is required if the first-year cost for 2020 is more than $912.

Currently, the district has 46 users with a potential buildout of 64 users given the current subdivision of lots. Any vacant lots in the district would be subject to the debt service payment and 10% of the water flat fee and no O&M charge. Based on this, the vacant lot charge for the water district would be $770.06.

Appendix D contains possible reductions in user costs based on various assumed grant amounts for comparison purposes.

Required Approvals and Other Actions
The following approvals are required prior to the construction of the proposed Outlet Drive and Sagamore Drive Sewer and Water District:
• Submission of this Map, Plan and Report to the Town Board, followed by a Public Hearing and potential revisions to this MPR based on public comments.
• Final review and acceptance of the Map, Plan and Report followed by review and approval by the NYS Office of the State Comptroller.
• SEQRA review to support bonding of project costs.
• Procuring of permanent utility easements to allow design and construction of the sewer and water district
• Preparation of project final design documents including specifications, bid documents and contract drawings prepared by the engineer.
• Review and approval of contract drawings and specifications by regulatory agencies including NYSDEC, APA, LGPC etc.
• Approval of any highway work permits required

Summary
The Outlet Drive and Sagamore Drive Sewer and Water District construction will improve groundwater and Lake George water quality by removing failing and/or substandard on-site wastewater treatment systems (OWTS). Site soils consist of impermeable silts and clays with high groundwater levels and density of development along the lake shore precludes installation of systems that meet current DOH, DEC and APA standards. Further, the cost of upgrading systems by installation of alternative systems to meet acceptable treatment standards can typically cost $20,000 to $30,000 with limited life span and sustainability.

Residents using lake water or wells will now have access to clean potable municipal water and will benefit from additional fire protection as a result of fire hydrants that will be installed throughout the district. These systems will increase the Health and Safety of the residents of the district as well as improve the environmental conditions in the district and ultimately Lake George and Lake Champlain. Creation of the sewer and water districts included in this Map, Plan and Report will also promote additional development and have potential economic benefits for the residents and the Town of Ticonderoga.
Custom Soil Resource Report for
Essex County, New York
Outlet and Sagamore Drive

January 21, 2020
Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil
scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.
Custom Soil Resource Report

Soil Map (Outlet and Sagamore Drive)

Map Scale: 1:6,380 if printed on A portrait (8.5" x 11") sheet.

Soil Map may not be valid at this scale.
The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, New York
Survey Area Data: Version 19, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 28, 2012—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
## Map Unit Legend (Outlet and Sagamore Drive)

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>KyA</td>
<td>Kingsbury silty clay loam, 0 to 3 percent slopes</td>
<td>3.2</td>
<td>5.3%</td>
</tr>
<tr>
<td>RmA</td>
<td>Rippowam fine sandy loam, 0 to 3 percent slopes</td>
<td>1.8</td>
<td>3.0%</td>
</tr>
<tr>
<td>VeB</td>
<td>Vergennes silty clay loam, 3 to 8 percent slopes</td>
<td>43.3</td>
<td>71.1%</td>
</tr>
<tr>
<td>VeC</td>
<td>Vergennes silty clay loam, 8 to 15 percent slopes</td>
<td>11.0</td>
<td>18.1%</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
<td>1.5</td>
<td>2.4%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td><strong>60.9</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

## Map Unit Descriptions (Outlet and Sagamore Drive)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not
mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a soil series. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An undifferentiated group is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.
Essex County, New York

KyA—Kingsbury silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: bq3k
Elevation: 100 to 510 feet
Mean annual precipitation: 26 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 130 to 150 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kingsbury and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the map unit.

Description of Kingsbury

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 9 inches: silty clay loam
Bt1 - 9 to 14 inches: clay
Bt2 - 14 to 21 inches: clay
CB - 21 to 34 inches: silty clay
C1 - 34 to 65 inches: clay
C2 - 65 to 93 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No
Minor Components

Covington
Percent of map unit: 4 percent  
Landform: Lake plains  
Landform position (two-dimensional): Toeslope  
Landform position (three-dimensional): Tread  
Down-slope shape: Concave  
Across-slope shape: Concave  
Hydric soil rating: Yes

Cosad
Percent of map unit: 3 percent  
Hydric soil rating: No

Churchville
Percent of map unit: 3 percent  
Hydric soil rating: No

Vergennes
Percent of map unit: 2 percent  
Hydric soil rating: No

Livingston
Percent of map unit: 1 percent  
Landform: Lake plains  
Landform position (two-dimensional): Toeslope  
Landform position (three-dimensional): Tread  
Down-slope shape: Concave  
Across-slope shape: Concave  
Hydric soil rating: Yes

Unnamed
Percent of map unit: 1 percent  
Hydric soil rating: No

Niagara
Percent of map unit: 1 percent  
Hydric soil rating: No

RmA—Rippowam fine sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 1vk0f  
Elevation: 100 to 510 feet  
Mean annual precipitation: 26 to 36 inches  
Mean annual air temperature: 45 to 48 degrees F  
Frost-free period: 130 to 150 days  
Farmland classification: Farmland of statewide importance
Map Unit Composition

Rippowam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the map unit.

Description of Rippowam

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical profile

Oe - 0 to 2 inches: mucky peat
Ap - 2 to 11 inches: fine sandy loam
Cg1 - 11 to 21 inches: fine sandy loam
Cg2 - 21 to 29 inches: fine sandy loam
Cg3 - 29 to 36 inches: fine sandy loam
Cg4 - 36 to 43 inches: fine sandy loam
Cg5 - 43 to 72 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Pootatuck

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 4 percent
Hydric soil rating: No

Fluvaquents-udifluvents

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip, rise
Down-slope shape: Concave  
Across-slope shape: Concave  
Hydric soil rating: No  

Gougeville  
Percent of map unit: 3 percent  
Landform: Deltas  
Landform position (two-dimensional): Toeslope  
Landform position (three-dimensional): Tread  
Down-slope shape: Concave  
Across-slope shape: Concave  
Hydric soil rating: Yes  

VeB—Vergennes silty clay loam, 3 to 8 percent slopes  

Map Unit Setting  
National map unit symbol: 2rvsk  
Elevation: 100 to 510 feet  
Mean annual precipitation: 31 to 59 inches  
Mean annual air temperature: 39 to 48 degrees F  
Frost-free period: 120 to 175 days  
Farmland classification: Farmland of statewide importance  

Map Unit Composition  
Vergennes and similar soils: 85 percent  
Minor components: 15 percent  
Estimates are based on observations, descriptions, and transects of the map unit.  

Description of Vergennes  

Setting  
Landform: Lake terraces  
Landform position (two-dimensional): Summit, shoulder  
Landform position (three-dimensional): Tread  
Down-slope shape: Convex  
Across-slope shape: Convex  
Parent material: Calcareous clayey estuarine deposits derived from limestone and/or calcareous clayey glaciolacustrine deposits derived from limestone  

Typical profile  
Ap - 0 to 8 inches: silty clay loam  
B/E - 8 to 10 inches: clay  
Bt - 10 to 22 inches: clay  
BC - 22 to 29 inches: silty clay  
C1 - 29 to 37 inches: silty clay  
C2 - 37 to 45 inches: silty clay  
C3 - 45 to 79 inches: silty clay  

Properties and qualities  
Slope: 3 to 8 percent  
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Kingsbury
Percent of map unit: 5 percent
Landform: Lake terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Cayuga
Percent of map unit: 5 percent
Landform: Drumlinoïd ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wilpoint
Percent of map unit: 3 percent
Landform: Lake terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Farmington
Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No
VeC—Vergennes silty clay loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: bq2d
Elevation: 100 to 510 feet
Mean annual precipitation: 26 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 130 to 150 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Vergennes and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vergennes
Setting
Landform: Lake plains
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey glaciolacustrine deposits derived from igneous and sedimentary rock

Typical profile
Ap - 0 to 8 inches: silty clay loam
B/E - 8 to 10 inches: clay
Bt - 10 to 22 inches: clay
BC - 22 to 29 inches: silty clay
C1 - 29 to 37 inches: silty clay
C2 - 37 to 45 inches: silty clay
C3 - 45 to 72 inches: silty clay

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Kingsbury
  Percent of map unit: 4 percent
  Hydric soil rating: No

Cayuga
  Percent of map unit: 4 percent
  Hydric soil rating: No

Dunkirk
  Percent of map unit: 4 percent
  Hydric soil rating: No

Unnamed
  Percent of map unit: 3 percent
  Hydric soil rating: No

W—Water

Map Unit Composition
  Water: 100 percent
  Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Setting
  Landform: Lakes
References


Custom Soil Resource Report


APPENDIX B

PROPOSED OUTLET DRIVE AND SAGAMORE DRIVE WATER AND SEWER DISTRICT MAPPING
Notes:

1. Map developed from Engineers Map, Plan and Report for Outlet Drive and Sagamore Drive Sewer District dated August 15, 2001 prepared by Kestner Engineers, P.C. of Troy, NY and modified and updated using Essex County GIS.

2. Currently 46 structures available for sewer and water connection with potential of 64 units given current properties with no additional subdivision.

3. Currently the Town provides sewer and water service to a few of the lots along Outlet Drive on a contract service basis.
Notes:

1. Map developed from Engineers Map, Plan and Report for Outlet Drive and Sagamore Drive.
2. Currently 46 Structures available for sewer and water connection with potential of 64 units given current properties with no additional subdivision.
3. Currently the Town provides sewer and water service to a few of the lots along Outlet drive on a contract service basis.
APPENDIX C

OPINION OF PROBABLE COST OUTLET DRIVE AND SAGAMORE DRIVE WATER AND SEWER DISTRICT
<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restoration (paving/topsoil)</td>
<td>1</td>
<td>LS</td>
<td>$15,000.00</td>
<td>$15,000.00</td>
</tr>
<tr>
<td>Grinder station equip</td>
<td>64</td>
<td>EA</td>
<td>$4,500.00</td>
<td>$288,000.00</td>
</tr>
<tr>
<td>Curb Stop, check valves</td>
<td>64</td>
<td>EA</td>
<td>$450.00</td>
<td>$28,800.00</td>
</tr>
<tr>
<td>GP install and Hook up to ROW</td>
<td>64</td>
<td>EA</td>
<td>$2,000.00</td>
<td>$128,000.00</td>
</tr>
<tr>
<td>1.25 lateral pipe supply</td>
<td>3200</td>
<td>LF</td>
<td>$1.25</td>
<td>$4,000.00</td>
</tr>
<tr>
<td>HDD small diam. rolled cost</td>
<td>5100</td>
<td>LF</td>
<td>$100.00</td>
<td>$510,000.00</td>
</tr>
<tr>
<td>1.25&quot; tap and install to ROW</td>
<td>64</td>
<td>EA</td>
<td>$1,500.00</td>
<td>$96,000.00</td>
</tr>
<tr>
<td><strong>Construction subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$1,069,800.00</td>
</tr>
<tr>
<td>Permanent easements-inc. legal</td>
<td></td>
<td></td>
<td></td>
<td>$15,000.00</td>
</tr>
<tr>
<td>Contingency - 10%</td>
<td></td>
<td></td>
<td></td>
<td>$106,980.00</td>
</tr>
<tr>
<td>Engineering and Administration -10%</td>
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<td></td>
<td></td>
<td>$106,980.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$1,298,760.00</td>
</tr>
</tbody>
</table>

**Opinion of Probable Cost**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restoration (paving/topsoil)</td>
<td>1</td>
<td>LS</td>
<td>$15,000.00</td>
<td>$15,000.00</td>
</tr>
<tr>
<td>Hydrants</td>
<td>12</td>
<td>EA</td>
<td>$4,000.00</td>
<td>$48,000.00</td>
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<tr>
<td>Air relief Valve</td>
<td>1</td>
<td>EA</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
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<tr>
<td>Tapping Sleeve and Valve</td>
<td>1</td>
<td>EA</td>
<td>$8,000.00</td>
<td>$8,000.00</td>
</tr>
<tr>
<td>HDD 8&quot;diam. rolled cost</td>
<td>5200</td>
<td>LF</td>
<td>$110.00</td>
<td>$572,000.00</td>
</tr>
<tr>
<td>Service tap, curb stop install to ROW</td>
<td>64</td>
<td>EA</td>
<td>$1,500.00</td>
<td>$96,000.00</td>
</tr>
<tr>
<td><strong>Construction subtotal</strong></td>
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<td></td>
<td></td>
<td>$749,000.00</td>
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<tr>
<td>Permanent easements-inc. legal</td>
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<td>$15,000.00</td>
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<tr>
<td>Contingency - 10%</td>
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<td></td>
<td></td>
<td>$74,900.00</td>
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<tr>
<td>Engineering and Administration -10%</td>
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<td>$74,900.00</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$913,800.00</td>
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</tbody>
</table>
APPENDIX D

ANNUAL USER COST ASSUMING VARIOUS LEVELS OF GRANT FUNDING FOR COMPARISON
## First Year Cost For Various Assumed Funding Levels

### Town of Ticonderoga
#### Outlet and Sagamore Drive Sewer and Water District

<table>
<thead>
<tr>
<th></th>
<th>Total Capital Cost</th>
<th>Sewer</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Grant Funding</strong></td>
<td></td>
<td>$1,298,760.00</td>
<td>$913,800.00</td>
</tr>
<tr>
<td>30yr bond, 3% annual pymt</td>
<td></td>
<td>$66,261.77</td>
<td>$46,621.40</td>
</tr>
<tr>
<td>Annual debt service per unit (64)</td>
<td>$1,035.34</td>
<td>$728.46</td>
<td></td>
</tr>
<tr>
<td>Annual flat rate inc. O&amp;M</td>
<td>$638.00</td>
<td>$455.00</td>
<td></td>
</tr>
<tr>
<td><strong>Total district year one cost/unit</strong></td>
<td>$1,673.34</td>
<td>$1,183.46</td>
<td></td>
</tr>
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</table>

### 25% Grant Funding

<table>
<thead>
<tr>
<th></th>
<th>Assumed Grant</th>
<th>$324,690.00</th>
<th>Debt Remaining</th>
<th>$974,070.00</th>
<th>$685,350.00</th>
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</thead>
<tbody>
<tr>
<td>30yr bond, 3% annual pymt</td>
<td>$49,696.33</td>
<td>$34,966.05</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Annual debt service per unit (64)</td>
<td>$776.51</td>
<td>$546.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual flat rate inc. O&amp;M</td>
<td>$638.00</td>
<td>$455.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total district year one cost/unit</strong></td>
<td>$1,414.51</td>
<td>$1,001.34</td>
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</tr>
</tbody>
</table>

### 50% Grant Funding

<table>
<thead>
<tr>
<th></th>
<th>Assumed Grant</th>
<th>$649,380.00</th>
<th>Debt Remaining</th>
<th>$649,380.00</th>
<th>$456,900.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>30yr bond, 3% annual pymt</td>
<td>$33,130.89</td>
<td>$23,310.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual debt service per unit (64)</td>
<td>$517.67</td>
<td>$364.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual flat rate inc. O&amp;M</td>
<td>$638.00</td>
<td>$455.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total district year one cost/unit</strong></td>
<td>$1,155.67</td>
<td>$819.23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E

PROPOSED SEWER AND WATER DISTRICT
UTILITY EASMENTS
### Proposed Permanent Utility Easements

<table>
<thead>
<tr>
<th>Easement No.</th>
<th>Section-Block-Lot</th>
<th>Easement area (SF)</th>
<th>Easement area (Ac)</th>
<th>Owner (N/F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>150.67-4-21.112</td>
<td>3240</td>
<td>0.074</td>
<td>Lailer</td>
</tr>
<tr>
<td>2</td>
<td>150.67-7-2.000</td>
<td>6600</td>
<td>0.152</td>
<td>Outar</td>
</tr>
<tr>
<td>3</td>
<td>150.67-7-1</td>
<td>4200</td>
<td>0.096</td>
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<tr>
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<td>3480</td>
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<td>National Grid</td>
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<td>150.4-1-39.000</td>
<td>8000</td>
<td>0.184</td>
<td>Nolfe</td>
</tr>
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</table>

* Property is outside of District Boundary at Stoughton Drive