Preliminary Engineering Report

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LaBella
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Wastewater System Feasibility Study
Preliminary Engineering Report

Village of Burdett and Town of Hector, Schuyler County, NY

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1. EXECUTIVE SUMMARY

In 2024, the Town of Hector & Village of Burdett contracted LaBella Associates to evaluate alternatives and develop a preliminary engineering report for constructing a new municipal wastewater system aimed at achieving the following goals:

- Reduce environmental harm caused by onsite septic systems to Seneca Lake and near waterways.
- Encourage economic growth of the area while protecting and maintaining the area's inherent environmental beauty and health.
- Provide the sewer infrastructure or interceptor sewer necessary for lakefront communities to connect their wastewater flows in the future.
- Provide or utilize a treatment system that is sustainable and expandable for future needs.
- Cost / Affordability to residents

Residences and businesses within the project area currently rely on onsite septic systems to treat sanitary flows. However, the project area is not well-suited for septic systems due to shallow bedrock, high groundwater levels, and its proximity to vulnerable water bodies such as Seneca Lake and its tributary streams. Aging and inefficient septic systems result in leachate that poses significant risks to water quality, including contamination of Seneca Lake and infiltration into drinking wells. These challenging geologic conditions also impede regional economic growth and discourage new development, as modern septic systems require substantial costs and larger lot sizes for proper installation. Addressing these issues is essential to improving environmental quality and promoting sustainable economic development.

We considered multiple types of collection systems including a conventional gravity and force main and low-pressure sewer system (LPSS) and found that the conventional system is the only primary collection system that can feasibly accommodate future flows. For both feasible alternatives, we utilized a conventional system for the primary collection system and selectively used an LPSS in areas along the Lake that have limited growth opportunities.

We evaluated the following 3 alternatives for the project.

1. Alternate 1: Null Alternative
2. Alternate 2: New Sewer Infrastructure With Connection to the existing Catherine Valley Reclamation Plant
3. Alternate 3: New Sewer Infrastructure and Installation and Connection to a new wastewater treatment facility within the project area.

Based on the analysis outlined in Section 3, we recommend Alternative 2. Below is a summary of the key reasons for this recommendation.

1. Cost Efficiency & Savings
2. Alignment with Regulatory Agency Preferences
3. Less Regulatory Burden

4. Lower Environmental Impact
5. Greater Future Adaptability
6. Less Required Land Acquisition

Based on input from Town and Village officials, Alternative 2 is not presently financially feasible even with optimistic assumptions regarding awards from presently-available funding programs. Accordingly, with input from Village and Town officials, a phased approach is recommended which generally involves advancing a Village-only version of Alternative 2 in the near-term followed by Town connection at a later date. Materials presented within this Report detail recommended steps for the Village and Town to advance as complementary measures to infrastructure implementation.

This engineering report is prepared in accordance with the NYSEFC Engineering Report Outline for New York State Wastewater Infrastructure Projects, October 1, 2024 and the latest editions of the following standards whenever practicable and as appropriate:

- Recommended Standards for Wastewater Facilities - Policies for the Design, Review, and Approval of Plans and Specifications for Wastewater Collection and Treatment Facilities (commonly known as the Ten States Standards)1
- Recommended Standards for Water Works
- TR-16 Guides for the Design of Wastewater Treatment Works - New England Interstate Water Pollution Control Commission
- New York State Stormwater Management Design Manual
- New York State Design Standards for Intermediate Sized Wastewater Treatment Systems Statewide and Lake George Design Standards
- New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act (CRRA)
- American Water Works Association Manual M6, Water Meters – Selection, Installation, Testing, and maintenance

2. PROJECT BACKGROUND AND HISTORY

2.1 Site Information

2.1.1 Location

The proposed project would serve the Town of Hector and Village of Burdett. The project area is within the Town of Hector and Village of Burdett along the southeast portion of Seneca Lake. The Town of Hector is situated in northeastern Schuyler County. The nearest sizable cities are Ithaca approximately 20 miles to the east; Elmira approximately 25 miles to the south; and Corning approximately 25 miles to the southwest. The Town of Hector is bordered to the west by Seneca Lake, to the north by the Town of Lodi, to the east by the Town of Ulysses and to the south by the Towns of Catharine, Montour, and the Village of Watkins Glen which houses the county seat.

The Town of Hector has a total area of 112.5 square miles. Hector is the largest Town in Schuyler County, containing 66,122 acres. The Village of Burdett is the only incorporated Village within the Town. Other community centers include the Hamlets of Bennettsburg, East Steamburg, Hector, Logan, Mecklenburg, Perry City, Reynoldsville, Searsburg, Valois and Smith Valley.

The project area primarily follows NYS Route 414, extending north to south from the hamlet of Valois, through the Village of Burdett, and reaching the outskirts of the Village of Watkins Glen.

Please refer to the project location aerial image provided in Figure 2.1 below and the location map in Appendix A.

2.1.2 Geologic Conditions

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey was utilized to identify geological conditions in the project area, suitable for planning purposes. Table 2-1 provides information on predominant soil type, depth to bedrock and groundwater, and representative slope. Please refer to Figure 2.3 and ***Appendix C***, USDA Web Soil Map for the complete USDA soil survey and area map. We reviewed the soil survey and found the following characteristics to consider suitability for onsite septic systems and suitability for construction of a municipal collection system.

Table 2-1: USDA Soil Data				
Suitability Analysis	**Condition Percentage of Area**	**Condition Percentage of Area**	**Condition Percentage of Area**	**Condition Percentage of Area**
Shallow Excavations, including development of collection system	Very Limited 65.6%	Somewhat Limited 30.7%	Not Rated 3.7%	
Erosion Hazard, road and trail development	Very Severe 0%	Severe 43.1%	Moderate 46.4%	Slight 6.8%
Septic Tank Absorption Fields (NY)	Very Limited 55.4%	Somewhat Limited 40.8%	Not Limited 0%	Not Rated 3.8%
Manure and Food-Processing Waste – (Suitability for Land Application)	Very Limited 77.9%	Somewhat Limited 18.4%	Not Limited 0%	Not Rated 3.7%
USGS Soil Group	Group A 18.7%	Group B 31.1%	Group C 27.1%	Group D 19.5%

The United States Geological Survey (USGS) defines the soil groups as follows:

- Type A Soils: Soils having a high infiltration rate and low runoff potential when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
- Type B Soils: Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained, or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of transmission.
- Type C Soils: Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
- Type D Soils: Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Figure 2.1– Project Area

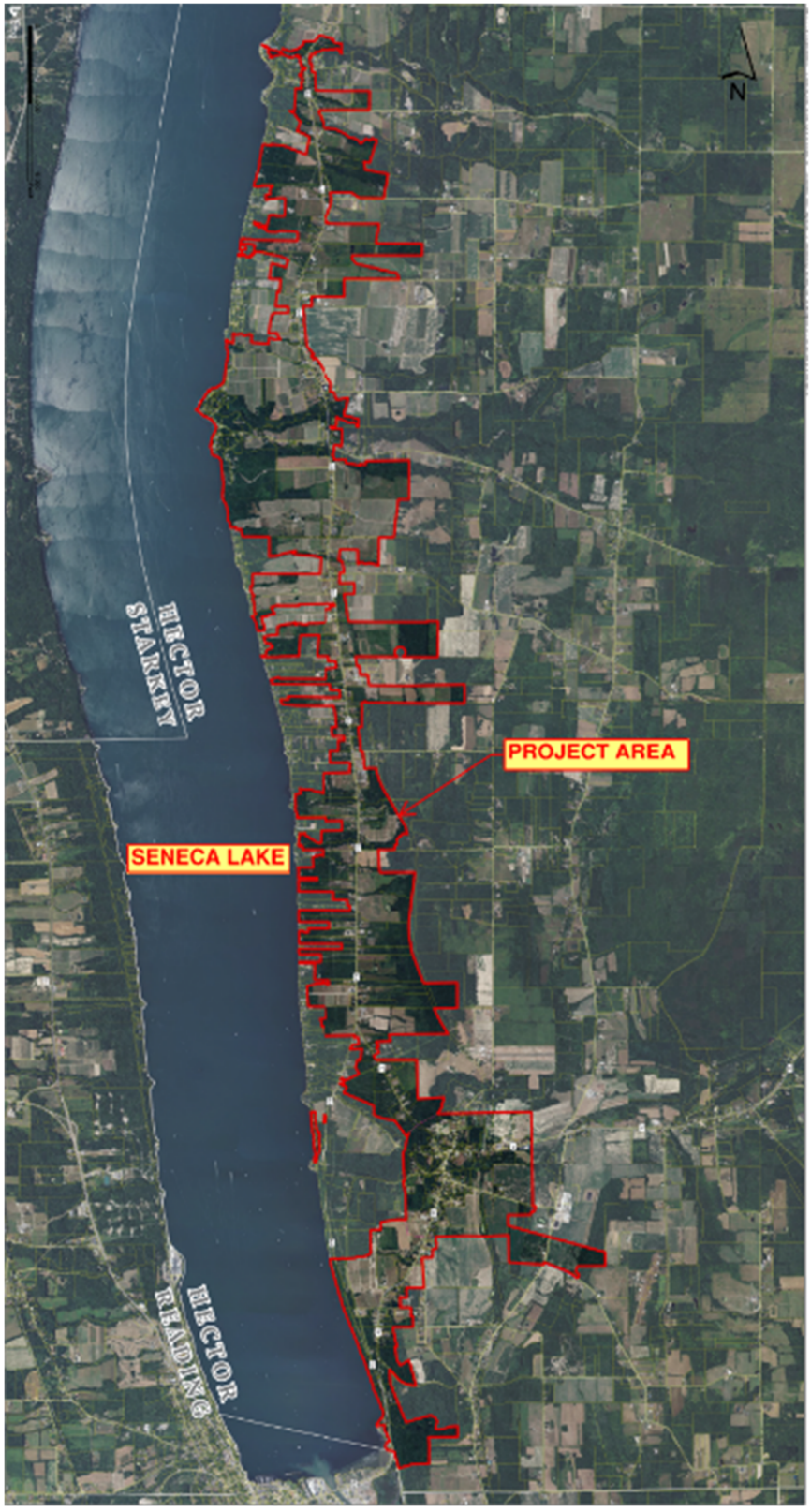


Figure 2.2–Vicinity Map

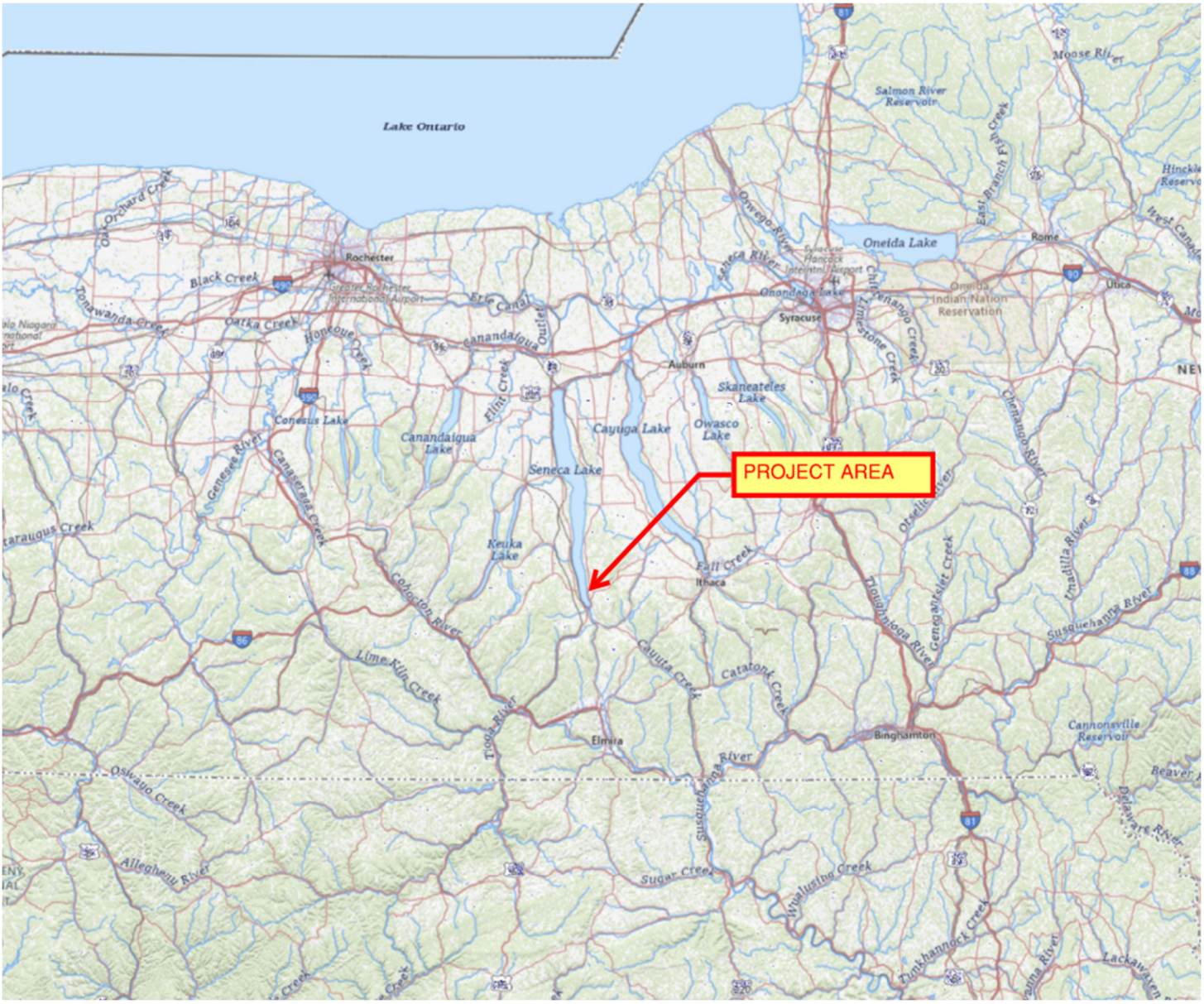
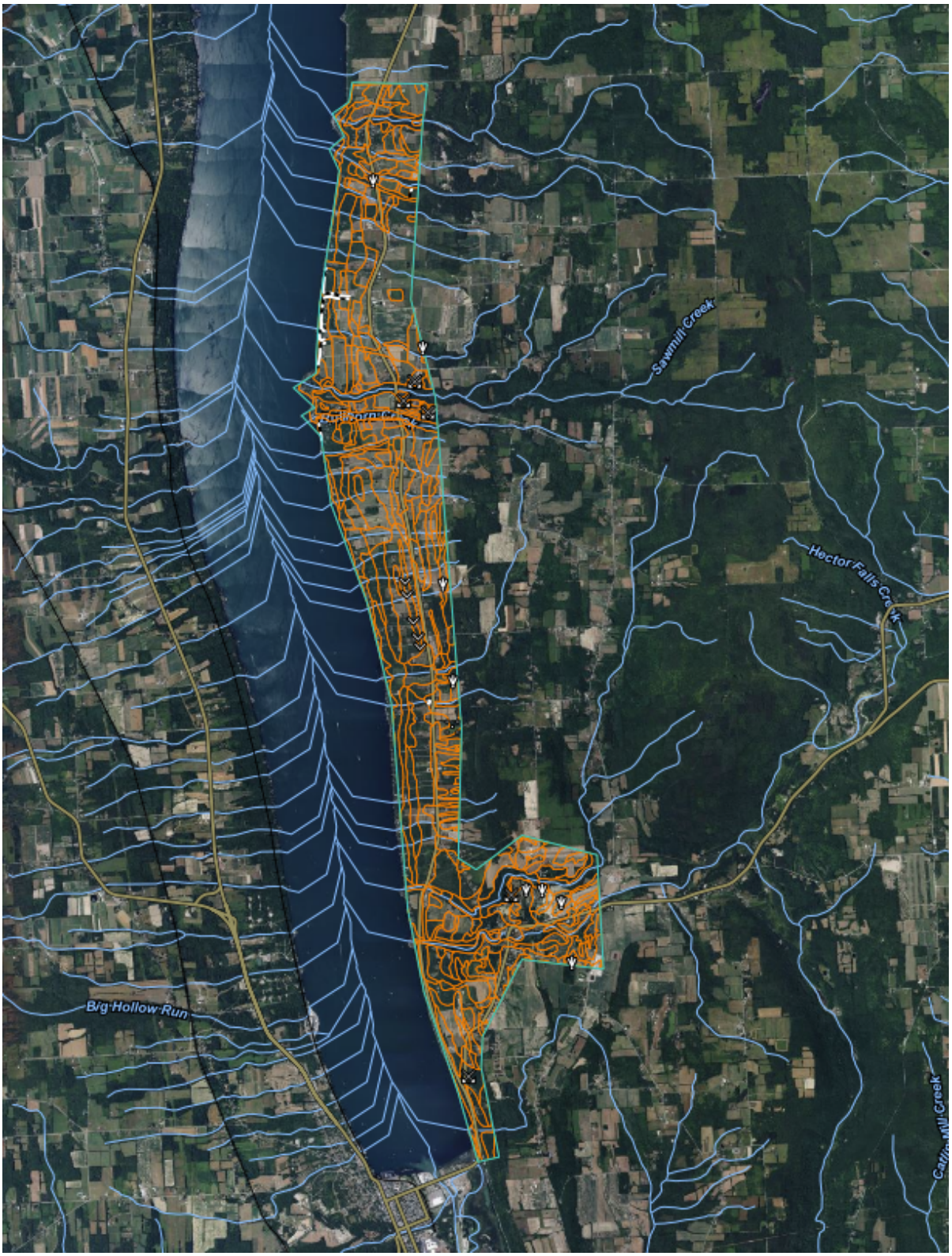


Figure 2.3–USDA Soils Map



2.1.3 Environmental Resources

2.1.3.1 Waterbodies

Based on review of the DECinfo Locator, Seneca Lake, Glen Creek, Old Barge Canal, Hector Falls Creek, Bullhorn Creek, Sawmill Creek, Breakneck Creek, and numerous unnamed streams are located within the vicinity of the project site. The current wastewater treatment facility servicing the Village of Watkins Glen and the Village of Montour, Catherine Valley Water Reclamation Facility, discharges to the Chemung Canal (Old Barge Canal Channel). The table below includes waterbody information for Seneca Lake and tributary streams within the project area. A map of the waterbodies generated from the DECinfo Locator is included in Appendix B.

Table 2-2:
Project Area Waterbodies

Waterbody Name	Waterbody Type	Classification	Stream Order	Stream Level	Size	Location Description
Seneca Lake	Lake/Reservoir	AA(TS)	N/A	N/A	40,289.5 Acres	West of project area
Glen Creek	River/Stream	B	3	1	45.5 miles	Watkins Glen, west of canal
Old Barge Canal Channel (Chemung Canal)	Canal/Artificial	N/A	4	2	1.15 miles	Watkins Glen
Unnamed	River/Stream	N/A	2	2	4.24 miles	Between Cass Road and Jolly Road
Hector Falls Creek and tribs	River	C(TS)	3	2	26.9 miles	Village of Burdett, ~2.3 miles from south end of Seneca Lake
Unnamed	River/Stream	N/A	2	2	2.93 miles	NY 414, ~2.8 Miles from south end of Seneca Lake
Unnamed	River/Stream	N/A	1	2	1.01 miles	NY 414 and County Rt 5
Unnamed	River/Stream	N/A	1	2	1.07 miles	NY 414, ~0.2 mi north of County Rt 5
Unnamed	River/Stream	N/A	1	2	1.11 miles	NY 414 north of Giles Road
Unnamed	River/Stream	N/A	1	2	1.4 miles	NY 414 between Burrell Rd and Nipantuck Rd
Unnamed	River/Stream	N/A	1	2	3.34 miles	NY 414 north of Sutphen Rd

Unnamed	River/Stream	N/A	1	2	0.98 miles	NY 414 north of La Bourgade Ln
Unnamed	River/Stream	N/A	1	2	1.04 miles	NY 414 north of Beattie Bond Rd
Unnamed	River/Stream	N/A	1	2	1.12 miles	NY 414, ~ 0.2 mi north of Nichols Rd
Unnamed	River/Stream	N/A	1	2	1.03 miles	NY 414 north of Wickham Rd
Unnamed	River/Stream	N/A	1	2	1.37 miles	NY 414 south of Club Seneca Rd
Unnamed	River/Stream	N/A	1	2	1.22 miles	NY 414 south of Beattie Hill Rd
Unnamed	River/Stream	N/A	1	2	1.27 miles	NY 414 south of Bond-Smith Park Rd
Bullhorn Creek	River/Stream	N/A	1	2	2.96 miles	NY 414 south of County Rt 2
Sawmill Creek	River/Stream	C	2	2	15.2 miles	NY 414, ~ 0.2 mi north of County Rt 2
Unnamed	River/Stream	N/A	1	2	2.5 miles	NY 414, ~0.3 mi south of Leidenfrost Rd
Unnamed	River/Stream	N/A	1	2	1.4 miles	NY 414, south of Valois-Castel Rd
Unnamed	River/Stream	N/A	1	2	1.97 miles	NY 414 and Spirawk Rd
Unnamed	River/Stream	N/A	1	2	1.62 miles	NY 414 and Fausold Rd
Unnamed	River/Stream	N/A	1	2	4.44 miles	NY 414 north of Beckhorn Rd
Unnamed	River/Stream	N/A	1	2	1.8 miles	NY 414 north of County Rt 1
Breakneck Creek	River/Stream	N/A	2	2	1.69 miles	NY 414 ~ 0.2 mi north of Lake St

Table 2-3:
Primary Surface Water Bodies Water Quality Criterion

Waterbody Name	PWL-ID	Drainage Basin	Waterbody Classification	Assessment Factor	Water Quality Criterion
Seneca Lake	0705-0021	Oswego-Seneca-Oneida	AA(TS)	3	24
Old Barge Canal	0705-0083	Oswego-Seneca-Oneida	C(T)	Unassessed 1	6
Glen Eldridge Creek	0705-0073	Oswego-Seneca-Oneida	C(TS)	Unassessed 1	6

$$Water\ Quality\ Criterion = Classification\ Points\ Factor\ x\ Assessment\ Factor$$

$$WQC = CPF\ x\ AS$$

Where:

Classification Points Factor	
8	*A, A-Special, A(T), A(TS), AA, AA-Special, AA(T), AA(TS), SA, GA), GSA*
6	*B, SB, C(T), C (TS)*
3	*C, SC, I*
2	*D, SD, GSB*
1	*Impact on resource which have important environmental quality impacts such as odor, sludge disposal, sewer maintenance equipment, etc*

And where:

Assessment Factor	
6	*Impaired/Restricted: Water quality standards are not attained and best use(s) are not supported.*
3	*Stressed/Impacted: Water quality standards are attained but data or information indicate a potential impact to best use(s).*
1	*None: Water quality standards are attained and best use(s) are supported.*

2.1.3.2 Aquifers

The proposed study area is not located on or within a close proximity to a Sole Source Aquifer as defined by USEPA. The study area contains an unconfined Principal Aquifer. This aquifer is located in parts of the Village of Burdett and the Town of Hector and covers approximately 2.1 square miles. Refer to Appendix B.2, USGS Aquifer Map.

2.1.3.3 Wetlands

A search of the NYSDEC Environmental Resource Mapper on 9/26/2024 determined that there are known state regulated freshwater wetlands located on or in the vicinity of the study area. There is an approximate 755 acre Class 1 freshwater wetland that spans parts of the Village of Watkins Glen, Town of Dix, and the Village of Montour Falls. The Catharine Valley Water Reclamation Facility is located within this sensitive area. The study area

extends to the southern portion of Seneca Lake, at the edge of the NYSDEC regulated wetland. Refer to Appendix B.3, Wetlands Map

A search of the National Wetlands Inventory on 9/26/2024 identified numerous freshwater ponds, rivervine areas, and freshwater wetlands within the study area. The NWI classified the large wetland south of the study area as a PEM1E. Refer to Appendix B.4, Wetlands Map.

2.1.3.4 Endangered Species

A search was performed on the NYSDEC Environmental Resource Mapper on 9/26/2024 and determined that the study area includes rare plants or animals.

A search was performed on the US Fish and Wildlife Service Information for Planning and Consultation (IPaC) on 9/26/2024 and determined that the study area includes the Northern Long-eared Bat, Tricolored Bat, and Monarch Butterfly, and does not include critical habitats. The Northern Long-Eared Bat is currently listed as endangered. The Tricolored Bat is listed as a proposed endangered species. The Monarch Butterfly is listed as a candidate species.

2.1.4 Floodplains

The FEMA flood map for the project area is number 361204B, effective on 7/20/1984. The project area includes areas within Zone C, Areas outside the 500-year flood. Please refer to *Appendix B*, FEMA Flood Maps.

2.1.5 Environmental Justice and Disadvantaged Communities

Environmental Justice is the fair and meaningful treatment of all people, regardless of race, income, national origin or color, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Commissioner Policy 29 provides guidance for incorporating environmental justice into review and identifies potential environmental justice areas. A Potential Environmental Justice Area means a minority or low-income community that may bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The project's water service area does not include DEC defined Potential Environmental Justice Areas.

The project area is not within a NYS Disadvantaged Community. New York's Climate Act recognizes that climate change doesn't affect all communities equally, and positions disadvantaged communities (DACs) for inclusion in climate policy initiatives to ensure they directly benefit from the State's historic transition to cleaner, greener sources of energy, reduced pollution and cleaner air, and economic opportunities.

2.2 Ownership and Service Area

The Town of Hector and Village of Burdett do not currently have a sewer district nor sewer infrastructure. To inform future sections of the report, information on the Town of Hector Water District and Village of Watkins Glen and Village of Montour Falls Catharine Valley Water Reclamation Facility are provided.

2.2.1 Town of Hector Drinking Water System Management

The Town of Hector water system serves approximately 1,300 people through approximately 645 service connections. The water source is ground water from two wells and an infiltration gallery. The water is filtered and treated with chlorine for disinfection and phosphate for corrosion control. The Hector Water District Rules and Regulations were adopted April 1974 and amended by the Town Board of the Town of Hector. The purpose and intent is to supply water to persons and premises within the Water District through its facilities provided and maintained and in accordance with the scheduled rates and charges.

Table 2-4: Hector Water District - System Management

Title	Name	
Water District Superintendent	Joshua Mikkelsen	
Assistant Water Superintendent	Jeremy Brown	

2.2.1 Sewer District Boundaries

The Village of Burdett and Town of Hector have not defined sewer district boundaries at this time. The proposed project area is provided in Figure 2.1– Project Area.

The sewer districts within 5-miles of the project area include the Village of Watkins Glen Sewer District, Village of Montour Falls Sewer District, Village of Odessa Sewer District, and Village of Lodi Sewer District. The Village of Watkins Glen District and Village of Montour Falls District are conveyed to the Catharine Valley Water Reclamation Facility (CVWRF). The nearest connection to CVWRF is located at the southern border of the project area with potential connection at the Watkins Glen Clute Park Pump Station. The Village of Odessa Sewer District is approximately 5 miles south of the project area and does not have available capacity to accept the anticipated project wastewater flow. The Village of Lodi Sewer District is approximately 5 miles north of the project area and does have available capacity to accept project area wastewater. The Village of Lodi sewer is conveyed to the Seneca County Sewer District #1 Waste Water Treatment Plant operated by the Seneca County Water and Sewer Authority.

2.2.2 Catharine Valley Water Reclamation Facility: Village Watkins Glen/Montour Falls Regional Wastewater Treatment Facility Management

The CVWRF is located in proximity to the project area and has available excess capacity to service the anticipated proposed project flows, refer to Section 2.3 Existing Facilities and Present Condition for additional information on the CVWRF.

Through Intermunicipal Agreements, the Village of Watkins Glen and Village of Montour Falls created the Joint Sewer Plan Committee to manage the CVWRF serving the Village of Watkins Glen, Village of Montour Falls, and portions of the Town of Dix and Town of Reading. The Joint Sewer Plan Committee is the administrative body responsible for plant

operations and financing, while the Village of Watkins Glen is the lead agency on the NYS SPDES Permit.

The Village of Watkins Glen and the Village of Montour Falls enacted, and amend as needed, Local Laws relating to the regulation of Sewer Use, such that the sewer systems may be properly maintained, improved and extended, primarily for the benefit of the users and taxpayers within the service area.

The CVWRF is maintained and operated by the following NYS certified wastewater operators:

Table 2-5:
CVWRF Wastewater Management

Title	Name	Certification Level
Joint Sewer Plan Committee	N/A	Administrative Oversight
Water Reclamation Plant Supervisor	Terry Wilcox	
Wastewater Treatment Plant Operator	Edward Berry	WWTP Operator 3A
Wastewater Treatment Plant Operator	Brad Gallow	WWTP Operator 2A
Municipal Worker	Nicholas Leeber	
Wastewater Treatment Plant Operator Trainee	Calvin Buckley	

2.2.3 Seneca County Sewer District #1: Willard Wastewater Treatment Plant

The Seneca County Sewer District #1 (SSCD1) is located approximately 5-miles north of the project area and has available excess capacity to service the anticipated proposed project flows, refer to Section 2.3 Existing Facilities and Present Condition for additional information on the WWTP. The nearest reach of the sewer collection system is in the Village of Lodi on Orchard Street and Grove Street.

The Seneca County Water and Sewer Authority was recently established to provide for more efficient operation of water and sewer utilities under a central entity whose sole function is to administer the authority. Once the Board of Supervisors sets up the authority's membership and bylaws, existing water and sewer districts throughout the county currently run by towns and villages can voluntarily join the authority and have operations consolidated under a central administration. The Authority proposes to improve efficiency and create a pathway for sustainable growth, reliable infrastructure and better opportunities to secure and implement critical funding.

The Willard WWTP serves Sampson State Park, the hamlet of Willard (the former Drug Treatment Center Campus), and the Villages of Lodi and Ovid. A capital upgrade is anticipated to begin construction in Spring 2026 and includes the addition of a sanitary waste receiving station and ultraviolet disinfection, as well as upgrades to the chemical addition area, screening, grit removal, extended aeration, filtration system, and sludge drying beds. The objective of this capital program is to replace aging equipment at the end

of its useful life, comply with SPDES permit requirements, and meet final effluent limitations for Total Phosphorus, Total Ammonia, Total Fecal Coliform, and Total Chlorine Residual.

The SSCD1 WWTP is maintained and operated by the following NYS certified wastewater operators:

Table 2-6:
Seneca County Sewer District Wastewater Management

Title	Name	Certification Level
Seneca County Water and Sewer Authority	Daniel Schmalzel	Director
Wastewater Treatment Plant Operator		
Wastewater Treatment Plant Operator		

2.2.4 Population Growth Trends

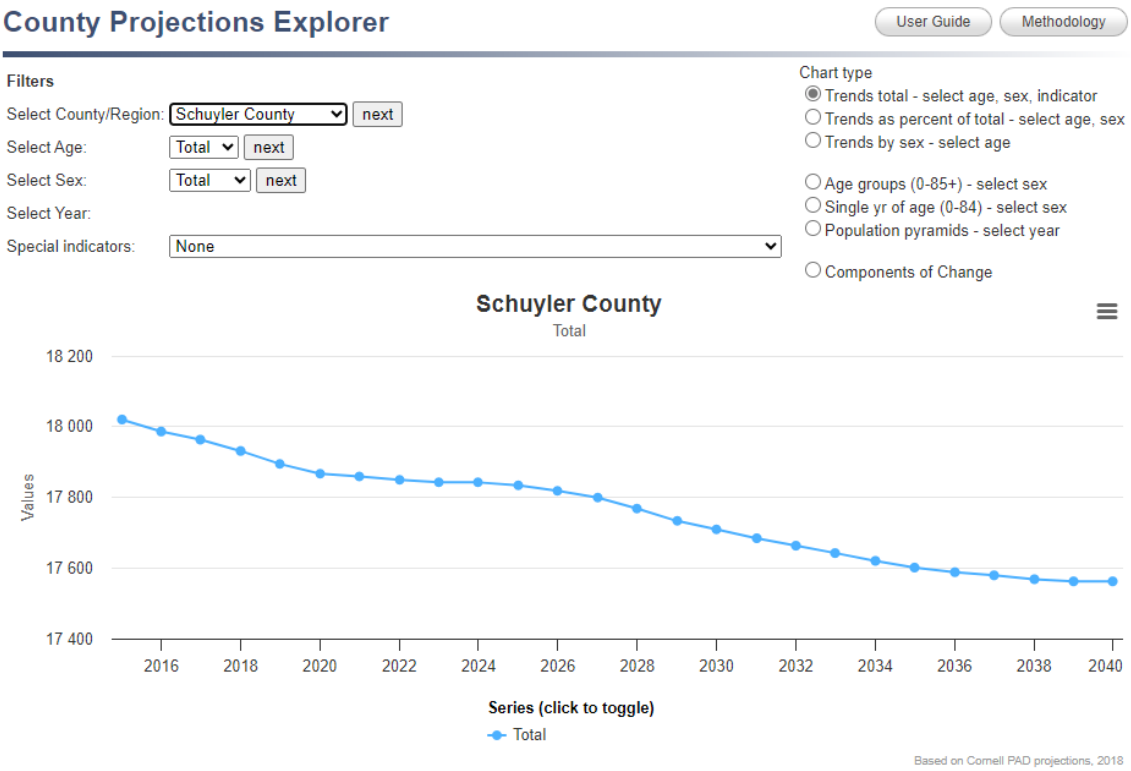
The population and growth trends for project area municipalities are included in Table 2-7: Population Growth Trends. The data is gathered from the United States Census Bureau. The population within Schuyler County is projected by the Cornell Program on Applied Demographics to continue to decline. The projections were produced using a cohort component model and the assumption is that components of demographic change in the future will remain like recent components of demographic change.

Table 2-7:
Population Growth Trends

Municipality	Population 2010[1]	Median Household Income 2010[2]	Population 2020[3]	Median Household Income 2020[4]	Population 2021[5]	Median Household Income 2021[5]
Village of Burdett	340	$43,125	331	$60,833	479	$53,393
Town of Hector	4,940	$54,382	4,895	$59,940	4,911	$75,212
Schuyler County	18,343	$47,404	17,898	$53,291	17,920	$56,437

1 DP1 Profile of General Demographic Characteristics: 2010, DEC Summary File 4 Demographic Profile
2 S1901 Income in the Past 12 Months: 2010
3 DP1 Profile of General Demographic Characteristics: 2020, DEC Summary File 4 Demographic Profile
4 S1901 Income in the Past 12 Months: 2020
5 2021 American Community Survey Data

Figure 2.4–Schuyler County Population Projection



EFC is currently utilizing 2021 American Community Survey 5-Year Estimates in evaluating eligibility for CWSRF Hardship and Engineering Planning Grants, the 2021 ACS for the project area includes parcels in both the Village of Burdett and Town of Hector, an income survey is required to determine income specific to the project area.

2.2.5 Existing Adjacent Wastewater Facilities Rates and Debt Service

Sewer rates are typically comprised of the following components:

- Volumetric Usage Charge: customers pay an amount proportional to water usage. This can be uniform across all amounts of water consumed or tied to an increasing or decreasing block structure to encourage industrial usage, encourage conservation efforts, or achieve other local goals.
- Fixed Fee – Base Charge: charges paid by customers irrespective of volume of usage. Often includes costs associated with maintaining infrastructure. May include a minimum charge for the opportunity to connect.
- Fixed Fee Debt Service Charge: charges paid by customer irrespective of volume of usage. Charge associated with debt service for specific capital investments that benefit the user.
- Startup and Service Fees: paid when a customer establishes an account or requires service. Often associated with administrative costs such as billing or service fees including new connection or changes to connection.

To determine a realistic usage volume for the project area, the following resources were reviewed . EPA Sewer and Rate Survey 2022 for Ohio included an average residential sewer rate usage of 4,000 gallons per month.[1] The Environmental Finance Center Network 2024 New Hampshire average residential sewer usage rate was 6,000 gallons per month.[2] A similar report for New York was not identified. To provide comparison of sewer rates in the region, the following assumptions are made based on NYS Design Standards for Intermediate Sized Wastewater Treatment Systems. Calculation of monthly wastewater production in the table below is based on 2.2 persons per household, utilizing 110 gpd per person for monthly water consumption of 7,260 gallons per month. The assumption that water consumed is equivalent to wastewater production was made, resulting in a monthly wastewater production per household of 7,260 gallons per month or 87,120 gallons per year. A review of rates and debt service for regional sewer systems with a monthly consumption of 7,260 gallons per month is provided in the below table and figure.

Table 2-8: Regional Residential Sewer Rates and Debt Services

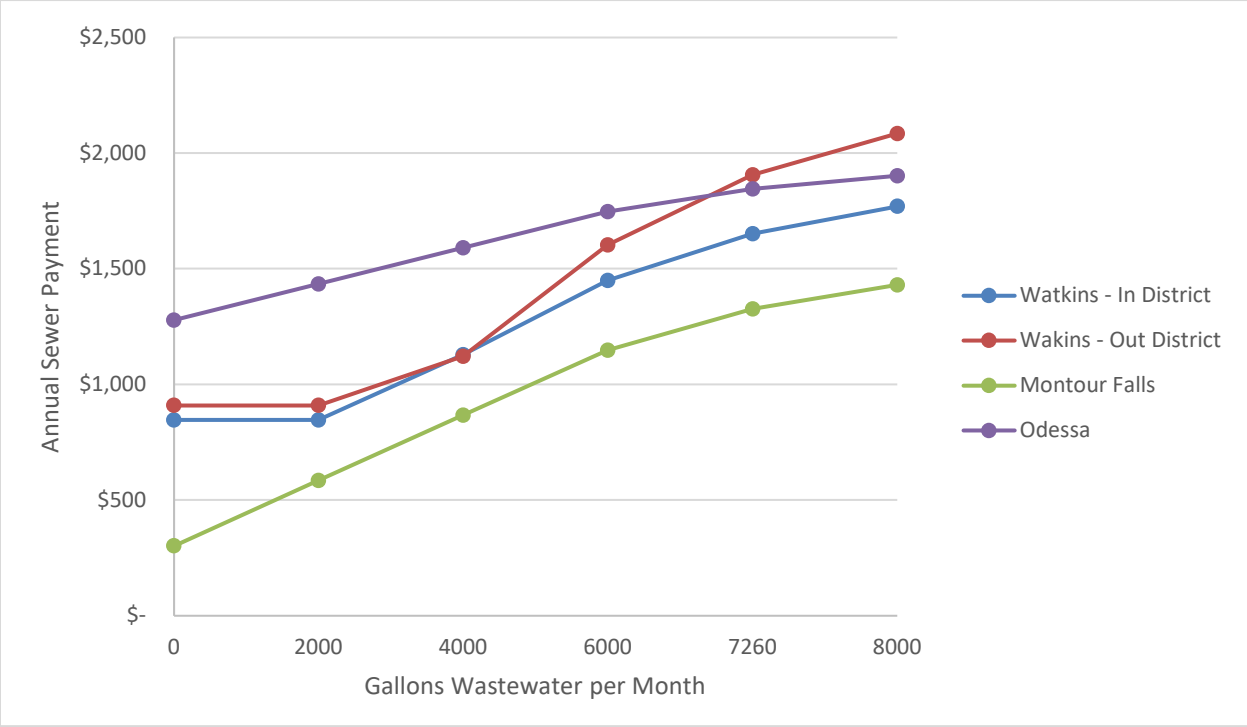
	In-District Residential Rates	**Out-District Residential Rates**	**Debt Service**	**Total Annual Fee Based on Estimated Residential Annual Consumption**	
Village of Watkins Glen	Base Charge $15.50/month Usage Charge $35 plus $10/unit	Base Charge $23.25/month Usage Charge $52.50 plus $15/unit	In-District $20/month Out-District None	In-District: Base: $186 Usage: $1,240 Debt: $240 TOTAL: $1,666	Out District: Base: $279 Usage: $1,651 Debt: $0 TOTAL: $1,930
Village of Montour Falls	Base Charge $3.56/2-month billing cycle Usage Charge $11.75/1,000 gallons	Not Applicable	$280.74/year	Base: $21 Usage: $1038 Debt: $280 TOTAL: $1,340	
Village of Odessa	Base Charge $35/2-month billing cycle Usage Charge $6.50/1,000 gallons	Not Applicable	$178/2-month Billing Cycle	Base: $210 Usage: $576 Debt: $1,068 TOTAL: $1,854	
Village of Lodi			New Capital Project		

[1] Ohio_EPA_2022_Sewer_and_Water_Rate_Survey.pdf

[2] New-Hampshire-Rates-Report-2024.pdf

			Planned – will increase in near future.	

Figure 2.5 – Regional Residential Sewer Rates



2.2.6 Existing Typical Residential On-site Sewer Annual Expenses

The useful life of a septic system typically ranges from 20-30 years. Installation costs for a new, or redevelopment of a, septic system varies based on site conditions. Discussion with the Schuyler County Watershed Inspector, responsible for approval of residential septic system with less than 1,000 gpd, identified that the typical regional system is a conventional gravity fed septic system with sand filter. Regionally, the typical conventional system capital investment is between $18,000-$20,000 with design and permitting fees of approximately $5,000 for new installation. Operation and maintenance expenses for a conventional sand filter septic system includes:

- Inspection every 3 years ($250)
- Pumping every 3-5 years ($200-$400)
- Replacement of individual parts:
    - Tank Lid ($70)
    - Inlet or Outlet Baffles ($250-$500)
    - Pipe Repair ($1,000)

The total cost of a typical residential conventional gravity fed system over the lifetime of 25 years is $30,870, the simple annual average total cost is $1,235 per year. More complex replacement systems, often required on smaller lakeside lots, include initial capital investments of $25,000 - $30,000 and fees of $7,500 for design and permit for the system

with a total cost over the lifetime of 25 years of $43,370 and simple annual average total cost of $1,735.

Homeowner actions to maintain system and prolong useful life include:

- Clearing vegetation, routine mowing
- Maintain record of pumping, inspections, maintenance, and repairs
- Keep area clear of heavy vehicles or equipment
- Keep are clear of structures such as decks, patios, etc
- Don't flush or use strong chemicals and bacteria destroying products
- Don't flush materials that don't degrade
- Avoid septic tank additives
- Avoid garbage disposals and grinders
- Direct drainage away from the septic from roof, sump pump, and surface water

2.2.7 Proposed Services and Debt Responsibility

The proposed sewer service area consists of 643 parcels. The proposed sewer district parcel data was collected utilizing GIS on October 9, 2024, the characteristics of each parcel was reviewed to identify the estimated flow and corresponding EDU value, detailed information including references are located in Appendix D.

Table 2-9: Project Area Parcel Count and EDU

TYPE	DESCRIPTION	PARCEL COUNT	TOTAL EDU
Agricultural	Agricultural vacant land (productive)	10	0
Agricultural	Field crops	2	0
Agricultural	Vineyards	8	0
Residential	One family year-round residence	242	242
Residential	Two family year-round residence	14	28
Residential	Three family year-round residence	4	9
Residential	Rural residence with acreage	35	35
Residential	Seasonal residences	24	7
Residential	Mobile home	10	10
Residential	Multiple mobile homes	2	4
Residential	Residential (Multipurpose)	7	7
Residential	Multiple residences - La Bourgade Ln	1	56
Residential	Residence with incidental commercial use	12	12
Vacant Land	Vacant Land	3	1.5
Vacant Land	Residential vacant land	23	11.5
Vacant Land	Residential land including a small improvement (not used for living accommodations)	38	19
Vacant Land	Rural vacant lots of 10 acres or less	35	17.5
Vacant Land	Abandoned agricultural land	2	1

Vacant Land	Residential vacant land over 10 acres	9	4.5
Vacant Land	Vacant land located in commercial areas	2	1
Commercial	Commercial	2	2
Commercial	Apartments	1	1
Commercial	Inns, lodges, boarding and rooming houses, tourist homes, fraternity and sorority houses	2	13
Commercial	Restaurants - Demolished	1	0.5
Commercial	Diners and luncheonettes	2	4
Commercial	Bar	1	1
Commercial	Auto body, tire shops, other related auto sales	1	1
Commercial	Storage, warehouse and distribution facilities	2	2
Commercial	Mini warehouse (self–storage)	1	0
Commercial	Other storage, warehouse and distribution facilities	2	1.5
Commercial	Small retail outlet	2	2
Commercial	Office building	3	3
Commercial	Miscellaneous services	1	0
Commercial	Downtown row type (with common wall)	1	2
Commercial	Downtown row type (detached)	1	1
Commercial	Converted residence	4	6.5
Commercial	One story small structure	12	27
Commercial	Minimart	2	2
Community Services	Other educational facilities	1	1
Community Services	Religious	3	3
Community Services	Office building	1	1
Community Services	Police and fire protection, electrical signal	3	5
Community Services	Recreational facilities	1	4
Community Services	Cemeteries	2	0
Public Services	Water treatment facilities	1	1
Public Services	Telephone	3	3
Public Services	Water	1	1
Wild, forested, conservation lands and public parks	City, town, or village public parks and recreation areas	2	2
No Assigned Land Use Code		13	0
TOTAL		555	556

The number of Equivalent Dwelling Units (EDUs) that will pay debt service for a project is determined to adequately assess a project. The table below provides a summary of the type of use. The following definitions provide guidance:

(1) **Number of residential services** is equivalent to all proposed sewer hook-ups that are residential in nature, including single family, multiple family, seasonal residences, and mobile home parks.

(2) **Total residential flow** the service area has an average household size of 2.44 persons based on the 2022 ACS 5-Year Census. An estimate of 110 GPD per person (based on NYS Design Standards for Intermediate Sized Wastewater Systems for Single Family Home, and 220 GPD for Mobile Home structures. Seasonal residences are weighted to 4 months per year based on Town of Hector water billing requirements;

(3) **1 EDU** is equivalent to a typical residential household = (2)/(1);

(4) **Number of commercial/business/industrial services** includes 54 within the Town of Hector and Village of Burdett based on tax parcel records;

(5) **Total commercial/business/industrial flow** is based on a combination of actual water meter readings where water service is provided and calculated consumption based on use category for parcels with private water supply wells;

(6) **Number of commercial/business/industrial EDUs** = (5)/(3).

Table 2-10:
Service Type and Flow

Description	Value	Units
(1) Number of residential services	410	EDU
(2) Total residential flow	109,880	GPD
(3) Residential flow per day from typical user	268	GPD
(4) Number of commercial/business/industrial services	54	
(5) Total commercial/business/industrial flow	23,485	GPD
(6) Number of commercial/business/industrial EDUs	90	EDU

Based on the Town of Hector Water rates, vacant parcels within the Village and Town are anticipated to be subject to the O&M and debt service at a rate of ½ per parcel, except for landlocked vacant parcels that do not have access to connect to sewer mains.

Vacant Buildable Parcels		
Description	Value	Units
(7) Number of vacant buildable parcels	112	
(8) Percentage of user fee charged for debt service	50	%
(9) Number of vacant land EDUs	56	EDU

Based on the above tables, the sewer system is comprised of residential users, business/commercial/industrial users, and vacant lots. There are 410 residential EDUs,90 commercial/business/industrial EDUs, and 56 vacant EDUs. **The Total System EDU is equivalent to 556 EDU. The Village is assessed to contain 244 EDUs, while the service area within the Town is assessed to contain 312 EDUs.**

2.3 Existing Facilities and Present Condition

2.3.1 Project Area Public Water Supplies and Projected Sewer Load based on Water Consumption

Public water supplies are regulated and monitored by the New York State Departments of Health (DOH) and Environmental Conservation (DEC) and local health departments, local officials and water suppliers to protect public water. The EPA Safe Drinking Water Information System (SDWIS) was reviewed on January 19, 2024, the following public water supplies are in the project area:

Table 2-11: Public Water Supplies

Water System Name	PWS Number	Population Served	Water System Type	Primary Water Source	Health Based Violations
Hector Water District	NY4801191	1,340	Community Water System	Groundwater under influence of surface water	None reported last 10 years.
Country Hill Manor	NY4821864	57	Community Water System	Groundwater	None reported last 10 years.
Seneca Sol	NY4830052	25	Transient Non-Community Water System	Groundwater	None reported last 10 years.
Silver Queen Farms	NY4830048	25	Transient Non-Community Water System	Groundwater	None reported last 10 years.

Sagoyewatha Park	NY4814156	25	Transient Non-Community Water System	Groundwater	None reported last 10 years.

2.3.1.1 Town of Hector Water Production

The Town of Hector currently supplies municipal water to a majority of the State Route 414 corridor in the Town of Hector through the municipal water district (NY4801191). The Town of Hector water district has some overlap with the proposed sewer district; there are additional proposed sewer users outside of the water district and water users outside of the proposed sewer district. There are approximately 645 active water accounts. The water supply for the Town comes from two gravel packed groundwater wells and one infiltration gallery. The system includes a water treatment plant and a distribution system consisting of 3 storage tanks, 10 main line pressure regulating valves with 9 pressure zones, 4 pump stations, 198 fire hydrants and 25 miles of distribution piping. The annual water withdrawal from the NYSDEC Annual Water Withdrawal Reporting Form is below.

Table 2-12:
Town of Hector Water District Production (2020-2022)

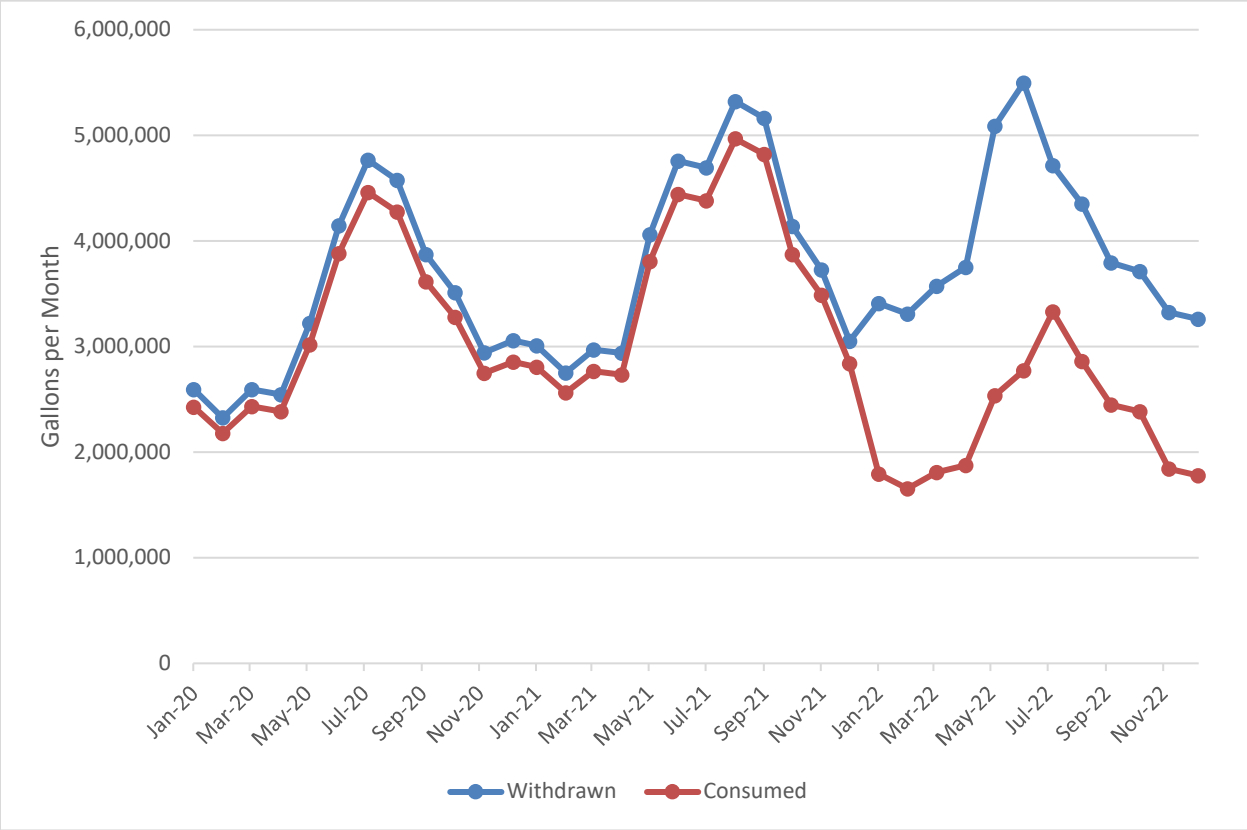
	2020 GPD	2021 GPD	2022 GPD	Average GPD
Average Day Withdrawal (GPD)	109,995	127,599	118,356	118,650
Maximum Day Withdrawal	215,000	198,000	183,267	
Permitted Withdrawal	240,000	240,000	240,000	

2.3.1.2 Town of Hector Water Consumption

The Town of Hector annual water consumption from the NYSDEC Annual Water Withdrawal Reporting Form is below.

Table 2-13:
Town of Hector Water District Consumption (2020-2022)

	2020 Gallons per Month	2021 Gallons per Month	2022 Gallons per Month	Average Gallons per Day
Average Monthly Consumed (Gallons/Month)	3,129,083	3,623,583	2,256,924	100,107
Minimum Monthly Consumed (Gallons/Month)	2,179,000	2,562,000	1,653,960	
Maximum Monthly Consumed (Gallons/Month)	4,460,000	4,969,000	3,329,290	



The Town of Hector also provided water billing records for the four most recent water billings as of September 2024, the report reaches back to 2015. This data set lacks consistent billing records over time but does provide information to identify the largest municipal water supply users, the users located within the proposed sewer district are identified in below table.

Table 2-14: Town of Hector Largest Municipal Water Supply Users within Proposed Sewer District

Address	Account	Average GPD
3717 LA BOURGADE LANE	LA BOURGADE	2,215
5303 PARK AVE	TOWN OF HECTOR/SMITH PARK	1,027
4156 NYS RT. 414 -EM	RYAN WILLIAM VINEYARD	847
5930 STATE ROUTE 414 -EM	SCALE HOUSE BREWERY	830
4920 ROUTE 414 BREW	GRIST IRON BREWING	805
4124 LAKE AVE	BURDETT FIRE HOUSE	744
4095 COUNTY ROUTE 5	ARC OF SCHUYLER	727
3708 MATHEWS RD. -N	BARONE, ENRICO	703
3800 BALL DIAMOND RD	LOGAN RIDGE ASSOCIATES	625
5522 NYS ROUTE 414 -N	DANDY MINI MART	567

5722 NYS ROUTE 414	HAZLITT 1852	555
3675 TICHENOR RD	RED NEWT CELLARS	526
4457 NYS ROUTE 414	KLINE / DEVAUL	427
4093 LAKE AVE.	ECKSTROM, ERIKA	419
5240 NYS ROUTE 414	BECK, MAGNOLIA PLACE	374
5027 NYS ROUTE 414 - N	TWO GOATS BREWERY LLC	353
3775 MATHEWS ROAD	FORGE CELLARS	349
5514 PEACH ORCHARD	ROCHOLL, HENRY & SUSAN	325
5057 NYS ROUTE 414 -E	ATWATER ESTATE WINERY	300
5315 NY STATE ROUTE 414	STONECAT CAFE	251

2.3.1.3 Private Water Wells

Parcels in the proposed sewer district that do not presently receive municipal water supply from the Town of Hector operate private drinking water wells. More than 50% of Schuyler County's residents get their drinking water from an individual water supply. State and County policy and rules regulate the development of an individual water supply. However, each individual water supply currently being utilized in Schuyler County (and NY as a whole) is largely unregulated. Therefore, it is the owner's responsibility to make sure that the water coming out of the tap is clean and safe to drink. On an annual basis, between 10% and 15% of the individual water supply samples collected by the Schuyler County Water Protection Agency do not meet the Federal EPA potability standards. For these situations and on a case by case basis, additional monitoring, maintenance practices, treatment and/or well replacement are recommended.

2.3.2 Sewer Management in the Region

Table 2-15:
Regional Sewer Management

	Distance from Project Area	System Type	Discharge Receiving Waterbody	Effluent Flow Limit MGD	Available Capacity
Private On-Site Septic Systems	Throughout District	On-Site Septic	Groundwater	0.001 MGD	NA
Watkins Glen/Montour Falls Regional Wastewater Treatment Facility - Catharine Valley Water Reclamation Facility SPDES NY0271942)	1 mile from Town Hector southern boundary	Screening, Grit Removal, SBR, EQ Tanks, Filtration, UV	Seneca Lake Barge Canal	1.2 MGD	YES
Village of Odessa Wastewater Treatment Facility (SPDES NY0272183)	Approx. 5 miles from	Package WWTP and Absorption Trenches	Groundwater	.015 MGD	NO
Seneca County Sewer District #1 – Willard Wastewater	Approx. 4 miles from Town of	Screening, Grit Removal,	Seneca Lake	0.7 MGD	YES, Subject to DEC

Treatment Plant (SPDES NY0160407)	Hector proposed sewer district southern boundary to Village Odessa Collection System	Aeration and Settling Tank, Aerobic Digestor, Sand Filters, Chlorine			Compliance Schedule for final effluent limitation compliance

2.3.2.1 Onsite Septic Systems

The project area includes onsite septic systems that are regulated by Schuyler County Watershed Protection Law, last updated in 1994. This local law adopts Part 8 and 75 of Chapter I of the New York State Sanitary Code. Based on review of Schuyler County GIS data, the project area includes 533 private onsite septic systems. Schuyler County Watershed Protection Agency reports that 89 failed septic systems between 2010 and the present were documented and repaired, the majority of failed septic systems were identified during property transfers.

The Schuyler County Watershed Protection Law, Section Q includes minimum lot sizes for new construction.

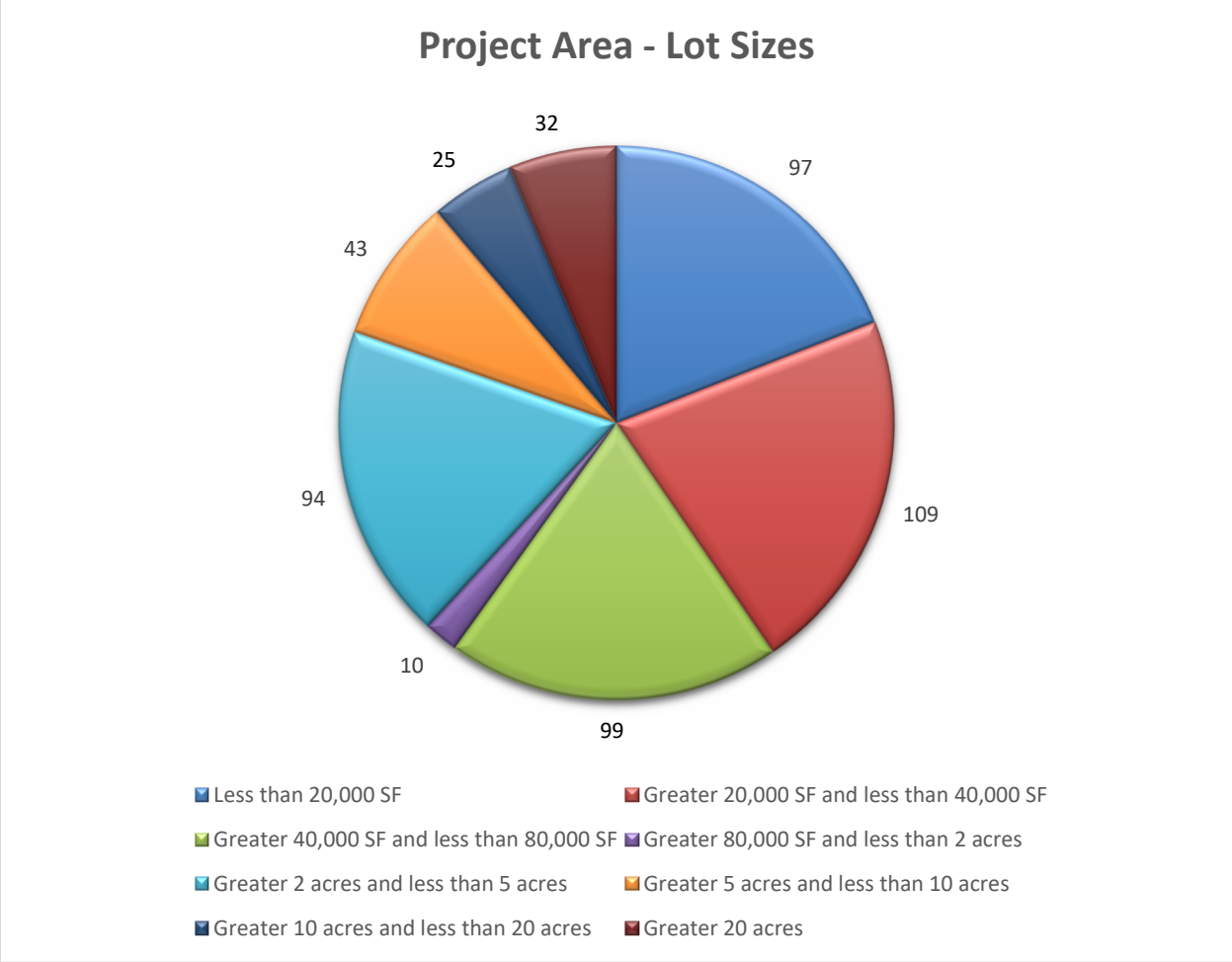
Alternative Wastewater Treatment System

- 80,000 SF of usable land with a minimum of 150 feet diameter circle for wastewater treatment system installation
- 40,000 SF of usable land with a minimum of 150 feet diameter circle for wastewater treatment system installation allowed if connected to public water system, lake, or private water supply situated outside of the 40,000 SF

Conventional Sewage Disposal System

- 40,000 SF of usable land with a minimum of 100 feet diameter circle for wastewater treatment system installation
- 20,000 SF of usable land with a minimum of 100 feet diameter circle for wastewater treatment system installation allowed if connected to public water system, lake, or private water supply situated outside of the 20,000 SF lot.

The project area contains parcels categorized in the following lot sizes with 97 parcels less than 20,000 SF, 109 parcels between 20,000 and 40,000 SF, and 99 parcels with lot sizes between 40,000 and 80,000 SF. Development of new septic systems on these lots may require exemptions from the Schuyler County Watershed Protection Law.



Review of GIS property data and corresponding Town of Hector water district data indicates that only two parcels are less than 40,000 SF and contain both private septic systems and private drinking water supply wells. These septic systems have the following characteristics.

Table 2-16:
Project Area Parcels Less than Minimum Lot Size for Private Water and Sewer

Parcel	Septic Tank Size	Type of Treatment	Date of Construction	Violations
6.12-2-9	1,000 Gallons	Absorption Trenches Eljen GSF	2017	None identified since 2017 new system installed, prior system experienced ecoli and coliform.
54.00-1-36.112	1,000 Gallons	Sand Filter Absorption Trench	1996	None identified.

Review of NRCS Web Soil Survey Septic Tank Absorption Fields (NY) Land Management category, project area includes soils that are very limited for septic tank absorption fields, please refer to Appendix C for full report.

Table 2-17:
Project Area USDA NRCS Septic Tank Absorption Fields Rating

Rating	Acres in Project Area	Percent of Project Area
Very Limited	3,192	58.3%
Somewhat Limited	2,052	37.5%
Null or Not Rated	227	4.1%

Schuyler County Sewer Use Law allows for onsite holding tanks for production waste associated with agricultural and business practices. These holding tanks are not permitted to received domestic waste. The holding tanks are included in the County Septic tank inspection and permitting program. The stored waste in the holding tanks can be land applied following Schuyler County land management practices or hauled to the Ithaca Wastewater treatment plant. Typical waste composition from the holding tanks is acidic and is anticipated to require pretreatment if connected to a municipal sewer.

2.3.2.2 Watkins Glen/Montour Falls Regional Catharine Valley Water Reclamation Facility

Catharine Valley Water Reclamation Facility (CVWRF) regional wastewater facility consists of a centralized regional treatment plant, pump stations, and force main systems in the villages of Watkins Glen and Montour Falls, the plant began operation in 2020. Taking a regional approach, the system now serves Village of Watkins Glen, portions of Town of Dix, portions of Town of Reading, Village of Montour Falls, serving approximately 1,200 residential properties and 300 non-residential properties with a design flow of 1.2 million gallons per day. No hauled waste is accepted at the facility. The treatment system consists of: Screening, Grit Removal, sequencing batch reactors (SBRs) (3 total, 2 routinely in use), Post-SBR Equalization (2 tanks), Filtration, and UV – seasonal. The average observed daily flow is 0.28 MGD, peak observed flow 0.45 GPD, and permit limit of 1.2 MGD. The system operates within compliance with regulations and is currently conducting an improvement of the Clute Park Pump Station, with no other major improvements anticipated in the near future. There is available capacity to accept the anticipated volume from the project area. Preliminary meetings with stakeholders indicate an interest in further discussions to consider treatment of project area wastewater.

2.3.2.3 Odessa Municipal Wastewater Treatment Plant

The Odessa Municipal Wastewater Treatment Plant serves the Village of Odessa Business District including the Odessa School. The facility consists of Screening, Septic Tank, and Infiltration Field. The facility is permitted to manage 15,520 GPD and operates under SPDES

Permit Number NY0272183. The system has capacity to add additional users within the Village of Odessa, but was not designed to receive regional wastewater. There is no opportunity to consider project area wastewater to the Village of Odessa system.

2.3.2.4 Seneca County Sewer District #1

The Seneca County Water and Sewer Authority operates Seneca County Sewer District #1 and includes the Willard WWTP. The plant serves Sampson State Park, the hamlet of Willard (the former Drug Treatment Center Campus), and the Villages of Lodi and Ovid. The facility operates under SPDES Permit Number NY0160407 and currently has a compliance order. The planned capital upgrades to address the compliance order include the addition of a sanitary waste receiving station and ultraviolet disinfection, as well as upgrades to the chemical addition area, screening, grit removal, extended aeration, filtration system, and sludge drying beds. The objective of this capital program is to replace aging equipment at the end of its useful life, comply with SPDES permit requirements, and meet final effluent limitations for Total Phosphorus, Total Ammonia, Total Fecal Coliform, and Total Chlorine Residual. The permitted flow limit is 0.70 MGD, discussion with the Seneca County Water and Sewer Authority indicate that there is available capacity to receive additional wastewater and interest in further discussions to consider treatment of project area wastewater.

2.3.3 State Pollution Discharge Elimination System (SPDES) Permit

The Project Area does not have a SPDES permit. Discussions with NYSDEC indicated support for regional consolidation at an existing wastewater treatment plant. Preliminary SPDES permit limits for the potential development of a new WWTP discharging to surface or groundwater were discussed but permit limits were not able to be assessed at this time.

2.3.4 Existing & Design Flows and Loadings

As there is no existing public sanitary collection system or wastewater treatment facility serving the study area, the municipalities lack records that specifically document existing sanitary flows and contaminant loadings generated. To inform the present evaluation, existing records were used to the extent possible, followed by a series of assumptions based on industry standard practices and texts. The following summarizes information evaluated to determine design flows and contaminant loading.

- Publicly-available online tax parcel records for the study area which identify number of parcels and current use (residential, commercial, industrial, vacant, etc.)
- Water consumption records for parcels within the study area served by the Town of Hector water system.
- Calculation, as summarized in Section 2.2.7, of 556 EDUs within study area
- 268 gallons per day of wastewater generated per EDU on average
    - An average of 2.44 people per household per 2022 ACS 5-Year Census
    - 110 GPD per person based on NYS Design Standards for Intermediate Sized Wastewater Systems for Single Family Home
- Based on a service area estimated population of 1,569, a peaking factor of 3.67 between average daily flow and peak hourly flow per the equation presented in Figure 1 of Ten States Wastewater (2014 Ed.)

It is anticipated that the strength of wastewater collected from users in the study area will be comparable to the typical composition of wastewater generated from domestic users. Industrial users producing wastewater with a contaminant load that significantly exceeds typical domestic strength wastewater will be required to pre-treat their wastewater prior to discharge to the municipally-owned collection system. For these reasons, the basis of design for wastewater to be collected, conveyed, and treated has been set to industry standard values for "Medium strength" wastewater per Metcalf & Eddy, Wastewater Engineering Treatment, Disposal, and Reuse, 3rd Ed.

Table 2-18:
Design Flows & Contaminant Concentrations

Design Flows	
Design Average Daily Flow, gal/d	149,000
Design Peak Hourly Flow, gal/d	547,000
Design Untreated Wastewater Contaminant Concentrations[1]	
Total Solids	720
Total Dissolved Solids	500
Total Suspended Solids	220
Settleable Solids	10
Biochemical Oxygen Demand, 5-day (BOD_5)	220
Total Organic Carbon	160
Chemical Oxygen Demand	500
Nitrogen (total as N)	40
Phosphorous (total as P)	8
Chlorides	50
Sulfate	30
Alkalinity (as $CaCO_3$)	100
Grease	100
Total Coliform	10^7 - 10^8
Volatile Organic Compounds	100 – 400

[1] According to "Medium" values from Metcalf & Eddy, Wastewater Engineering Treatment, Disposal, and Reuse, 3rd Ed., Table 3-16 "Typical Composition of Untreated Domestic Wastewater")

2.3.5 Current Energy Consumption

The proposed system is conceptual and no recent energy audits have been completed.

2.3.6 Storm or Flood Impact Damage

The project area does include steep slopes, a significant number of surface water body crossings, and limited drift thickness for absorption of storm precipitation events. The Schuyler County Hazard Mitigation Plan, 2021-2026 includes:

> "Flooding is the most significant concern for Schuyler County. In addition to the flooding events that received federal disaster declarations, severe flooding occurred in both July and October of 1970, June of 1976, June of 2015, and August of 2018. Flash floods are characterized by a rapid rise in water level, high velocity, and large amounts of debris. They are capable of tearing out trees, undermining buildings, and scouring new channels. Major factors causing flash flooding are the intensity and duration of rainfall, the steepness of the watershed, and stream gradients. The soil types, watershed vegetation, natural and artificial flood water storage areas, and the configuration of the streambed and floodplain are also important.
>
> The soils and topography of Schuyler County make it very susceptible to flash flooding and water quickly runs off from higher elevations, traverses down steeper terrain, and collects in lower elevation areas.
>
> When thunderstorms, tropical storm systems, or other weather patterns produce intense rainfall or rapid snowmelt, water rushes down the hillsides into drainage ditches and streams. Streams respond quickly and may overflow into their floodplains with little or no warning. Flash flood damages result from both inundation by floodwater and erosion of drainage ways and stream channels [fluvial erosion].
>
> All of Schuyler County's streams have relatively small watersheds, which fill quickly with heavy rainfall events. As a result, flood conditions develop rapidly, with little warning, and are classified as flash flooding. Flooding of the county's lakes, particularly Seneca Lake, develops more slowly, occurs less frequently, and is not included in this discussion of flash flooding.
>
> Erosion of stream banks and drainage ways during flash flooding is a major concern. The severity of erosion problems is due, in part, to the widespread occurrence of poorly consolidated glacial deposits, which are particularly susceptible to erosive forces. The high gradients of streams flowing down steep slopes provide the energy needed for fluvial erosion and the transport of bank materials. In addition, disturbance of natural stream beds and floodplains can lead to adjustments within the stream system that cause increased erosion and/or deposition. Examples of such disturbances are: channel straightening, dredging, bridge/culvert installation, berms along a stream [which limited flow into the floodplain], removal of stabilizing vegetation along a stream, and filling of floodplains. In addition, land use changes in the watershed can alter the delivery of water and sediment to the stream and thus contribute to imbalances in the stream system.

Stream adjustments and the resulting erosion, whether natural or human-caused, are often accelerated during flood events"

Design and development of a collection system in the project area requires consideration of flash flooding and erosion.

2.3.7 Unit Processes Evaluation

As there is no existing public sanitary collection system or wastewater treatment facility serving the study area, a unit process evaluation was not completed.

2.3.8 Planned, Current, or Future Improvements Outside of the Project Scope

There are no planned current or future improvements that would result in significant changes to the anticipated project area wastewater flow. Discussions with regional stakeholders including local municipal, county, and regional persons did not identify planned economic development activities that would impact the project assumptions.

2.4 Definition of the Problem/Need for the Project

2.4.1 Regional Plans Documenting Need

2.4.1.1 Seneca-Keuka Watershed Nine Element Plan for Phosphorous, 2022

The Seneca-Keuka Watershed Nine Element Plan (9E Plan) builds on relationships and collaborations established through previous watershed planning processes, including Setting a Course for Seneca Lake, the State of the Seneca Lake Watershed (1999), the Seneca Lake Watershed Management Plan (2012), the Keuka Lake Watershed Protection Plan (1996), and the Keuka Lake Watershed Land Use Planning Guide (2009). Seneca Lake is a highly valued water resource that supports multiple uses. Seneca Lake and Keuka Lake were included on the recent (2020-2022) NYSDEC/Division of Water (DOW) draft WI/PWL as threatened waterbodies due to their resource value as a potable water source and the need to provide additional protection, rather than any specifically identified threats. Swimming is evaluated as threatened by occasional growths of aquatic plants and algal blooms that can discourage swimming and other recreational uses. Although all uses are currently supported in the lakes, these threats should continue to be monitored.

In recent years, Seneca Lake has experienced an increase in reported algal blooms and HABs. HABs threaten and impair recreational access and potable water use. Although final scientific consensus on the cause(s) of HABs has not been reached, elevated phosphorus is a suspected driver of cyanobacterial blooms along with other factors related to climate and invasive species. The 9-E included analysis of the relative magnitude of phosphorus load from individual on-site wastewater disposal systems (septic systems) adjacent to surface waters within the Seneca-Keuka watershed using the NYSDEC spreadsheet screening tool LENS (Loading Estimator of Nutrient Sources).

Table 26: Summary of Phosphorus Load, Seneca-Keuka Watershed

Source	Estimated Total Phosphorus Load (lbs/yr)	Percent Phosphorus Contribution to Watershed
Nonpoint Sources (Landscape): SWAT	271,900	88%
Nonpoint Sources (Septic Systems): LENS	2,900	1%
Point Sources at Permit Limits	32,878	11%

Recommended Actions under Category 3: Wastewater Management include the following:

- Replace and/or upgrade failing septic systems to address Phosphorus, Nitrogen, *E. coli*, Organics
- Develop feasibility studies on installation of sanitary sewer infrastructure and implement where practical to address Phosphorus, Nitrogen, *E. coli*, Organics
- Increase adoption of enhanced phosphorus removal technologies designed for personal and public wastewater systems to address Phosphorus
- Explore novel opportunities to identify failing systems via non-direct monitoring methods to address Phosphorus, Nitrogen, *E. coli*, Organics

2.4.1.2 Village of Burdett Comprehensive Plan, 2014

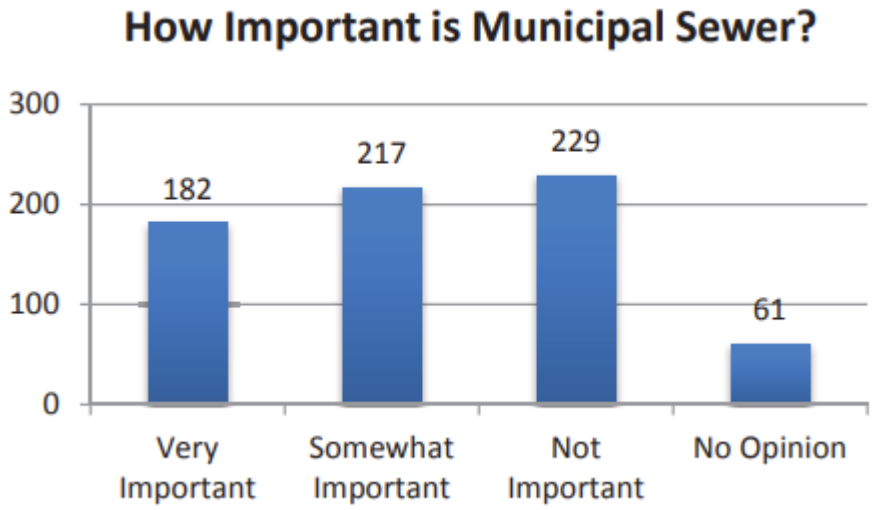
The comprehensive plan was designed to ensure that land use decision-making in the village has the following characteristics: 1) Is responsive to community goals and objectives, 2) Respects the sensitive ecosystems within the village's jurisdiction, 3) Creates and enforces local laws that will protect public values in designated areas, and 4) Protects the overall public health, safety and welfare of village residents. The Plan states, "Today, Burdett is a quiet village, home to approximately 350 residents and more than a dozen businesses. These businesses are predominately privately-owned/family-operated. These businesses include two restaurants, a bar, a stable, a driving range, a farm stand, two u-pick berries patches, a mid-wife, post office, gas station and convenience store, a saw works, a warehouse distributor, a beauty salon, a dog grooming parlor, a bike shop, library & art gallery and a wood pulp business. A number of individuals also offer services from their homes, such as music lessons, antique purchases and sales. The majority of the residents work in the nearby towns of Watkins Glen, Elmira, Corning and Ithaca."

The plan includes a Vision that All Village residents will have water and sewer at a reasonable cost. The plan includes an Issue that the proliferation of Individual Sewage Disposal Systems is not carefully monitored and maintained, has the potential to pollute surface and ground water and that there are inadequate sewer systems in Burdett. The strategies and actions include the following sewer related actions:

- Work with Schuyler County to find ways to collaborate with county policies, plans, and new wastewater treatment facilities.
- The Village should participate in discussions with the County and the Village of Watkins Glen about a central wastewater treatment plant.
- The Village should explore long-term solutions to address inadequate wastewater systems in the Village.
- The Village should seek grants and funding sources to address wastewater issues.

2.4.1.3 Town of Hector Comprehensive Plan, 2015

The Town of Hector was established in 1802 and has traditionally been an agriculturally centered community. Recent trends indicate a decrease in farming activity and a shift toward a rural residential community along with a significant influx of tourism based industry. Issues of significance identified through community survey included the following results for public assessment of importance of municipal sewer:



The plan includes the Implementation Item to work with county watershed department to develop handout on potential septic issues/watershed.

2.4.1.4 Schuyler County Comprehensive Plan, 2105

The Plan documents the importance of protection of Seneca Lake, the defining feature of the Schuyler County landscape is Seneca Lake. The area's early development as a tourist location was due in part to the many gorges and waterfalls that grace the County. However, most of the early water-related industrial development also revolved around these prime locations which can present current challenges as the push for redevelopment and community revitalization continues to grow. The main challenges facing Schuyler County mirror those faced by many rural communities in New York State, increasing operational costs and a low population density make it increasingly difficult to provide community services without large tax increases. It will be important to continue to promote tourism as an opportunity for new development as well as a way to increase the tax base and sales tax revenue. The promotion of tourism throughout Schuyler County will also be integral to attracting visitors and maintaining high room tax revenue.

Local municipalities work with limited budgets, largely due to small tax bases. They have begun to take a shared service approach where they share work and equipment, which helps to save money and maintain a high level of service to the local residents. The Plan identifies Primary Challenges including Infrastructure Development – Developing infrastructure that enables marketplace and residential growth is critical to the County's future. The Plan identifies the necessity to improve the existing wastewater infrastructure or construct a new regional wastewater treatment plant to handle the existing demand as well

as future growth. Integrating clean technologies into new infrastructure would provide the new capacity along with additional economic and environmental benefits. Since the Plan was adopted, the Catharine Valley Water Recovery Facility was built with capacity for future growth. The Plan includes the following implementation items related to sewer in the project area:

- Encourage the completion of the new regional wastewater treatment plant serving the Villages of Montour Falls and Watkins glen while eliminating the direct discharge of wastewater effluent to Seneca Lake.
- Evaluate the feasibility of and possible solutions for sewage treatment in Burdett and Odessa.

2.4.1.5 Village of Odessa, Village of Burdett Commercial District Improvement Strategy, 2011

The Commercial District Improvement Strategy presents a Vision for Burdett's commercial district at the crossroads of outdoor recreation and tourism experiences offering trails and byways with residents and visitors experiencing an inviting atmosphere with unique dining and shopping in a picturesque historic village setting. Infrastructure Goals and Objectives include: 1) to remain involved with the sanitary sewer study process to become familiar with the land and water resources those systems may need to operate, and 2) to ensure that new development that expect to be connected to future sewer are located in an area that will be served.

2.4.1.6 Schuyler County Water/Wastewater Infrastructure Development Evaluation for Business and Economic Development, 2003

The Schuyler County evaluation identified the following recommended improvements for the Village of Burdett:

> To address reported problems with individual on-lot septic system problems in the Village of Burdett (which may stifle economic growth in the community), a municipal wastewater collection and treatment system was evaluated….A number of design and construction challenges exist:
>
> - Rock is reported to be at relatively shallow depths in many portions of the village. The associated rock excavation would most likely be expensive.
> - Small streams pass through the Village of Burdett
> - The topography within the Village is such that a number of pump stations would be required to collect and convey wastewater to a central treatment facility

2.4.2 Health, Sanitation, and/or Security

Failing on-site septic systems can pose health risks as they may discharge untreated wastewater containing pathogens, nutrients, and other harmful substances into the groundwater or surface waters. Proper design, maintenance, and operation are important to mitigate risks. The Seneca Lake Nine Element Plan assumed that 25% of private on-site septic systems were failing and contributing to Phosphorus loading in the Seneca Lake watershed. The current inspection program for residential septic systems in the project area includes inspections at the time of property transfer, an accurate accounting of the number of failing septic systems is currently unknown.

2.4.3 Aging Infrastructure

Development of septic systems within the project area is complicated by limited drift thickness, steep slopes, and many stream crossings. While the project area is determined to have somewhat limited conditions for septic system development, the majority of septic systems in the project area are conventional systems. The septic systems in the project area are aging and redevelopment of the systems is anticipated to pose financial challenges to homeowners to meet current requirements.

2.4.4 Storm and Flood Resiliency

Erosion of stream banks and drainage ways during flash flooding is a major concern in the project area, refer to Section 2.3.7. The severity of erosion problems is due, in part, to the widespread occurrence of poorly consolidated glacial deposits, which are particularly susceptible to erosive forces. Flooding events have previously disrupted the community and resulted in declared disasters. Flooding events can impact on-site septic systems both through oversaturation of the soils and to displacement of soils.

2.4.5 Compliance with Accepted Standards

Private on-site septic systems in the project area are regulated by NYSDOH, NYSDEC, and County Watershed Protection Agency. The County Watershed Agency reports that 89 failed septic systems between 2010 and the present were documented and repaired, the majority of failed septic systems were identified during property transfers.

3. ALTERNATIVES ANALYSIS

3.1 Description

The following 3 alternatives were evaluated for the client:

1.) Alternative 1 – "No Action"

2.) Alternative 2 – Construct a collection system and convey flow to the existing Catherine Valley Water Reclamation Plant

3.) Alternative 3 – Construct a collection system and convey flow to a new wastewater treatment facility within the project area

Any alternatives considered technically infeasible should be identified as such and the rationale briefly discussed.

3.2 Alternative 1 – No Action

The "no action" alternative entails making no changes to the current wastewater treatment and disposal systems in the project area, making the property owner responsible for correctly handling generated wastewater. Presently, the residences and businesses within the project area are connected to septic systems for wastewater treatment. This action would not address the current wastewater problems, improve environmental health or promote economic growth within the community. Therefore, the "no action" alternative is not a viable alternative for the project.

3.3 Alternative 2 – Construct a collection system and convey flow to the existing Catherine Valley Water Reclamation Plant

3.3.1 Description

Alternative 2 primarily utilizes a conventional gravity sewer and force main system to collect and convey sanitary flows to the existing Catherine Valley Water Reclamation Plant. Additionally, it incorporates a targeted LPSS collection system in specific low-elevation areas to serve homes and cottages in two communities along Seneca Lake.

This approach eliminates reliance on inefficient onsite septic systems, reducing the potential for environmental harm to Seneca Lake and nearby waterways. Eliminating the need for septic systems would also support regional economic growth while preserving the area's natural beauty and environmental health.

Utilizing the existing regional reclamation plant aligns with a sustainable, expandable solution to meet future needs. The existing reclamation plant can accept the project flows and was designed to be the primary wastewater treatment facility for the region.

By providing a trunk or interceptor sewer, this alternate would provide the sewer infrastructure needed to connect other lakefront communities in future projects. This fosters continued improvements to Seneca Lake's water quality by providing a means for the Lakefront communities along this portion of the Lake to disconnect their septic systems in future projects.

The system generally flows from north to south and connects to an existing pump station owned by the Village of Watkins Glen, which then connects to the Catherine Valley Reclamation Plant. The proposed sewer system includes approximately 64,000 feet of gravity sewer, 210 manholes, 50,000 feet of force main, 28 pump stations, 12,000 feet of low-pressure sewer, and 106 individual grinder pumps. Due to the area's numerous creek crossings and undulating topography, many pump stations are required throughout the system. In many sections, gravity sewer and force main run parallel, with gravity lines flowing downhill to pump stations at low points, and force mains transporting wastewater from the pump stations to the next downstream high point.

We sized the main trunk line of the gravity sewer to be 12" PVC and the tributary sewers to be 8" PVC. Based on the topography, we assumed that the sewer would be 8' deep and have a minimum slope of .5%. The 12" and 8" sewer would provide capacity for future flows to be connected and PVC is a durable material that has an expected design life of over 50 years. Outside the roadway limits and along the alignment of the sewer there are deep ditches, severe cross slopes, existing electrical poles, existing water mains, and other unknown utilities: thus, we assumed the sewers would need to be installed within the roadway. Precast manholes are located every 400' of sewer or where the direction of the sewer changes in accordance with the 10 State Standards. The users would be provided a connection point and cleanout on the right-of-way line to connect their sewer flows.

Sewer pump stations are located at low points, stream crossings, and at intervals of every 125 feet of vertical elevation change in areas with significant uphill sections. The pump stations would be duplex stations (two pumps) that operate alternately with one pump capable of handling peak flows and another for redundancy. Each pump station would require a new 3-phase electrical service and a diesel emergency backup generator to provide backup power in case of a power outage. A control panel with an alarm would be located at each site for the pumps and alert Village/Town personnel if there is a problem. The pump stations would pump sewer through 8" and 6" HDPE force mains to an upstream pump station or high point manhole. We assumed the force main along the main trunk line would be 8" and force mains along the tributary portions would 6". HDPE is a robust material with a design life of greater than 50 years and can be installed via directional drill and stream crossing would be installed via directional drill.

The 2 lakeside communities along Seneca Lake at Peach Orchard Road and N Falls Road would be served be LPSS. The users would be provided a grinder pump, alarm panel and stub to connect to. We chose to utilize an LPSS in these specific locations because the proximity to Lake offers limited potential for future population growth and undulating topography.

3.3.2 Technical Feasibility

This alternative is technically feasible because it addresses all the environmental and sustainability concerns summarized in section 2.4. By utilizing PVC and HDPE sewers, which are resistant to corrosion and have a design lifespan of greater than 50 years, there will not be frequent replacements and repairs, lessening the environmental impact over time. Furthermore, the infrastructure would be able to accommodate additional flow to incorporate future economic development and existing communities along the lake.

Utilizing the existing treatment at the Catherine Valley Water Reclamation Plant supports the NYSDEC goal of utilizing regional treatment facilities and is more sustainable for the following reasons.

1. Catherine Valley Water Reclamation Plant Capacity: As mentioned previously in the report, the Catherine Valley Water Reclamation Plant has enough excess capacity to incorporate the project flows and the Village of Watkins Glen supports the project. The operator of the plant told us that the plant was designed for surrounding communities to connect to.
2. Environmental Protection: By using the existing regional facility, alternate 2 reduces the number of wastewater discharges in the project vicinity and can better manage the cumulative impacts on water bodies. Fewer discharge points mean less potential for localized pollution and help to protect aquatic ecosystems and drinking water sources.
3. Resource Optimization: Connecting to the reclamation plant allows for better allocation of skilled personnel and resources. It can be challenging for smaller facilities to attract and retain qualified operators, whereas regional facilities can offer more competitive employment opportunities. Based on recent conversations with the Catherine Valley operator, it is very difficult to find qualified operator in the area currently and will be even more difficult in the future.
4. Economies of Scale: The regional facility is more cost-effective to operate and maintain. By treating larger volumes of wastewater in a single location, the communities can share the costs associated with advanced treatment technologies, staffing, and infrastructure maintenance. In this case, the project users would share the maintenance costs of the treatment plant with the Villages of Watkins Glen & Montour Falls.

3.3.3 Land Requirements

We anticipate that we would need to acquire permanent easements for each pump station location and some of the creek crossings.

3.3.4 Environmental Impacts and Mitigation Measure

Alternative 2 is expected to improve water quality in the project vicinity by eliminating septic systems within the project area.

The replacement of existing facilities and construction activities under Alternative 2 are anticipated to have minimal or no significant adverse environmental impacts. This conclusion considers concerns addressed under the State Environmental Quality Review (SEQR), including water quality and supply, air quality, noise levels, population growth, wetlands, floodplains, and other ecologically sensitive areas, which are expected to remain minimally affected.

As the project is likely to disturb more than 1 acre of land, a Stormwater Pollution Prevention Plan (SWPPP) would be developed prior to construction. The SWPPP would detail strategies to manage stormwater runoff and minimize soil erosion. Mitigation measures would include

the use of silt fencing, silt socks, and inlet protection to control sediment transport, ensuring the preservation of water quality in nearby water bodies.

3.3.5 Constructability and Schedule Considerations

The sewer improvements would be installed using a combination of directional drilling and open-cut methods. However, the project faces several challenges such as shallow bedrock and high groundwater levels in the area that are expected to complicate construction, requiring significant rock excavation and drilling. Additionally, the project would cross several streams, which would require careful planning and execution to minimize environmental impacts. A large portion of the sewer installation would also occur along a NYSDOT roadway, necessitating traffic management measures to ensure safety and reduce disruptions during construction.

The improvements described within this alternative would initiate with a detailed preliminary engineering/permitting followed by detailed design effort spanning approximately one years. Once engineering is completed and all stakeholders consulted, the bidding and construction effort can be expected to cover approximately 4 years culminating in a new public sewer system. Section 5.3 presents the proposed schedule for the recommended alternative.

3.3.6 Cost Estimate

Section 3.5 presents a cost estimate for this alternative.

Alternative 2 would utilize an existing wastewater treatment facility, reducing upfront capital costs associated with purchasing land and constructing a new facility. Leveraging the existing plant would also lower system and maintenance costs of treatment, as the operating expenses would be shared by a larger community.

However, the overall scope of the sewer collection system includes thousands of linear feet of gravity and force main sewer piping, hundreds of structures, and numerous pump stations, all contributing to the capital cost estimate. A significant portion of the sewer infrastructure would be installed within NYSDOT and County Road rights-of-way, requiring extensive Maintenance and Protection of Traffic (MPOT) measures and additional restoration expenses. Based on conversations with the NYSDOT, full roadway restoration would be required within trench limits, and NYSDOT and County roadways would need to be milled and repaved after the sewer installation.

Based on discussions with the Town of Hector's Water Superintendent, field observations, and soil maps, we anticipate encountering bedrock that would likely be rippable by an excavator. The presence of rock would increase installation costs. We estimate bedrock to be encountered at a depth of 3 feet for 25% of the sewer installation.

Annual costs for maintaining and operating the sewer system would include the following:

1. Sewer administration
2. Employee benefits and salaries
3. Watkins Glen Reclamation Plant fees

4. Pump station power usage
5. Odor control

Additionally, the Town would need to allocate funds annually for the replacement and maintenance of short-lived assets, including:

1. Flow meters
2. Air relief, pressure relief, and vacuum relief valves
3. Sewage pumps
4. Flushing of low-pressure mains
5. Emergency backup generators

3.4 Alternative 3 – Install and connect to a new wastewater treatment facility within the project area

3.4.1 Description

Alternative 3 collects and conveys wastewater flow in the same manner as alternative 2. However, alternative 3 includes the construction of a new WWTP to receive and treat wastewater generated within the study area, and discharge treated effluent. Please refer to Section 3.3.1 for a description of the collection system that would be constructed to collect sanitary flow and convey it to, in the case of Alternative 3, the new WWTP. The only significant differences between the collection system for Alternative 2 and the collection system for Alternative 3 are as follows:

- The Alternative 3 collection system conveys flow to the proposed site of the new Burdett/Hector WWTP, located near the intersection of Peach Orchard Point and NYS Route 414. Thus, collection system pumps station infrastructure south of that point convey flow northward (rather than southward as in Alternative 2), and are positioned appropriately to do so.

Similar to alternative 2, this approach eliminates reliance on inefficient onsite septic systems, reducing environmental harm and supports regional economic growth while preserving the area's natural beauty and environmental health. A trunk or interceptor sewer would provide sewer infrastructure to connect other existing lakefront communities in future projects.

For this alternative, the new WWTP would be required to apply for a SPDES permit from NYSDEC. Once issued, the WWTP would need to meet all operating requirements and effluent discharge limits stated within the SPDES permit. During the evaluation, the project team collaborated with NYSDEC regarding anticipated effluent discharge limits for two types of facilities: a WWTP discharging its treated effluent to a surface waterbody and a WWTP discharging its treated effluent to groundwater. Said discussions made clear that a WWTP discharging to groundwater holds several advantages relative to a facility discharging treated effluent to surface water, as outlined below.

- Issuance of a SPDES permit would be anticipated to be simpler, given the environmental sensitivity of the area and desire to avoid further contaminant loading to Seneca Lake and surface waterbodies that flow into it.

- Lower (i.e. less stringent) effluent discharge limits anticipated, thus reduced cost of treatment.
- Potential for reduced level of operator certification, thus simpler and less expensive to staff.

For these reasons, the WWTP contemplated in this alternative is one that discharges its treated effluent to groundwater.

During the evaluation, NYSDEC provided the following existing SPDES permits for facilities discharging treated effluent to groundwater and suggested that limits for the Burdett/Hector WWTP be estimated from them.

- Village of Hammondsport WWTF (SPDES No. NY0272205; effective date 10/1/22)
- Village of Odessa WWTF (SPDES No. NY0272183; effective date 7/8/21)
- Town of Newfield Sewer District #1 (SPDES No. NY0110752; effective date 5/1/10)
- Town of Riverhead Calverton Sewer District and WWTF (SPDES No. NY0025453; effective date 10/1/19)
- Suffolk Country Sewer District #27 – Forge River (SPDES No. NY0280089; effective date 6/1/20)

After review of the above-stated SPDES permits, the effluent limits presented in the table below were selected to be the design effluent limits for the Burdett/Hector WWTP.

Table 3-1: **Design WWTP Effluent Limits**	
Parameter	**Effluent Limitation**
Flow, Monthly Average, gal/d	149,000
Flow, Daily Maximum, gal/d	547,000
pH	6.5 – 8.5
Biochemical Oxygen Demand, 5-day (BOD_5)	Monitor
Total Suspended Solids	Monitor
Total Dissolved Solids	1,000 mg/L
Nitrogen (total as N)	10 mg/L
TKN (Total Kjeldahl Nitrogen)	Monitor
Ammonia	Monitor
Nitrate	Monitor
Nitrite	Monitor
Total Residual Chlorine (if Chlorine used)	2 mg/L
Phosphorous (total as P)	0.5 mg/L
Groundwater levels of the following: Water level, TKN, Ammonia, Nitrate, Nitrite, Nitrogen (total as N), Total Dissolved Solids	Monitor

Various types of treatment processes were considered to meet the design effluent limits, including a membrane bioreactor (MBR), moving bed biofilm reactor, an activated sludge and disc filter process, and a SBR with tertiary filtration. Ultimately, the unit processes at the Burdett/Hector WWTP envisioned for this alternative are as follows, based on being able to meet the design effluent limits, providing ease of use and maintenance, maximizing simplicity, and minimizing life-cycle cost.

- Influent mechanical fine screening including washing and compaction of screenings. Washed, compacted screenings to be conveyed to a roll-away dumpster for periodic disposal by Owner.
- Two continuous flow Intermittent Cycle Extended Aeration System SBR tanks
- Coagulant addition for phosphorous removal
- Tertiary disc filtration (two units for redundancy)
- Effluent Disinfection (UV) (two units for redundancy)
- Subsurface effluent dispersal field with infiltration units

  - Three beds, each with nine 100-foot long infiltrator rows.
  - Infiltrator chambers with capacity of 20 gallons per foot, thus each bed with capacity of 18,000 gallons per dosing cycle.
  - Total cycle time for any single bed of 2 hours: 30 minutes of dosing following by 90 minutes of infiltration.
  - Design maximum flow rate into a bed of 600 gallons per minute during the 30 minutes of dosing.
  - Dosing to cycle through beds in alternating fashion.
- Sludge Thickener (gravity)

The proposed WWTP design is based upon periodic withdrawal of thickened sludge from the thickener tank and hauling by tanker truck to the CVWRF where it would be introduced into CVWRF's ISAM sludge reduction system for inactivation and volume reduction, followed by dewatering, and hauling to landfill for disposal. Leveraging, via intermunicipal cooperation, existing sludge inactivation and dewatering facilities at the CVWRF rather than constructing a full suite of comparable facilities at this WWTP is assessed to be preferable.

Appendix G presents a conceptual site plan shown at a location within the study area selected based upon being particularly suitable for siting the proposed Burdett/Hector WWTP. Selection of this area is in alignment with recommendations in the NYSDEC NYS Design Standards for Intermediate Sized Wastewater Treatment Systems (March 2014).

- Within study area, thus proximate to the proposed collection system
- Moderately to well-drained soils (type A or B soils) suitable for receiving WWTP treated effluent discharge
- Low to moderate slopes (<15%)
- > 100 feet from streams, wetlands, and other surface waterbodies
- Undeveloped (agriculture or rural residential)
- To facilitate negotiation of land acquisition or easement: one owner and local knowledge (based on input from Village and Town officials) that the owner may be open to discussing selling land or granting long-term easement

Please note that although this site has been identified for the purposes of the present evaluation, the site has not been purchased nor an easement granted.

3.4.2 Technical Feasibility

This alternative is technically feasible because it addresses the environmental and sustainability concerns outlined in Section 2.4. Like Alternative 2, Alternative 3 uses PVC and HDPE sewer materials, which resist corrosion and last approximately 50 years. These durable materials reduce the need for frequent replacements and repairs, minimizing long-term environmental impacts. The infrastructure would also handle increased flow capacity, supporting future economic development and allowing existing communities along the lake to connect.

In this alternative, wastewater flows would be directed to a new treatment facility located off Peach Orchard Point. The treatment facility would be sized to receive and treat the design flows presented, which includes capacity for growth within the planning period. To implement this alternative, the Village of Burdett must obtain an SPDES permit and hire or

contract qualified personnel to operate and maintain the facility. These operators would ensure the effluent consistently meets the quality standards required by the SPDES permit.

3.4.3 Land Requirements

We anticipate that we would need to acquire easements for each pump station location and as needed for creek crossings. Alternate 3 also requires the Village to acquire approximately 4 acres land for the wastewater treatment facility.

3.4.4 Environmental Impacts and Mitigation Measures

Like Alternate 2, Alternative 3 is expected to significantly improve water quality in the project vicinity by eliminating septic systems within the project area. Because treated effluent from the WWTP would be discharged to groundwater and groundwater monitoring wells would be implemented to ensure pollution is not occurring, the type of WWTP is intended to minimize or eliminate any impact to Seneca Lake or other nearby surface waterbodies.

Similarly to Alternative 2, the transmission and collection system would have minimal or no significant adverse environmental impacts. However, the new wastewater treatment plant would have an inherent risk to the environment. In particular, during operation, there is potential for improper management of treatment byproducts, accidental chemical spills, and improper treatment that could pose a threat to the environment. The Town and facility management would need to employ proper management and adherence to regulatory requirements would substantially minimize environmental impacts. To ensure this happens the Town would hire qualified staff to operate and manage the facility and dedicate funds yearly for upgrades and maintenance.

As the project is likely to disturb more than 1 acre of land, a Stormwater Pollution Prevention Plan (SWPPP) would be developed before construction. The SWPPP would detail strategies to manage stormwater runoff and minimize soil erosion. Mitigation measures would include the use of silt fencing, silt socks, and inlet protection to control sediment transport, ensuring the preservation of water quality in nearby water bodies.

3.4.5 Constructability and Schedule Considerations

Alternative 3 has all the same constructability considerations as Alternative 2 for the transmission and collection system. However, the treatment facility would add more challenges. In particular, developing a new or expanded treatment plant often involves additional site preparation, longer construction timelines, and more complex permitting requirements. Furthermore, the facility would require a significant amount of land for its footprint and associated infrastructure. The Town would need to buy the land which increases project costs significantly.

Additionally, there is the potential for “Not in My Backyard” opposition from local residents who may be concerned about odors, noise, traffic, and property values. This further complicates site selection and stakeholder engagement. Overall, these factors may lengthen project schedules, increase construction-related disruptions (e.g., noise, dust, traffic), and demand a higher level of compliance with environmental regulations and safety standards.

The presence of specialized treatment processes can also raise capital expenses and necessitate advanced operator training or certifications. Qualified operators are not easily

available in the project area and the Town may need to contract out operations until local personnel can be trained and certified.

The addition of a new wastewater treatment facility will also extend the construction duration and require more time for permitting and engineering. The Town or Village would need to negotiate land acquisition with the property owner and execute a contract. Furthermore, to obtain a SPDES permit, the Town or Village will need to coordinate with the NYSDEC to establish effluent limits, which will likely involve field testing. These hurdles would significantly extend the project schedule and add to the overall complexity of implementation.

3.4.6 Cost Estimate

Section 3.5 presents a cost estimate for this alternative.

The costs associated with the sewer collection system are similar to those mentioned in Alternative 2, with slight variations in quantities. The primary cost difference in Alternative 3 lies in the expenses related to constructing and maintaining a new wastewater treatment facility. Please note the following significant assumptions related to WWTP capital and O&M costs:

- The land acquisition cost in the estimate is assumed. At this point, acquisition of the land at the proposed site has not been discussed with the land owner.
- Post-SBR equalization is proposed to preclude the need to upsize subsequent unit processes.
- Decant from the Sludge Thickener will be recirculated to the WWTP influent channel for treatment.
- According to estimates prepared by an SBR instrumentation manufacturer, sludge production under maximum month conditions is assumed to be approximately 3,000 gallons per day at 0.85% solids. It is conservatively assumed that the sludge thickener will operate sufficiently to thicken sludge to an average of 2% solids (per Metcalf & Eddy, Wastewater Engineering Treatment, Disposal, and Reuse, 3rd Ed., Table 12-13) prior to hauling to CVWRF, thus under maximum month conditions, average daily production will be 1,275 gallons. Given an assumed tanker trunk capacity of 4,500 gallons, we assume 2 trips per week to haul thickened sludge to CVWRF during maximum month conditions and 1 trip per week during average conditions.

3.4.7 Non-Monetary Factors

The following are anticipated non-monetary factors for consideration as related to this alternative:

- More challenging to permit
- Increased regulatory burden
- Improvement in water quality
- Improved climate resiliency
- Community objection to required land acquisition for treatment plant.

3.5 Engineer's Opinions of Probable Construction Costs

Total project cost with construction costs, non-construction costs and contingency separately stated

- Non-construction may include land/easement acquisition, legal, engineering, construction management, financial advisor, grant/loan administrator, etc.
- Contingency up to 30% is acceptable

Annual operation and maintenance (O&M) cost considering personnel, administration, water purchase or waste treatment costs, insurance, energy cost (fuel or electric), process chemical, monitoring and testing, short-lived asset maintenance and replacement (see Appendix B: Examples of Short-Lived Assets), professional services, and residuals disposal. Include any income from energy generation or outside revenue.

3.5.1 Alternative 1 – "No Action"

The "no action" alternative carries no associated costs beyond the potential adverse environmental effects.

3.5.2 Alternative 2 – Connect to the existing Catherine Valley Water Reclamation Plant

The following table presents a summary of the Engineer's Opinion of Probable Construction Costs of Alternative 2. Please refer to Appendix F for the detailed estimate. Please note the estimate assumes the midpoint of construction would be approximately mid-2027.

Table 3-2:
EOPCC for Alternative 2

Description	Total Cost
Present Value Construction Subtotal	$59,597,000
2027 Construction Subtotal (6% Escalation)	$63,173,000
Construction Contingency (30%)	$18,952,000
Engineering, Planning, Permitting and Construction Services (20%)	$12,635,000
Admin, Financial, Bonding and Legal Services (5%)	$3,159,000
Permitting, Planning and Engineering Contingency (5%)	$3,159,000
Total Estimated Project Cost	**$97,920,000**

3.5.3 Alternative 3 – Connect to a new WWTP built within the project area.

The following table presents a summary of the Engineer's Opinion of Probable Construction Costs of Alternative 2. Please refer to Appendix F for the detailed estimate. Please note the estimate assumes the midpoint of construction would be approximately mid-2027.

Table 3-3:
EOPCC for Alternative 3

Description	Total
Present Value Construction Subtotal	$73,973,000
2027 Construction Subtotal (6% Escalation)	$78,412,000
Construction Contingency (30%)	$23,524,000
Engineering, Planning, Permitting and Construction Services (20%)	$15,682,000
Admin, Financial, Bonding and Legal Services (5%)	$3,920,600
Permitting, Planning and Engineering Contingency (5%)	$3,920,600
Total Estimated Project Cost	**$125,460,000**

4. SUMMARY AND COMPARISON OF ALTERNATIVES

If field investigations and further design work during detailed design reveal significant modifications are necessary, this analysis and the recommendation of an alternative must be re-evaluated. At the present level of investigation, the summary and comparison follow. The following table presents a summary of technically feasible alternatives including major differences, pros and cons, non-monetary factors, and costs.

Alternative	**Alternative 2: Connect to the Existing Catherine Valley Water Reclamation Plant**	**Alternative 3: Install and connect to a new wastewater treatment facility within the project area**
Major Difference(s)	• Collection system connects to existing Catherine Valley Water Reclamation Plant in Watkins Glen. • The Town of Hector and/or Village of Burdett do **not** own/operate a separate treatment facility.	• Collection system connects to a **new** treatment facility located within the project area. • The Town of Hector and/or Village of Burdett **own and operate** its own wastewater treatment plant.
Compliance Deficiencies	• The Town of Hector and/or Village of Burdett must maintain the collection system, ensuring compliance with NYSDEC standards. • The receiving plant (Catherine Valley) assumes the primary treatment and effluent compliance burden.	• The Town of Hector and/or Village of Burdett must maintain **both** a collection system **and** a treatment facility. • The Town of Hector and/or Village of Burdett WWTP must comply with NYSDEC effluent limits and associated permitting, testing, and reporting requirements for wastewater treatment.
Interagency Coordination	• Coordinate with Watkins Glen for connection fees, flow monitoring, and any capacity-sharing agreements. • Less direct oversight of plant operations but must maintain good intermunicipal relations.	• Ongoing coordination with NYSDEC for the facility's discharge permit, effluent monitoring, and compliance enforcement. • Potentially more complex coordination if changes to discharge limits or state/federal regulations occur.
Pros	• **Reduced Regulatory Burden**: Primary treatment responsibility lies with the existing regional plant. • **Lower Staffing Needs**: Fewer skilled operators are required • **Supports Regional Approach**: Aligns with NYSDEC's preference for larger, regional wastewater solutions. • **Easier to Permit**: Fewer separate permits for the treatment component.	• **Local Control of Costs**: Long-term control over treatment fees (no reliance on another entity's user rates) • **Direct Management**: The Village can optimize operations based on local priorities.

	• **Higher Likelihood of Community Support**: Odors, noise, and other treatment-related impacts are off-site. • **Adaptability:** The existing plant may have the capacity or the ability to expand more easily if needed. The existing plant will be more capable of adapting to future regulatory requirements.	
Cons	• **Annual User Costs**: The Town of Hector and/or Village of Burdett must negotiate ongoing user fees with Watkins Glen. • **Less Direct Control**: Dependent on the regional plant's policies, capacities, and operational decisions.	• Much greater regulatory burden. • Lower likelihood of community support. • Less adaptable for future economic and population growth. • Does not comply with NYSDEC preference of regional wastewater facilities. • Less adaptable to future regulatory requirements.
Summary of Life-Cycle Costs	• Estimated Project Cost: $97,920,000 • Estimated life-cycle costs: o Simple annual average total cost over 30-year planning period: $7,412,902 o Simple annual average total cost per EDU over 30-year planning period (assumes Town and Village EDUs pay same rate): $13,333	• Estimated Project Cost: $125,460,000 • Estimated life-cycle costs: o Simple annual average total cost over 30-year planning period: $7,943,486 o Simple annual average total cost per EDU over 30-year planning period (assumes Town and Village EDUs pay same rate): $14,287

4.1 Life-Cycle Cost Analysis

Appendix F presents a life-cycle cost analysis for each feasible alternative considered. The asset investment schedule for each alternative presents opinions of probable present value cost and incurrence schedule for:

- Capital costs for the proposed project. Note that this scenario assumes a non-phased approach to project implementation.
- Operational costs, including energy and chemical consumption costs, related to new equipment and processes as recommended for the capital improvements. Costs, such as employee benefits, interfund transfers, special items, and any administrative costs associated with the alternative have been estimated and included.

- Maintenance costs, including typical activities such as pump and pump station maintenance, jet cleaning of sewer pipes, and replacement of wear items.
- Short-lived asset costs, including replacement of components critical to process operation, but do not require a full equipment replacement or rehabilitation. Short-lived assets typically would be replaced at least once within the planning period, falling in the 5 year to 20 year timeframe.

Debt service, operating, maintenance, and short-lived asset present value costs are compiled into an overall annual costs table, escalated by an average amount per year to account for long-term inflation. An assessment can then be made regarding accelerating or delaying certain investments to either consolidate expenditures (for the purpose of creating a viable capital project), or deferring activities to years where fewer expenditures would be required according to the typical replacement or O&M schedule. This allows a possible annual budget to be developed that avoids significant annual deviations.

5. RECOMMENDED ALTERNATIVE

Of the alternatives analyzed, we recommend **Alternative 2: Connect to the Existing Catherine Valley Water Reclamation Plant.** Important factors that form the basis of selection of this alternative include:

1. Lower capital and life-cycle costs.
2. Simpler permitting.
3. Decreased regulatory, operations, monitoring, and staffing burden based on Watkins Glen remaining responsible for O&M and regulatory compliance of the Catherine Valley Water Reclamation Plant.
4. Effective leveraging of regional wastewater treatment resources in a manner that promotes efficiency and intermunicipal cooperation, and aligns with regulatory agency preferences for regional wastewater solutions.

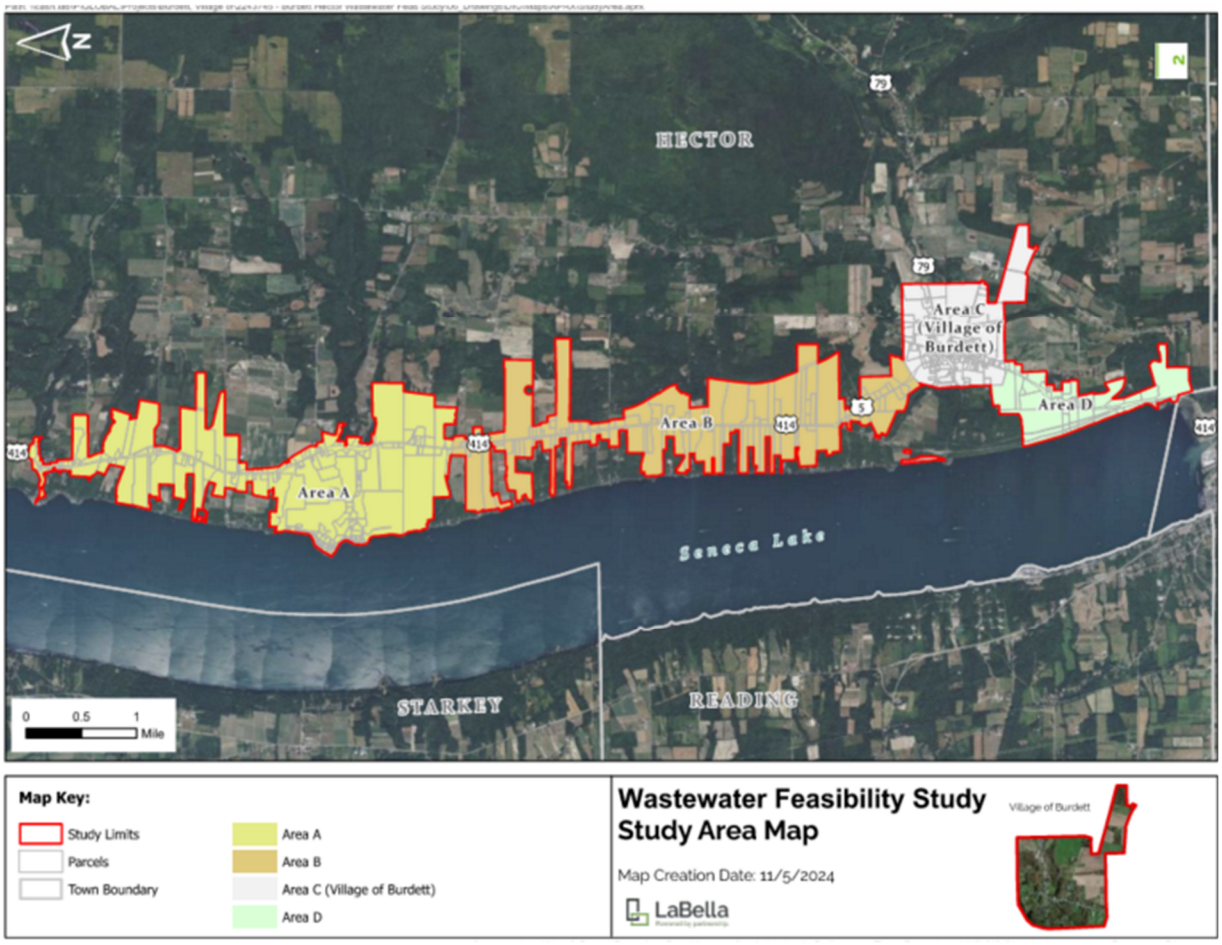
5.1 Community Engagement

Community engagement throughout the present evaluation focused on description of existing conditions, gathering public input, and presenting feasible alternatives for consideration. The recommendation above takes into account public input received. Community acceptance is often higher for projects that utilize existing regional wastewater treatment facilities. Since the major treatment processes and any associated odors, noise, or visual impacts are already located off-site, residents and businesses are less likely to raise concerns about these issues. In addition, using an established plant can foster a sense of cooperation with neighboring communities and regional authorities, further reducing the potential for "Not in My Backyard" objections and easing the path to project approval.

The project included public engagement through a mailed and online community survey, two (2) public information sessions, and stakeholder interviews. Please refer to Appendix H for Community Engagement documentation.

5.1.1 Community Engagement Survey Results

The public engagement survey was mailed to 638 recipients within the study area, the total number of respondents was 184, with 53% of respondents interested in municipal wastewater service. A summary of responses is provided in the tables below, refer to Appendix H for additional results.



EXISTING CONDITIONS									Of Respondents	w/ previous problems	
Area	No. of Survey Responses	On-Site Well	Off-Site Well	Municipal		No. of Respondents with Septic/Cesspool System	% of Respondents with Struggling Septic/Cesspool Systems	% of Respondents who previously had problems with their Septic/Cesspool Systems	% of Respondents who were able to fix their problems	% of Respondents who weren't able to fix their problem	% of Respondents who never had any issues
A	64	5	0	47	12	60	8%	38%	96%	4%	52%
B	34	1	0	31	2	31	6%	41%	86%	14%	53%
C	72	7	0	60	5	67	4%	44%	88%	13%	50%
D	14	13	0	1	0	14	7%	50%	86%	14%	50%
Overall	184	26	0	139	19	172	6%	42%	90%	10%	51%

INTEREST AND COST								Of the respondents who are interested in WW Service				
Area	No. of Survey Responses	On-Site Well	Off-Site Well	Municipal		No. of Respondents Interested in WW Service	Percent of Respondents Interested in WW Service	% WTP $34/mo ($400/yr)	% WTP $42/mo ($500/yr)	% WTP $50/mo ($600/yr)	% WTP $59/mo ($700/yr)	% WTP Not Indicated or Other Amount
A	64	5	0	47	12	34	53%	85%	56%	41%	18%	18%
B	34	1	0	31	2	18	53%	94%	67%	44%	28%	6%
C	72	7	0	60	5	36	50%	100%	64%	47%	22%	0%
D	14	13	0	1	0	10	71%	100%	80%	20%	20%	0%
Overall	184	26	0	139	19	98	53%	94%	63%	42%	21%	6%

5.1.2 Public Information Sessions

Public information sessions were held on February 5 and February 12, 2025. The public information sessions included a formal presentation with questions and answers and display boards soliciting discussion and public feedback. The sessions were attended by approximately fifty individuals. Summary of discussion included:

- Sewer priority around lake
    - Can sewer be installed along all lakeside properties
    - Can the lake be lowered 10 feet, install sewer, raise lake
    - Can the lake be lowered, install sewer – install lakeside trail
- Village of Burdett as sewered area
    - Consider all or portion of village and local package plant
- Document number of failing septic systems in Town and Village
    - Dye testing
- Consider Septic Inspection Program
    - As stand alone

    - In coordination with lakeside sewer project, provide incentive to be sewered
- Consider small community treatment systems in priority areas similar to LaBourgade treatment system
- Establish community program for septic improvements – funding
- Running sewer on 79 instead of 414 from Burdett – community indicated less steep
- Community desire for Zoning to proceed sewer
- Community concern for sewer leading to increased development impacting character
- Community concern for cost of sewer long term
- Community concern for number of pump stations including challenges with maintenance emergency response and aesthetics
- Community concern with discharge to CVWRF and lack of control of future costs
- Community comment that well-functioning septic can achieve similar treatment to WWTP with less cost
- Community comment that in 40 years no management of septic system – free
- Community concern for being charged for sewer if elect not to hook up or if outside of district
- Community concern for development of rate structure
- Community concern that system will require more water than typically generated and the pumps will lay stagnant or dry out and require extra maintenance or extra water consumption from a water source that is already compromised – Town Municipal water
- Community concern that town municipal water requires upgrades and costs associated with both water improvements and new sewer project is not bearable

5.1.3 Stakeholder Engagement

Meetings with regional and project area stakeholders were held between October 2024 and April 2025. The following stakeholders were engaged, minutes are included in Appendix H:

- NYS Department of Environmental Conservation, Division of Water
- NYS Environmental Facilities Corporation – scoping call
- Catherine Valley Water Recovery Facility
- Odessa Department Public Works, WWTF
- RCAP Solutions
- Seneca Lake Pure Waters
- Schuyler County Partnership for Economic Development
- Seneca Watershed Steward
- Schuyler County Watershed Inspector

- Seneca County Sewer District

5.2 Project Costs & Phased Approach

Based on input from Town and Village officials, Alternative 2, Connect to the Existing Catherine Valley Water Reclamation Plant recommended above, is not presently financially feasible even with optimistic assumptions regarding awards from presently-available funding programs. Accordingly, with input from Village and Town officials, the following phased approach is recommended.

Alternative 2 - Phase 1: Village of Burdett Sanitary Collection System	
Action	**Timeline**
1.1 Village of Burdett Joint Sewer Plan Committee Coordination Village collaborates with Joint Sewer Plan Committee to clarify the costs of the Catherine Valley Water Reclamation Plant providing treatment for Village sanitary flows.	Summer 2025 – Fall 2026
1.2 Village of Burdett Sewer Rate Analysis Village utilizes information gathered during Action 1.1, this Preliminary Engineering Report, and Village tax and billing records to evaluate and identify a sewer rate structure that is feasible, consideration of eliminating select parcels from the analysis that may require extensive infrastructure to provide service.	Summer 2025 – Fall 2026
1.3 Village of Burdett Sanitary Collection System Following completion of actions 1.1 and 1.2 above, the Village advances a Village-only version of Alternative 2. This would include construction of a sanitary collection system to serve the Village and conveyance of collected wastewater to the Catherine Valley Water Reclamation Plant for treatment.	2026 – 2028 (refer to detailed schedule in Section 5.4)
Alternative 2 - Phase 2: Town of Hector Sanitary Inspection and Planning	
Action	**Timeline**
2.1 Town of Hector Septic System Inspection Program Town enacts legislation requiring that each septic system owner have their system inspected once every three years with results submitted to the Town. This program will give the Town an improved understanding of the condition of septic systems within the Town, require improvement where deficient condition is identified, and inform future study related to sanitary collection system development.	2025
2.2 Town of Hector Lakeside Septic System Investigation Town initiates study of high-priority lakeside areas believed to be home to highest impact aging septic systems serving lakeside homes.	2026-2027
2.3 Town of Hector Land Use and/or Zoning Adoption Town develops land use and/or zoning regulations that would support future formation of a sewer district.	2026-2028
Alternative 2 - Phase 3: Town of Hector Sanitary Collection System	
Action	**Timeline**
3.1 Town of Hector Joint Sewer Plan Committee Coordination Town collaborates with Joint Sewer Plan Committee to clarify the costs of the Catherine Valley Water Reclamation Plant providing treatment for Town sanitary flows.	2028 - 2029

3.2 Town of Hector Wastewater Map, Plan, and Report Based on information collected during Phase 1, Town initiates development of Map, Plan, and Report for Town Sewer District Formation to serve high priority and feasible areas.	2029
3.3 Town of Hector Sewer Rate Analysis Town utilizes information gathered during Phase 2 and Phase 3, Actions 1 and 2, this Preliminary Engineering Report, and Town tax and billing records to evaluate and identify a sewer rate structure that is feasible.	2029
3.4 Town of Hector Sanitary Collection System Based on the present evaluation and new information collected during Phase 1, Town initiates a project to construct a sanitary collection system in a defined area of the Town to connect to Village's system and convey collected sanitary flow to the Catherine Valley Water Reclamation Plant for treatment.	2029 -2031 (must only proceed if Village successfully constructs Collection System)

5.2.1 Action 1.1: Village of Burdett Joint Sewer Plan Committee Coordination

Village collaborates with Joint Sewer Plan Committee to clarify the ongoing operation and maintenance costs associated with connection to the Catherine Valley Water Reclamation Plant. This coordination will inform the Village on potential participation in the governance of the Joint Sewer Plan Committee, proposed rates and responsibilities for the Village of Burdett, shared services for operation and maintenance, and will inform the financial feasibility of advancing the proposed project. The involved agencies are encouraged to apply for a NYS Department of State Local Government Efficiency Grant for planning purposes to consider development of the following:

- Joint Sewer Plan Committee roles, responsibilities, and legal documents;
- Sewer Use Ordinances;
- Regional Sewer Rate Analysis;
- Shared Services for Wastewater Collection System Operation and Maintenance; and
- Shared Services for Wastewater Treatment Plant Operation and Maintenance.

Participation in the LGE Planning grant will support competitiveness for a future LGE Implementation grant. Local Government Efficiency Grant Application Anticipated November 2025.
Anticipated Summer 2025 - Fall 2026

5.2.2 Action 1.2: Village of Burdett Sewer Rate Analysis

Village utilizes information gathered during Action 5.2.1, this Preliminary Engineering Report, and Village tax and billing records to evaluate and identify a sewer rate structure that is feasible. The evaluation should consider evaluation and potential elimination of select parcels that may require extensive infrastructure to provide service. The resulting rate analysis is recommended to be shared with the community and a minimum threshold of required capital grant award acquisition necessary to advance the project to design and construction. Collaboration with one or more of the following no-cost technical assistance entities is recommended to conduct the evaluation, further detailed analysis from a private municipal financial planning entity may also be required:

- RCAP Solutions no-cost technical assistance to conduct a rate study and recommendations as well as grant and loan application assistance.
    - Water & Wastewater Services | RCAP Solutions
- NYS Environmental Facilities Corporation Community Assistance Teams no-cost technical assistance to provide information about EFC program benefits and eligibility, tips for completing applications, creative funding solutions tailored to your community, and guidance on state and federal funding requirements.
    - Community Assistance Teams | Environmental Facilities Corporation
- EPA Water Technical Assistance, Wastewater Challenges in America no-cost technical assistance to provide assessment of wastewater needs, evaluate feasibility of wastewater solutions, perform rate study, identify funding options, assist community with establishing an ordinance for wastewater management.
    - Water Technical Assistance Programs | US EPA

Anticipated Summer 2025 - Fall 2026

5.2.3 Action 1.3: Village of Burdett Sanitary Collection System

Please refer to Section 5.3-5.5 for Cost Estimate, Detailed Schedule and Next Steps.

5.2.4 Action 2.1 Town of Hector Septic System Inspection Program

Recommend Town of Hector implement Town-wide or critical area septic system inspection program modeled after the Seneca County or Keuka Lake Inspection programs to routinely inspect existing septic systems in coordination with Schuyler Watershed Protection office. The purpose of the program will be to develop a uniform wastewater enforcement program, adopt regulations, and enforce improved wastewater management of private on-site septic systems. The regulations are encouraged to include structure for watershed inspections, staffing, payment, party responsibilities, protocols, permits, and enforcement.

5.2.5 Action 2.2 Town of Hector Lakeside Septic Investigation

Community engagement events identified an interest in conducting an evaluation of the Town of Hector lakeside parcels to identify compromised and failing on-site septic systems that may impact water quality, health and safety. This action should include inspections of high priority lakeside on-site septic systems and development of a Preliminary Engineering Report that documents existing conditions, study results, explores alternatives including No Action, Small Community Cluster Onsite Wastewater, and Development of Collection System and Connection to Regional WWTP. The Town of Burdett is encouraged to apply for a NYS Environmental Facilities Corporation Engineering Planning Grant to evaluate this priority area.

Anticipated EPG Grant Application: April 2026

Anticipated Study: July 2026 – June 2027

5.2.6 Action 2.3 Town of Hector Land Use and/or Zoning Adoption

To support community support for development of a municipal sewer collection system, the Town is encouraged to evaluate and adopt Land Use and/or Zoning to define the best uses for areas that are proposed for sewer development. Adopted zoning provides

a thoughtful approach to sewer district extension, allows for the advancement of Smart Growth Principles, and engages the community in planning and advancement. NYS Department of State Smart Growth Community Planning and Zoning Grant Program can be leveraged to advance local zoning.
NYS DOS Smart Growth Grant Anticipated Due July 2025
Zoning Development and Adoption Anticipated January 2026 – June 2028

5.2.7 Action 3.1 Town of Hector Joint Sewer Plan Committee Coordination

Town collaborates with Joint Sewer Plan Committee to clarify the ongoing operation and maintenance costs associated with connection to the Catherine Valley Water Reclamation Plant. This coordination will inform the Town on potential participation in the governance of the Joint Sewer Plan Committee, proposed rates and responsibilities for the Town of Hector, shared services for operation and maintenance, and will inform the financial feasibility of advancing the proposed project. The involved agencies are encouraged to apply for a NYS Department of State Local Government Efficiency Grant for planning purposes to consider development of the following:

- Joint Sewer Plan Committee roles, responsibilities, and legal documents;
- Sewer Use Ordinances;
- Shared Services for Wastewater Collection System Operation and Maintenance; and
- Shared Services for Wastewater Treatment Plant Operation and Maintenance.

Participation in the LGE Planning grant will support competitiveness for a future LGE Implementation grant.
Local Government Efficiency Grant Application Anticipated November 2027
Anticipated Summer 2028 -Fall 2029

5.2.8 Action 3.2 Town of Hector Map, Plan and Report

Town to develop Map, Plan and Report for proposed sewer district development areas in conformance with the requirements of New York State Town Law, Article 12 District and Special Improvements and Article 12 A Establishment or Extension of Improvement Districts.
Anticipated 2029

5.2.9 Action 3.3 Town of Hector Sewer Rate Analysis

Town utilizes information gathered during previous Actions, this Preliminary Engineering Report, and Village tax and billing records to evaluate and identify a sewer rate structure that is feasible. The evaluation should consider evaluation and potential elimination of select parcels that may require extensive infrastructure to provide service. The resulting rate analysis is recommended to be shared with the community and a minimum threshold of required capital grant award acquisition necessary to advance the project to design and construction. Collaboration with one or more of the following no-cost technical assistance entities is recommended to conduct the evaluation, further detailed analysis from a private municipal financial planning entity may also be required:

- RCAP Solutions no-cost technical assistance to conduct a rate study and recommendations as well as grant and loan application assistance.
    - Water & Wastewater Services | RCAP Solutions

- NYS Environmental Facilities Corporation Community Assistance Teams no-cost technical assistance to provide information about EFC program benefits and eligibility, tips for completing applications, creative funding solutions tailored to your community, and guidance on state and federal funding requirements.
    - Community Assistance Teams | Environmental Facilities Corporation
- EPA Water Technical Assistance, Wastewater Challenges in America no-cost technical assistance to provide assessment of wastewater needs, evaluate feasibility of wastewater solutions, perform rate study, identify funding options, assist community with establishing an ordinance for wastewater management.
    - Water Technical Assistance Programs | US EPA

Anticipated Spring 2029 - Winter 2029

5.2.10 Action 3.4 Town of Hector Collection System

Following satisfactory completion of the above Town of Hector steps, advance the Town of Hector Collection System Capital project. The Town of Hector Collection System is dependent on the completion of the Village Collection System Capital Project. It is recommended that this action would follow a similar series of steps as shown below for the Village of Burdett Collection System project.

5.3 Alternative 2 - Phase 1: Village of Burdett Sanitary Collection System Improvements Project Opinion of Probable Construction Cost

Refer to Appendix F for the engineer's opinion of probable construction cost. The table below presents estimated annual costs, including cost per EDU, based on anticipated life-cycle costs and the implementation of an asset reserve to provide funds for anticipated short-lived asset costs. Please note the costs below include service to all Village residents and excludes any grant funding.

Year	Total Debt Service	O&M Costs	Short Lived Asset Costs	Annual Total	Annual Total EDU	Annual Total Cost per Village EDU
2024	$0	$720,000	$40,000	$760,000	244	$3,115
2025	$0	$741,000	$40,000	$781,000	244	$3,201
2026	$0	$763,000	$40,000	$803,000	244	$3,291
2027	$1,150,000	$830,170	$40,000	$2,020,170	244	$8,279
2028	$1,150,000	$856,309	$40,000	$2,046,309	244	$8,387
2029	$1,150,000	$881,656	$45,000	$2,076,656	244	$8,511
2030	$1,150,000	$908,843	$45,000	$2,103,843	244	$8,622
2031	$1,150,000	$934,142	$45,000	$2,129,142	244	$8,726
2032	$1,150,000	$962,378	$45,000	$2,157,378	244	$8,842
2033	$1,150,000	$990,629	$45,000	$2,185,629	244	$8,957
2034	$1,150,000	$1,019,912	$50,000	$2,219,912	244	$9,098
2035	$1,150,000	$1,049,115	$50,000	$2,249,115	244	$ 9,218
2036	$1,150,000	$1,081,446	$50,000	$2,281,446	244	$9,350
2037	$1,150,000	$1,112,602	$50,000	$2,312,602	244	$9,478
2038	$1,150,000	$1,147,981	$50,000	$2,347,981	244	$9,623
2039	$1,150,000	$1,181,088	$65,000	$2,396,088	244	$9,820

2040	$1,150,000	$1,216,515	$65,000	$2,431,515	244	$9,965
2041	$1,150,000	$1,250,574	$65,000	$2,465,574	244	$10,105
2042	$1,150,000	$1,289,050	$65,000	$2,504,050	244	$10,262
2043	$1,150,000	$1,325,061	$65,000	$2,540,061	244	$10,410
2044	$1,150,000	$1,366,584	$65,000	$2,581,584	244	$10,580
2045	$1,150,000	$1,404,547	$65,000	$2,619,547	244	$10,736
2046	$1,150,000	$1,448,118	$65,000	$2,663,118	244	$10,914
2047	$1,150,000	$1,489,034	$65,000	$2,704,034	244	$11,082
2048	$1,150,000	$1,532,653	$65,000	$2,747,653	244	$11,261
2049	$1,150,000	$1,578,520	$65,000	$2,793,520	244	$11,449
2050	$1,150,000	$1,624,187	$65,000	$2,839,187	244	$11,636
2051	$1,150,000	$1,672,006	$65,000	$2,887,006	244	$11,832
2052	$1,150,000	$1,722,722	$65,000	$2,937,722	244	$12,040
2053	$1,150,000	$1,771,493	$65,000	$2,986,493	244	$12,240

5.4 Alternative 2 - Phase 1: Village of Burdett Sanitary Collection System Improvements Project Schedule

5.4.1 Village of Burdett Sanitary Sewer Collection System Capital Improvement Project

- NYS DOS Local Government Efficiency Planning Grant Application for Regional Wastewater Management (Applicants: Joint Sewer Plan Committee, Village of Montour Falls, Village of Watkins Glen, Village of Burdett, Town of Hector, Schuyler County)– Funds to support Joint Sewer Plan Committee roles, responsibilities, and legal documents; Village of Burdett Sewer Use Ordinance; Regional Sewer Rate Analysis; Shared Services for Wastewater Collection System Operation and Maintenance – Anticipated Application November 2025
- SEQR Full EAF Coordinated Review - Fall 2025 - Spring 2026
- Bond Resolution – May 2026
- Capital Project Grant Submissions
    - NYS DEC Water Quality Improvement Program Grant Application – July 2025
    - USDA Rural Development Grant Application – August 2025
    - WIIA/IMG Grant Application Submission – June 2026
    - ESD Grant Application Submission - July 2026
    - ARC Grant Application Submission – September 2026
    - NYS DOS Local Government Efficiency Implementation Grant Application – November 2026
    - Congressionally Directed Spending Grant Submission – February 2027
- Capital Project Grant Awards and Contract Execution
    - Anticipated WQIP Award – December 2025
    - Anticipated USDA RD Award – March 2026
    - Anticipated WIIA Award – November 2026
    - Anticipated ESD Award – December 2026
    - Anticipated ARC Award – July 2027
    - Anticipated DOS LGE Award – March 2027
    - Anticipated CDS Award – June 2027

- Village RFQ for Professional Engineering Services and NEPA– January 2027– February 2027
- NEPA Requirements to fulfill USDA and ARC –March 2027- August 2027
- Design and Spec Development – March 2027 – August 2027
- Design Review and Approval – August 2027 – October 2027
- Permits and Approvals – March 2027 – September 2027
    - NYS DEC
        - Approval of Plans and Specs
        - Joint Application
        - Stormwater Construction
        - Wetlands - Permit
    - NYSDOT
        - Approval of Plans and Specs
        - Roadway Permit
- Construction Bidding – October – December 2027
- Construction Contract Award & Execution – January – February 2028
- Construction Start – April 2028
- Construction – April 2028 to October 2028
- Substantial Completion – November 2028

5.5 Alternative 2 - Phase 1 Improvements Project Next Steps

5.5.1 Community Engagement

The proposed project would provide public notification during the following steps: Village Board meetings, SEQR review, Bond Financing, Intended Use Plan listing.

5.5.2 SEQR and SHPO Review

The recommended alternative is anticipated to utilize NYS Environmental Facilities Corporation (EFC) financing. As such, the State Environmental Quality Review (SEQR) review requires State Environmental Review Process (SERP), which may be more stringent than the requirements under SEQR. As such, an Unlisted Action generally must be treated as a Type I Action under SEQR. Therefore, the review included completion of Full Environmental Assessment Forms Part 1 through 3 and coordinated review. It is anticipated that the Village would act as Lead Agency with the Town of Hector, Village of Watkins Glen, Schuyler County, Joint Plan Committee, NYS DEC, NYS DOT, and funding agencies acting as involved and interested agencies.

If federal funding is directed to the project from USDA RD, ARC, or other sources, the project will also require National Environmental Policy Act (NEPA) review conducted in accordance with the select program requirements.

Consultation with New York's State Historic Preservation Office (SHPO), within the New York State Office of Parks, Recreation and Historic Preservation is anticipated. The proposed design is proposed to be submitted through the online Cultural Resource Information System (CRIS) to obtain a review letter from SHPO which will inform necessary actions and become part of the project record.

If federal funding is directed to the project from USDA RD, ARC, or other source, the project will also require Tribal Historic Preservation Office (THPO) review and approval.

5.5.3 Anticipated Procurement Methods

Based on an anticipated capital cost of $34,510,000 for Village of Burdett Sanitary Sewer Collection System Capital Improvement Project. It is anticipated that the Village of Burdett will pursue a combination of regional, state, federal grant and loan programs. In addition, the Village is anticipated to adopt a Municipal Bond to leverage short and long term financing from NYS EFC and/or USDA RD. Based on historic funding, it is anticipated that the following programs will be considered and may result in the following grant funding:

Program	Anticipated Due Date	Anticipated Award Date	Anticipated Maximum Award	Required Match
WQIP	Jul-25	Dec-25	$10,000,000	$2,500,000
USDA RD	Aug-25	Mar-26	$5,000,000	
ARC	Sep-26	Jul-27	$500,000	$250,000
ESD Grant Funds	Jul-26	Dec-26	$6,902,000	10% Grant Cash Equity
Congressionally Directed Spending	Jan-27	Oct-27	$500,000	0
LGE	Jan-26	Jun-26	$750,000	$75,000
WIIA (Small Community)	Jun-25	Oct-25	$4,016,500	0

5.5.4 NYSEFC Requirements

Please refer to Appendix J for documentation of compliance with EFC requirements.

5.5.5 Smart Growth

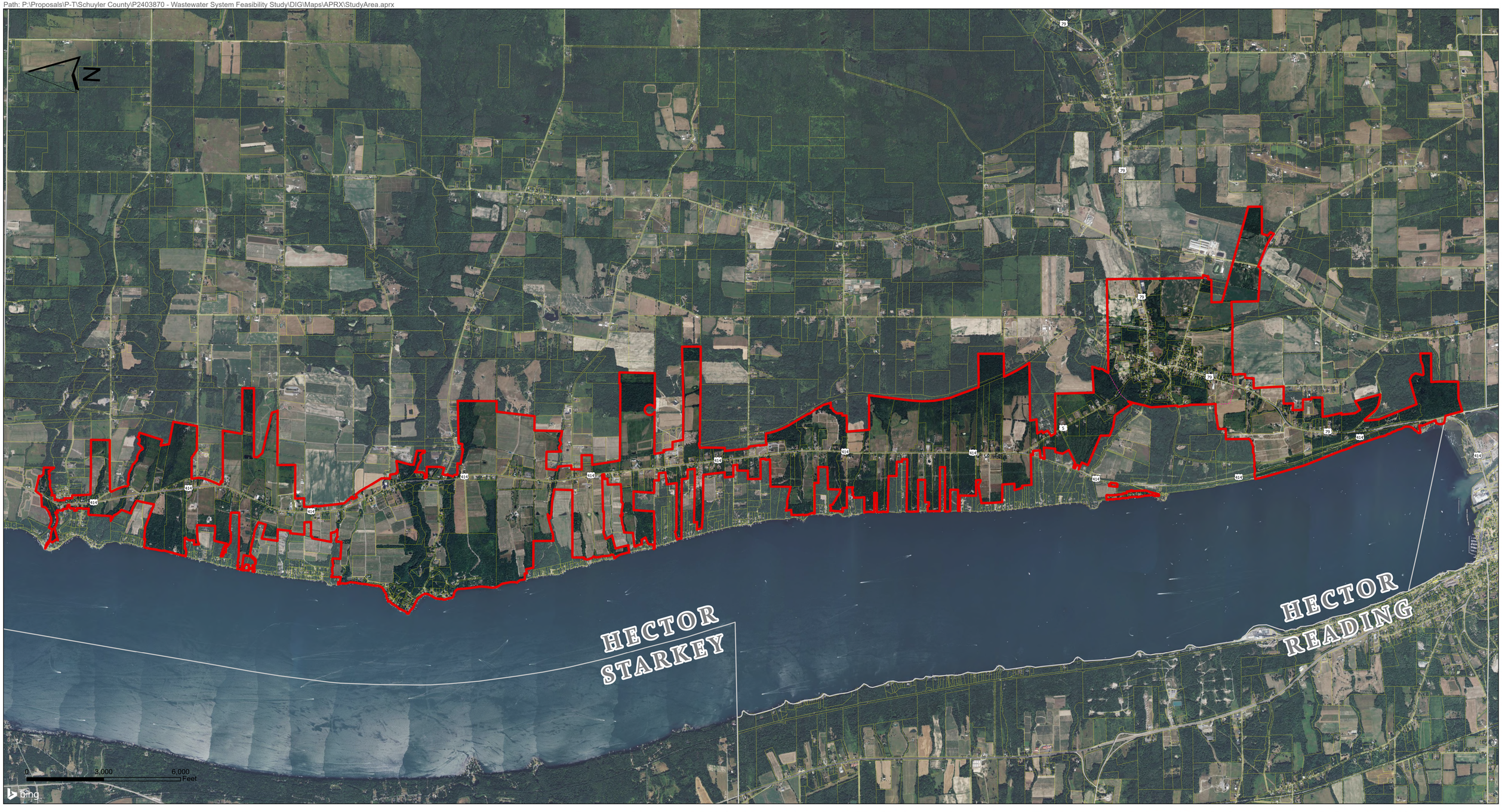
Please refer to Appendix K for Smart Growth Form.

5.5.6 Engineering Report Certification

Please refer to Appendix L signed Engineering Report Certification.

Appendix A: Project Area Maps and Figures

Path: P:\Proposals\P-T\Schuyler County\P2403870 - Wastewater System Feasibility Study\DIG\Maps\APRX\StudyArea.aprx



Map Key:

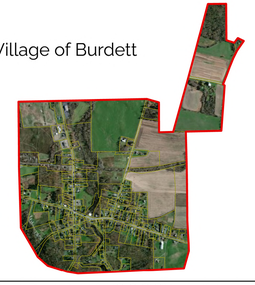
- Study Limits
- Parcel Boundary
- Town Boundary

Water Feasibility Study
Study Area Map

Schyler County, NY
Map Creation Date: 08/16/2024

LaBella
Powered by partnership.

Village of Burdett



Sources: Land Use & Parcel Boundary Regrid, 2024; Study Limits: LaBella, 2024; Town Boundary: NYS GIS Clearinghouse, 2024; Basemap: Bing, 2024

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

BURDETT QUADRANGLE
NEW YORK - SCHUYLER COUNTY
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 18T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, October 2017 - December 2017
Roads..... U.S. Census Bureau, 2016
Roads within US Forest Service Lands.....FSTopo Data with limited Forest Service updates, 2020
Names.....GNIS, 1980 - 2023
Hydrography.....National Hydrography Dataset, 2001 - 2019
Contours.....National Elevation Dataset, 2021
Boundaries.....Multiple sources; see metadata file 2017 - 2022

Wetlands.....FWS National Wetlands Inventory 1985

MN
GN
11°32'
205 MILS
1°13'
22 MILS
UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
UN
UM
Grid Zone Designation 18T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Dundee
2 Lodi
3 Trumansburg
4 Reading Center
5 Mecklenburg
6 Beaver Dams
7 Montour Falls
8 Alpine
ADJOINING QUADRANGLES

ROAD CLASSIFICATION

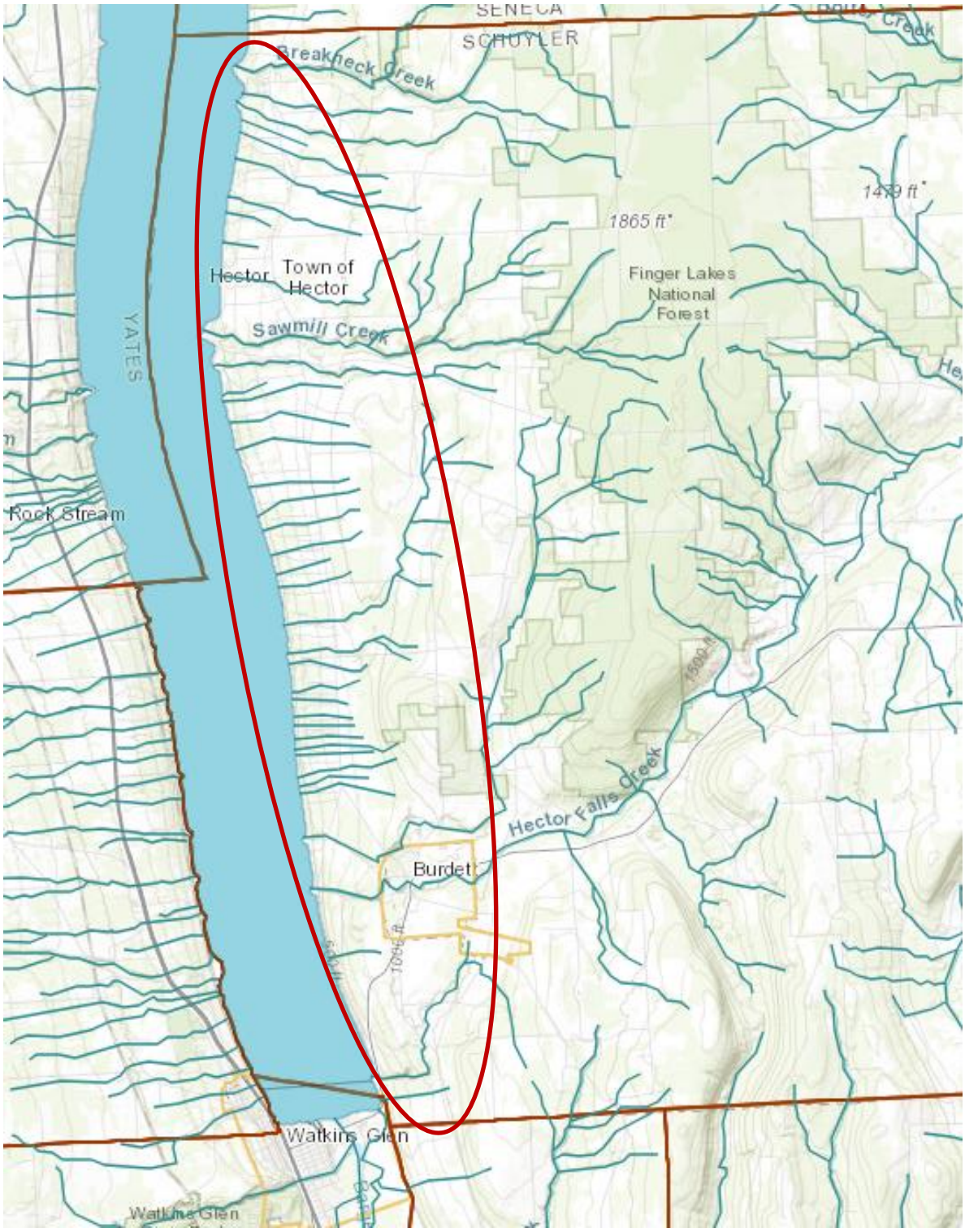
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route
FS Primary Route
FS Passenger Route
FS High Clearance Route

Check with local Forest Service unit for current travel conditions and restrictions.

BURDETT, NY
2023

NSN, 7643016386502
NGA REF NO. USGSX24K6223

Appendix B: Environmental Resources

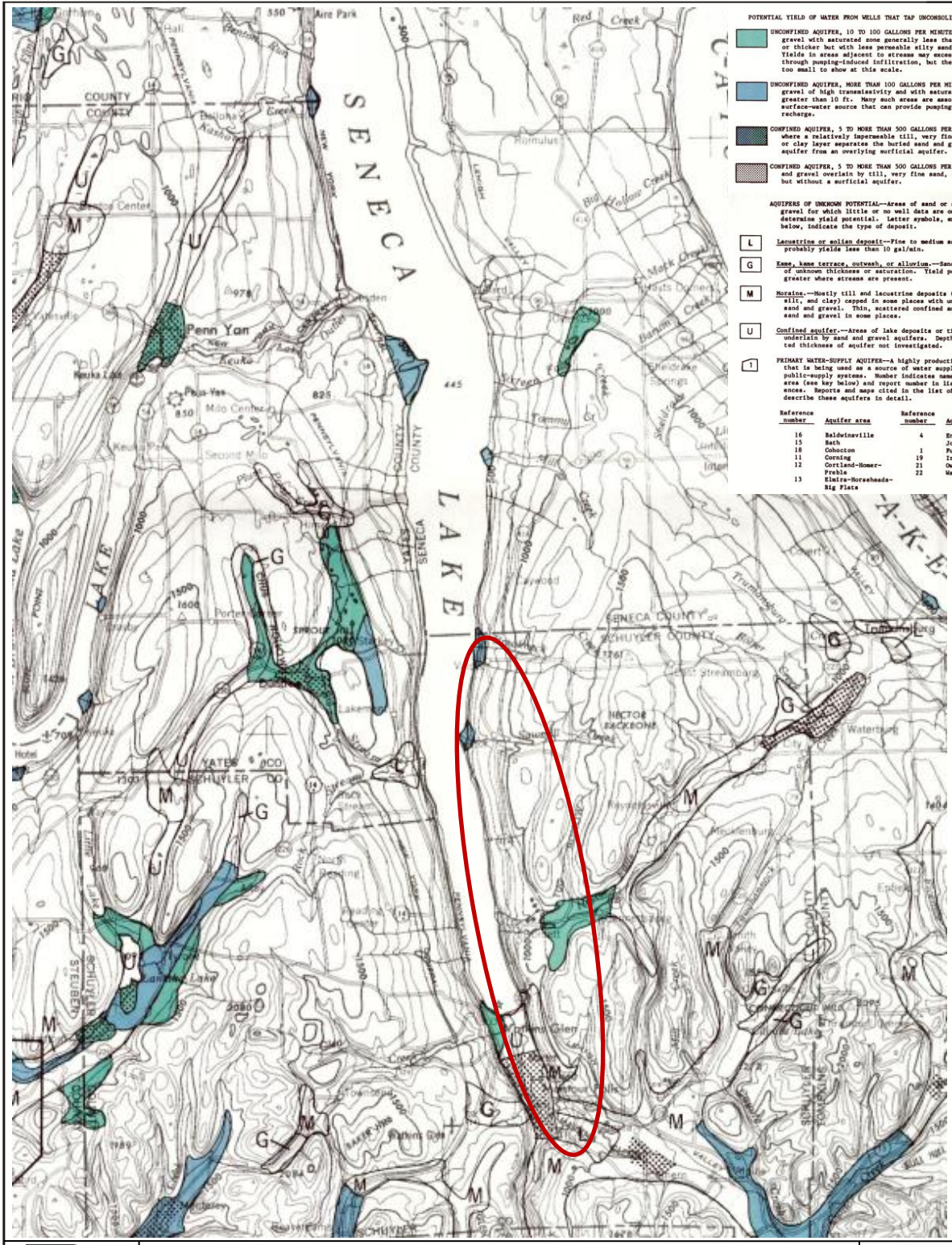


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area Surface Waters
NYSDEC InfoLocator

FIGURE B.1

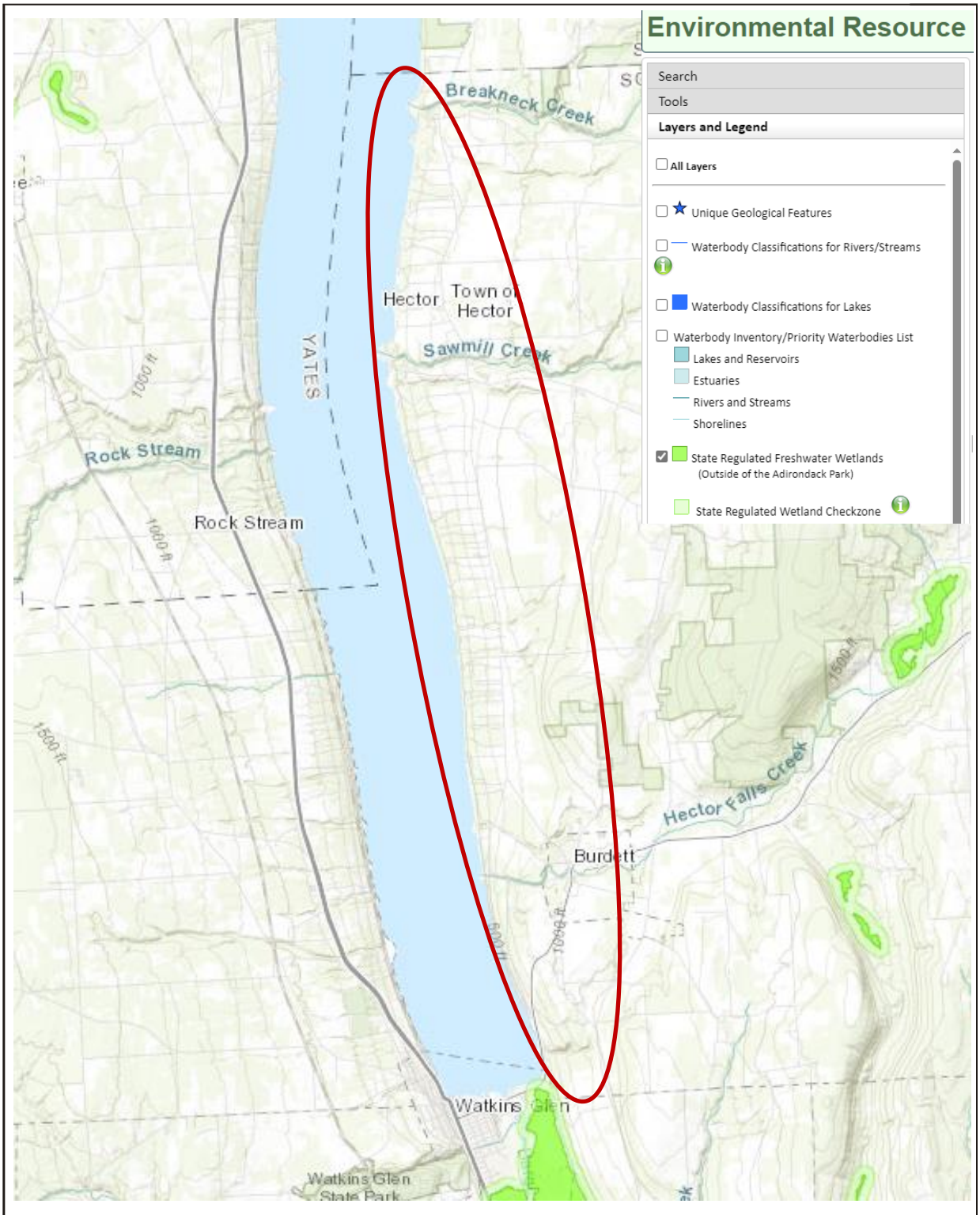


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area Aquifers
USGS Uncolsolidate Aquifers in Upstate New York – Finger Lakes Sheet

FIGURE B.2

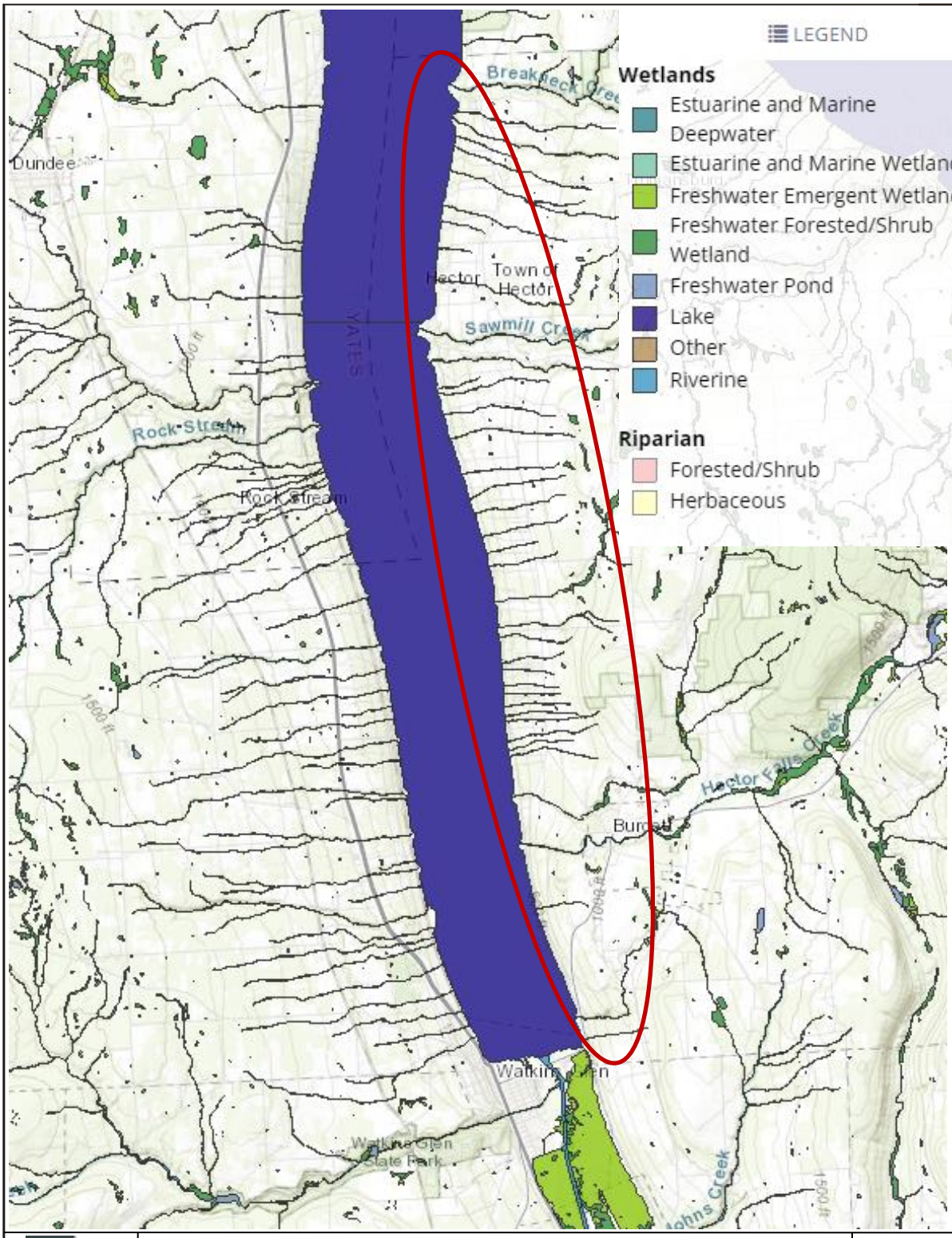


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area Wetlands
NYSDEC Resource Mapper

FIGURE B.4

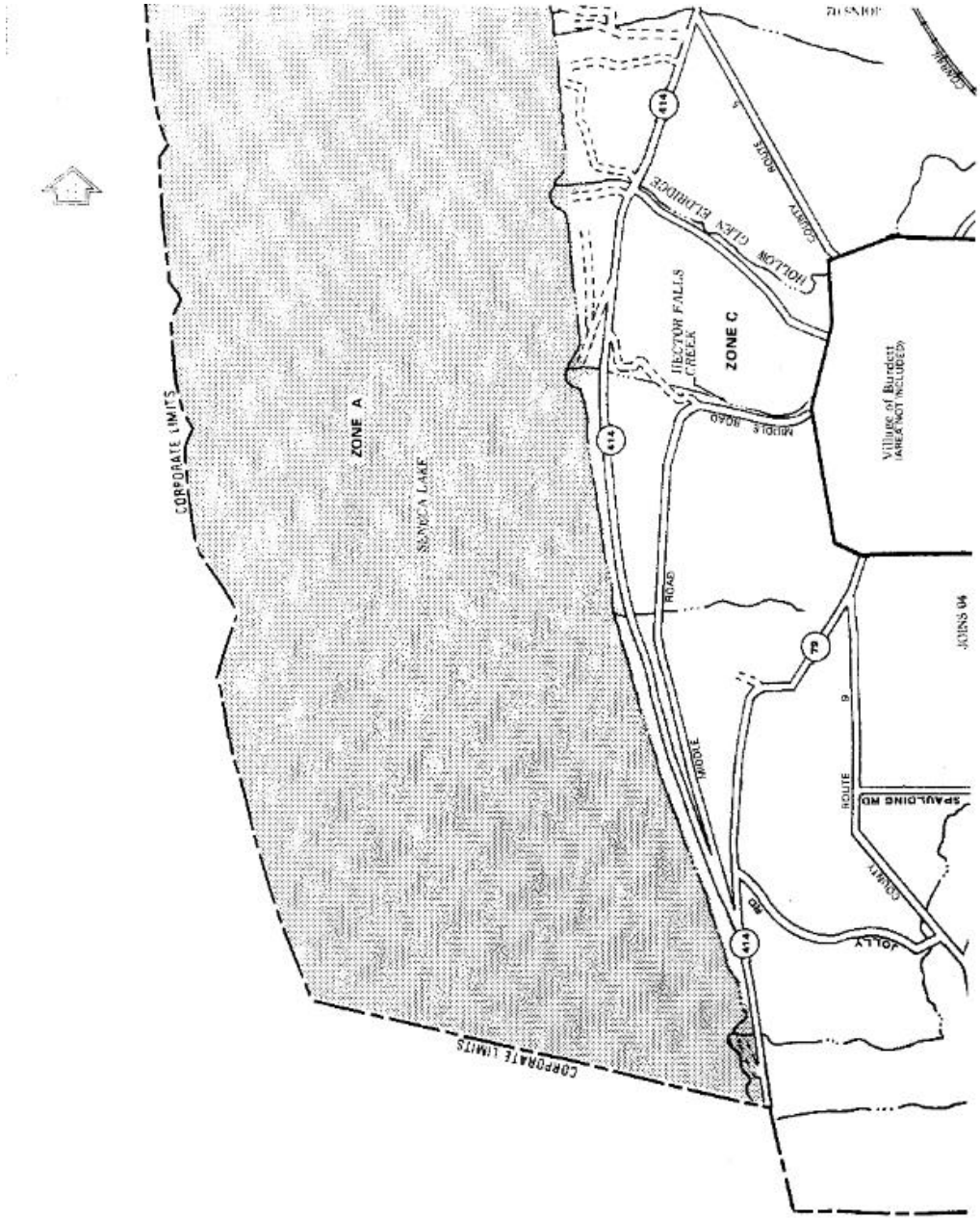


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area Wetlands
National Wetlands Inventory

FIGURE B.4

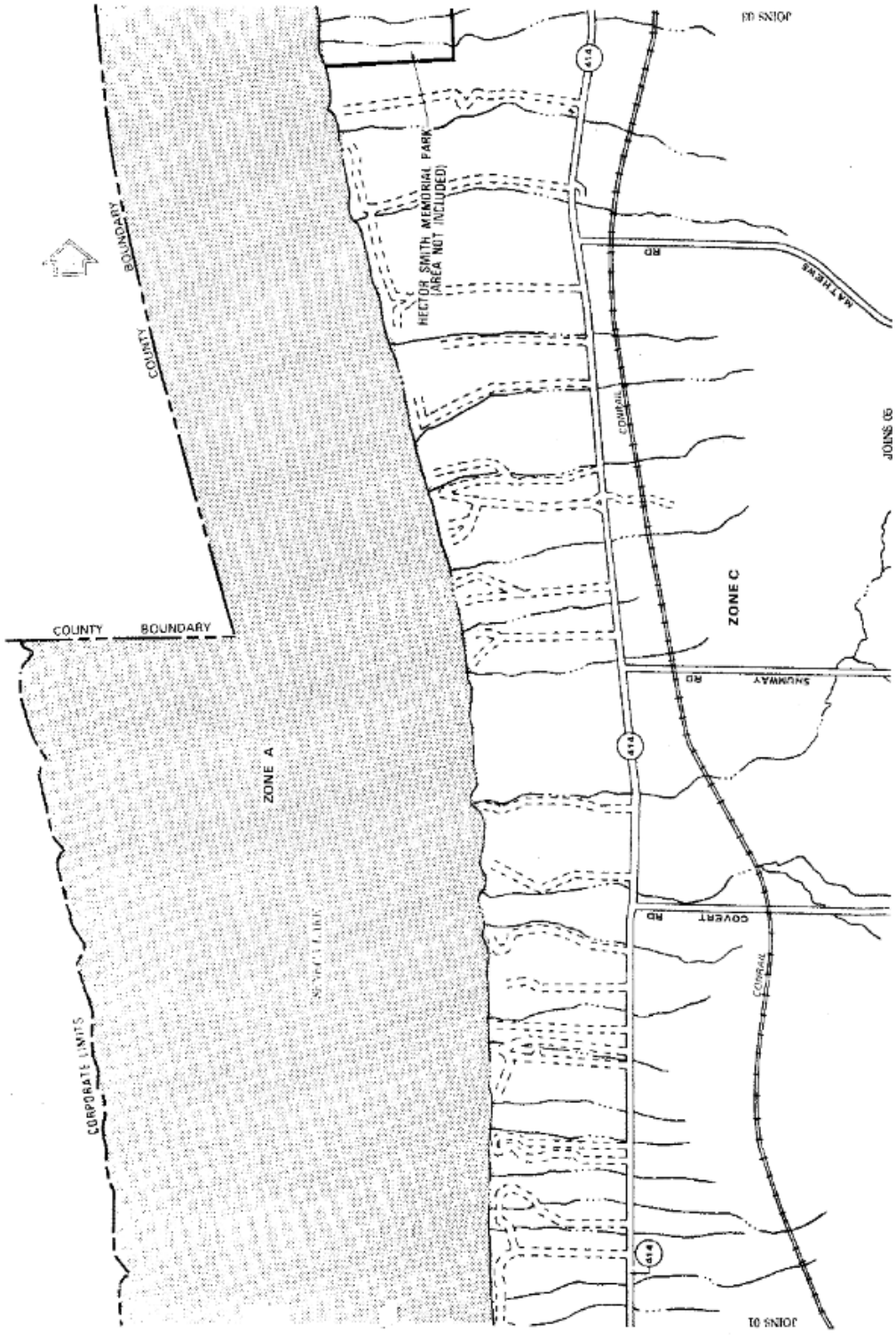


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area FEMA FIRM
FEMA Flood Map, 361204B-01

FIGURE B.5.a

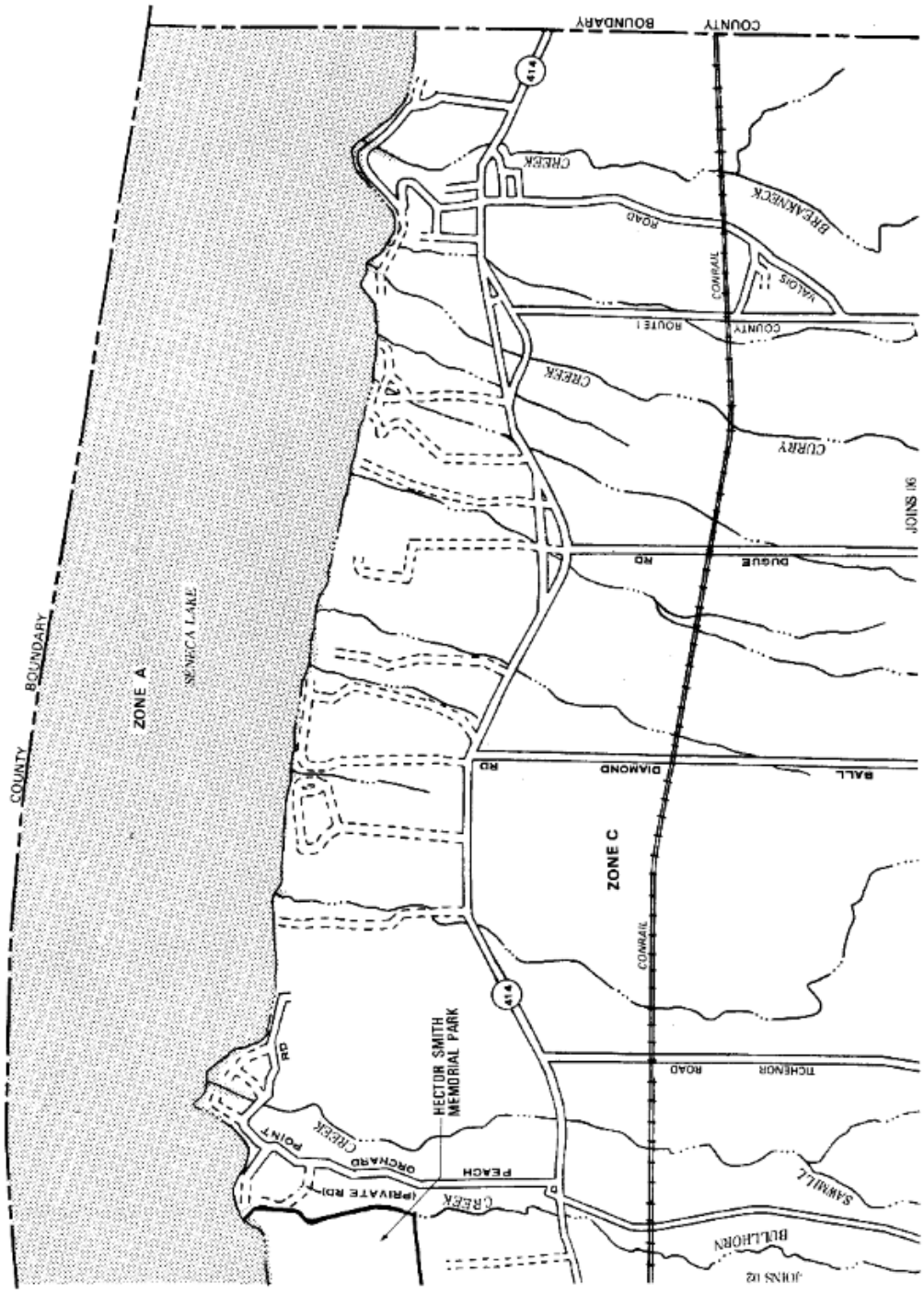


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area FEMA FIRM
FEMA Flood Map, 361204B-02

FIGURE B.5.b

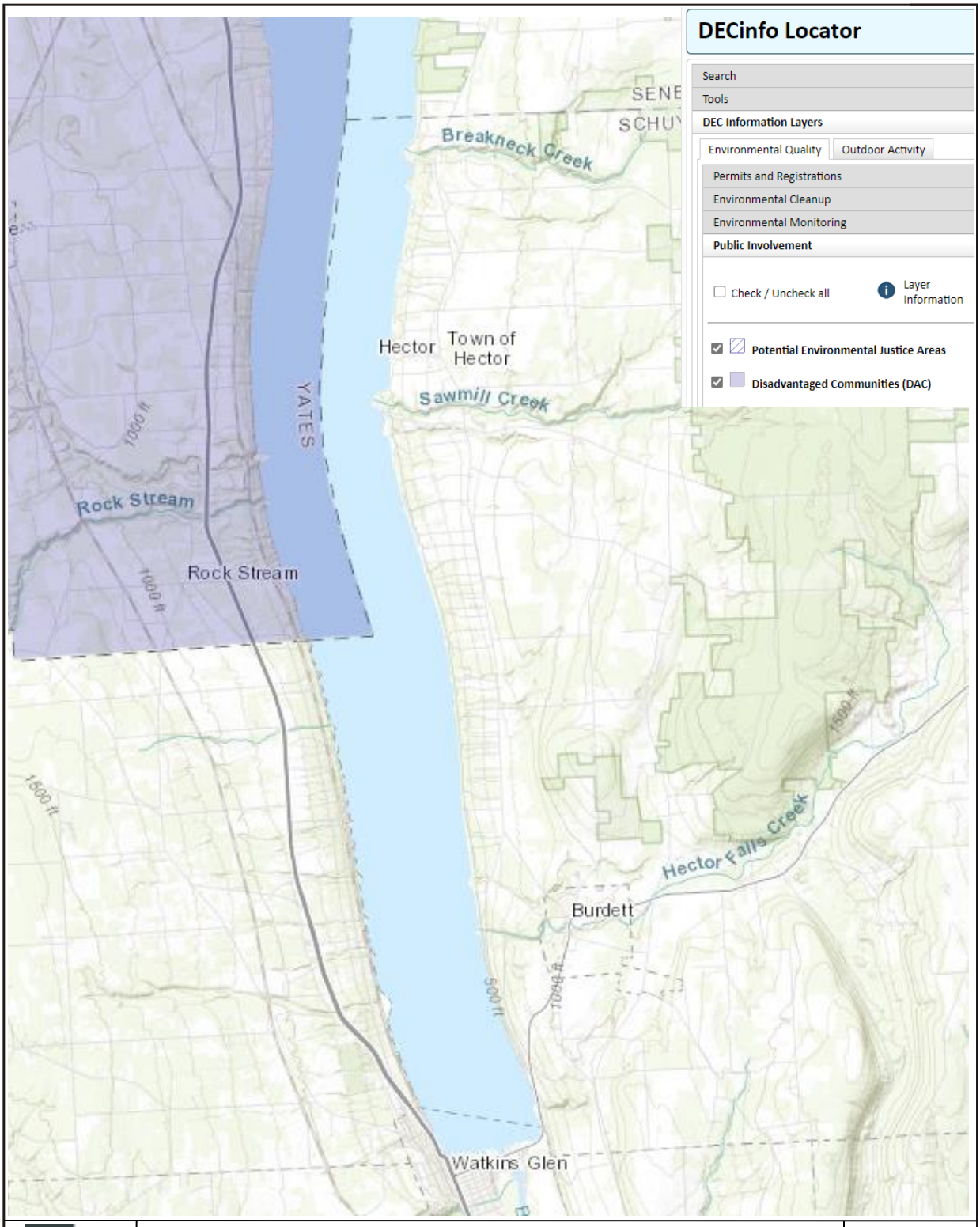


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

N

Project Area FEMA FIRM
FEMA Flood Map, 361204B-03

FIGURE B.5.c

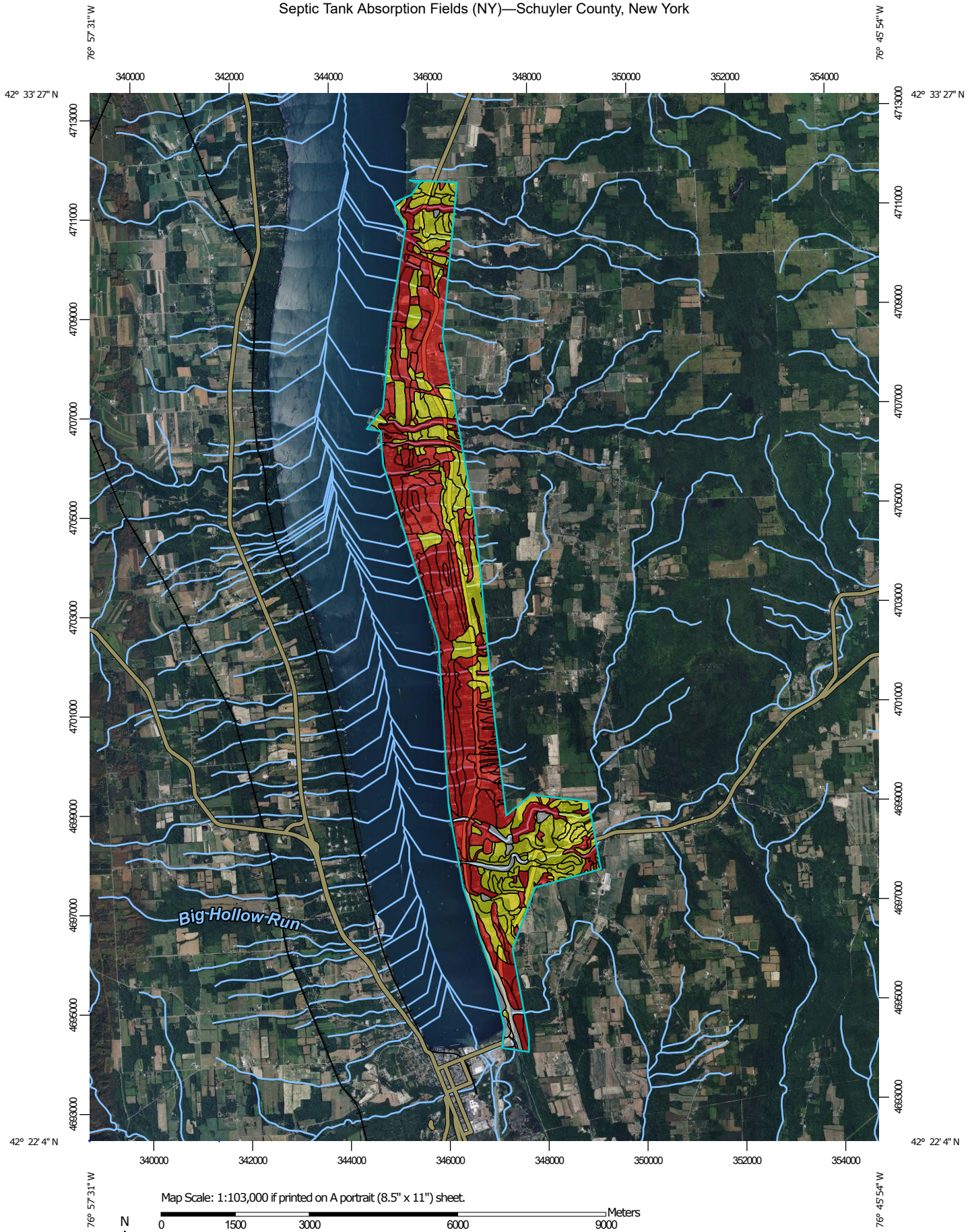


Village of Burdett and Town of Hector Wastewater System Feasibility Study, Schuyler County, NY

Project Area Disadvantaged Communities and Potential Environmental Justice Areas
NYSDEC Info Locator

FIGURE B.6

Appendix C: Soil Properties


76° 57' 31" W
76° 45' 54" W
42° 33' 27" N
42° 22' 4" N
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352000
354000
4713000
4711000
4709000
4707000
4705000
4703000
4701000
4699000
4697000
4695000
4693000
Big Hollow Run
Map Scale: 1:103,000 if printed on A portrait (8.5" x 11") sheet.
N
Meters
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6000
9000
Feet
0
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10000
20000
30000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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.

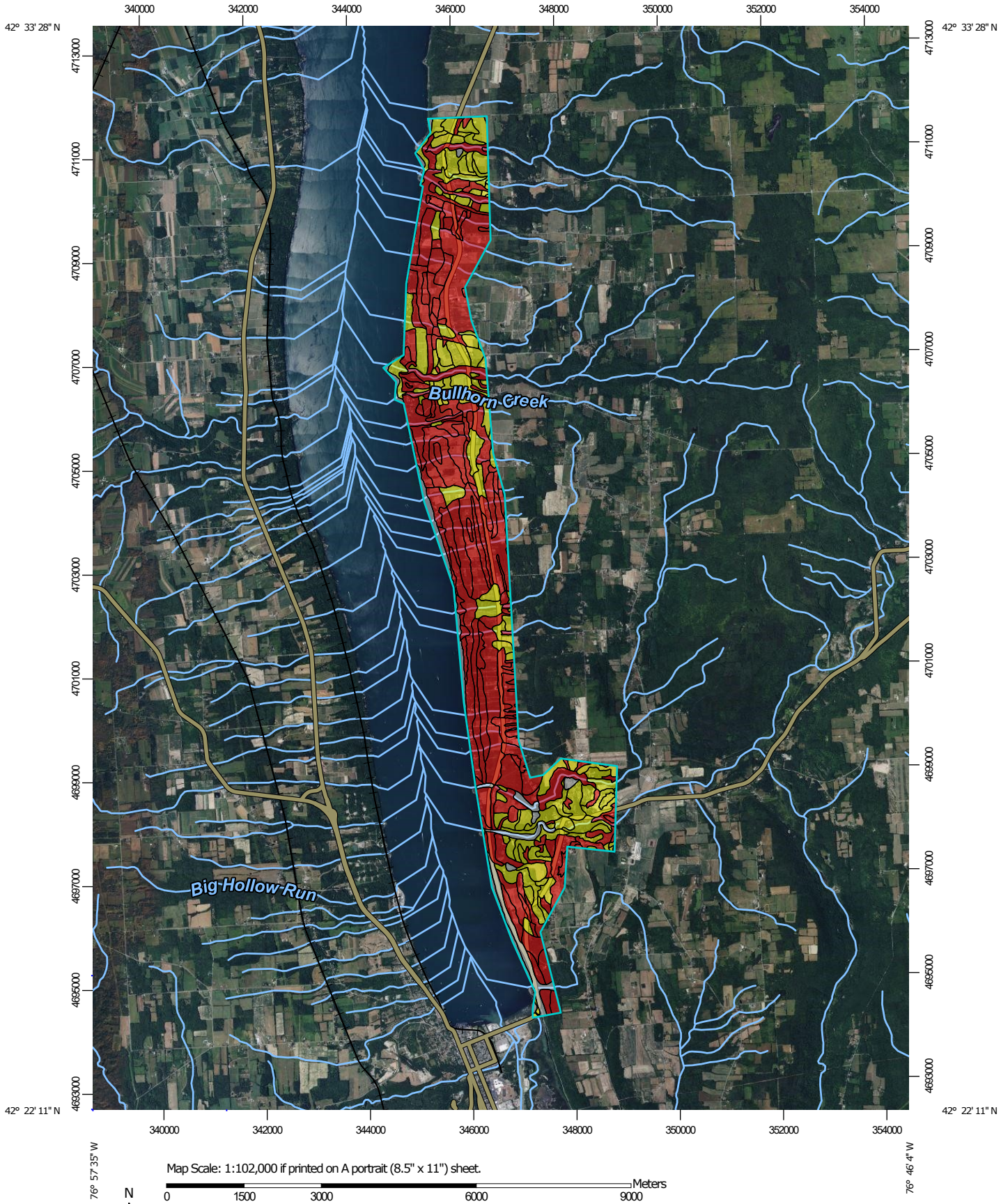
This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

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.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76° 46' 4" W
42° 33' 28" N
42° 22' 11" N
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4711000
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4703000
4701000
4699000
4697000
4695000
4693000
Bullhorn Creek
Big Hollow Run
Map Scale: 1:102,000 if printed on A portrait (8.5" x 11") sheet.
N
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3000
6000
9000
Feet
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4500
9000
18000
27000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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Web Soil Survey URL:
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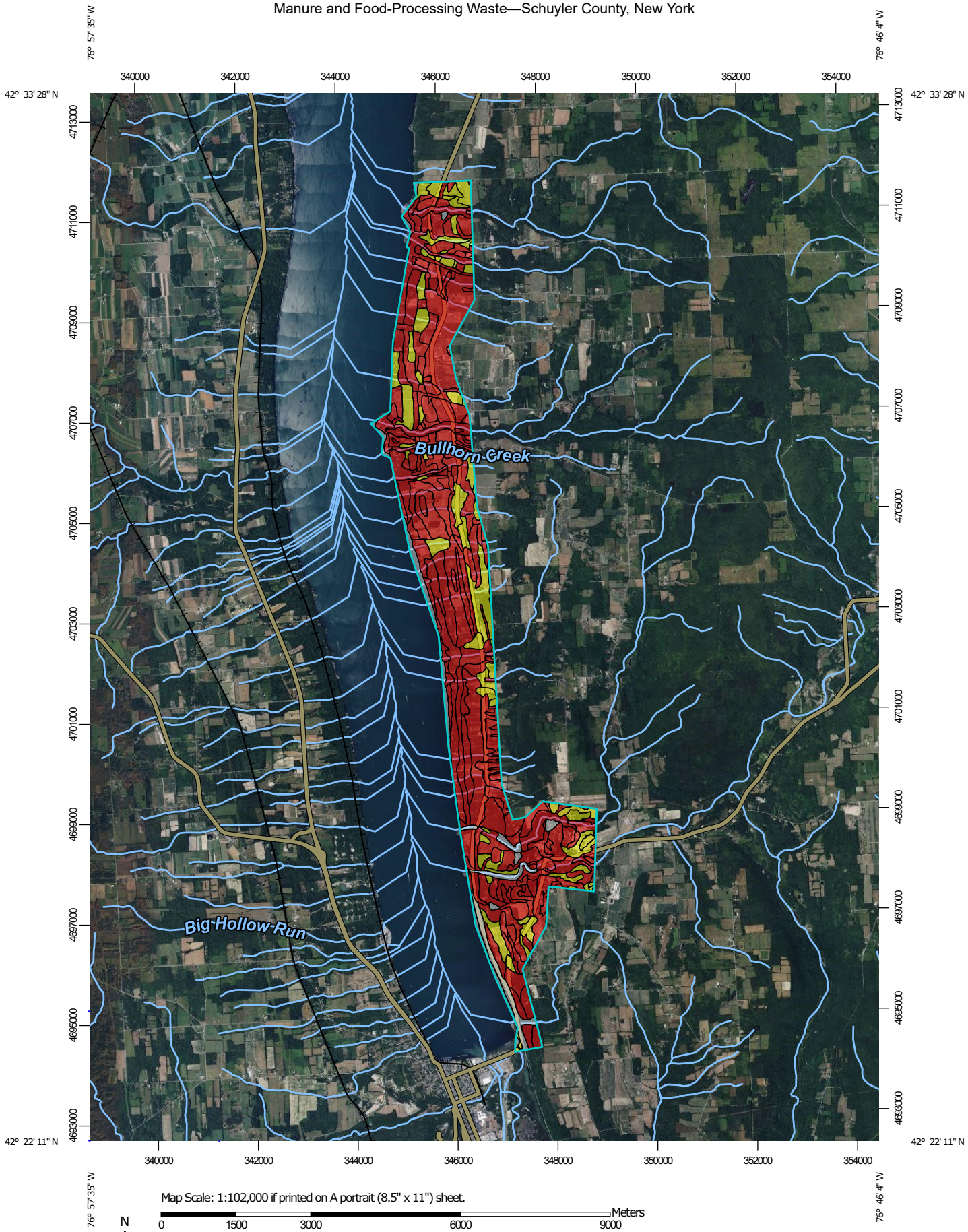
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Bullhorn Creek
Big Hollow Run
Map Scale: 1:102,000 if printed on A portrait (8.5" x 11") sheet.
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Feet
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18000
27000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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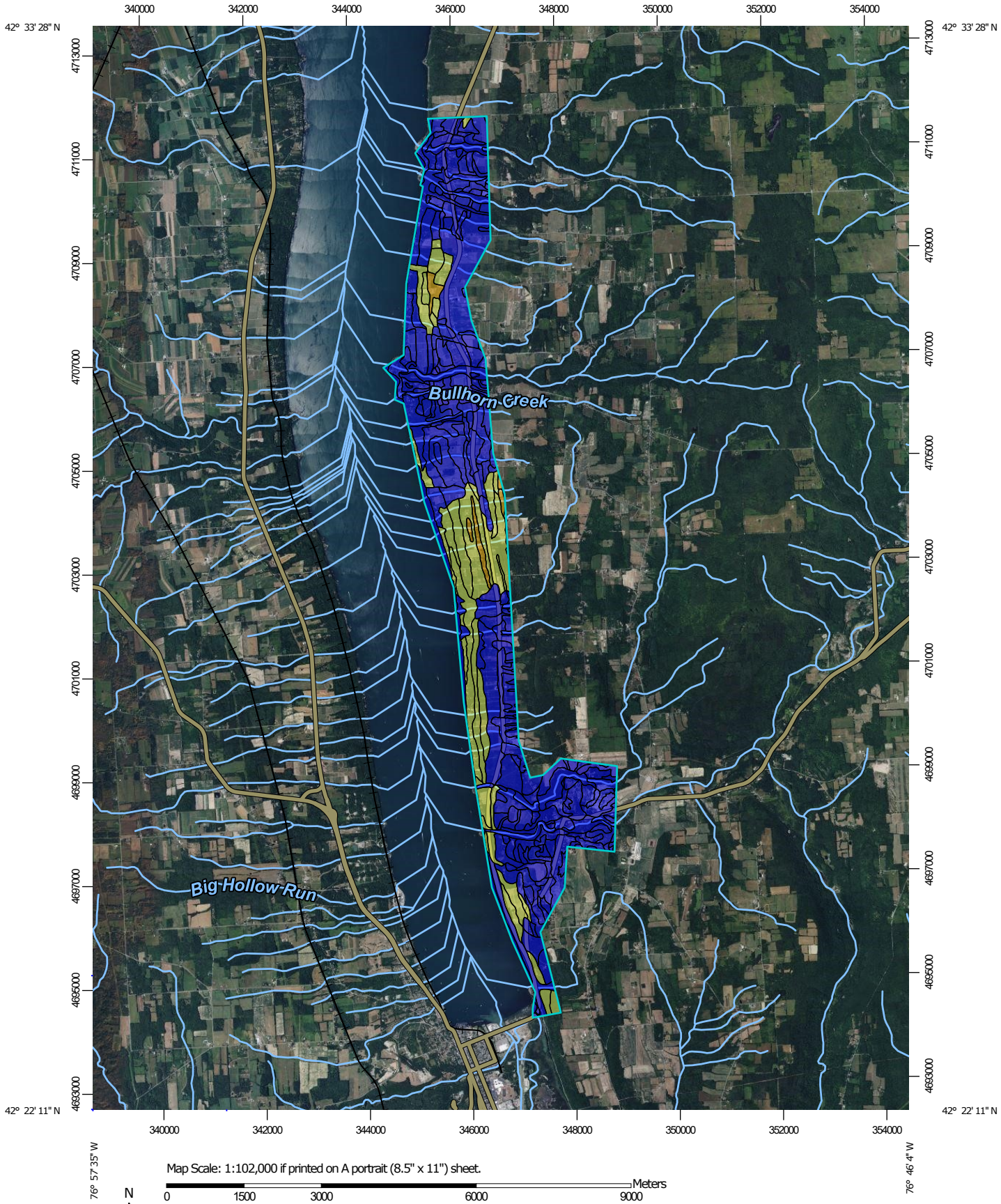
Depth to Bedrock—Schuyler County, New York



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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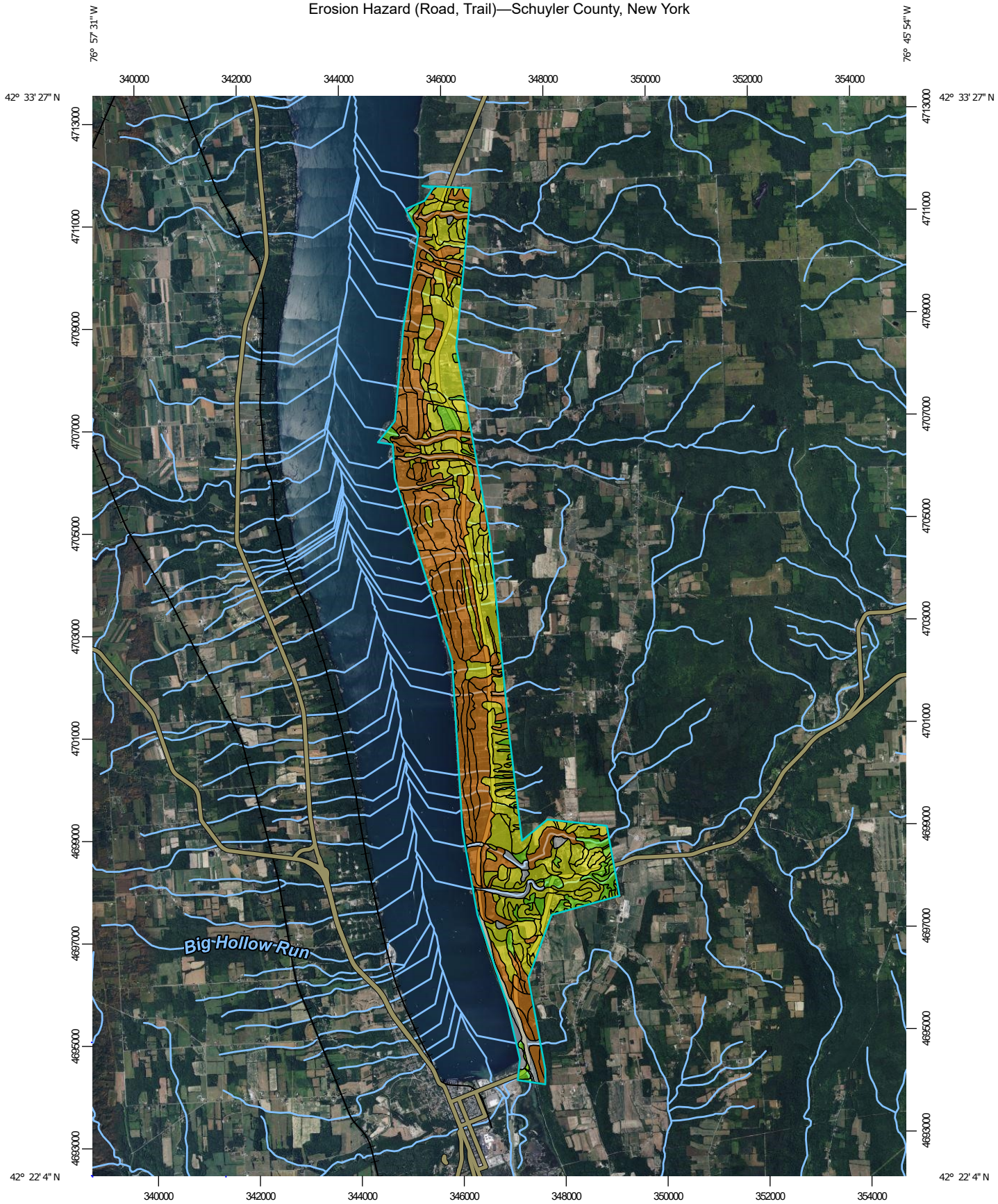
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42° 22' 4" N
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4699000
4697000
4695000
4693000
Big Hollow Run
Map Scale: 1:103,000 if printed on A portrait (8.5" x 11") sheet.
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Meters
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9000
Feet
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5000
10000
20000
30000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Schuyler County, New York, and Seneca County, New York

December 4, 2024

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.

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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.

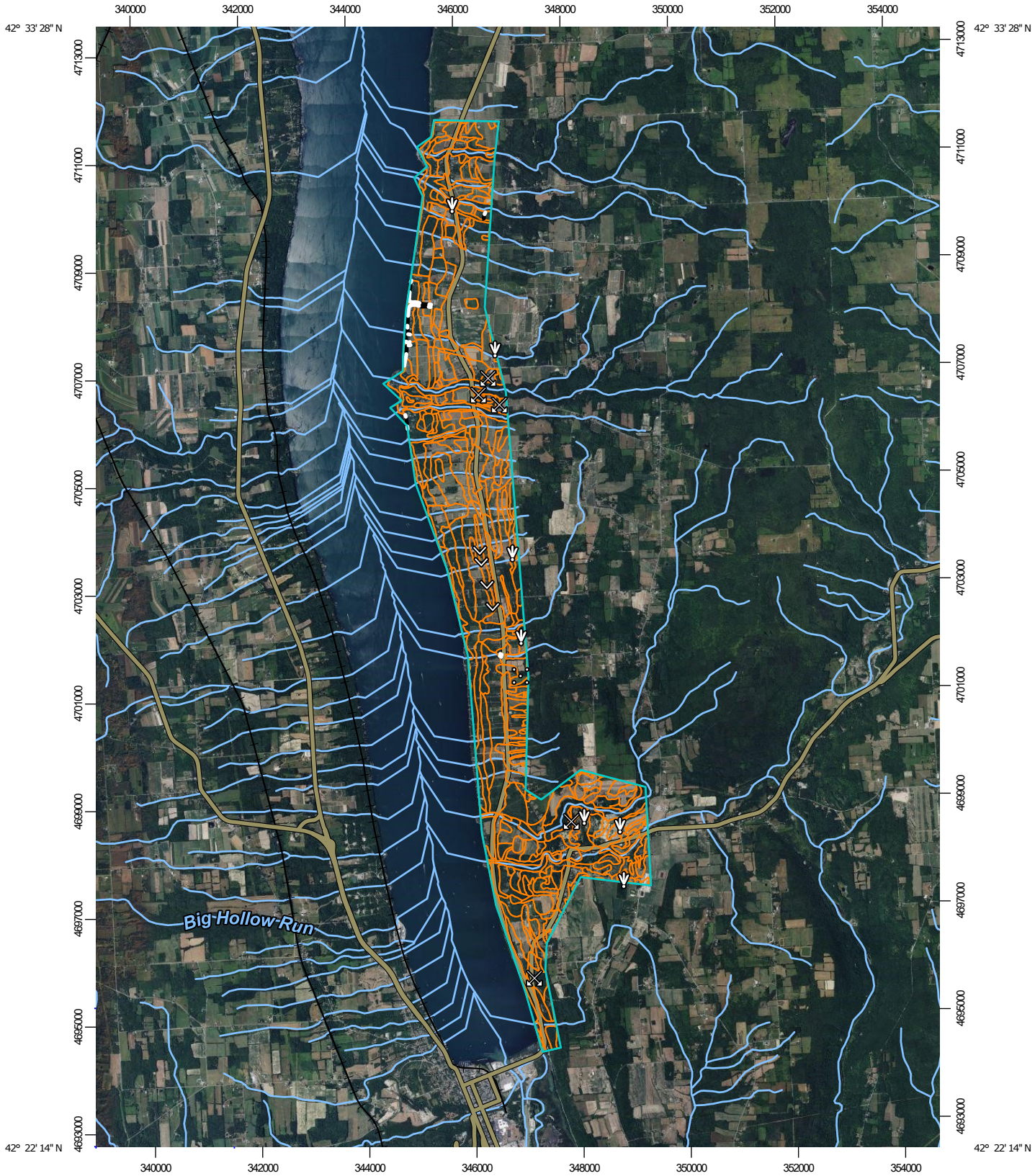
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	78.3	1.2%
AnC	Angola silt loam, 8 to 15 percent slopes	49.4	0.8%
ApA	Appleton silt loam, 0 to 3 percent slopes	56.2	0.9%
ApB	Appleton silt loam, 3 to 8 percent slopes	20.9	0.3%
ArB	Arnot channery silt loam, 3 to 8 percent slopes	6.8	0.1%
ArC	Arnot channery silt loam, 8 to 15 percent slopes	73.3	1.2%
AuB	Aurora channery silt loam, 3 to 8 percent slopes	5.6	0.1%
AuD	Aurora channery silt loam, 15 to 25 percent slopes	6.6	0.1%
BuB	Burdett silt loam, 3 to 8 percent slopes	450.3	7.1%
BuC	Burdett silt loam, 8 to 15 percent slopes	40.3	0.6%
BuD	Burdett silt loam, 15 to 25 percent slopes	6.2	0.1%
Ce	Castile gravelly silt loam	41.1	0.6%
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	57.0	0.9%
CrA	Collamer silt loam, 0 to 3 percent slopes	12.0	0.2%
CrB	Collamer silt loam, 3 to 8 percent slopes	12.3	0.2%
CsA	Conesus silt loam, 0 to 3 percent slopes	13.8	0.2%
CsB	Conesus silt loam, 3 to 8 percent slopes	252.2	4.0%
CsC	Conesus silt loam, 8 to 15 percent slopes	56.3	0.9%
DkC	Dunkirk silt loam, 8 to 15 percent slopes	20.2	0.3%
DUE3	Dunkirk and Hudson soils, steep, severely eroded	16.1	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ErB	Erie silt loam, 3 to 8 percent slopes	26.5	0.4%
FF	Fluvaquents-Udifluvents complex, frequently flooded	3.1	0.0%
Ha	Halsey mucky silt loam	40.0	0.6%
HnB	Hornell channery silt loam, 3 to 8 percent slopes	10.2	0.2%
HrA	Howard gravelly loam, 0 to 3 percent slopes	58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	396.7	6.3%
HrCK	Howard gravelly loam, rolling	35.5	0.6%
HSD	Howard soils, moderately steep	66.6	1.1%
HSE	Howard soils, steep	41.7	0.7%
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	45.9	0.7%
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	166.3	2.6%
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	208.5	3.3%
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	352.1	5.6%
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	136.3	2.1%
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	12.8	0.2%
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	225.1	3.6%
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	267.5	4.2%
LTE	Lordstown-Arnot complex, steep, rocky	177.3	2.8%
LTF	Lordstown-Arnot complex, very steep, very rocky	103.0	1.6%
Ma	Madalin silt loam, 0 to 3 percent slopes	32.5	0.5%
MrB	Mardin channery silt loam, 3 to 8 percent slopes	16.4	0.3%
MrC	Mardin channery silt loam, 8 to 15 percent slopes	1.4	0.0%
MrD	Mardin channery silt loam, 15 to 25 percent slopes	3.7	0.1%
OdB	Odessa silt loam, 3 to 8 percent slopes	138.3	2.2%
Pt	Pits, gravel	27.1	0.4%
Rh	Red Hook gravelly silt loam	35.9	0.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	14.2	0.2%
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	80.9	1.3%
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	94.7	1.5%
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	343.8	5.4%
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	28.7	0.5%
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	68.7	1.1%
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	189.5	3.0%
TuC	Tuller channery silt loam, 8 to 15 percent slopes	8.3	0.1%
UD	Udorthents, smoothed	3.6	0.1%
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	204.1	3.2%
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	204.4	3.2%
VEE	Valois soils, steep	127.0	2.0%
VHF	Valois and Howard soils, very steep	249.0	3.9%
W	Water	75.0	1.2%
Subtotals for Soil Survey Area		**6,337.0**	**99.9%**
Totals for Area of Interest		**6,340.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	0.0	0.0%
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	0.1	0.0%
HnB	Honeoye silt loam, 3 to 8 percent slopes	1.1	0.0%
HnC	Honeoye silt loam, 8 to 15 percent slopes	2.3	0.0%
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	0.3	0.0%
Subtotals for Soil Survey Area		**3.8**	**0.1%**
Totals for Area of Interest		**6,340.9**	**100.0%**

Map Unit Descriptions

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.

Schuyler County, New York

AnB—Angola silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wjb
Elevation: 330 to 2,460 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Angola and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Angola

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived mainly from shale and siltstone

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 27 inches: channery silty clay loam
H3 - 27 to 31 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F140XY028NY - Moist Till Upland
Hydric soil rating: No

Minor Components

Aurora

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

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

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

Alden
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

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

AnC—Angola silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9wjc
Elevation: 330 to 2,460 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Angola and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Angola

Setting
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived mainly from shale and siltstone

Typical profile
H1 - 0 to 8 inches: silt loam
H2 - 8 to 27 inches: channery silty clay loam
H3 - 27 to 31 inches: bedrock

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F140XY028NY - Moist Till Upland
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Erie

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

Aurora

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

Tuller

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

Burdett

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

ApA—Appleton silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w5hn
Elevation: 260 to 1,740 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Appleton

Setting

Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: silt loam
E - 8 to 16 inches: loam
Bt - 16 to 30 inches: gravelly silt loam
C1 - 30 to 54 inches: gravelly loam
C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Lima

Percent of map unit: 5 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lyons

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Darien

Percent of map unit: 3 percent
Landform: Till plains, drainageways
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Churchville

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise, talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

ApB—Appleton silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w5ht
Elevation: 260 to 1,740 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Appleton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Appleton

Setting

Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: silt loam
E - 8 to 16 inches: loam
Bt - 16 to 30 inches: gravelly silt loam
C1 - 30 to 54 inches: gravelly loam

C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Conesus

Percent of map unit: 7 percent
Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Lyons

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Darien

Percent of map unit: 4 percent
Landform: Drainageways, till plains
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Churchville

Percent of map unit: 4 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise, talf
Down-slope shape: Concave

Across-slope shape: Linear
Hydric soil rating: No

ArB—Arnot channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wbmc
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Arnot

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Ap - 0 to 7 inches: channery silt loam
Bw1 - 7 to 12 inches: very channery silt loam
Bw2 - 12 to 17 inches: very channery silt loam
2R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: D
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

Minor Components

Lordstown
Percent of map unit: 10 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountaintop, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Tuller, somewhat poorly drained
Percent of map unit: 5 percent
Landform: Benches, ridges, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

ArC—Arnot channery silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2wbmg
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

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

Description of Arnot

Setting
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: channery silt loam
Bw1 - 3 to 12 inches: very channery silt loam
Bw2 - 12 to 17 inches: very channery silt loam
2R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

Minor Components

Lordstown, very stony

Percent of map unit: 10 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tuller, somewhat poorly drained

Percent of map unit: 5 percent
Landform: Benches, ridges, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 0 percent
Hydric soil rating: No

AuB—Aurora channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wjl
Elevation: 1,000 to 1,300 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Aurora and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aurora

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from calcareous shale, with some limestone and sandstone

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 23 inches: silty clay loam
H3 - 23 to 27 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F140XY028NY - Moist Till Upland
Hydric soil rating: No

Minor Components

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

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

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

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

AuD—Aurora channery silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9wjn
Elevation: 1,000 to 1,300 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Aurora and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aurora

Setting
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from calcareous shale, with some limestone and sandstone

Typical profile
H1 - 0 to 4 inches: channery silt loam
H2 - 4 to 23 inches: silty clay loam
H3 - 23 to 27 inches: weathered bedrock

Properties and qualities
Slope: 15 to 25 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F140XY028NY - Moist Till Upland
Hydric soil rating: No

Minor Components

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

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

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

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

BuB—Burdett silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9wjt
Elevation: 400 to 1,600 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Burdett and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Burdett

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: A thin silt mantle overlying till that is strongly influenced by shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 19 inches: silt loam
H3 - 19 to 32 inches: silty clay loam
H4 - 32 to 64 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F140XY025NY - Rich Till Uplands
Hydric soil rating: No

Minor Components

Unnamed soils

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

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Appleton

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

Fremont

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

Angola

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

BuC—Burdett silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9wjv
Elevation: 400 to 1,600 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Burdett and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Burdett

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: A thin silt mantle overlying till that is strongly influenced by shale

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 19 inches: silt loam
H3 - 19 to 32 inches: silty clay loam
H4 - 32 to 64 inches: channery silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F140XY025NY - Rich Till Uplands
Hydric soil rating: No

Minor Components

Alden
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

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

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

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

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

BuD—Burdett silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9wjw
Elevation: 400 to 1,600 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Burdett and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Burdett

Setting
Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: A thin silt mantle overlying till that is strongly influenced by shale

Typical profile
H1 - 0 to 5 inches: silt loam
H2 - 5 to 16 inches: silt loam

H3 - 16 to 30 inches: silty clay loam
H4 - 30 to 64 inches: channery silt loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F140XY025NY - Rich Till Uplands
Hydric soil rating: No

Minor Components

Fremont

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

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Volusia

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

Unnamed soils

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

Angola

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

Ce—Castile gravelly silt loam

Map Unit Setting

National map unit symbol: 9wjz
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Castile and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Castile

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 11 inches: gravelly silt loam
H2 - 11 to 35 inches: very gravelly loam
H3 - 35 to 50 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F140XY022NY - Moist Outwash
Hydric soil rating: No

Minor Components

Philo

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

Howard

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

Red hook

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

Chenango

Percent of map unit: 5 percent

Hydric soil rating: No

CnA—Chenango gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9wk1
Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 37 inches: very gravelly loam
H3 - 37 to 50 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

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

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

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

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

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

CnB—Chenango gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9wk2
Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Chenango and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting
Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 33 inches: very gravelly loam

H3 - 33 to 50 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

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

Howard

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

Valois

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

Unnamed soils

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

Philo

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

CoB—Chenango channery silt loam, fan, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wk3
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango, fan, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango, Fan

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 32 inches: very channery loam
H3 - 32 to 50 inches: very gravelly sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

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

Teel

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

Philo

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

Howard

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

CrA—Collamer silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9wk5
Elevation: 330 to 2,460 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Collamer and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Collamer

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 16 inches: silt loam
H3 - 16 to 38 inches: silty clay loam
H4 - 38 to 50 inches: stratified very fine sand to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

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

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

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

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

CrB—Collamer silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9wk6
Elevation: 330 to 2,460 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Collamer and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Collamer

Setting
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile
H1 - 0 to 10 inches: silt loam
H2 - 10 to 16 inches: silt loam
H3 - 16 to 38 inches: silty clay loam
H4 - 38 to 50 inches: stratified very fine sand to silt

Properties and qualities
Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Dunkirk

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

Hudson

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

Unnamed soils

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

Schoharie

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

CsA—Conesus silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w3j6
Elevation: 460 to 1,510 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Conesus

Setting

Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: silt loam
E/B - 9 to 14 inches: gravelly silt loam
Bt/E - 14 to 19 inches: gravelly silt loam
Bt1 - 19 to 25 inches: gravelly silt loam
Bt2 - 25 to 36 inches: gravelly silt loam
C - 36 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Lansing

Percent of map unit: 7 percent
Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Kendaia

Percent of map unit: 3 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave

Across-slope shape: Linear
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Nunda

Percent of map unit: 2 percent
Landform: Hills, drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Lyons

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

CsB—Conesus silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w3jl
Elevation: 390 to 1,970 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Conesus

Setting

Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: silt loam
E/B - 9 to 14 inches: gravelly silt loam
Bt/E - 14 to 19 inches: gravelly silt loam
Bt1 - 19 to 25 inches: gravelly silt loam
Bt2 - 25 to 36 inches: gravelly silt loam
C - 36 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Lansing

Percent of map unit: 7 percent
Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Kendaia

Percent of map unit: 3 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Nunda

Percent of map unit: 2 percent
Landform: Hills, drumlinoid ridges
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lyons

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

CsC—Conesus silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w3jm
Elevation: 490 to 1,710 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Conesus

Setting

Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: silt loam

E/B - 9 to 14 inches: gravelly silt loam
Bt/E - 14 to 19 inches: gravelly silt loam
Bt1 - 19 to 25 inches: gravelly silt loam
Bt2 - 25 to 36 inches: gravelly silt loam
C - 36 to 79 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Lansing

Percent of map unit: 8 percent
Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Kendaia

Percent of map unit: 3 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Nunda

Percent of map unit: 2 percent
Landform: Hills, drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent

Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

DkC—Dunkirk silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9wkc
Elevation: 100 to 1,000 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Dunkirk and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunkirk

Setting

Landform: Lake plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 11 inches: silt loam
H3 - 11 to 44 inches: silty clay loam
H4 - 44 to 64 inches: stratified silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F140XY017NY - Well Drained Lake Plain
Hydric soil rating: No

Minor Components

Collamer

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

Hudson

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

Odessa

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

Unnamed soils

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

DUE3—Dunkirk and Hudson soils, steep, severely eroded

Map Unit Setting

National map unit symbol: 9wkd
Elevation: 100 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Dunkirk, severely eroded, and similar soils: 45 percent
Hudson and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunkirk, Severely Eroded

Setting

Landform: Lake plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 26 inches: silty clay loam
H3 - 26 to 64 inches: stratified silt loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F140XY017NY - Well Drained Lake Plain
Hydric soil rating: No

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: silty clay loam
H2 - 5 to 13 inches: silty clay loam
H3 - 13 to 40 inches: silty clay
H4 - 40 to 60 inches: silty clay

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain

Hydric soil rating: No

Minor Components

Collamer

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

Unnamed soils

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

Odessa

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

ErB—Erie silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wn3h
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Erie and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Erie

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 13 inches: channery silt loam
Bg - 13 to 15 inches: channery silt loam
Bx - 15 to 38 inches: channery silt loam
C - 38 to 72 inches: channery loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 21 inches to fragipan

Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 7 to 14 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Langford

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Chippewa

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Fremont

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

FF—Fluvaquents-Udifluvents complex, frequently flooded

Map Unit Setting

National map unit symbol: 9wkj
Elevation: 100 to 3,000 feet

Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 41 percent
Udifluvents and similar soils: 39 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium with highly variable texture

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 70 inches: very gravelly silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F140XY015NY - Wet Low Floodplain
Hydric soil rating: Yes

Description of Udifluvents

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium with a wide range of texture

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 70 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Ecological site: F140XY014NY - Low Floodplain
Hydric soil rating: No

Minor Components

Atkins

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Teel

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

Wayland

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Wallkill

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Ha—Halsey mucky silt loam

Map Unit Setting

National map unit symbol: 9wkn
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Halsey and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Halsey

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: mucky silt loam
H2 - 10 to 25 inches: gravelly loam
H3 - 25 to 51 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F140XY016NY - Mineral Wetlands
Hydric soil rating: Yes

Minor Components

Red hook

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

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

HnB—Hornell channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wkp
Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hornell and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hornell

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till, or till and residuum, derived from acid shale and siltstone

Typical profile

H1 - 0 to 6 inches: channery silt loam
H2 - 6 to 28 inches: silty clay loam
H3 - 28 to 39 inches: channery silty clay loam
H4 - 39 to 43 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F140XY028NY - Moist Till Upland
Hydric soil rating: No

Minor Components

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

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

Alden
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

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

HrA—Howard gravelly loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9wks
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Howard and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting
Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile
H1 - 0 to 10 inches: gravelly loam

H2 - 10 to 28 inches: very gravelly loam
H3 - 28 to 36 inches: very gravelly silt loam
H4 - 36 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

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

Chenango

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

Valois

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

Philo

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

HrB—Howard gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wkt
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Howard and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 28 inches: very gravelly loam
H3 - 28 to 36 inches: very gravelly silt loam
H4 - 36 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

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

Chenango

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

Philo

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

Valois

Percent of map unit: 5 percent

Hydric soil rating: No

HrC—Howard gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9wkv
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Howard and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 28 inches: very gravelly loam
H3 - 28 to 36 inches: very gravelly silt loam
H4 - 36 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash

Hydric soil rating: No

Minor Components

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

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

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

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

HrCK—Howard gravelly loam, rolling

Map Unit Setting
National map unit symbol: 9wkw
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Howard and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting
Landform: Terraces, valley trains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile
H1 - 0 to 6 inches: gravelly loam
H2 - 6 to 28 inches: very gravelly loam
H3 - 28 to 36 inches: very gravelly silt loam
H4 - 36 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

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

Valois

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

Chenango

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

Unnamed soils

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

HSD—Howard soils, moderately steep

Map Unit Setting

National map unit symbol: 9wkx
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Howard and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 5 inches: gravelly loam
H2 - 5 to 28 inches: very gravelly loam
H3 - 28 to 36 inches: very gravelly silt loam
H4 - 36 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Unnamed soils

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

Castile

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

Valois

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

Chenango

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

HSE—Howard soils, steep

Map Unit Setting

National map unit symbol: 9wky
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Howard and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 5 inches: gravelly loam
H2 - 5 to 28 inches: very gravelly loam
H3 - 28 to 36 inches: very gravelly silt loam
H4 - 36 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

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

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

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

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

HuB—Hudson gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9wkz
Elevation: 300 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Hudson and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 18 inches: gravelly silt loam
H3 - 18 to 40 inches: silty clay
H4 - 40 to 60 inches: silty clay

Properties and qualities
Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Collamer

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

Schoharie

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

Odessa

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

Rhinebeck

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

Dunkirk

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

HuC—Hudson gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9wl0
Elevation: 300 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hudson and similar soils: 80 percent
Minor components: 20 percent

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

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 15 inches: gravelly silt loam
H3 - 15 to 40 inches: silty clay
H4 - 40 to 60 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Dunkirk

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

Schoharie

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

Rhinebeck

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

Collamer

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

LnB—Lansing gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w3mb
Elevation: 460 to 1,800 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Lansing

Setting

Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
E - 8 to 13 inches: gravelly silt loam
Bt/E - 13 to 21 inches: gravelly silt loam
Bt1 - 21 to 28 inches: gravelly silt loam
Bt2 - 28 to 39 inches: gravelly silt loam
C - 39 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Conesus
Percent of map unit: 8 percent
Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Kendaia
Percent of map unit: 3 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Appleton
Percent of map unit: 2 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Palatine
Percent of map unit: 1 percent
Landform: Ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Danley
Percent of map unit: 1 percent
Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

LnC—Lansing gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w3md
Elevation: 520 to 1,970 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Lansing

Setting

Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
E - 8 to 13 inches: gravelly silt loam
Bt/E - 13 to 21 inches: gravelly silt loam
Bt1 - 21 to 28 inches: gravelly silt loam
Bt2 - 28 to 39 inches: gravelly silt loam
C - 39 to 79 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Conesus

Percent of map unit: 8 percent
Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Kendaia

Percent of map unit: 3 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent
Landform: Drumlins, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Wassaic

Percent of map unit: 1 percent
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Danley

Percent of map unit: 1 percent
Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

LnD—Lansing gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2w3my
Elevation: 660 to 1,740 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Lansing

Setting

Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
E - 8 to 13 inches: gravelly silt loam
Bt/E - 13 to 21 inches: gravelly silt loam
Bt1 - 21 to 28 inches: gravelly silt loam
Bt2 - 28 to 39 inches: gravelly silt loam
C - 39 to 79 inches: gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Conesus
Percent of map unit: 9 percent
Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Wassaic
Percent of map unit: 3 percent
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Kendaia
Percent of map unit: 2 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Appleton
Percent of map unit: 1 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

LoB—Lordstown channery silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2wzl0
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Lordstown and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw1 - 9 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Mardin

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Arnot

Percent of map unit: 5 percent
Landform: Hills, mountains

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

LoC—Lordstown channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wzl1
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lordstown and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountaintop, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw1 - 9 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Arnot

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

LoD—Lordstown channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wzl2
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Lordstown

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw1 - 9 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Cadosia, very stony

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Arnot

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

LTE—Lordstown-Arnot complex, steep, rocky

Map Unit Setting

National map unit symbol: 2ywlb
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lordstown, very stony, and similar soils: 50 percent
Arnot, very stony, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic silt loam
Bw1 - 5 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 10 to 40 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Arnot, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: channery silt loam
Bw1 - 3 to 12 inches: very channery silt loam
Bw2 - 12 to 17 inches: very channery silt loam
2R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 10 to 40 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

Minor Components

Cadosia, extremely stony

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Bath

Percent of map unit: 4 percent

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop
Percent of map unit: 1 percent
Hydric soil rating: No

LTF—Lordstown-Arnot complex, very steep, very rocky

Map Unit Setting
National map unit symbol: 2ywlc
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Lordstown, very stony, and similar soils: 50 percent
Arnot, very stony, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Very Stony

Setting
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone and siltstone

Typical profile
Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic silt loam
Bw1 - 5 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities
Slope: 15 to 60 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Arnot, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: channery silt loam
Bw1 - 3 to 12 inches: very channery silt loam
Bw2 - 12 to 17 inches: very channery silt loam
2R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 15 to 60 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

Minor Components

Cadosia, extremely stony
Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

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

Ma—Madalin silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2spk0
Elevation: 230 to 930 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Farmland of statewide importance

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

Description of Madalin

Setting
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Brown clayey glaciolacustrine deposits derived from calcareous shale

Typical profile
Ap - 0 to 8 inches: silt loam
Btg1 - 8 to 16 inches: silty clay loam
Btg2 - 16 to 25 inches: silty clay
Btg3 - 25 to 33 inches: silty clay
C - 33 to 79 inches: stratified silt to clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 8 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY010NY - Wet Lake Plain Depression
Hydric soil rating: Yes

Minor Components

Rhinebeck

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

Canandaigua

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

Fonda

Percent of map unit: 4 percent
Landform: Depressions
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: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex

Hydric soil rating: No

MrB—Mardin channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2srhb
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Mardin

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: channery silt loam
BE - 8 to 12 inches: channery silt loam
Bw1 - 12 to 16 inches: channery silt loam
Bw2 - 16 to 20 inches: channery silt loam
Bx1 - 20 to 36 inches: channery silt loam
Bx2 - 36 to 57 inches: channery silt loam
C - 57 to 72 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Bath
Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Volusia
Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lordstown
Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

MrC—Mardin channery silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2srhj
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Mardin and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mardin

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: channery silt loam
BE - 8 to 12 inches: channery silt loam
Bw1 - 12 to 16 inches: channery silt loam
Bw2 - 16 to 20 inches: channery silt loam
Bx1 - 20 to 36 inches: channery silt loam
Bx2 - 36 to 57 inches: channery silt loam
C - 57 to 72 inches: channery silt loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear

Hydric soil rating: No

Lordstown

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

MrD—Mardin channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2srh8
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Mardin

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: channery silt loam
BE - 8 to 12 inches: channery silt loam
Bw1 - 12 to 16 inches: channery silt loam
Bw2 - 16 to 20 inches: channery silt loam
Bx1 - 20 to 36 inches: channery silt loam
Bx2 - 36 to 57 inches: channery silt loam
C - 57 to 72 inches: channery silt loam

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Lordstown

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

OdB—Odessa silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wrdk
Elevation: 250 to 1,280 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days

Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Odessa

Setting

Landform: Lake terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Red clayey glaciolacustrine deposits derived from calcareous shale

Typical profile

Ap - 0 to 8 inches: silt loam
Bt/E - 8 to 10 inches: silty clay loam
Bt1 - 10 to 15 inches: silty clay
Bt2 - 15 to 25 inches: silty clay
C - 25 to 79 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
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 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Schoharie

Percent of map unit: 6 percent
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lakemont

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

Churchville

Percent of map unit: 3 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Rhinebeck

Percent of map unit: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Pt—Pits, gravel

Map Unit Setting

National map unit symbol: 9wll
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, gravel: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Gravel

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

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

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

Halsey
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

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

Rh—Red Hook gravelly silt loam

Map Unit Setting
National map unit symbol: 9wlm
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Red hook and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Red Hook

Setting
Landform: Terraces, valley trains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits

Typical profile
H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 28 inches: gravelly sandy loam
H3 - 28 to 50 inches: very gravelly sandy loam

Properties and qualities
Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F140XY022NY - Moist Outwash
Hydric soil rating: No

Minor Components

Castile

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

Unnamed soils

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

Howard

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

Atkins

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Halsey

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

RnA—Rhinebeck gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9wln
Elevation: 80 to 1,000 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

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 and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 14 inches: silty clay loam
H3 - 14 to 37 inches: silty clay
H4 - 37 to 54 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Collamer

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

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Hudson

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

Odessa

Percent of map unit: 5 percent

Hydric soil rating: No

RnB—Rhinebeck gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wlp
Elevation: 80 to 1,000 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

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 and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 14 inches: silty clay loam
H3 - 14 to 42 inches: silty clay
H4 - 42 to 54 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

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

Madalin
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

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

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

ROF—Rock outcrop-Arnot complex, 25 to 70 percent slopes

Map Unit Setting
National map unit symbol: 2wbnb
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Rock outcrop: 55 percent
Arnot, extremely stony, and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Arnot, Extremely Stony

Setting
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank, free face, side slope, nose slope, free face
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: channery silt loam
Bw1 - 3 to 12 inches: very channery silt loam
Bw2 - 12 to 17 inches: very channery silt loam
2R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 25 to 70 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

Minor Components

Lordstown, extremely stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

ScB3—Schoharie silty clay loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xggk
Elevation: 490 to 1,180 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Schoharie

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: Red clayey glaciolacustrine deposits derived from calcareous shale

Typical profile

Ap - 0 to 8 inches: silty clay loam
E - 8 to 11 inches: silt loam
Bt/E - 11 to 18 inches: silty clay
Bt - 18 to 33 inches: clay
C1 - 33 to 52 inches: silty clay
C2 - 52 to 79 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
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 0.14 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Odessa

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

Cazenovia

Percent of map unit: 5 percent
Landform: Till plains, reworked lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Collamer

Percent of map unit: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

ScC3—Schoharie silty clay loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2xggn
Elevation: 390 to 1,690 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Schoharie

Setting

Landform: Lake terraces
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Red clayey glaciolacustrine deposits derived from calcareous shale

Typical profile

Ap - 0 to 8 inches: silty clay loam
E - 8 to 11 inches: silt loam
Bt/E - 11 to 18 inches: silty clay
Bt - 18 to 33 inches: clay
C1 - 33 to 52 inches: silty clay
C2 - 52 to 79 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
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 0.14 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Odessa

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

Cazenovia

Percent of map unit: 5 percent
Landform: Till plains, reworked lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Concave

Across-slope shape: Convex
Hydric soil rating: No

Collamer

Percent of map unit: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

ScD3—Schoharie silty clay loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2xggs
Elevation: 390 to 1,570 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Schoharie

Setting

Landform: Lake terraces
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Red clayey glaciolacustrine deposits derived from calcareous shale

Typical profile

Ap - 0 to 8 inches: silty clay loam
E - 8 to 11 inches: silt loam
Bt/E - 11 to 18 inches: silty clay
Bt - 18 to 33 inches: clay
C1 - 33 to 52 inches: silty clay
C2 - 52 to 79 inches: silty clay

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
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 0.14 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Cazenovia

Percent of map unit: 5 percent
Landform: Till plains, reworked lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Odessa

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

Cayuga

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Collamer

Percent of map unit: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

ShC3—Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 9wlv
Elevation: 1,000 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Schoharie variant and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schoharie Variant

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Reddish clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 24 inches: silty clay loam
H3 - 24 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

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

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

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

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

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

ShD3—Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded

Map Unit Setting
National map unit symbol: 9wlw
Elevation: 1,000 to 1,800 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Schoharie variant and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schoharie Variant

Setting
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Reddish clayey and silty glaciolacustrine deposits

Typical profile
H1 - 0 to 4 inches: silty clay loam
H2 - 4 to 22 inches: silty clay loam

H3 - 22 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain, F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Schoharie

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

Dunkirk

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

Odessa

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

Hudson

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

Collamer

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

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

TuC—Tuller channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9wm2
Elevation: 600 to 1,800 feet

Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Tuller and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tuller

Setting

Landform: Benches, ridges, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

H1 - 0 to 5 inches: channery silt loam
H2 - 5 to 15 inches: channery silt loam
H3 - 15 to 22 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F140XY016NY - Mineral Wetlands
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Erie

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

Lordstown

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

Arnot

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

Volusia

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

UD—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9wm3
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Typical profile

H1 - 0 to 12 inches: channery silt loam
H2 - 12 to 72 inches: very channery loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Minor Components

Halsey

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Collamer

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

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

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

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

VaB—Valois gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9wm4
Elevation: 600 to 1,750 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Valois and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting
Landform: Lateral moraines, valley sides, end moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 36 inches: gravelly loam
H3 - 36 to 48 inches: gravelly sandy loam
H4 - 48 to 60 inches: very gravelly sandy loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Lansing

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

Mardin

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

Bath

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

Howard

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

VaC—Valois gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9wm5
Elevation: 600 to 1,750 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Valois and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting

Landform: Lateral moraines, valley sides, end moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 36 inches: gravelly loam
H3 - 36 to 45 inches: gravelly sandy loam
H4 - 45 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Lansing

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

Bath

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

Mardin

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

Howard

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

VaD—Valois gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9wm6
Elevation: 600 to 1,750 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Valois and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting

Landform: Lateral moraines, valley sides, end moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 4 inches: gravelly silt loam
H2 - 4 to 30 inches: gravelly loam
H3 - 30 to 42 inches: gravelly sandy loam
H4 - 42 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Bath

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

Chenango

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

Lordstown

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

Mardin

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

Lansing

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

VEE—Valois soils, steep

Map Unit Setting

National map unit symbol: 9wm7
Elevation: 600 to 1,750 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Valois and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting

Landform: Lateral moraines, valley sides, end moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 4 inches: gravelly silt loam
H2 - 4 to 30 inches: gravelly loam
H3 - 30 to 42 inches: gravelly sandy loam
H4 - 42 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Volusia

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

Bath

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

Chenango

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

Lordstown

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

Lansing

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

VHF—Valois and Howard soils, very steep

Map Unit Setting

National map unit symbol: 9wm8
Elevation: 160 to 1,970 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Valois and similar soils: 40 percent
Howard and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting

Landform: Lateral moraines, valley sides, end moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 3 inches: gravelly silt loam
H2 - 3 to 25 inches: gravelly loam
H3 - 25 to 34 inches: gravelly sandy loam
H4 - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 35 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 22 inches: very gravelly loam
H3 - 22 to 31 inches: very gravelly silt loam
H4 - 31 to 54 inches: stratified very gravelly sand

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Chenango

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

Bath

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

Lansing

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

Lordstown

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

Unnamed soils

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

W—Water

Map Unit Setting

National map unit symbol: 9wmf
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Seneca County, New York

AwB—Aurora silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9wmz
Elevation: 1,000 to 1,300 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 145 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Aurora and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aurora

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from calcareous shale, with some limestone and sandstone

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 32 inches: silty clay loam
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Angola

Percent of map unit: 5 percent

Hydric soil rating: No

Cazenovia

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

Danley

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

Lima

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

AzF—Aurora and Farmington soils, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9wn2
Elevation: 100 to 1,300 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 145 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Aurora and similar soils: 41 percent
Farmington and similar soils: 39 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aurora

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from calcareous shale, with some limestone and sandstone

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 32 inches: silty clay loam
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 25 to 75 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Description of Farmington

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits

Typical profile

H1 - 0 to 3 inches: silt loam
H2 - 3 to 15 inches: silt loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F101XY011NY - Shallow Till Upland
Hydric soil rating: No

Minor Components

Cazenovia

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

Lansing

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

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

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

Rock outcrop
Percent of map unit: 2 percent
Hydric soil rating: Unranked

HnB—Honeoye silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2w3p2
Elevation: 260 to 1,780 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

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

Description of Honeoye

Setting
Landform: Drumlins, till plains, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile
Ap - 0 to 8 inches: silt loam
E - 8 to 10 inches: silt loam
Bt/E - 10 to 14 inches: loam
Bt1 - 14 to 23 inches: loam
Bt2 - 23 to 29 inches: gravelly loam
C - 29 to 79 inches: gravelly loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Lima
Percent of map unit: 5 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Lansing
Percent of map unit: 4 percent
Landform: Drumlins, hills, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Appleton
Percent of map unit: 4 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Wassaic
Percent of map unit: 2 percent
Landform: Benches, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HnC—Honeoye silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w3p6
Elevation: 380 to 1,840 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Honeoye

Setting

Landform: Drumlins, till plains, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: silt loam
E - 8 to 10 inches: silt loam
Bt/E - 10 to 14 inches: loam
Bt1 - 14 to 23 inches: loam
Bt2 - 23 to 29 inches: gravelly loam
C - 29 to 79 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Lima
Percent of map unit: 5 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Appleton
Percent of map unit: 4 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lansing
Percent of map unit: 4 percent
Landform: Drumlins, hills, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wassaic
Percent of map unit: 2 percent
Landform: Benches, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

LsC—Lansing gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2w3md
Elevation: 520 to 1,970 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Lansing

Setting

Landform: Hills, drumlins, till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
E - 8 to 13 inches: gravelly silt loam
Bt/E - 13 to 21 inches: gravelly silt loam
Bt1 - 21 to 28 inches: gravelly silt loam
Bt2 - 28 to 39 inches: gravelly silt loam
C - 39 to 79 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Conesus

Percent of map unit: 8 percent
Landform: Hills, drumlins, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Kendaia

Percent of map unit: 3 percent
Landform: Drumlins, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Wassaic

Percent of map unit: 1 percent
Landform: Benches, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Danley

Percent of map unit: 1 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Shallow Excavations

ENG - Engineering

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately

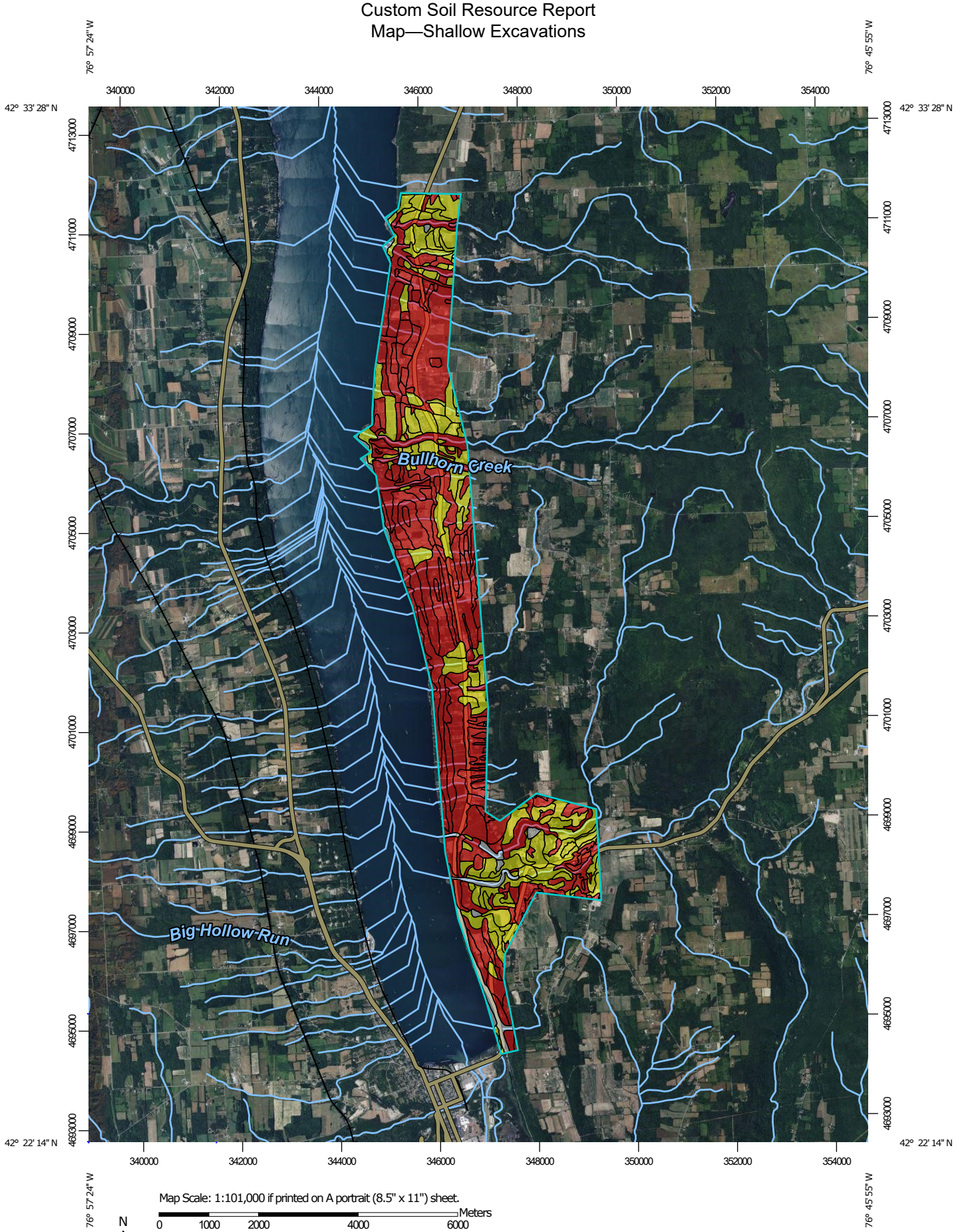
favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Shallow Excavations



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Shallow Excavations

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	Very limited	Angola (75%)	Depth to saturated zone (1.00)	78.3	1.2%
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
AnC	Angola silt loam, 8 to 15 percent slopes	Very limited	Angola (75%)	Depth to saturated zone (1.00)	49.4	0.8%
				Depth to hard bedrock (1.00)		
				Slope (0.63)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
ApA	Appleton silt loam, 0 to 3 percent slopes	Very limited	Appleton (85%)	Depth to saturated zone (1.00)	56.2	0.9%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Lima (5%)	Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Lyons (4%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Darien (3%)	Depth to saturated zone (1.00)		
				Dusty (0.02)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
			Churchville (3%)	Depth to saturated zone (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
ApB	Appleton silt loam, 3 to 8 percent slopes	Very limited	Appleton (80%)	Depth to saturated zone (1.00)	20.9	0.3%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Conesus (7%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Lyons (5%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Darien (4%)	Depth to saturated zone (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Churchville (4%)	Depth to saturated zone (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
ArB	Arnot channery silt loam, 3 to 8 percent slopes	Very limited	Arnot (85%)	Depth to hard bedrock (1.00)	6.8	0.1%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Lordstown (10%)	Depth to hard bedrock (1.00)		
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Tuller, somewhat poorly drained (5%)	Depth to hard bedrock (1.00)		
				Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
ArC	Arnot channery silt loam, 8 to 15 percent slopes	Very limited	Arnot (85%)	Depth to hard bedrock (1.00)	73.3	1.2%
				Organic matter content (1.00)		
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Lordstown, very stony (10%)	Depth to hard bedrock (1.00)		
				Slope (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Tuller, somewhat poorly drained (5%)	Depth to hard bedrock (1.00)		
				Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
AuB	Aurora channery silt loam, 3 to 8 percent slopes	Very limited	Aurora (80%)	Depth to saturated zone (1.00)	5.6	0.1%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
AuD	Aurora channery silt loam, 15 to 25 percent slopes	Very limited	Aurora (80%)	Slope (1.00)	6.6	0.1%
				Depth to saturated zone (1.00)		
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
BuB	Burdett silt loam, 3 to 8 percent slopes	Very limited	Burdett (75%)	Depth to saturated zone (1.00)	450.3	7.1%
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
BuC	Burdett silt loam, 8 to 15 percent slopes	Very limited	Burdett (75%)	Depth to saturated zone (1.00)	40.3	0.6%
				Slope (0.63)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
BuD	Burdett silt loam, 15 to 25 percent slopes	Very limited	Burdett (75%)	Slope (1.00)	6.2	0.1%
				Depth to saturated zone (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
Ce	Castile gravelly silt loam	Very limited	Castile (80%)	Depth to saturated zone (1.00)	41.1	0.6%
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
CnA	Chenango gravelly silt	Somewhat limited	Chenango (75%)	Dusty (0.02)	61.2	1.0%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	loam, 0 to 3 percent slopes			Unstable excavation walls (0.01)		
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Chenango (75%)	Dusty (0.02)	6.1	0.1%
				Unstable excavation walls (0.01)		
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	Somewhat limited	Chenango, fan (80%)	Depth to saturated zone (0.35)	57.0	0.9%
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
CrA	Collamer silt loam, 0 to 3 percent slopes	Very limited	Collamer (80%)	Depth to saturated zone (1.00)	12.0	0.2%
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
CrB	Collamer silt loam, 3 to 8 percent slopes	Very limited	Collamer (80%)	Depth to saturated zone (1.00)	12.3	0.2%
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
CsA	Conesus silt loam, 0 to 3 percent slopes	Very limited	Conesus (85%)	Depth to saturated zone (1.00)	13.8	0.2%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Kendaia (3%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Appleton (2%)	Depth to saturated zone (1.00)		
				Dense layer (0.50)		
				Dusty (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
			Nunda (2%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Lyons (1%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
CsB	Conesus silt loam, 3 to 8 percent slopes	Very limited	Conesus (85%)	Depth to saturated zone (1.00)	252.2	4.0%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Kendaia (3%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Nunda (2%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Appleton (2%)	Depth to saturated zone (1.00)		
				Dense layer (0.50)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Lyons (1%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
CsC	Conesus silt loam, 8 to 15 percent slopes	Very limited	Conesus (85%)	Depth to saturated zone (1.00)	56.3	0.9%
				Slope (0.37)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Kendaia (3%)	Depth to saturated zone (1.00)		
				Slope (0.37)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Nunda (2%)	Depth to saturated zone (1.00)		
				Slope (0.37)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Appleton (2%)	Depth to saturated zone (1.00)		
				Dense layer (0.50)		
				Slope (0.37)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
DkC	Dunkirk silt loam, 8 to 15 percent slopes	Somewhat limited	Dunkirk (80%)	Slope (0.63)	20.2	0.3%
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
DUE3	Dunkirk and Hudson soils,	Very limited	Dunkirk, severely eroded (45%)	Slope (1.00)	16.1	0.3%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	steep, severely eroded			Dusty (0.03)		
				Unstable excavation walls (0.01)		
			Hudson (40%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
ErB	Erie silt loam, 3 to 8 percent slopes	Very limited	Erie (80%)	Depth to saturated zone (1.00)	26.5	0.4%
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Langford (10%)	Depth to saturated zone (1.00)		
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Chippewa (5%)	Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Fremont (5%)	Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
FF	Fluvaquents-Udifluvents complex, frequently flooded	Very limited	Fluvaquents (41%)	Ponding (1.00)	3.1	0.0%
				Depth to saturated zone (1.00)		
				Flooding (0.80)		
				Dusty (0.02)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
			Udifluvents (39%)	Unstable excavation walls (1.00)		
				Flooding (0.80)		
				Depth to saturated zone (0.61)		
Ha	Halsey mucky silt loam	Very limited	Halsey (80%)	Depth to saturated zone (1.00)	40.0	0.6%
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
HnB	Hornell channery silt loam, 3 to 8 percent slopes	Very limited	Hornell (80%)	Depth to saturated zone (1.00)	10.2	0.2%
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
HrA	Howard gravelly loam, 0 to 3 percent slopes	Somewhat limited	Howard (80%)	Dusty (0.01)	58.4	0.9%
				Unstable excavation walls (0.01)		
HrB	Howard gravelly loam, 3 to 8 percent slopes	Somewhat limited	Howard (80%)	Dusty (0.01)	404.1	6.4%
				Unstable excavation walls (0.01)		
HrC	Howard gravelly loam, 8 to 15 percent slopes	Somewhat limited	Howard (80%)	Slope (0.63)	396.7	6.3%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
HrCK	Howard gravelly loam, rolling	Somewhat limited	Howard (80%)	Slope (0.04)	35.5	0.6%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
HSD	Howard soils, moderately steep	Very limited	Howard (80%)	Slope (1.00)	66.6	1.1%
				Dusty (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
HSE	Howard soils, steep	Very limited	Howard (80%)	Slope (1.00)	41.7	0.7%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	Very limited	Hudson (75%)	Depth to saturated zone (1.00)	45.9	0.7%
				Too clayey (0.50)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	Very limited	Hudson (80%)	Depth to saturated zone (1.00)	166.3	2.6%
				Slope (0.63)		
				Too clayey (0.50)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Lansing (85%)	Dusty (0.01)	208.5	3.3%
				Unstable excavation walls (0.01)		
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Lansing (85%)	Slope (0.37)	352.1	5.6%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	Very limited	Lansing (85%)	Slope (1.00)	136.3	2.1%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Conesus (9%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Wassaic (3%)	Slope (1.00)		
				Depth to hard bedrock (1.00)		
				Dusty (0.04)		
				Unstable excavation walls (0.01)		
			Kendaia (2%)	Depth to saturated zone (1.00)		
				Slope (0.16)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Appleton (1%)	Depth to saturated zone (1.00)		
				Dense layer (0.50)		
				Slope (0.16)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	Very limited	Lordstown (90%)	Depth to hard bedrock (1.00)	12.8	0.2%
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Mardin (5%)	Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Arnot (5%)	Depth to hard bedrock (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	Very limited	Lordstown (90%)	Depth to hard bedrock (1.00)	225.1	3.6%
				Slope (0.63)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Arnot (5%)	Depth to hard bedrock (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Mardin (5%)	Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	Very limited	Lordstown (85%)	Slope (1.00)	267.5	4.2%
				Depth to hard bedrock (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Arnot (5%)	Depth to hard bedrock (1.00)		
				Organic matter content (1.00)		
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Mardin (5%)	Depth to saturated zone (1.00)		
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Cadosia, very stony (5%)	Slope (1.00)		
				Large stones (0.10)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Dusty (0.01)		
LTE	Lordstown-Arnot complex, steep, rocky	Very limited	Lordstown, very stony (50%)	Depth to hard bedrock (1.00)	177.3	2.8%
				Slope (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Arnot, very stony (35%)	Depth to hard bedrock (1.00)		
				Organic matter content (1.00)		
				Slope (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Cadosia, extremely stony (10%)	Slope (1.00)		
				Large stones (0.10)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Bath (4%)	Depth to saturated zone (1.00)		
				Slope (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
LTF	Lordstown-Arnot complex, very steep, very rocky	Very limited	Lordstown, very stony (50%)	Depth to hard bedrock (1.00)	103.0	1.6%
				Slope (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Arnot, very stony (35%)	Depth to hard bedrock (1.00)		
				Slope (1.00)		
				Organic matter content (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Cadosia, extremely stony (10%)	Slope (1.00)		
				Large stones (0.10)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
Ma	Madalin silt loam, 0 to 3 percent slopes	Very limited	Madalin (85%)	Depth to saturated zone (1.00)	32.5	0.5%
				Too clayey (0.32)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Rhinebeck (5%)	Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Canandaigua (4%)	Depth to saturated zone (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Fonda (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Cosad (2%)	Depth to saturated zone (1.00)		
				Too clayey (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
MrB	Mardin channery silt loam, 3 to 8 percent slopes	Very limited	Mardin (85%)	Depth to saturated zone (1.00)	16.4	0.3%
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Bath (5%)	Depth to saturated zone (1.00)		
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Volusia (5%)	Depth to saturated zone (1.00)		
				Dense layer (0.50)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Lordstown (5%)	Depth to hard bedrock (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
MrC	Mardin channery silt loam, 8 to 15 percent slopes	Very limited	Mardin (88%)	Depth to saturated zone (1.00)	1.4	0.0%
				Slope (0.63)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Bath (5%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Dusty (0.01)		
			Volusia (5%)	Depth to saturated zone (1.00)		
				Dense layer (0.50)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Lordstown (2%)	Slope (1.00)		
				Depth to hard bedrock (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
MrD	Mardin channery silt loam, 15 to 25 percent slopes	Very limited	Mardin (85%)	Slope (1.00)	3.7	0.1%
				Depth to saturated zone (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Lordstown (5%)	Depth to hard bedrock (1.00)		
				Slope (1.00)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Volusia (5%)	Depth to saturated zone (1.00)		
				Slope (0.63)		
				Dense layer (0.50)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
			Bath (5%)	Slope (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
OdB	Odessa silt loam, 3 to 8 percent slopes	Very limited	Odessa (85%)	Depth to saturated zone (1.00)	138.3	2.2%
				Too clayey (0.32)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Schoharie (6%)	Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Lakemont (4%)	Depth to saturated zone (1.00)		
				Too clayey (0.32)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Churchville (3%)	Depth to saturated zone (1.00)		
				Unstable excavation walls (1.00)		
				Too clayey (0.84)		
				Dense layer (0.50)		
				Dusty (0.01)		
			Rhinebeck (2%)	Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
Pt	Pits, gravel	Not rated	Pits, gravel (80%)		27.1	0.4%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Unnamed soils (5%)			
			Chenango (5%)			
			Halsey (5%)			
			Red Hook (5%)			
Rh	Red Hook gravelly silt loam	Very limited	Red Hook (75%)	Depth to saturated zone (1.00)	35.9	0.6%
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	Very limited	Rhinebeck (80%)	Depth to saturated zone (1.00)	14.2	0.2%
				Too clayey (0.50)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	Very limited	Rhinebeck (80%)	Depth to saturated zone (1.00)	80.9	1.3%
				Too clayey (0.50)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	Not rated	Rock outcrop (55%)		134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	Very limited	Schoharie (85%)	Depth to saturated zone (1.00)	94.7	1.5%
				Too clayey (0.68)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Odessa (5%)	Depth to saturated zone (1.00)		
				Too clayey (0.32)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Cazenovia (5%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Cayuga (3%)	Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Collamer (2%)	Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	Very limited	Schoharie (85%)	Depth to saturated zone (1.00)	343.8	5.4%
				Too clayey (0.68)		
				Slope (0.37)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Odessa (5%)	Depth to saturated zone (1.00)		
				Slope (0.37)		
				Too clayey (0.32)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Cazenovia (5%)	Depth to saturated zone (1.00)		
				Slope (0.37)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Cayuga (3%)	Depth to saturated zone (1.00)		
				Too clayey (0.50)		
				Slope (0.37)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Collamer (2%)	Depth to saturated zone (1.00)		
				Slope (0.37)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	Very limited	Schoharie (85%)	Slope (1.00)	28.7	0.5%
				Depth to saturated zone (1.00)		
				Too clayey (0.68)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Cazenovia (5%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Odessa (5%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Too clayey (0.32)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Cayuga (3%)	Slope (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Too clayey (0.50)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Collamer (2%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	Very limited	Schoharie variant (75%)	Depth to saturated zone (1.00)	68.7	1.1%
				Depth to hard bedrock (1.00)		
				Slope (0.63)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	Very limited	Schoharie variant (75%)	Slope (1.00)	189.5	3.0%
				Depth to saturated zone (1.00)		
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
TuC	Tuller channery silt loam, 8 to 15 percent slopes	Very limited	Tuller (75%)	Depth to hard bedrock (1.00)	8.3	0.1%
				Depth to saturated zone (1.00)		
				Slope (0.63)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
UD	Udorthents, smoothed	Somewhat limited	Udorthents (75%)	Depth to saturated zone (0.35)	3.6	0.1%
				Dusty (0.02)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Valois (80%)	Dusty (0.02)	135.2	2.1%
				Unstable excavation walls (0.01)		
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Valois (80%)	Slope (0.63)	204.1	3.2%
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	Very limited	Valois (75%)	Slope (1.00)	204.4	3.2%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
VEE	Valois soils, steep	Very limited	Valois (75%)	Slope (1.00)	127.0	2.0%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
VHF	Valois and Howard soils, very steep	Very limited	Valois (40%)	Slope (1.00)	249.0	3.9%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Howard (35%)	Slope (1.00)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
W	Water	Not rated	Water (100%)		75.0	1.2%
Subtotals for Soil Survey Area					**6,337.0**	**99.9%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	Very limited	Aurora (80%)	Depth to saturated zone (1.00)	0.0	0.0%
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Unstable excavation walls (0.01)		
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	Very limited	Aurora (41%)	Slope (1.00)	0.1	0.0%
				Depth to saturated zone (1.00)		
				Depth to hard bedrock (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
			Farmington (39%)	Depth to hard bedrock (1.00)		
				Slope (1.00)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
HnB	Honeoye silt loam, 3 to 8 percent slopes	Somewhat limited	Honeoye (85%)	Dusty (0.01)	1.1	0.0%
				Unstable excavation walls (0.01)		
			Lansing (4%)	Dusty (0.01)		
				Unstable excavation walls (0.01)		
HnC	Honeoye silt loam, 8 to 15 percent slopes	Somewhat limited	Honeoye (85%)	Slope (0.63)	2.3	0.0%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
			Lansing (4%)	Slope (0.63)		
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Lansing (85%)	Slope (0.37)	0.3	0.0%
				Dusty (0.01)		
				Unstable excavation walls (0.01)		
Subtotals for Soil Survey Area					**3.8**	**0.1%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	4,157.8	65.6%
Somewhat limited	1,946.4	30.7%
Null or Not Rated	236.6	3.7%
Totals for Area of Interest	**6,340.9**	**100.0%**

Rating Options—Shallow Excavations

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Road, Trail)

FOR - Forestry

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

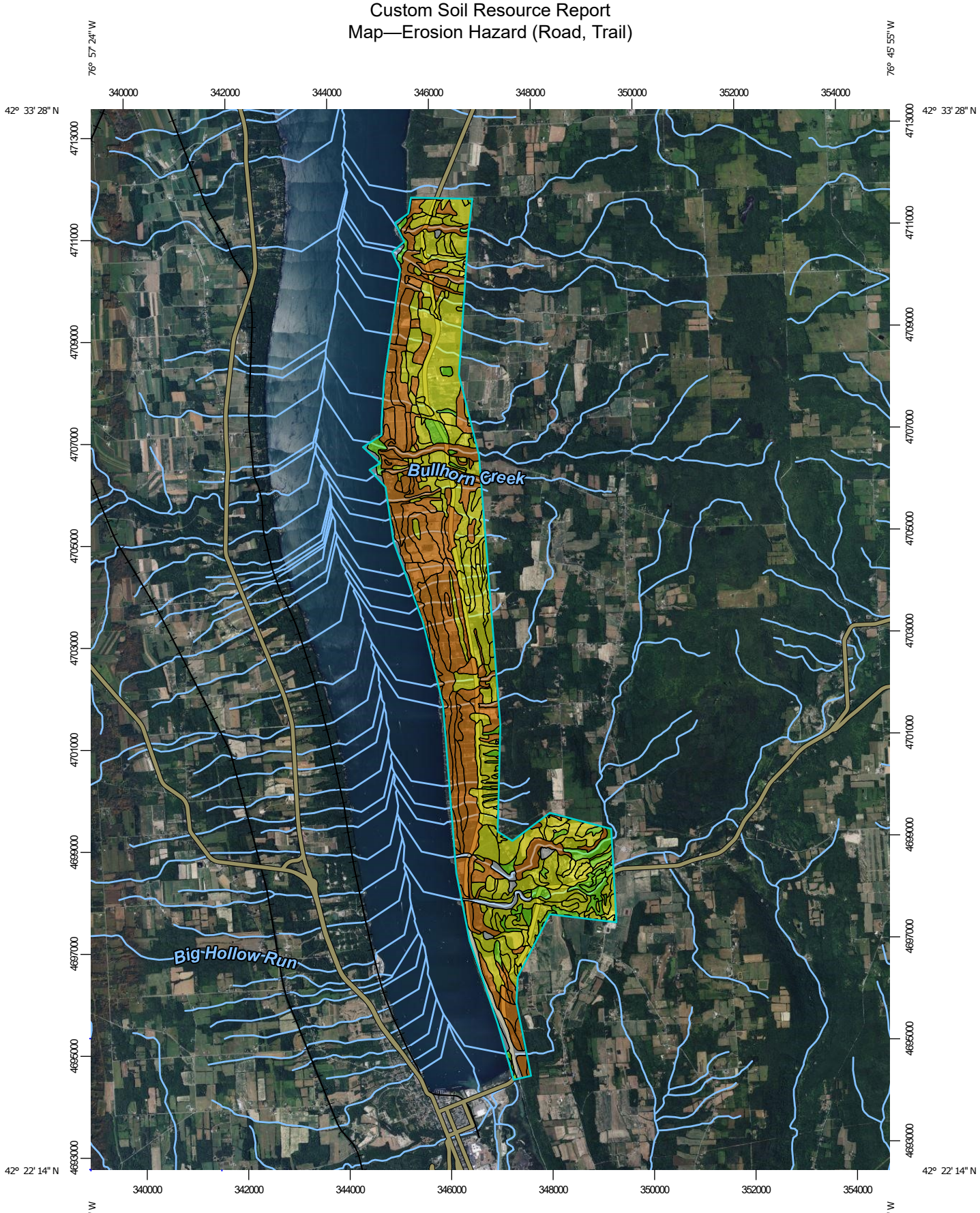
The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Erosion Hazard (Road, Trail)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Road, Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	Moderate	Angola (75%)	Slope/erodibility (0.50)	78.3	1.2%
AnC	Angola silt loam, 8 to 15 percent slopes	Severe	Angola (75%)	Slope/erodibility (0.95)	49.4	0.8%
ApA	Appleton silt loam, 0 to 3 percent slopes	Slight	Appleton (85%)		56.2	0.9%
			Lima (5%)			
			Lyons (4%)			
			Darien (3%)			
			Churchville (3%)			
ApB	Appleton silt loam, 3 to 8 percent slopes	Moderate	Appleton (80%)	Slope/erodibility (0.50)	20.9	0.3%
			Conesus (7%)	Slope/erodibility (0.50)		
			Lyons (5%)	Slope/erodibility (0.50)		
			Darien (4%)	Slope/erodibility (0.50)		
			Churchville (4%)	Slope/erodibility (0.50)		
ArB	Arnot channery silt loam, 3 to 8 percent slopes	Moderate	Arnot (85%)	Slope/erodibility (0.50)	6.8	0.1%
			Lordstown (10%)	Slope/erodibility (0.50)		
ArC	Arnot channery silt loam, 8 to 15 percent slopes	Moderate	Arnot (85%)	Slope/erodibility (0.50)	73.3	1.2%
AuB	Aurora channery silt loam, 3 to 8 percent slopes	Moderate	Aurora (80%)	Slope/erodibility (0.50)	5.6	0.1%
AuD	Aurora channery silt loam, 15 to 25 percent slopes	Severe	Aurora (80%)	Slope/erodibility (0.95)	6.6	0.1%
BuB	Burdett silt loam, 3 to 8 percent slopes	Moderate	Burdett (75%)	Slope/erodibility (0.50)	450.3	7.1%
BuC	Burdett silt loam, 8 to 15 percent slopes	Severe	Burdett (75%)	Slope/erodibility (0.95)	40.3	0.6%
BuD	Burdett silt loam, 15 to 25 percent slopes	Severe	Burdett (75%)	Slope/erodibility (0.95)	6.2	0.1%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Ce	Castile gravelly silt loam	Slight	Castile (80%)		41.1	0.6%
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	Slight	Chenango (75%)		61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	Moderate	Chenango (75%)	Slope/erodibility (0.50)	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	Slight	Chenango, fan (80%)		57.0	0.9%
CrA	Collamer silt loam, 0 to 3 percent slopes	Slight	Collamer (80%)		12.0	0.2%
CrB	Collamer silt loam, 3 to 8 percent slopes	Moderate	Collamer (80%)	Slope/erodibility (0.50)	12.3	0.2%
CsA	Conesus silt loam, 0 to 3 percent slopes	Slight	Conesus (85%)		13.8	0.2%
			Lansing (7%)			
			Kendaia (3%)			
			Appleton (2%)			
			Nunda (2%)			
			Lyons (1%)			
CsB	Conesus silt loam, 3 to 8 percent slopes	Moderate	Conesus (85%)	Slope/erodibility (0.50)	252.2	4.0%
			Lansing (7%)	Slope/erodibility (0.50)		
			Kendaia (3%)	Slope/erodibility (0.50)		
			Nunda (2%)	Slope/erodibility (0.50)		
			Appleton (2%)	Slope/erodibility (0.50)		
			Lyons (1%)	Slope/erodibility (0.50)		
CsC	Conesus silt loam, 8 to 15 percent slopes	Severe	Conesus (85%)	Slope/erodibility (0.95)	56.3	0.9%
			Lansing (8%)	Slope/erodibility (0.95)		
			Nunda (2%)	Slope/erodibility (0.95)		
			Appleton (2%)	Slope/erodibility (0.95)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
DkC	Dunkirk silt loam, 8 to 15 percent slopes	Severe	Dunkirk (80%)	Slope/erodibility (0.95)	20.2	0.3%
DUE3	Dunkirk and Hudson soils, steep, severely eroded	Severe	Dunkirk, severely eroded (45%)	Slope/erodibility (0.95)	16.1	0.3%
			Hudson (40%)	Slope/erodibility (0.95)		
ErB	Erie silt loam, 3 to 8 percent slopes	Moderate	Erie (80%)	Slope/erodibility (0.50)	26.5	0.4%
			Fremont (5%)	Slope/erodibility (0.50)		
FF	Fluvaquents-Udifluvents complex, frequently flooded	Slight	Fluvaquents (41%)		3.1	0.0%
			Udifluvents (39%)			
Ha	Halsey mucky silt loam	Slight	Halsey (80%)		40.0	0.6%
HnB	Hornell channery silt loam, 3 to 8 percent slopes	Moderate	Hornell (80%)	Slope/erodibility (0.50)	10.2	0.2%
HrA	Howard gravelly loam, 0 to 3 percent slopes	Slight	Howard (80%)		58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	Moderate	Howard (80%)	Slope/erodibility (0.50)	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	Moderate	Howard (80%)	Slope/erodibility (0.50)	396.7	6.3%
HrCK	Howard gravelly loam, rolling	Moderate	Howard (80%)	Slope/erodibility (0.50)	35.5	0.6%
HSD	Howard soils, moderately steep	Severe	Howard (80%)	Slope/erodibility (0.95)	66.6	1.1%
HSE	Howard soils, steep	Severe	Howard (80%)	Slope/erodibility (0.95)	41.7	0.7%
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	Moderate	Hudson (75%)	Slope/erodibility (0.50)	45.9	0.7%
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	Severe	Hudson (80%)	Slope/erodibility (0.95)	166.3	2.6%
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	Moderate	Lansing (85%)	Slope/erodibility (0.50)	208.5	3.3%
			Conesus (8%)	Slope/erodibility (0.50)		
			Kendaia (3%)	Slope/erodibility (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Appleton (2%)	Slope/erodibility (0.50)		
			Danley (1%)	Slope/erodibility (0.50)		
			Palatine (1%)	Slope/erodibility (0.50)		
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	Severe	Lansing (85%)	Slope/erodibility (0.95)	352.1	5.6%
			Appleton (2%)	Slope/erodibility (0.95)		
			Wassaic (1%)	Slope/erodibility (0.95)		
			Danley (1%)	Slope/erodibility (0.95)		
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	Severe	Lansing (85%)	Slope/erodibility (0.95)	136.3	2.1%
			Conesus (9%)	Slope/erodibility (0.95)		
			Wassaic (3%)	Slope/erodibility (0.95)		
			Appleton (1%)	Slope/erodibility (0.95)		
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	Moderate	Lordstown (90%)	Slope/erodibility (0.50)	12.8	0.2%
			Mardin (5%)	Slope/erodibility (0.50)		
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	Moderate	Lordstown (90%)	Slope/erodibility (0.50)	225.1	3.6%
			Arnot (5%)	Slope/erodibility (0.50)		
			Mardin (5%)	Slope/erodibility (0.50)		
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	Severe	Lordstown (85%)	Slope/erodibility (0.95)	267.5	4.2%
			Cadosia, very stony (5%)	Slope/erodibility (0.95)		
LTE	Lordstown-Arnot complex, steep, rocky	Severe	Lordstown, very stony (50%)	Slope/erodibility (0.95)	177.3	2.8%
			Arnot, very stony (35%)	Slope/erodibility (0.95)		
			Cadosia, extremely stony (10%)	Slope/erodibility (0.95)		
LTF	Lordstown-Arnot complex, very steep, very rocky	Severe	Lordstown, very stony (50%)	Slope/erodibility (0.95)	103.0	1.6%
			Arnot, very stony (35%)	Slope/erodibility (0.95)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Cadosia, extremely stony (10%)	Slope/erodibility (0.95)		
Ma	Madalin silt loam, 0 to 3 percent slopes	Slight	Madalin (85%)		32.5	0.5%
			Rhinebeck (5%)			
			Canandaigua (4%)			
			Fonda (4%)			
			Cosad (2%)			
MrB	Mardin channery silt loam, 3 to 8 percent slopes	Moderate	Mardin (85%)	Slope/erodibility (0.50)	16.4	0.3%
			Lordstown (5%)	Slope/erodibility (0.50)		
MrC	Mardin channery silt loam, 8 to 15 percent slopes	Moderate	Mardin (88%)	Slope/erodibility (0.50)	1.4	0.0%
			Volusia (5%)	Slope/erodibility (0.50)		
MrD	Mardin channery silt loam, 15 to 25 percent slopes	Severe	Mardin (85%)	Slope/erodibility (0.95)	3.7	0.1%
			Lordstown (5%)	Slope/erodibility (0.95)		
			Volusia (5%)	Slope/erodibility (0.95)		
OdB	Odessa silt loam, 3 to 8 percent slopes	Moderate	Odessa (85%)	Slope/erodibility (0.50)	138.3	2.2%
			Schoharie (6%)	Slope/erodibility (0.50)		
			Churchville (3%)	Slope/erodibility (0.50)		
			Rhinebeck (2%)	Slope/erodibility (0.50)		
Pt	Pits, gravel	Not rated	Pits, gravel (80%)		27.1	0.4%
			Unnamed soils (5%)			
			Chenango (5%)			
			Halsey (5%)			
			Red Hook (5%)			
Rh	Red Hook gravelly silt loam	Slight	Red Hook (75%)		35.9	0.6%
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	Slight	Rhinebeck (80%)		14.2	0.2%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	Moderate	Rhinebeck (80%)	Slope/erodibility (0.50)	80.9	1.3%
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	Not rated	Rock outcrop (55%)		134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	Moderate	Schoharie (85%)	Slope/erodibility (0.50)	94.7	1.5%
			Odessa (5%)	Slope/erodibility (0.50)		
			Cazenovia (5%)	Slope/erodibility (0.50)		
			Cayuga (3%)	Slope/erodibility (0.50)		
			Collamer (2%)	Slope/erodibility (0.50)		
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	Severe	Schoharie (85%)	Slope/erodibility (0.95)	343.8	5.4%
			Odessa (5%)	Slope/erodibility (0.95)		
			Cazenovia (5%)	Slope/erodibility (0.95)		
			Cayuga (3%)	Slope/erodibility (0.95)		
			Collamer (2%)	Slope/erodibility (0.95)		
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	Severe	Schoharie (85%)	Slope/erodibility (0.95)	28.7	0.5%
			Cazenovia (5%)	Slope/erodibility (0.95)		
			Odessa (5%)	Slope/erodibility (0.95)		
			Cayuga (3%)	Slope/erodibility (0.95)		
			Collamer (2%)	Slope/erodibility (0.95)		
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	Severe	Schoharie variant (75%)	Slope/erodibility (0.95)	68.7	1.1%
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	Severe	Schoharie variant (75%)	Slope/erodibility (0.95)	189.5	3.0%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
TuC	Tuller channery silt loam, 8 to 15 percent slopes	Severe	Tuller (75%)	Slope/erodibility (0.95)	8.3	0.1%
UD	Udorthents, smoothed	Slight	Udorthents (75%)		3.6	0.1%
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	Moderate	Valois (80%)	Slope/erodibility (0.50)	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	Moderate	Valois (80%)	Slope/erodibility (0.50)	204.1	3.2%
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	Severe	Valois (75%)	Slope/erodibility (0.95)	204.4	3.2%
VEE	Valois soils, steep	Severe	Valois (75%)	Slope/erodibility (0.95)	127.0	2.0%
VHF	Valois and Howard soils, very steep	Severe	Valois (40%)	Slope/erodibility (0.95)	249.0	3.9%
			Howard (35%)	Slope/erodibility (0.95)		
W	Water	Not rated	Water (100%)		75.0	1.2%
Subtotals for Soil Survey Area					**6,337.0**	**99.9%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	Moderate	Aurora (80%)	Slope/erodibility (0.50)	0.0	0.0%
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	Severe	Aurora (41%)	Slope/erodibility (0.95)	0.1	0.0%
			Farmington (39%)	Slope/erodibility (0.95)		
HnB	Honeoye silt loam, 3 to 8 percent slopes	Moderate	Honeoye (85%)	Slope/erodibility (0.50)	1.1	0.0%
			Lima (5%)	Slope/erodibility (0.50)		
			Lansing (4%)	Slope/erodibility (0.50)		
			Appleton (4%)	Slope/erodibility (0.50)		
			Wassaic (2%)	Slope/erodibility (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
HnC	Honeoye silt loam, 8 to 15 percent slopes	Severe	Honeoye (85%)	Slope/erodibility (0.95)	2.3	0.0%
			Lima (5%)	Slope/erodibility (0.95)		
			Appleton (4%)	Slope/erodibility (0.95)		
			Lansing (4%)	Slope/erodibility (0.95)		
			Wassaic (2%)	Slope/erodibility (0.95)		
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	Severe	Lansing (85%)	Slope/erodibility (0.95)	0.3	0.0%
			Appleton (2%)	Slope/erodibility (0.95)		
			Wassaic (1%)	Slope/erodibility (0.95)		
			Danley (1%)	Slope/erodibility (0.95)		
Subtotals for Soil Survey Area					**3.8**	**0.1%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Moderate	2,943.6	46.4%
Severe	2,731.7	43.1%
Slight	428.9	6.8%
Null or Not Rated	236.6	3.7%
Totals for Area of Interest	**6,340.9**	**100.0%**

Rating Options—Erosion Hazard (Road, Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Sanitary Facilities

Sanitary Facilities interpretations are tools designed to guide the user in site selection for the safe disposal of sewage and solid waste. Example interpretations include septic tank absorption fields, sewage lagoons, and sanitary landfills.

Septic Tank Absorption Fields (NY)

Septic tank absorption fields are subsurface systems of perforated pipe or similar devices that distribute effluent from a septic tank into the soil. New York State Department of Health regulations allow installation of septic system absorption fields of varying designs, depending upon the depth of suitable soil material above any limitation in the natural soil at a site (New York State Department of Health, 1990). Where necessary, imported fill material may be used to elevate absorption trenches to at least the minimum distance of 24 inches above limiting soil horizons. The depth ranges of suitable material and corresponding types of absorption systems allowed are as follows:

Less than 12 inches-no system allowed

12 to 24 inches-alternative raised trench

24 to 48 inches-conventional shallow trench

More than 48 inches-conventional system

The ratings in this interpretation are based on evaluation of the soil between depths of 12 and 48 inches. In addition, the bottom layer of the soil is evaluated for risk of seepage. This interpretation does not evaluate bedrock below the soil. The soil properties and site features considered are those that affect absorption of the effluent, construction and maintenance of the system, and public health.

The soil properties and qualities that affect the absorption and effective treatment of wastewater effluent are saturated hydraulic conductivity (Ksat), depth to a seasonal high water table, depth to bedrock, depth to dense material, and susceptibility to flooding. Stones and boulders and a shallow depth to bedrock or dense material interfere with installation. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas. In addition, the hazards of erosion and sedimentation increase as slope increases.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 2 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, ground water may be contaminated.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

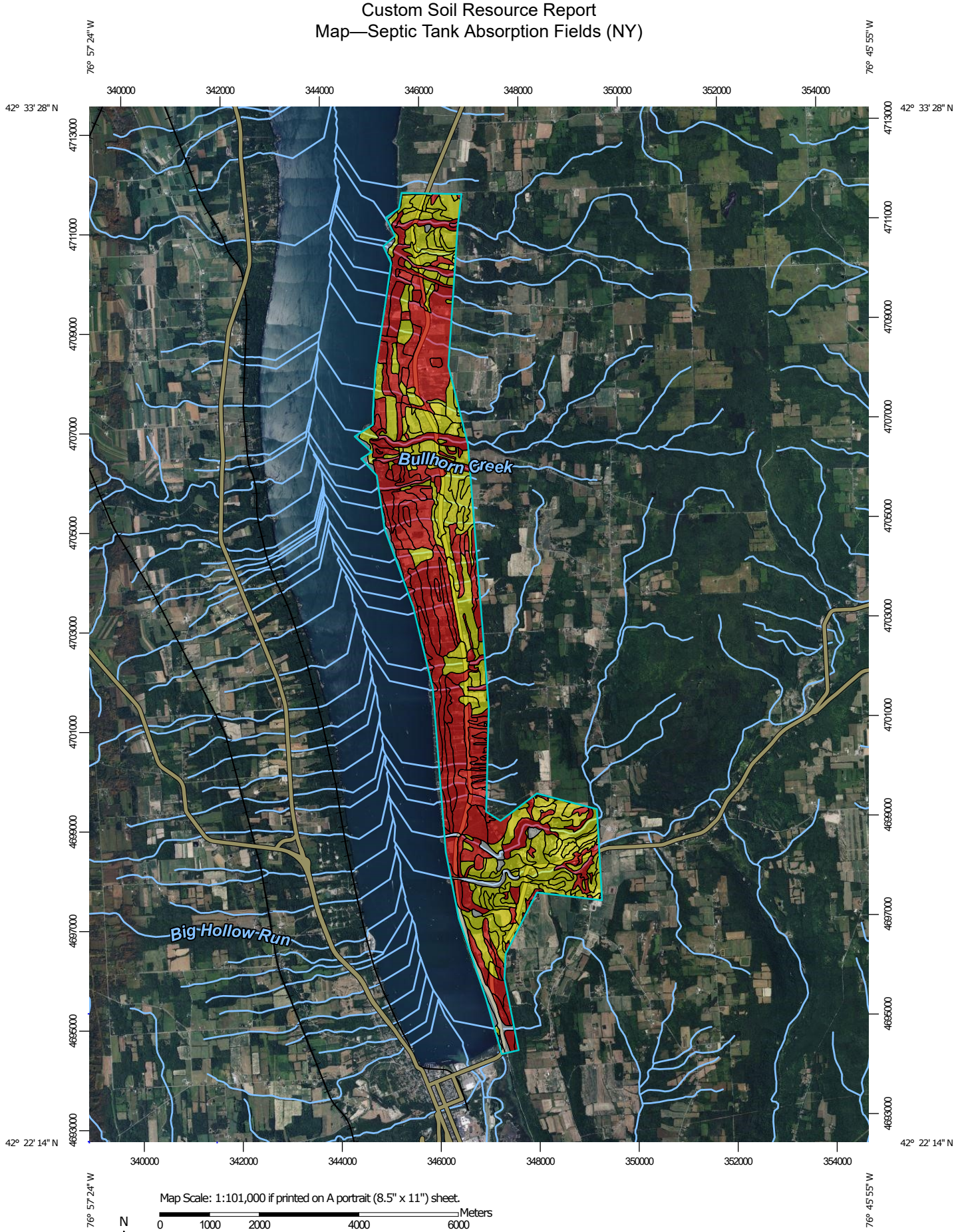
The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

The information in this interpretation is based on criteria developed specifically for soils in New York. The information is not site specific and does not eliminate the need for onsite investigation of the soils.

Reference:

New York State Department of Health. 1990. Appendix 75-A of Part 75, Section 201(1)(1) of New York Public Health Law. Nassau and Suffolk Counties have a waiver from this portion of New York State Department of Health regulations.



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Septic Tank Absorption Fields (NY)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	Very limited	Angola (75%)	Depth to saturated zone (1.00)	78.3	1.2%
				Restricted permeability (1.00)		
				Depth to bedrock (0.75)		
AnC	Angola silt loam, 8 to 15 percent slopes	Very limited	Angola (75%)	Depth to saturated zone (1.00)	49.4	0.8%
				Restricted permeability (1.00)		
				Depth to bedrock (0.75)		
				Slope (0.20)		
ApA	Appleton silt loam, 0 to 3 percent slopes	Very limited	Appleton (85%)	Depth to saturated zone (1.00)	56.2	0.9%
				Restricted permeability (0.83)		
			Lyons (4%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.83)		
			Churchville (3%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
			Darien (3%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.98)		
ApB	Appleton silt loam, 3 to 8 percent slopes	Very limited	Appleton (80%)	Depth to saturated zone (1.00)	20.9	0.3%
				Restricted permeability (0.83)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Lyons (5%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.83)		
			Darien (4%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.98)		
			Churchville (4%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
ArB	Arnot channery silt loam, 3 to 8 percent slopes	Very limited	Arnot (85%)	Depth to bedrock (1.00)	6.8	0.1%
				Restricted permeability (0.20)		
			Tuller, somewhat poorly drained (5%)	Depth to bedrock (1.00)		
				Depth to saturated zone (1.00)		
				Restricted permeability (0.99)		
ArC	Arnot channery silt loam, 8 to 15 percent slopes	Very limited	Arnot (85%)	Depth to bedrock (1.00)	73.3	1.2%
				Slope (0.20)		
				Restricted permeability (0.20)		
			Lordstown, very stony (10%)	Slope (1.00)		
				Depth to bedrock (0.75)		
				Surface rock fragments (0.60)		
				Restricted permeability (0.20)		
			Tuller, somewhat poorly drained (5%)	Depth to bedrock (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Restricted permeability (0.99)		
AuB	Aurora channery silt loam, 3 to 8 percent slopes	Very limited	Aurora (80%)	Restricted permeability (1.00)	5.6	0.1%
				Depth to saturated zone (0.80)		
				Depth to bedrock (0.75)		
AuD	Aurora channery silt loam, 15 to 25 percent slopes	Very limited	Aurora (80%)	Restricted permeability (1.00)	6.6	0.1%
				Slope (1.00)		
				Depth to saturated zone (0.80)		
				Depth to bedrock (0.75)		
BuB	Burdett silt loam, 3 to 8 percent slopes	Very limited	Burdett (75%)	Depth to saturated zone (1.00)	450.3	7.1%
				Restricted permeability (0.78)		
BuC	Burdett silt loam, 8 to 15 percent slopes	Very limited	Burdett (75%)	Depth to saturated zone (1.00)	40.3	0.6%
				Restricted permeability (0.78)		
				Slope (0.20)		
BuD	Burdett silt loam, 15 to 25 percent slopes	Very limited	Burdett (75%)	Depth to saturated zone (1.00)	6.2	0.1%
				Slope (1.00)		
				Restricted permeability (0.85)		
Ce	Castile gravelly silt loam	Somewhat limited	Castile (80%)	Leaching or seepage (0.90)	41.1	0.6%
				Depth to saturated zone (0.80)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	Somewhat limited	Chenango (75%)	Leaching or seepage (0.90)	61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Chenango (75%)	Leaching or seepage (0.90)	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	Somewhat limited	Chenango, fan (80%)	Leaching or seepage (0.90)	57.0	0.9%
				Depth to saturated zone (0.17)		
CrA	Collamer silt loam, 0 to 3 percent slopes	Somewhat limited	Collamer (80%)	Restricted permeability (0.84)	12.0	0.2%
				Depth to saturated zone (0.80)		
CrB	Collamer silt loam, 3 to 8 percent slopes	Somewhat limited	Collamer (80%)	Restricted permeability (0.84)	12.3	0.2%
				Depth to saturated zone (0.80)		
CsA	Conesus silt loam, 0 to 3 percent slopes	Somewhat limited	Conesus (85%)	Restricted permeability (0.83)	13.8	0.2%
				Depth to saturated zone (0.80)		
			Lansing (7%)	Restricted permeability (0.83)		
			Nunda (2%)	Restricted permeability (0.90)		
				Depth to saturated zone (0.80)		
CsB	Conesus silt loam, 3 to 8 percent slopes	Somewhat limited	Conesus (85%)	Restricted permeability (0.83)	252.2	4.0%
				Depth to saturated zone (0.80)		
			Lansing (7%)	Restricted permeability (0.83)		
			Nunda (2%)	Restricted permeability (0.90)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.80)		
CsC	Conesus silt loam, 8 to 15 percent slopes	Somewhat limited	Conesus (85%)	Restricted permeability (0.83)	56.3	0.9%
				Depth to saturated zone (0.80)		
				Slope (0.20)		
			Lansing (8%)	Restricted permeability (0.83)		
				Slope (0.20)		
			Nunda (2%)	Restricted permeability (0.90)		
				Depth to saturated zone (0.80)		
				Slope (0.20)		
DkC	Dunkirk silt loam, 8 to 15 percent slopes	Somewhat limited	Dunkirk (80%)	Restricted permeability (0.98)	20.2	0.3%
				Slope (0.20)		
DUE3	Dunkirk and Hudson soils, steep, severely eroded	Very limited	Dunkirk, severely eroded (45%)	Slope (1.00)	16.1	0.3%
				Restricted permeability (0.98)		
			Hudson (40%)	Restricted permeability (1.00)		
				Slope (1.00)		
				Depth to saturated zone (0.80)		
ErB	Erie silt loam, 3 to 8 percent slopes	Very limited	Erie (80%)	Depth to dense material (1.00)	26.5	0.4%
				Depth to saturated zone (1.00)		
				Restricted permeability (0.79)		
			Chippewa (5%)	Depth to dense material (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Restricted permeability (0.20)		
			Fremont (5%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.79)		
FF	Fluvaquents-Udifluvents complex, frequently flooded	Very limited	Fluvaquents (41%)	Flooding (1.00)	3.1	0.0%
				Depth to saturated zone (1.00)		
				Leaching or seepage (1.00)		
				Filtering capacity (1.00)		
				Ponding (1.00)		
			Udifluvents (39%)	Flooding (1.00)		
				Leaching or seepage (1.00)		
				Filtering capacity (1.00)		
				Depth to saturated zone (0.33)		
Ha	Halsey mucky silt loam	Very limited	Halsey (80%)	Depth to saturated zone (1.00)	40.0	0.6%
				Leaching or seepage (0.90)		
HnB	Hornell channery silt loam, 3 to 8 percent slopes	Very limited	Hornell (80%)	Depth to saturated zone (1.00)	10.2	0.2%
				Restricted permeability (1.00)		
				Depth to bedrock (0.75)		
HrA	Howard gravelly loam, 0 to 3 percent slopes	Somewhat limited	Howard (80%)	Leaching or seepage (0.90)	58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	Somewhat limited	Howard (80%)	Leaching or seepage (0.90)	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	Somewhat limited	Howard (80%)	Leaching or seepage (0.90)	396.7	6.3%
				Slope (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
HrCK	Howard gravelly loam, rolling	Somewhat limited	Howard (80%)	Leaching or seepage (0.90)	35.5	0.6%
				Slope (0.20)		
HSD	Howard soils, moderately steep	Very limited	Howard (80%)	Slope (1.00)	66.6	1.1%
				Leaching or seepage (0.90)		
HSE	Howard soils, steep	Very limited	Howard (80%)	Slope (1.00)	41.7	0.7%
				Leaching or seepage (0.90)		
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	Very limited	Hudson (75%)	Restricted permeability (1.00)	45.9	0.7%
				Depth to saturated zone (0.80)		
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	Very limited	Hudson (80%)	Restricted permeability (1.00)	166.3	2.6%
				Depth to saturated zone (0.80)		
				Slope (0.20)		
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Lansing (85%)	Restricted permeability (0.83)	208.5	3.3%
			Conesus (8%)	Restricted permeability (0.83)		
				Depth to saturated zone (0.80)		
			Palatine (1%)	Depth to bedrock (0.75)		
				Restricted permeability (0.31)		
			Danley (1%)	Restricted permeability (0.98)		
				Depth to saturated zone (0.80)		
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Lansing (85%)	Restricted permeability (0.83)	352.1	5.6%
				Slope (0.20)		
			Conesus (8%)	Restricted permeability (0.83)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.80)		
				Slope (0.20)		
			Danley (1%)	Restricted permeability (0.98)		
				Depth to saturated zone (0.80)		
				Slope (0.20)		
			Wassaic (1%)	Depth to bedrock (0.75)		
				Restricted permeability (0.49)		
				Slope (0.20)		
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	Very limited	Lansing (85%)	Slope (1.00)	136.3	2.1%
				Restricted permeability (0.83)		
			Conesus (9%)	Slope (1.00)		
				Restricted permeability (0.83)		
				Depth to saturated zone (0.80)		
			Wassaic (3%)	Slope (1.00)		
				Depth to bedrock (0.75)		
				Restricted permeability (0.49)		
			Kendaia (2%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.31)		
				Slope (0.20)		
			Appleton (1%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.99)		
				Slope (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	Somewhat limited	Lordstown (90%)	Depth to bedrock (0.75)	12.8	0.2%
				Restricted permeability (0.20)		
			Mardin (5%)	Depth to saturated zone (0.91)		
				Depth to dense material (0.89)		
				Restricted permeability (0.20)		
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	Somewhat limited	Lordstown (90%)	Depth to bedrock (0.75)	225.1	3.6%
				Slope (0.20)		
				Restricted permeability (0.20)		
			Mardin (5%)	Depth to saturated zone (0.91)		
				Depth to dense material (0.89)		
				Restricted permeability (0.20)		
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	Very limited	Lordstown (85%)	Slope (1.00)	267.5	4.2%
				Depth to bedrock (0.75)		
				Restricted permeability (0.20)		
			Cadosia, very stony (5%)	Slope (1.00)		
				Surface rock fragments (0.30)		
				Restricted permeability (0.20)		
				Content of large stones (0.13)		
			Arnot (5%)	Depth to bedrock (1.00)		
				Slope (0.20)		
				Restricted permeability (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
LTE	Lordstown-Arnot complex, steep, rocky	Very limited	Lordstown, very stony (50%)	Slope (1.00)	177.3	2.8%
				Depth to bedrock (0.75)		
				Surface rock fragments (0.60)		
				Restricted permeability (0.20)		
			Arnot, very stony (35%)	Depth to bedrock (1.00)		
				Slope (1.00)		
				Surface rock fragments (0.60)		
				Restricted permeability (0.20)		
			Cadosia, extremely stony (10%)	Slope (1.00)		
				Surface rock fragments (0.40)		
				Restricted permeability (0.20)		
				Content of large stones (0.13)		
			Bath (4%)	Slope (1.00)		
				Depth to saturated zone (0.33)		
				Depth to dense material (0.30)		
				Restricted permeability (0.20)		
LTF	Lordstown-Arnot complex, very steep, very rocky	Very limited	Lordstown, very stony (50%)	Slope (1.00)	103.0	1.6%
				Depth to bedrock (0.75)		
				Surface rock fragments (0.60)		
				Restricted permeability (0.20)		
			Arnot, very stony (35%)	Depth to bedrock (1.00)		
				Slope (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Surface rock fragments (0.60)		
				Restricted permeability (0.20)		
			Cadosia, extremely stony (10%)	Slope (1.00)		
				Surface rock fragments (0.40)		
				Restricted permeability (0.20)		
				Content of large stones (0.13)		
Ma	Madalin silt loam, 0 to 3 percent slopes	Very limited	Madalin (85%)	Depth to saturated zone (1.00)	32.5	0.5%
				Restricted permeability (1.00)		
			Rhinebeck (5%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
			Canandaigua (4%)	Depth to saturated zone (1.00)		
				Restricted permeability (0.49)		
			Fonda (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
			Cosad (2%)	Depth to saturated zone (1.00)		
				Depth to dense material (0.80)		
				Restricted permeability (0.31)		
MrB	Mardin channery silt loam, 3 to 8 percent slopes	Somewhat limited	Mardin (85%)	Depth to saturated zone (0.91)	16.4	0.3%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to dense material (0.89)		
				Restricted permeability (0.20)		
			Lordstown (5%)	Depth to bedrock (0.75)		
				Restricted permeability (0.20)		
			Bath (5%)	Depth to saturated zone (0.33)		
				Depth to dense material (0.30)		
				Slope (0.20)		
				Restricted permeability (0.20)		
MrC	Mardin channery silt loam, 8 to 15 percent slopes	Somewhat limited	Mardin (88%)	Depth to saturated zone (0.91)	1.4	0.0%
				Depth to dense material (0.89)		
				Slope (0.20)		
				Restricted permeability (0.20)		
MrD	Mardin channery silt loam, 15 to 25 percent slopes	Very limited	Mardin (85%)	Slope (1.00)	3.7	0.1%
				Depth to saturated zone (0.91)		
				Depth to dense material (0.89)		
				Restricted permeability (0.20)		
			Volusia (5%)	Depth to dense material (1.00)		
				Depth to saturated zone (1.00)		
				Slope (0.20)		
				Restricted permeability (0.20)		
			Bath (5%)	Slope (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.33)		
				Depth to dense material (0.30)		
				Restricted permeability (0.20)		
			Lordstown (5%)	Slope (1.00)		
				Depth to bedrock (0.75)		
				Restricted permeability (0.20)		
OdB	Odessa silt loam, 3 to 8 percent slopes	Very limited	Odessa (85%)	Depth to saturated zone (1.00)	138.3	2.2%
				Restricted permeability (1.00)		
			Schoharie (6%)	Restricted permeability (1.00)		
				Depth to saturated zone (0.80)		
			Lakemont (4%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
			Churchville (3%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
				Depth to dense material (0.75)		
			Rhinebeck (2%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
Pt	Pits, gravel	Not rated	Pits, gravel (80%)		27.1	0.4%
			Red Hook (5%)			

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Unnamed soils (5%)			
			Chenango (5%)			
			Halsey (5%)			
Rh	Red Hook gravelly silt loam	Very limited	Red Hook (75%)	Depth to saturated zone (1.00)	35.9	0.6%
				Restricted permeability (0.49)		
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	Very limited	Rhinebeck (80%)	Depth to saturated zone (1.00)	14.2	0.2%
				Restricted permeability (1.00)		
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	Very limited	Rhinebeck (80%)	Depth to saturated zone (1.00)	80.9	1.3%
				Restricted permeability (1.00)		
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	Not rated	Rock outcrop (55%)		134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	Very limited	Schoharie (85%)	Restricted permeability (1.00)	94.7	1.5%
				Depth to saturated zone (0.80)		
			Odessa (5%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
			Cayuga (3%)	Restricted permeability (1.00)		
				Depth to saturated zone (0.80)		
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	Very limited	Schoharie (85%)	Restricted permeability (1.00)	343.8	5.4%
				Depth to saturated zone (0.80)		
				Slope (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Odessa (5%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
				Slope (0.20)		
			Cayuga (3%)	Restricted permeability (1.00)		
				Depth to saturated zone (0.80)		
				Slope (0.20)		
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	Very limited	Schoharie (85%)	Slope (1.00)	28.7	0.5%
				Restricted permeability (1.00)		
				Depth to saturated zone (0.80)		
			Cazenovia (5%)	Slope (1.00)		
				Restricted permeability (0.98)		
				Depth to saturated zone (0.80)		
			Odessa (5%)	Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
				Slope (1.00)		
			Cayuga (3%)	Restricted permeability (1.00)		
				Slope (1.00)		
				Depth to saturated zone (0.80)		
			Collamer (2%)	Slope (1.00)		
				Restricted permeability (0.89)		
				Depth to saturated zone (0.80)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	Very limited	Schoharie variant (75%)	Restricted permeability (1.00)	68.7	1.1%
				Depth to saturated zone (0.80)		
				Depth to bedrock (0.75)		
				Slope (0.20)		
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	Very limited	Schoharie variant (75%)	Restricted permeability (1.00)	189.5	3.0%
				Slope (1.00)		
				Depth to saturated zone (0.80)		
				Depth to bedrock (0.75)		
TuC	Tuller channery silt loam, 8 to 15 percent slopes	Very limited	Tuller (75%)	Depth to bedrock (1.00)	8.3	0.1%
				Depth to saturated zone (1.00)		
				Restricted permeability (0.99)		
				Slope (0.20)		
UD	Udorthents, smoothed	Not rated	Udorthents (75%)		3.6	0.1%
			Fredon (5%)			
			Erie (5%)			
			Halsey (5%)			
			Collamer (5%)			
			Bath (5%)			
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Valois (80%)	Restricted permeability (0.31)	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Valois (80%)	Restricted permeability (0.31)	204.1	3.2%
				Slope (0.20)		
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	Very limited	Valois (75%)	Slope (1.00)	204.4	3.2%
				Restricted permeability (0.31)		
VEE	Valois soils, steep	Very limited	Valois (75%)	Slope (1.00)	127.0	2.0%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Restricted permeability (0.31)		
VHF	Valois and Howard soils, very steep	Very limited	Valois (40%)	Slope (1.00)	249.0	3.9%
				Restricted permeability (0.31)		
			Howard (35%)	Slope (1.00)		
				Leaching or seepage (0.90)		
W	Water	Not rated	Water (100%)		75.0	1.2%
Subtotals for Soil Survey Area					**6,337.0**	**99.9%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	Somewhat limited	Aurora (80%)	Restricted permeability (0.92)	0.0	0.0%
				Depth to saturated zone (0.80)		
				Depth to bedrock (0.75)		
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	Very limited	Aurora (41%)	Slope (1.00)	0.1	0.0%
				Restricted permeability (0.92)		
				Depth to saturated zone (0.80)		
				Depth to bedrock (0.75)		
			Farmington (39%)	Depth to bedrock (1.00)		
				Slope (1.00)		
				Restricted permeability (0.31)		
HnB	Honeoye silt loam, 3 to 8 percent slopes	Somewhat limited	Honeoye (85%)	Restricted permeability (0.83)	1.1	0.0%
			Lima (5%)	Restricted permeability (0.83)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.80)		
			Lansing (4%)	Restricted permeability (0.83)		
			Wassaic (2%)	Depth to bedrock (0.75)		
				Restricted permeability (0.49)		
HnC	Honeoye silt loam, 8 to 15 percent slopes	Somewhat limited	Honeoye (85%)	Restricted permeability (0.83)	2.3	0.0%
				Slope (0.20)		
			Lima (5%)	Restricted permeability (0.83)		
				Depth to saturated zone (0.80)		
				Slope (0.20)		
			Lansing (4%)	Restricted permeability (0.83)		
				Slope (0.20)		
			Wassaic (2%)	Depth to bedrock (0.75)		
				Restricted permeability (0.49)		
				Slope (0.20)		
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Lansing (85%)	Restricted permeability (0.83)	0.3	0.0%
				Slope (0.20)		
			Conesus (8%)	Restricted permeability (0.83)		
				Depth to saturated zone (0.80)		
				Slope (0.20)		
			Wassaic (1%)	Depth to bedrock (0.75)		
				Restricted permeability (0.49)		
				Slope (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Danley (1%)	Restricted permeability (0.98)		
				Depth to saturated zone (0.80)		
				Slope (0.20)		
Subtotals for Soil Survey Area					**3.8**	**0.1%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	3,514.3	55.4%
Somewhat limited	2,586.3	40.8%
Null or Not Rated	240.2	3.8%
Totals for Area of Interest	**6,340.9**	**100.0%**

Rating Options—Septic Tank Absorption Fields (NY)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Waste Management

Waste Management interpretations are tools designed to guide the user in evaluating soils for use of organic wastes and wastewater as productive resources. Example interpretations include land application of manure, food processing waste, and municipal sewage sludge, and disposal of wastewater by irrigation or overland flow process.

Manure and Food-Processing Waste

The application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

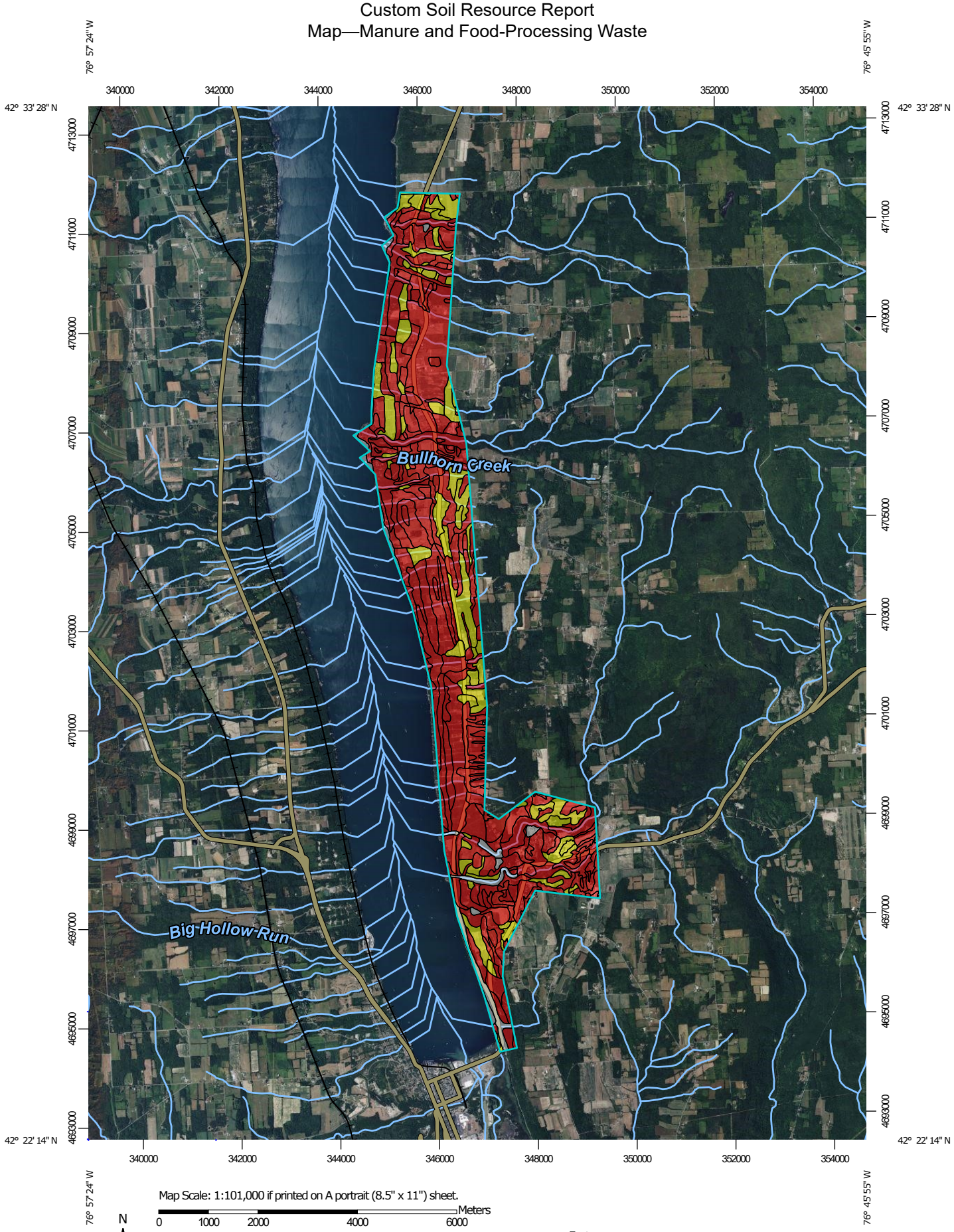
The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include saturated hydraulic conductivity (Ksat), depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.


76° 57' 24" W
76° 45' 55" W
42° 33' 28" N
42° 22' 14" N
340000
342000
344000
346000
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352000
354000
4713000
4711000
4709000
4707000
4705000
4703000
4701000
4699000
4697000
4695000
4693000
Bullhorn Creek
Big Hollow Run
Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.
Meters
0
1000
2000
4000
6000
Feet
0
4500
9000
18000
27000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Manure and Food-Processing Waste

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	Very limited	Angola (75%)	Slow water movement (1.00)	78.3	1.2%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Depth to bedrock (0.71)		
				Droughty (0.47)		
AnC	Angola silt loam, 8 to 15 percent slopes	Very limited	Angola (75%)	Slow water movement (1.00)	49.4	0.8%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Depth to bedrock (0.71)		
				Slope (0.63)		
ApA	Appleton silt loam, 0 to 3 percent slopes	Very limited	Appleton (85%)	Depth to saturated zone (1.00)	56.2	0.9%
				Leaching (0.70)		
			Lima (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
			Lyons (4%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
			Darien (3%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Leaching (0.50)		
			Churchville (3%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
ApB	Appleton silt loam, 3 to 8 percent slopes	Very limited	Appleton (80%)	Depth to saturated zone (1.00)	20.9	0.3%
				Leaching (0.70)		
			Conesus (7%)	Depth to saturated zone (1.00)		
				Leaching (0.70)		
				Too acid (0.01)		
			Lyons (5%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
			Darien (4%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
			Churchville (4%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
ArB	Arnot channery silt loam, 3 to 8 percent slopes	Very limited	Arnot (85%)	Droughty (1.00)	6.8	0.1%
				Depth to bedrock (1.00)		
				Runoff (0.40)		
				Too acid (0.32)		
				Cobble content (0.08)		
			Tuller, somewhat poorly drained (5%)	Slow water movement (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Droughty (1.00)		
				Depth to bedrock (1.00)		
				Too acid (0.62)		
ArC	Arnot channery silt loam, 8 to 15 percent slopes	Very limited	Arnot (85%)	Droughty (1.00)	73.3	1.2%
				Depth to bedrock (1.00)		
				Slope (0.63)		
				Too acid (0.62)		
				Runoff (0.40)		
			Lordstown, very stony (10%)	Slope (1.00)		
				Droughty (0.69)		
				Too acid (0.62)		
				Large stones (0.53)		
				Depth to bedrock (0.46)		
			Tuller, somewhat poorly drained (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Droughty (1.00)		
				Depth to bedrock (1.00)		
				Too acid (0.62)		
AuB	Aurora channery silt loam, 3 to 8 percent slopes	Very limited	Aurora (80%)	Slow water movement (1.00)	5.6	0.1%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
				Depth to bedrock (0.95)		
AuD	Aurora channery silt loam, 15 to 25 percent slopes	Very limited	Aurora (80%)	Slope (1.00)	6.6	0.1%
				Slow water movement (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
BuB	Burdett silt loam, 3 to 8 percent slopes	Very limited	Burdett (75%)	Slow water movement (1.00)	450.3	7.1%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Leaching (0.50)		
				Too acid (0.02)		
BuC	Burdett silt loam, 8 to 15 percent slopes	Very limited	Burdett (75%)	Slow water movement (1.00)	40.3	0.6%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Slope (0.63)		
				Leaching (0.50)		
BuD	Burdett silt loam, 15 to 25 percent slopes	Very limited	Burdett (75%)	Slope (1.00)	6.2	0.1%
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Leaching (0.50)		
Ce	Castile gravelly silt loam	Very limited	Castile (80%)	Filtering capacity (1.00)	41.1	0.6%
				Depth to saturated zone (1.00)		
				Leaching (0.90)		
				Droughty (0.80)		
				Too acid (0.32)		
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	Very limited	Chenango (75%)	Filtering capacity (1.00)	61.2	1.0%
				Leaching (0.45)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Droughty (0.42)		
				Too acid (0.32)		
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	Very limited	Chenango (75%)	Filtering capacity (1.00)	6.1	0.1%
				Droughty (0.63)		
				Leaching (0.45)		
				Too acid (0.32)		
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	Very limited	Chenango, fan (80%)	Filtering capacity (1.00)	57.0	0.9%
				Droughty (0.68)		
				Leaching (0.45)		
				Too acid (0.32)		
CrA	Collamer silt loam, 0 to 3 percent slopes	Very limited	Collamer (80%)	Depth to saturated zone (1.00)	12.0	0.2%
				Slow water movement (0.81)		
				Leaching (0.50)		
				Too acid (0.02)		
CrB	Collamer silt loam, 3 to 8 percent slopes	Very limited	Collamer (80%)	Depth to saturated zone (1.00)	12.3	0.2%
				Slow water movement (0.81)		
				Leaching (0.50)		
				Too acid (0.02)		
CsA	Conesus silt loam, 0 to 3 percent slopes	Very limited	Conesus (85%)	Depth to saturated zone (1.00)	13.8	0.2%
				Leaching (0.70)		
				Too acid (0.01)		
			Kendaia (3%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
			Appleton (2%)	Depth to saturated zone (1.00)		
				Dense layer (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Slow water movement (0.81)		
				Leaching (0.50)		
			Nunda (2%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
			Lyons (1%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
CsB	Conesus silt loam, 3 to 8 percent slopes	Very limited	Conesus (85%)	Depth to saturated zone (1.00)	252.2	4.0%
				Leaching (0.70)		
				Too acid (0.01)		
			Kendaia (3%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
			Nunda (2%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
			Appleton (2%)	Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Slow water movement (0.81)		
				Leaching (0.50)		
			Lyons (1%)	Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Slow water movement (1.00)		
				Leaching (0.50)		
CsC	Conesus silt loam, 8 to 15 percent slopes	Very limited	Conesus (85%)	Depth to saturated zone (1.00)	56.3	0.9%
				Leaching (0.70)		
				Slope (0.37)		
				Too acid (0.01)		
			Kendaia (3%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
				Slope (0.37)		
			Nunda (2%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
				Slope (0.37)		
			Appleton (2%)	Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Slow water movement (0.81)		
				Leaching (0.50)		
				Slope (0.37)		
DkC	Dunkirk silt loam, 8 to 15 percent slopes	Somewhat limited	Dunkirk (80%)	Slope (0.63)	20.2	0.3%
				Slow water movement (0.50)		
				Too acid (0.02)		
DUE3	Dunkirk and Hudson soils, steep, severely eroded	Very limited	Dunkirk, severely eroded (45%)	Slope (1.00)	16.1	0.3%
				Slow water movement (0.50)		
				Too acid (0.02)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Hudson (40%)	Slope (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
				Too acid (0.02)		
ErB	Erie silt loam, 3 to 8 percent slopes	Very limited	Erie (80%)	Slow water movement (1.00)	26.5	0.4%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
				Runoff (0.40)		
			Langford (10%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (0.83)		
				Slope (0.63)		
			Chippewa (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
				Runoff (0.40)		
			Fremont (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Runoff (0.40)		
				Too acid (0.32)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
FF	Fluvaquents-Udifluvents complex, frequently flooded	Very limited	Fluvaquents (41%)	Ponding (1.00)	3.1	0.0%
				Depth to saturated zone (1.00)		
				Flooding (1.00)		
				Leaching (0.90)		
				Too acid (0.08)		
			Udifluvents (39%)	Flooding (1.00)		
				Leaching (0.45)		
				Too acid (0.08)		
Ha	Halsey mucky silt loam	Very limited	Halsey (80%)	Filtering capacity (1.00)	40.0	0.6%
				Depth to saturated zone (1.00)		
				Leaching (0.70)		
HnB	Hornell channery silt loam, 3 to 8 percent slopes	Very limited	Hornell (80%)	Slow water movement (1.00)	10.2	0.2%
				Depth to saturated zone (1.00)		
				Too acid (0.73)		
				Runoff (0.40)		
				Droughty (0.30)		
HrA	Howard gravelly loam, 0 to 3 percent slopes	Very limited	Howard (80%)	Filtering capacity (1.00)	58.4	0.9%
				Droughty (0.71)		
				Leaching (0.45)		
				Too acid (0.02)		
HrB	Howard gravelly loam, 3 to 8 percent slopes	Very limited	Howard (80%)	Filtering capacity (1.00)	404.1	6.4%
				Droughty (0.74)		
				Leaching (0.45)		
				Too acid (0.02)		
HrC	Howard gravelly loam, 8 to 15 percent slopes	Very limited	Howard (80%)	Filtering capacity (1.00)	396.7	6.3%
				Droughty (0.75)		
				Slope (0.63)		
				Leaching (0.45)		
				Too acid (0.02)		
HrCK	Howard gravelly loam, rolling	Very limited	Howard (80%)	Filtering capacity (1.00)	35.5	0.6%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Droughty (0.77)		
				Leaching (0.45)		
				Slope (0.04)		
				Too acid (0.02)		
HSD	Howard soils, moderately steep	Very limited	Howard (80%)	Slope (1.00)	66.6	1.1%
				Filtering capacity (1.00)		
				Droughty (0.78)		
				Leaching (0.45)		
				Too acid (0.02)		
HSE	Howard soils, steep	Very limited	Howard (80%)	Slope (1.00)	41.7	0.7%
				Filtering capacity (1.00)		
				Droughty (0.78)		
				Leaching (0.45)		
				Too acid (0.02)		
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	Very limited	Hudson (75%)	Slow water movement (1.00)	45.9	0.7%
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
				Too acid (0.02)		
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	Very limited	Hudson (80%)	Slow water movement (1.00)	166.3	2.6%
				Depth to saturated zone (1.00)		
				Slope (0.63)		
				Leaching (0.50)		
				Too acid (0.02)		
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Lansing (85%)	Too acid (0.11)	208.5	3.3%
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Lansing (85%)	Slope (0.37)	352.1	5.6%
				Too acid (0.11)		
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	Very limited	Lansing (85%)	Slope (1.00)	136.3	2.1%
				Too acid (0.11)		
			Conesus (9%)	Slope (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Leaching (0.70)		
				Too acid (0.01)		
			Wassaic (3%)	Slope (1.00)		
				Slow water movement (1.00)		
				Droughty (0.77)		
				Depth to bedrock (0.46)		
			Kendaia (2%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Leaching (0.50)		
				Slope (0.16)		
			Appleton (1%)	Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Slow water movement (0.81)		
				Leaching (0.50)		
				Slope (0.16)		
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	Somewhat limited	Lordstown (90%)	Droughty (0.72)	12.8	0.2%
				Depth to bedrock (0.46)		
				Too acid (0.22)		
				Cobble content (0.01)		
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	Somewhat limited	Lordstown (90%)	Droughty (0.72)	225.1	3.6%
				Slope (0.63)		
				Depth to bedrock (0.46)		
				Too acid (0.22)		
				Cobble content (0.01)		
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	Very limited	Lordstown (85%)	Slope (1.00)	267.5	4.2%
				Droughty (0.72)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to bedrock (0.46)		
				Too acid (0.22)		
				Cobble content (0.01)		
			Arnot (5%)	Droughty (1.00)		
				Depth to bedrock (1.00)		
				Slope (0.63)		
				Too acid (0.62)		
				Runoff (0.40)		
			Mardin (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (0.91)		
				Slope (0.63)		
			Cadosia, very stony (5%)	Slope (1.00)		
				Large stones (0.76)		
				Too acid (0.62)		
				Cobble content (0.13)		
LTE	Lordstown-Arnot complex, steep, rocky	Very limited	Lordstown, very stony (50%)	Slope (1.00)	177.3	2.8%
				Droughty (0.69)		
				Too acid (0.62)		
				Depth to bedrock (0.46)		
				Large stones (0.19)		
			Arnot, very stony (35%)	Droughty (1.00)		
				Depth to bedrock (1.00)		
				Slope (1.00)		
				Too acid (0.62)		
				Runoff (0.40)		
			Cadosia, extremely stony (10%)	Slope (1.00)		
				Large stones (1.00)		
				Too acid (0.62)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Cobble content (0.13)		
			Bath (4%)	Slow water movement (1.00)		
				Slope (1.00)		
				Depth to saturated zone (0.95)		
				Droughty (0.40)		
				Too acid (0.11)		
LTF	Lordstown-Arnot complex, very steep, very rocky	Very limited	Lordstown, very stony (50%)	Slope (1.00)	103.0	1.6%
				Droughty (0.69)		
				Too acid (0.62)		
				Depth to bedrock (0.46)		
				Large stones (0.19)		
			Arnot, very stony (35%)	Slope (1.00)		
				Droughty (1.00)		
				Depth to bedrock (1.00)		
				Too acid (0.62)		
				Runoff (0.40)		
			Cadosia, extremely stony (10%)	Slope (1.00)		
				Large stones (1.00)		
				Too acid (0.62)		
				Cobble content (0.13)		
Ma	Madalin silt loam, 0 to 3 percent slopes	Very limited	Madalin (85%)	Slow water movement (1.00)	32.5	0.5%
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
				Too acid (0.01)		
			Rhinebeck (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Canandaigua (4%)	Depth to saturated zone (1.00)		
				Slow water movement (0.50)		
				Leaching (0.50)		
			Fonda (4%)	Slow water movement (1.00)		
				Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
			Cosad (2%)	Filtering capacity (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Droughty (1.00)		
				Leaching (0.50)		
MrB	Mardin channery silt loam, 3 to 8 percent slopes	Very limited	Mardin (85%)	Slow water movement (1.00)	16.4	0.3%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (0.91)		
				Runoff (0.40)		
			Bath (5%)	Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Slope (0.63)		
				Droughty (0.47)		
				Too acid (0.11)		
			Volusia (5%)	Slow water movement (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
				Runoff (0.40)		
MrC	Mardin channery silt loam, 8 to 15 percent slopes	Very limited	Mardin (88%)	Slow water movement (1.00)	1.4	0.0%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (0.91)		
				Slope (0.63)		
			Bath (5%)	Slope (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Droughty (0.47)		
				Too acid (0.11)		
			Volusia (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
				Runoff (0.40)		
			Lordstown (2%)	Slope (1.00)		
				Droughty (0.72)		
				Depth to bedrock (0.46)		
				Too acid (0.22)		
				Cobble content (0.01)		
MrD	Mardin channery silt loam, 15 to 25 percent slopes	Very limited	Mardin (85%)	Slope (1.00)	3.7	0.1%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (0.91)		
			Lordstown (5%)	Slope (1.00)		
				Droughty (0.69)		
				Too acid (0.62)		
				Depth to bedrock (0.46)		
				Cobble content (0.02)		
			Volusia (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Droughty (1.00)		
				Slope (0.63)		
			Bath (5%)	Slope (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Droughty (0.40)		
				Too acid (0.11)		
OdB	Odessa silt loam, 3 to 8 percent slopes	Very limited	Odessa (85%)	Slow water movement (1.00)	138.3	2.2%
				Depth to saturated zone (1.00)		
				Runoff (0.40)		
				Too acid (0.01)		
			Schoharie (6%)	Slow water movement (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.95)		
				Runoff (0.40)		
			Lakemont (4%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Runoff (0.40)		
			Churchville (3%)	Depth to saturated zone (1.00)		
				Droughty (1.00)		
				Slow water movement (1.00)		
				Shallow to densic materials (0.84)		
				Leaching (0.50)		
			Rhinebeck (2%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
Pt	Pits, gravel	Not rated	Pits, gravel (80%)		27.1	0.4%
			Unnamed soils (5%)			
			Chenango (5%)			
			Halsey (5%)			
			Red Hook (5%)			
Rh	Red Hook gravelly silt loam	Very limited	Red Hook (75%)	Depth to saturated zone (1.00)	35.9	0.6%
				Leaching (0.70)		
				Droughty (0.26)		
				Too acid (0.11)		
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	Very limited	Rhinebeck (80%)	Slow water movement (1.00)	14.2	0.2%
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Leaching (0.50)		
				Too acid (0.02)		
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	Very limited	Rhinebeck (80%)	Slow water movement (1.00)	80.9	1.3%
				Depth to saturated zone (1.00)		
				Leaching (0.50)		
				Too acid (0.02)		
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	Not rated	Rock outcrop (55%)		134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	Very limited	Schoharie (85%)	Slow water movement (1.00)	94.7	1.5%
				Depth to saturated zone (0.86)		
				Runoff (0.40)		
			Odessa (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Runoff (0.40)		
				Too acid (0.01)		
			Cazenovia (5%)	Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
			Cayuga (3%)	Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Runoff (0.40)		
			Collamer (2%)	Depth to saturated zone (1.00)		
				Slow water movement (0.81)		
				Leaching (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Too acid (0.02)		
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	Very limited	Schoharie (85%)	Slow water movement (1.00)	343.8	5.4%
				Depth to saturated zone (0.86)		
				Runoff (0.40)		
				Slope (0.37)		
			Odessa (5%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Runoff (0.40)		
				Slope (0.37)		
				Too acid (0.01)		
			Cazenovia (5%)	Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Slope (0.37)		
			Cayuga (3%)	Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Runoff (0.40)		
				Slope (0.37)		
			Collamer (2%)	Depth to saturated zone (1.00)		
				Slow water movement (0.81)		
				Leaching (0.50)		
				Slope (0.37)		
				Too acid (0.02)		
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	Very limited	Schoharie (85%)	Slope (1.00)	28.7	0.5%
				Slow water movement (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.86)		
				Runoff (0.40)		
			Cazenovia (5%)	Slope (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
			Odessa (5%)	Slope (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Runoff (0.40)		
				Too acid (0.01)		
			Cayuga (3%)	Slope (1.00)		
				Slow water movement (1.00)		
				Depth to saturated zone (0.95)		
				Runoff (0.40)		
			Collamer (2%)	Slope (1.00)		
				Depth to saturated zone (1.00)		
				Slow water movement (0.81)		
				Leaching (0.50)		
				Too acid (0.02)		
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	Very limited	Schoharie variant (75%)	Slow water movement (1.00)	68.7	1.1%
				Depth to saturated zone (1.00)		
				Depth to bedrock (0.90)		
				Droughty (0.82)		
				Slope (0.63)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	Very limited	Schoharie variant (75%)	Slope (1.00)	189.5	3.0%
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Depth to bedrock (0.97)		
				Droughty (0.94)		
TuC	Tuller channery silt loam, 8 to 15 percent slopes	Very limited	Tuller (75%)	Slow water movement (1.00)	8.3	0.1%
				Depth to saturated zone (1.00)		
				Droughty (1.00)		
				Depth to bedrock (1.00)		
				Slope (0.63)		
UD	Udorthents, smoothed	Somewhat limited	Udorthents (75%)	Leaching (0.45)	3.6	0.1%
				Too acid (0.08)		
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	Somewhat limited	Valois (80%)	Too acid (0.62)	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Valois (80%)	Slope (0.63)	204.1	3.2%
				Too acid (0.62)		
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	Very limited	Valois (75%)	Slope (1.00)	204.4	3.2%
				Too acid (0.62)		
				Droughty (0.01)		
VEE	Valois soils, steep	Very limited	Valois (75%)	Slope (1.00)	127.0	2.0%
				Too acid (0.62)		
				Droughty (0.01)		
VHF	Valois and Howard soils, very steep	Very limited	Valois (40%)	Slope (1.00)	249.0	3.9%
				Too acid (0.62)		
				Droughty (0.08)		
			Howard (35%)	Slope (1.00)		
				Filtering capacity (1.00)		
				Droughty (0.93)		
				Leaching (0.45)		
				Too acid (0.02)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
W	Water	Not rated	Water (100%)		75.0	1.2%
Subtotals for Soil Survey Area					**6,337.0**	**99.9%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	Very limited	Aurora (80%)	Slow water movement (1.00)	0.0	0.0%
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Runoff (0.40)		
				Droughty (0.31)		
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	Very limited	Aurora (41%)	Slope (1.00)	0.1	0.0%
				Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Dense layer (1.00)		
				Runoff (0.40)		
			Farmington (39%)	Slope (1.00)		
				Slow water movement (1.00)		
				Droughty (1.00)		
				Depth to bedrock (1.00)		
				Runoff (0.40)		
HnB	Honeoye silt loam, 3 to 8 percent slopes	Somewhat limited	Honeoye (85%)	Too acid (0.01)	1.1	0.0%
			Lansing (4%)	Too acid (0.11)		
HnC	Honeoye silt loam, 8 to 15 percent slopes	Somewhat limited	Honeoye (85%)	Slope (0.63)	2.3	0.0%
				Too acid (0.01)		
			Lansing (4%)	Slope (0.63)		
				Too acid (0.11)		
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	Somewhat limited	Lansing (85%)	Slope (0.37)	0.3	0.0%
				Too acid (0.11)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area					**3.8**	**0.1%**
Totals for Area of Interest					**6,340.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	4,938.9	77.9%
Somewhat limited	1,165.3	18.4%
Null or Not Rated	236.6	3.7%
Totals for Area of Interest	**6,340.9**	**100.0%**

Rating Options—Manure and Food-Processing Waste

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

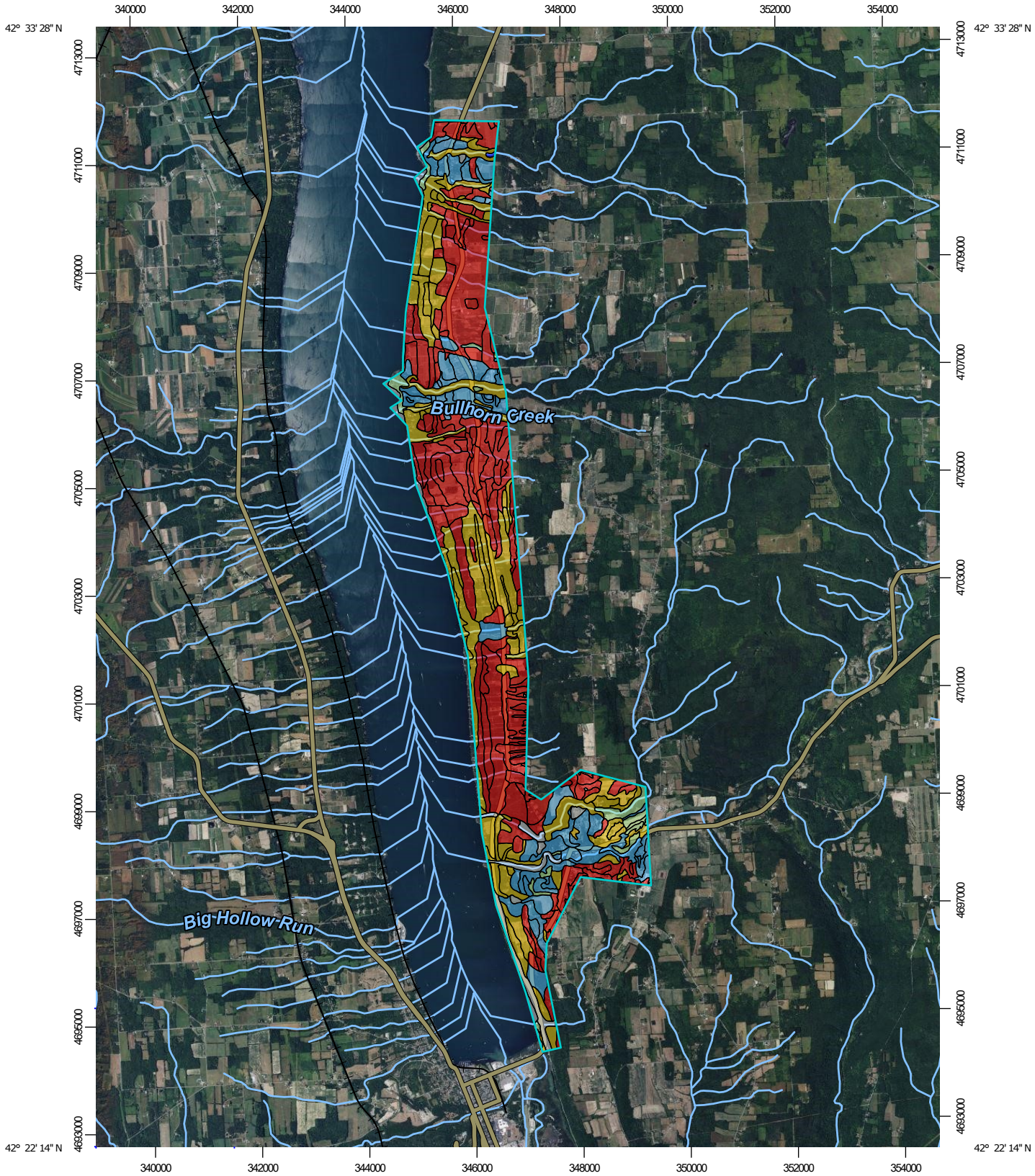
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 7.1721
- > 7.1721 and <= 21.2100
- > 21.2100 and <= 46.1885
- > 46.1885 and <= 52.9836
- > 52.9836 and <= 70.7622
- Not rated or not available

Soil Rating Lines

- <= 7.1721
- > 7.1721 and <= 21.2100
- > 21.2100 and <= 46.1885
- > 46.1885 and <= 52.9836
- > 52.9836 and <= 70.7622
- Not rated or not available

Soil Rating Points

- <= 7.1721
- > 7.1721 and <= 21.2100
- > 21.2100 and <= 46.1885
- > 46.1885 and <= 52.9836
- > 52.9836 and <= 70.7622
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	2.8435	78.3	1.2%
AnC	Angola silt loam, 8 to 15 percent slopes	2.8435	49.4	0.8%
ApA	Appleton silt loam, 0 to 3 percent slopes	6.6803	56.2	0.9%
ApB	Appleton silt loam, 3 to 8 percent slopes	6.6803	20.9	0.3%
ArB	Arnot channery silt loam, 3 to 8 percent slopes	8.1618	6.8	0.1%
ArC	Arnot channery silt loam, 8 to 15 percent slopes	9.4853	73.3	1.2%
AuB	Aurora channery silt loam, 3 to 8 percent slopes	3.1107	5.6	0.1%
AuD	Aurora channery silt loam, 15 to 25 percent slopes	1.9382	6.6	0.1%
BuB	Burdett silt loam, 3 to 8 percent slopes	4.0930	450.3	7.1%
BuC	Burdett silt loam, 8 to 15 percent slopes	4.0930	40.3	0.6%
BuD	Burdett silt loam, 15 to 25 percent slopes	3.6288	6.2	0.1%
Ce	Castile gravelly silt loam	44.1639	41.1	0.6%
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	38.8361	61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	44.4918	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	46.1885	57.0	0.9%
CrA	Collamer silt loam, 0 to 3 percent slopes	4.4919	12.0	0.2%
CrB	Collamer silt loam, 3 to 8 percent slopes	4.4919	12.3	0.2%
CsA	Conesus silt loam, 0 to 3 percent slopes	5.9426	13.8	0.2%
CsB	Conesus silt loam, 3 to 8 percent slopes	5.9426	252.2	4.0%
CsC	Conesus silt loam, 8 to 15 percent slopes	5.9426	56.3	0.9%
DkC	Dunkirk silt loam, 8 to 15 percent slopes	4.1459	20.2	0.3%

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
DUE3	Dunkirk and Hudson soils, steep, severely eroded	3.2164	16.1	0.3%
ErB	Erie silt loam, 3 to 8 percent slopes	2.0918	26.5	0.4%
FF	Fluvaquents-Udifluvents complex, frequently flooded	70.7622	3.1	0.0%
Ha	Halsey mucky silt loam	52.9344	40.0	0.6%
HnB	Hornell channery silt loam, 3 to 8 percent slopes	1.9403	10.2	0.2%
HrA	Howard gravelly loam, 0 to 3 percent slopes	52.9836	58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	52.9836	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	52.9836	396.7	6.3%
HrCK	Howard gravelly loam, rolling	52.9836	35.5	0.6%
HSD	Howard soils, moderately steep	52.9836	66.6	1.1%
HSE	Howard soils, steep	52.9836	41.7	0.7%
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	2.1275	45.9	0.7%
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	1.7339	166.3	2.6%
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	7.1721	208.5	3.3%
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	7.1721	352.1	5.6%
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	7.1721	136.3	2.1%
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	8.7624	12.8	0.2%
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	8.7624	225.1	3.6%
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	8.7624	267.5	4.2%
LTE	Lordstown-Arnot complex, steep, rocky	10.0990	177.3	2.8%

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
LTF	Lordstown-Arnot complex, very steep, very rocky	10.0990	103.0	1.6%
Ma	Madalin silt loam, 0 to 3 percent slopes	1.2070	32.5	0.5%
MrB	Mardin channery silt loam, 3 to 8 percent slopes	4.2385	16.4	0.3%
MrC	Mardin channery silt loam, 8 to 15 percent slopes	4.2385	1.4	0.0%
MrD	Mardin channery silt loam, 15 to 25 percent slopes	4.2385	3.7	0.1%
OdB	Odessa silt loam, 3 to 8 percent slopes	1.9246	138.3	2.2%
Pt	Pits, gravel		27.1	0.4%
Rh	Red Hook gravelly silt loam	8.4566	35.9	0.6%
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	1.2475	14.2	0.2%
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	1.1301	80.9	1.3%
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes		134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	1.7852	94.7	1.5%
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	1.7852	343.8	5.4%
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	1.7852	28.7	0.5%
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	1.1607	68.7	1.1%
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	0.9709	189.5	3.0%
TuC	Tuller channery silt loam, 8 to 15 percent slopes	3.0775	8.3	0.1%
UD	Udorthents, smoothed	21.2100	3.6	0.1%
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	12.5574	135.2	2.1%

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	12.5574	204.1	3.2%
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	14.2787	204.4	3.2%
VEE	Valois soils, steep	14.2787	127.0	2.0%
VHF	Valois and Howard soils, very steep	15.6557	249.0	3.9%
W	Water		75.0	1.2%
Subtotals for Soil Survey Area			**6,337.0**	**99.9%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	3.7443	0.0	0.0%
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	3.7443	0.1	0.0%
HnB	Honeoye silt loam, 3 to 8 percent slopes	6.4754	1.1	0.0%
HnC	Honeoye silt loam, 8 to 15 percent slopes	6.4754	2.3	0.0%
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	7.1721	0.3	0.0%
Subtotals for Soil Survey Area			**3.8**	**0.1%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 48

Units of Measure: Inches

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

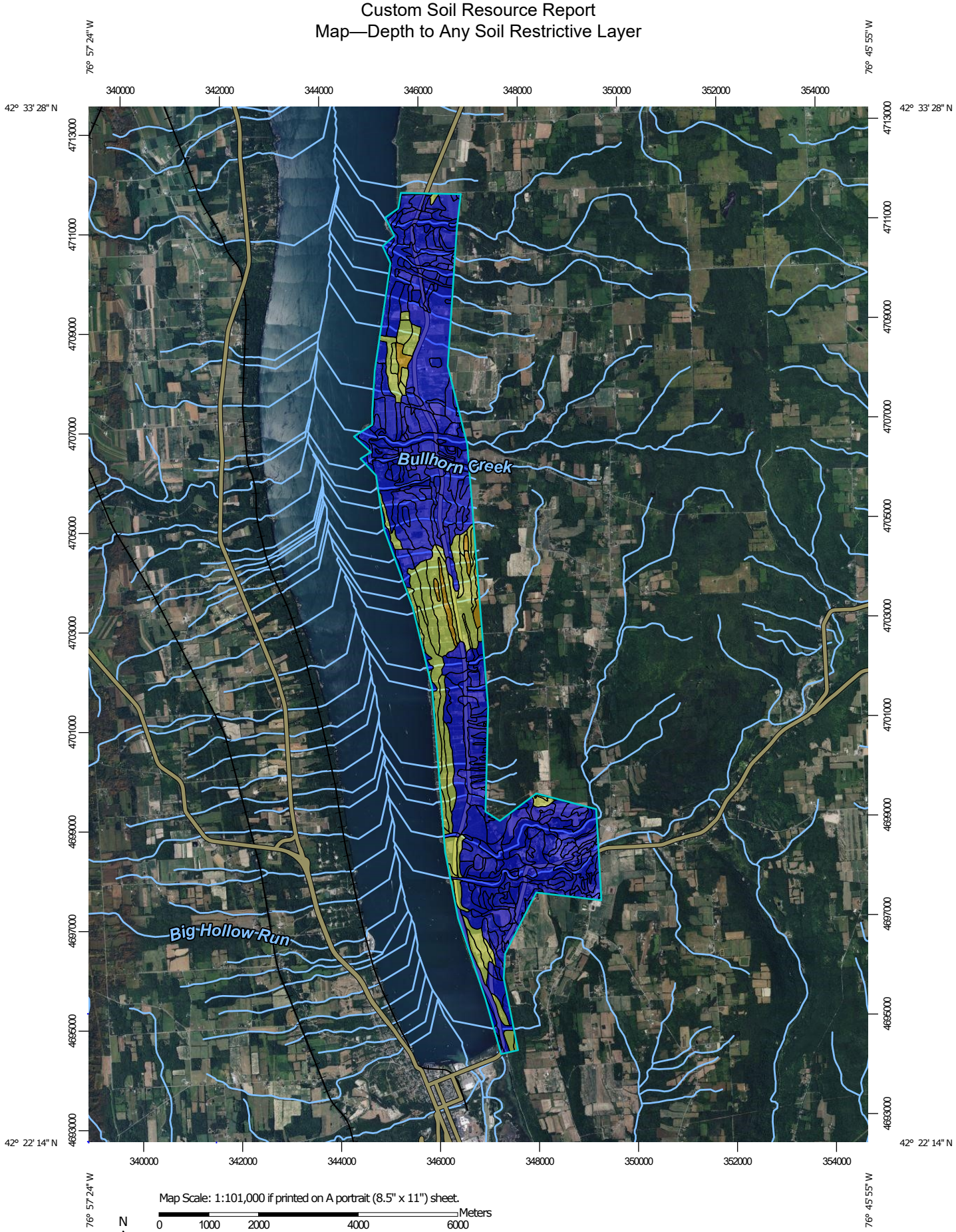
Depth to Any Soil Restrictive Layer

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "greater than 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	69	78.3	1.2%
AnC	Angola silt loam, 8 to 15 percent slopes	69	49.4	0.8%
ApA	Appleton silt loam, 0 to 3 percent slopes	>200	56.2	0.9%
ApB	Appleton silt loam, 3 to 8 percent slopes	>200	20.9	0.3%
ArB	Arnot channery silt loam, 3 to 8 percent slopes	43	6.8	0.1%
ArC	Arnot channery silt loam, 8 to 15 percent slopes	43	73.3	1.2%
AuB	Aurora channery silt loam, 3 to 8 percent slopes	58	5.6	0.1%
AuD	Aurora channery silt loam, 15 to 25 percent slopes	58	6.6	0.1%
BuB	Burdett silt loam, 3 to 8 percent slopes	>200	450.3	7.1%
BuC	Burdett silt loam, 8 to 15 percent slopes	>200	40.3	0.6%
BuD	Burdett silt loam, 15 to 25 percent slopes	>200	6.2	0.1%
Ce	Castile gravelly silt loam	>200	41.1	0.6%
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	>200	61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	>200	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	>200	57.0	0.9%
CrA	Collamer silt loam, 0 to 3 percent slopes	>200	12.0	0.2%
CrB	Collamer silt loam, 3 to 8 percent slopes	>200	12.3	0.2%
CsA	Conesus silt loam, 0 to 3 percent slopes	>200	13.8	0.2%
CsB	Conesus silt loam, 3 to 8 percent slopes	>200	252.2	4.0%
CsC	Conesus silt loam, 8 to 15 percent slopes	>200	56.3	0.9%
DkC	Dunkirk silt loam, 8 to 15 percent slopes	>200	20.2	0.3%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
DUE3	Dunkirk and Hudson soils, steep, severely eroded	>200	16.1	0.3%
ErB	Erie silt loam, 3 to 8 percent slopes	38	26.5	0.4%
FF	Fluvaquents-Udifluvents complex, frequently flooded	>200	3.1	0.0%
Ha	Halsey mucky silt loam	>200	40.0	0.6%
HnB	Hornell channery silt loam, 3 to 8 percent slopes	99	10.2	0.2%
HrA	Howard gravelly loam, 0 to 3 percent slopes	>200	58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	>200	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	>200	396.7	6.3%
HrCK	Howard gravelly loam, rolling	>200	35.5	0.6%
HSD	Howard soils, moderately steep	>200	66.6	1.1%
HSE	Howard soils, steep	>200	41.7	0.7%
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	>200	45.9	0.7%
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	>200	166.3	2.6%
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	>200	208.5	3.3%
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	>200	352.1	5.6%
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	>200	136.3	2.1%
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	76	12.8	0.2%
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	76	225.1	3.6%
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	76	267.5	4.2%
LTE	Lordstown-Arnot complex, steep, rocky	76	177.3	2.8%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
LTF	Lordstown-Arnot complex, very steep, very rocky	76	103.0	1.6%
Ma	Madalin silt loam, 0 to 3 percent slopes	>200	32.5	0.5%
MrB	Mardin channery silt loam, 3 to 8 percent slopes	51	16.4	0.3%
MrC	Mardin channery silt loam, 8 to 15 percent slopes	51	1.4	0.0%
MrD	Mardin channery silt loam, 15 to 25 percent slopes	51	3.7	0.1%
OdB	Odessa silt loam, 3 to 8 percent slopes	>200	138.3	2.2%
Pt	Pits, gravel	>200	27.1	0.4%
Rh	Red Hook gravelly silt loam	>200	35.9	0.6%
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	>200	14.2	0.2%
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	>200	80.9	1.3%
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	>200	134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	>200	94.7	1.5%
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	>200	343.8	5.4%
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	>200	28.7	0.5%
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	61	68.7	1.1%
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	56	189.5	3.0%
TuC	Tuller channery silt loam, 8 to 15 percent slopes	38	8.3	0.1%
UD	Udorthents, smoothed	>200	3.6	0.1%
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	>200	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	>200	204.1	3.2%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	>200	204.4	3.2%
VEE	Valois soils, steep	>200	127.0	2.0%
VHF	Valois and Howard soils, very steep	>200	249.0	3.9%
W	Water	>200	75.0	1.2%
Subtotals for Soil Survey Area			**6,337.0**	**99.9%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	81	0.0	0.0%
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	81	0.1	0.0%
HnB	Honeoye silt loam, 3 to 8 percent slopes	>200	1.1	0.0%
HnC	Honeoye silt loam, 8 to 15 percent slopes	>200	2.3	0.0%
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	>200	0.3	0.0%
Subtotals for Soil Survey Area			**3.8**	**0.1%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

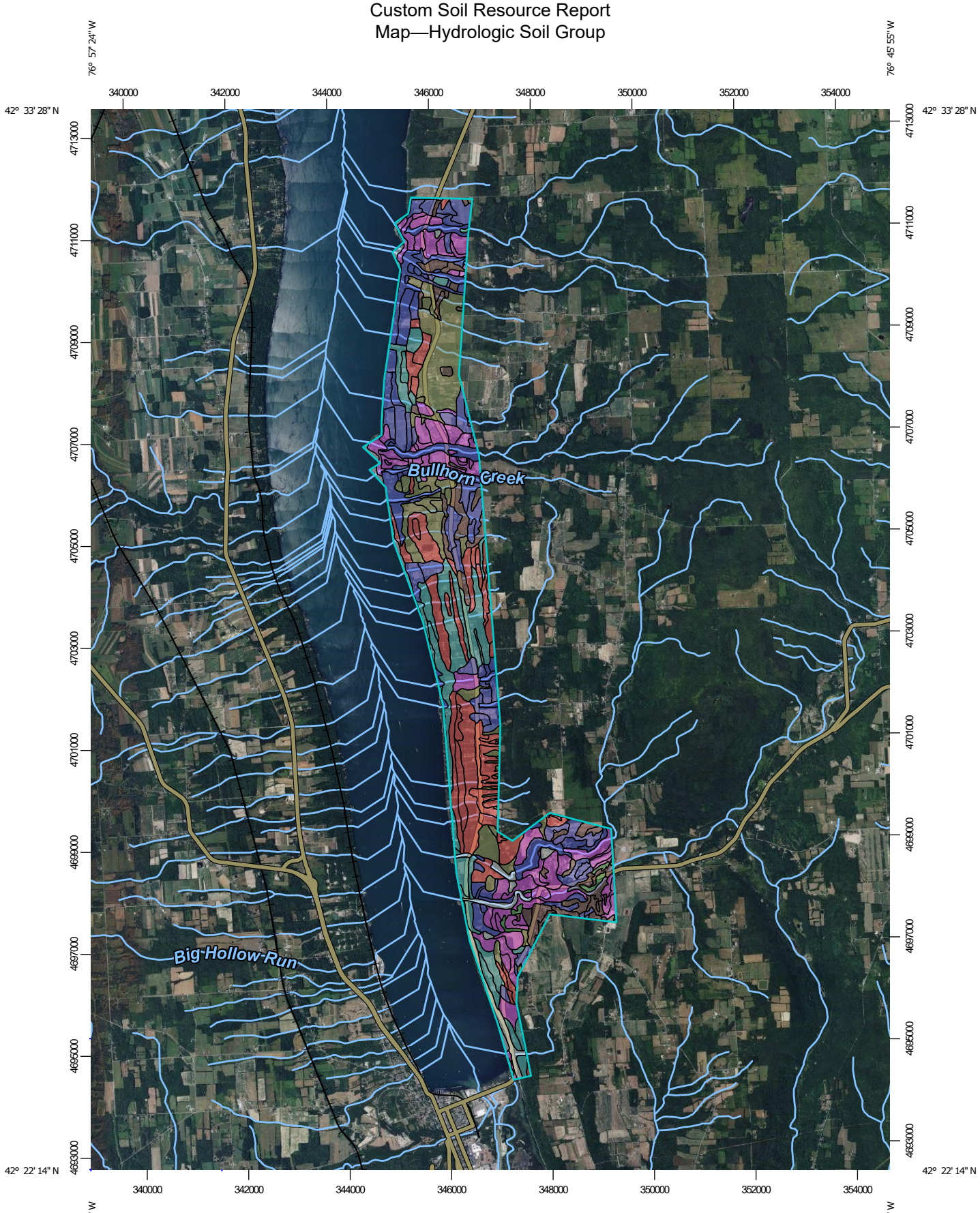
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	D	78.3	1.2%
AnC	Angola silt loam, 8 to 15 percent slopes	D	49.4	0.8%
ApA	Appleton silt loam, 0 to 3 percent slopes	B/D	56.2	0.9%
ApB	Appleton silt loam, 3 to 8 percent slopes	B/D	20.9	0.3%
ArB	Arnot channery silt loam, 3 to 8 percent slopes	D	6.8	0.1%
ArC	Arnot channery silt loam, 8 to 15 percent slopes	D	73.3	1.2%
AuB	Aurora channery silt loam, 3 to 8 percent slopes	D	5.6	0.1%
AuD	Aurora channery silt loam, 15 to 25 percent slopes	D	6.6	0.1%
BuB	Burdett silt loam, 3 to 8 percent slopes	C/D	450.3	7.1%
BuC	Burdett silt loam, 8 to 15 percent slopes	C/D	40.3	0.6%
BuD	Burdett silt loam, 15 to 25 percent slopes	C/D	6.2	0.1%
Ce	Castile gravelly silt loam	A/D	41.1	0.6%
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	A	61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	A	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	A	57.0	0.9%
CrA	Collamer silt loam, 0 to 3 percent slopes	C/D	12.0	0.2%
CrB	Collamer silt loam, 3 to 8 percent slopes	C/D	12.3	0.2%
CsA	Conesus silt loam, 0 to 3 percent slopes	B/D	13.8	0.2%
CsB	Conesus silt loam, 3 to 8 percent slopes	B/D	252.2	4.0%
CsC	Conesus silt loam, 8 to 15 percent slopes	B/D	56.3	0.9%
DkC	Dunkirk silt loam, 8 to 15 percent slopes	C	20.2	0.3%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DUE3	Dunkirk and Hudson soils, steep, severely eroded	C	16.1	0.3%
ErB	Erie silt loam, 3 to 8 percent slopes	D	26.5	0.4%
FF	Fluvaquents-Udifluvents complex, frequently flooded	A/D	3.1	0.0%
Ha	Halsey mucky silt loam	B/D	40.0	0.6%
HnB	Hornell channery silt loam, 3 to 8 percent slopes	D	10.2	0.2%
HrA	Howard gravelly loam, 0 to 3 percent slopes	A	58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	A	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	A	396.7	6.3%
HrCK	Howard gravelly loam, rolling	A	35.5	0.6%
HSD	Howard soils, moderately steep	A	66.6	1.1%
HSE	Howard soils, steep	A	41.7	0.7%
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	C/D	45.9	0.7%
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	C/D	166.3	2.6%
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	B	208.5	3.3%
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	B	352.1	5.6%
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	B	136.3	2.1%
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	C	12.8	0.2%
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	C	225.1	3.6%
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	C	267.5	4.2%
LTE	Lordstown-Arnot complex, steep, rocky	C	177.3	2.8%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
LTF	Lordstown-Arnot complex, very steep, very rocky	C	103.0	1.6%
Ma	Madalin silt loam, 0 to 3 percent slopes	C/D	32.5	0.5%
MrB	Mardin channery silt loam, 3 to 8 percent slopes	D	16.4	0.3%
MrC	Mardin channery silt loam, 8 to 15 percent slopes	D	1.4	0.0%
MrD	Mardin channery silt loam, 15 to 25 percent slopes	D	3.7	0.1%
OdB	Odessa silt loam, 3 to 8 percent slopes	D	138.3	2.2%
Pt	Pits, gravel		27.1	0.4%
Rh	Red Hook gravelly silt loam	B/D	35.9	0.6%
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	C/D	14.2	0.2%
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	C/D	80.9	1.3%
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes		134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	D	94.7	1.5%
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	D	343.8	5.4%
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	D	28.7	0.5%
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	D	68.7	1.1%
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	D	189.5	3.0%
TuC	Tuller channery silt loam, 8 to 15 percent slopes	D	8.3	0.1%
UD	Udorthents, smoothed	A	3.6	0.1%
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	B	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	B	204.1	3.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	B	204.4	3.2%
VEE	Valois soils, steep	B	127.0	2.0%
VHF	Valois and Howard soils, very steep	B	249.0	3.9%
W	Water		75.0	1.2%
Subtotals for Soil Survey Area			**6,337.0**	**99.9%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	D	0.0	0.0%
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	D	0.1	0.0%
HnB	Honeoye silt loam, 3 to 8 percent slopes	B	1.1	0.0%
HnC	Honeoye silt loam, 8 to 15 percent slopes	B	2.3	0.0%
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	B	0.3	0.0%
Subtotals for Soil Survey Area			**3.8**	**0.1%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

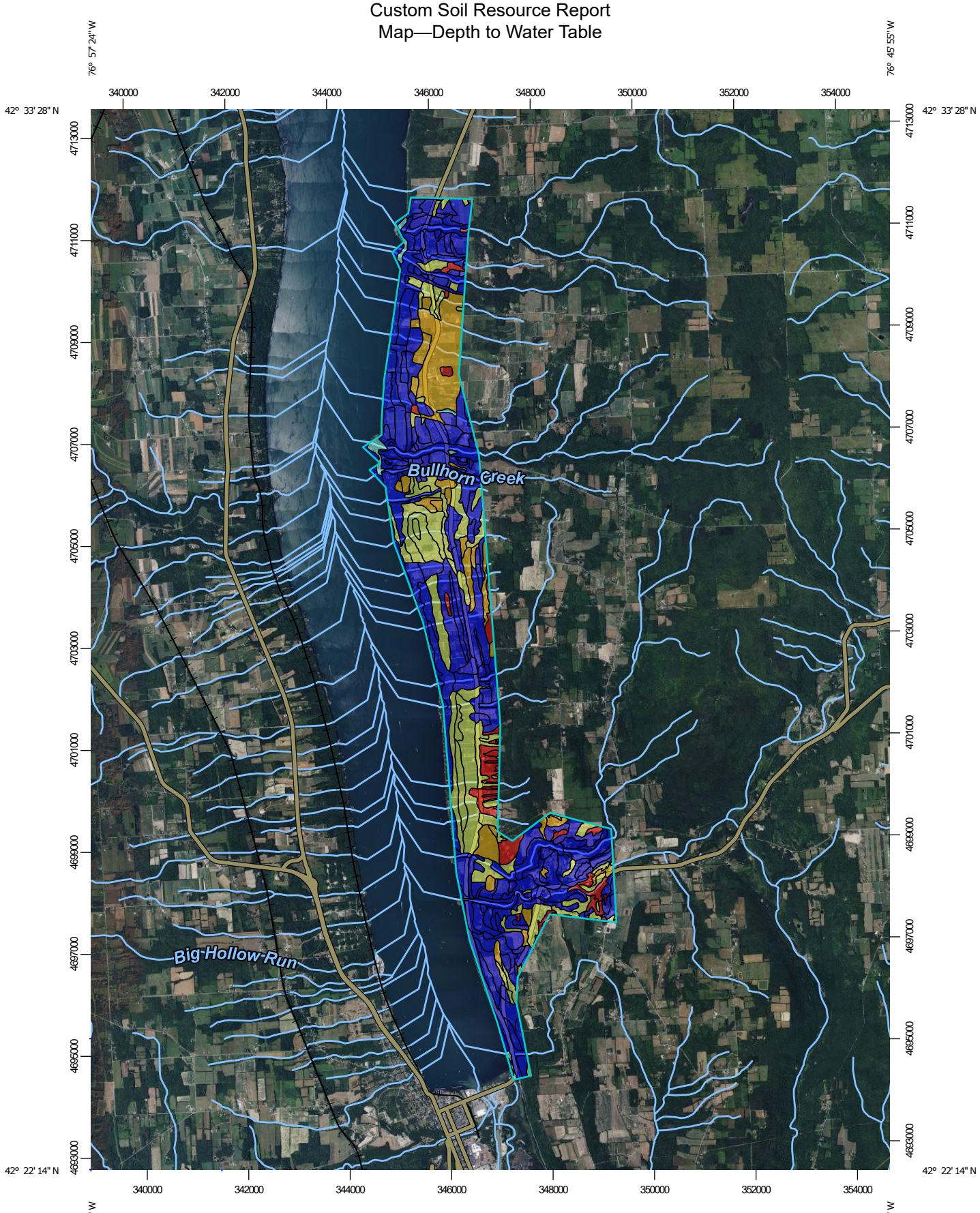
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors

(redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.



Map Scale: 1:101,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: 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: Schuyler County, New York
Survey Area Data: Version 21, Aug 29, 2024

Soil Survey Area: Seneca County, New York
Survey Area Data: Version 22, Aug 25, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AnB	Angola silt loam, 3 to 8 percent slopes	31	78.3	1.2%
AnC	Angola silt loam, 8 to 15 percent slopes	31	49.4	0.8%
ApA	Appleton silt loam, 0 to 3 percent slopes	20	56.2	0.9%
ApB	Appleton silt loam, 3 to 8 percent slopes	20	20.9	0.3%
ArB	Arnot channery silt loam, 3 to 8 percent slopes	>200	6.8	0.1%
ArC	Arnot channery silt loam, 8 to 15 percent slopes	>200	73.3	1.2%
AuB	Aurora channery silt loam, 3 to 8 percent slopes	54	5.6	0.1%
AuD	Aurora channery silt loam, 15 to 25 percent slopes	54	6.6	0.1%
BuB	Burdett silt loam, 3 to 8 percent slopes	31	450.3	7.1%
BuC	Burdett silt loam, 8 to 15 percent slopes	31	40.3	0.6%
BuD	Burdett silt loam, 15 to 25 percent slopes	31	6.2	0.1%
Ce	Castile gravelly silt loam	54	41.1	0.6%
CnA	Chenango gravelly silt loam, 0 to 3 percent slopes	>200	61.2	1.0%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	>200	6.1	0.1%
CoB	Chenango channery silt loam, fan, 0 to 8 percent slopes	137	57.0	0.9%
CrA	Collamer silt loam, 0 to 3 percent slopes	54	12.0	0.2%
CrB	Collamer silt loam, 3 to 8 percent slopes	54	12.3	0.2%
CsA	Conesus silt loam, 0 to 3 percent slopes	55	13.8	0.2%
CsB	Conesus silt loam, 3 to 8 percent slopes	55	252.2	4.0%
CsC	Conesus silt loam, 8 to 15 percent slopes	55	56.3	0.9%
DkC	Dunkirk silt loam, 8 to 15 percent slopes	>200	20.2	0.3%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
DUE3	Dunkirk and Hudson soils, steep, severely eroded	>200	16.1	0.3%
ErB	Erie silt loam, 3 to 8 percent slopes	25	26.5	0.4%
FF	Fluvaquents-Udifluvents complex, frequently flooded	0	3.1	0.0%
Ha	Halsey mucky silt loam	8	40.0	0.6%
HnB	Hornell channery silt loam, 3 to 8 percent slopes	31	10.2	0.2%
HrA	Howard gravelly loam, 0 to 3 percent slopes	>200	58.4	0.9%
HrB	Howard gravelly loam, 3 to 8 percent slopes	>200	404.1	6.4%
HrC	Howard gravelly loam, 8 to 15 percent slopes	>200	396.7	6.3%
HrCK	Howard gravelly loam, rolling	>200	35.5	0.6%
HSD	Howard soils, moderately steep	>200	66.6	1.1%
HSE	Howard soils, steep	>200	41.7	0.7%
HuB	Hudson gravelly silt loam, 3 to 8 percent slopes	54	45.9	0.7%
HuC	Hudson gravelly silt loam, 8 to 15 percent slopes	54	166.3	2.6%
LnB	Lansing gravelly silt loam, 3 to 8 percent slopes	>200	208.5	3.3%
LnC	Lansing gravelly silt loam, 8 to 15 percent slopes	>200	352.1	5.6%
LnD	Lansing gravelly silt loam, 15 to 25 percent slopes	>200	136.3	2.1%
LoB	Lordstown channery silt loam, 3 to 8 percent slopes	>200	12.8	0.2%
LoC	Lordstown channery silt loam, 8 to 15 percent slopes	>200	225.1	3.6%
LoD	Lordstown channery silt loam, 15 to 25 percent slopes	>200	267.5	4.2%
LTE	Lordstown-Arnot complex, steep, rocky	>200	177.3	2.8%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
LTF	Lordstown-Arnot complex, very steep, very rocky	>200	103.0	1.6%
Ma	Madalin silt loam, 0 to 3 percent slopes	0	32.5	0.5%
MrB	Mardin channery silt loam, 3 to 8 percent slopes	43	16.4	0.3%
MrC	Mardin channery silt loam, 8 to 15 percent slopes	43	1.4	0.0%
MrD	Mardin channery silt loam, 15 to 25 percent slopes	43	3.7	0.1%
OdB	Odessa silt loam, 3 to 8 percent slopes	20	138.3	2.2%
Pt	Pits, gravel	>200	27.1	0.4%
Rh	Red Hook gravelly silt loam	31	35.9	0.6%
RnA	Rhinebeck gravelly silt loam, 0 to 3 percent slopes	31	14.2	0.2%
RnB	Rhinebeck gravelly silt loam, 3 to 8 percent slopes	31	80.9	1.3%
ROF	Rock outcrop-Arnot complex, 25 to 70 percent slopes	>200	134.5	2.1%
ScB3	Schoharie silty clay loam, 3 to 8 percent slopes	76	94.7	1.5%
ScC3	Schoharie silty clay loam, 8 to 15 percent slopes	76	343.8	5.4%
ScD3	Schoharie silty clay loam, 15 to 25 percent slopes	76	28.7	0.5%
ShC3	Schoharie variant silty clay loam, 8 to 15 percent slopes, severely eroded	54	68.7	1.1%
ShD3	Schoharie variant silty clay loam, 15 to 25 percent slopes, severely eroded	54	189.5	3.0%
TuC	Tuller channery silt loam, 8 to 15 percent slopes	23	8.3	0.1%
UD	Udorthents, smoothed	137	3.6	0.1%
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	>200	135.2	2.1%
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	>200	204.1	3.2%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	>200	204.4	3.2%
VEE	Valois soils, steep	>200	127.0	2.0%
VHF	Valois and Howard soils, very steep	>200	249.0	3.9%
W	Water	>200	75.0	1.2%
Subtotals for Soil Survey Area			**6,337.0**	**99.9%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AwB	Aurora silt loam, 3 to 8 percent slopes	54	0.0	0.0%
AzF	Aurora and Farmington soils, 25 to 70 percent slopes	54	0.1	0.0%
HnB	Honeoye silt loam, 3 to 8 percent slopes	>200	1.1	0.0%
HnC	Honeoye silt loam, 8 to 15 percent slopes	>200	2.3	0.0%
LsC	Lansing gravelly silt loam, 8 to 15 percent slopes	>200	0.3	0.0%
Subtotals for Soil Survey Area			**3.8**	**0.1%**
Totals for Area of Interest			**6,340.9**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

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Appendix D: EDU Summary

Project Title: Burdett Hector Wastewater Feas Study
Project Number: 2243745
Spreadsheet Location: "B:\GLOBAL\Projects\Burdett, Village of\2243745 - Burdett Hector Wastewater Feas Study\05_Design\Civil\Muni\Preliminary Engineering\EDU's\Summary Table.xlsx"
Spreadsheet Creator: Eric Hughes
Spreadsheet Creation Date: 10/09/2024

Input layer: B:\GLOBAL\Projects\Burdett, Village of\2243745 - Burdett Hector Wastewater Feas Study\06_Drawings\DIG\Data\ProjectFeatures\ProjectFeatures\Parcels

VILLAGE OF BURDETT AND TOWN OF HECTOR PROJECT AREA - EQUIVALENT DWELLING UNITS

TYPE	DESCRIPTION	CODE	TOTAL NUMBER	GPD per Unit[1, 2, 3]	GPD	EDU PER CODE	TOTAL EDU
Agricultural	Agricultural vacant land (productive)	105	10				
Agricultural	Field crops	120	2				
Agricultural	Vineyards	152	8				
Residential	One family year-round residence [6]	210	242	268.4	64953	1	242
Residential	Two family year-round residence	220	14	536.8	7515	2	28
Residential	Three family year-round residence	230	4	805.2	2416	1 to 3 [4]	9
Residential	Rural residence with acreage	240	35	268.4	9394	1	35
Residential	Seasonal residences	260	24	268.4	2147	0.3 [5]	7
Residential	Mobile home	270	10	220	2200	1.0	10
Residential	Multiple mobile homes	271	2	220	880	1	4
Residential	Residential (Multipurpose)	280	7	268.4	1879	1	7
Residential	Multiple residences - La Bourgade Ln	281	1	268.4	15030	56	56
Residential	Residence with incidental commercial use	283	12	268.4	3221	1	12
Vacant Land	Vacant Land	300	3	0	0	T Hector Water charged 0.5 Debt Service on tax bill Landlocked parcels without access are NOT billed.	1.5
Vacant Land	Residential vacant land	311	23	0	0		11.5
Vacant Land	Residential land including a small improvement (not used for living accommodations)	312	38	0	0		19
Vacant Land	Rural vacant lots of 10 acres or less	314	35	0	0		17.5
Vacant Land	Abandoned agricultural land	321	2	0	0		1
Vacant Land	Residential vacant land over 10 acres	322	9	0	0		4.5
Vacant Land	Vacant land located in commercial areas	330	2	0	0		1
Commercial	Commercial	400	2	268.4	537	1	2
Commercial	Apartments	411	1	268.4	268	1	1
Commercial	Inns, lodges, boarding and rooming houses, tourist homes, fraternity and sorority houses	418	2	1732.2	3464	6.5	13
Commercial	Restaurants - Demolished	421	1	0	0	0.5	0.5
Commercial	Diners and luncheonettes	422	2	268.4	1074	2	4
Commercial	Bar	425	1	268.4	268	1	1
Commercial	Auto body, tire shops, other related auto sales	433	1	268.4	268	1	1
Commercial	Storage, warehouse and distribution facilities	440	2	268.4	523	1	2
Commercial	Mini warehouse (self–storage)	442	1	0	0	0	0
Commercial	Other storage, warehouse and distribution facilities	449	2	268.4	403	0.5 and 1 [4]	1.5
Commercial	Small retail outlet	457	2	268.4	537	1	2
Commercial	Office building	464	3	268.4	805	1	3
Commercial	Miscellaneous services	470	1	0	0	0	0
Commercial	Downtown row type (with common wall)	481	1	268.4	537	2	2
Commercial	Downtown row type (detached)	482	1	268.4	268	1	1
Commercial	Converted residence	483	4	268.4	1745	2, 1, 2, 1.5 [4]	6.5
Commercial	One story small structure	484	12	see below	7236	see below	27
Commercial	Minimart	486	2	536	501		2
Community Services	Other educational facilities	615	1	150	150	1	1
Community Services	Religious	620	3	150	450	1	3
Community Services	Office building	652	1	268.4	268	1	1
Community Services	Police and fire protection, electrical signal	662	3		1280		5
Community Services	Recreational facilities	682	1	1027	1027		4
Community Services	Cemeteries	695	2	0	0	0	0
Public Services	Water treatment facilities	823	1	263	263	1	1
Public Services	Telephone	831	3	268.4	805	1	3
Public Services	Water	845	1	268.4	268	1	1
Wild, forested, conservation lands and public parks	City, town, or village public parks and recreation areas	963	2	268.4	537	1	2
No Assigned Land Use Code			13	0	0	0	0
		TOTAL	555		133,120		556

Basis of Design Flows		
EDUs	556	
Average Daily Flow per EDU	268	gpd
Design Average Daily Flow	149,000	gpd
Peaking Factor	3.67	Per Ten States
Design Peak Hourly Flow	547,000	gpd

1 2014 NYS Design Standards for Intermediate-sized WWTPs.pdf
2 DP02: Selected Social ... - Census Bureau Table 2.44 persons per household
3 Hector Water District Consumption, printed 9/20/2024, average of four most recent billings per account
4 Based on Schuyler County Tax Parcel Water District Units
5 Hector Water District charges mimum of 4 months for seasonal residences, assume same structure
6 Per conversation with Larry Jaynes and Charlotte, Village includes 182 taxed residential parcels. For simplicity subtracted GIS Village Residential 270 Accounts - 88 = 182 Accounts as Reported by Village. Assume Town and Village GIS One-family residence minus Village overage (330-88=242).

Project Title: Burdett Hector Wastewater Feas Study
Project Number: 2243745
Spreadsheet Location: "B:\GLOBAL\Projects\Burdett, Village of\2243745 - Burdett Hector Wastewater Feas Study\05_Design\Civil\Muni\Preliminary Engineering\EDU's\Summary Table.xlsx"
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Input layer: B:\GLOBAL\Projects\Burdett, Village of\2243745 - Burdett Hector Wastewater Feas Study\06_Drawings\DIG\Data\ProjectFeatures\ProjectFeatures\Parcels

VILLAGE OF BURDETT EQUIVALENT DWELLING UNITS

TYPE	DESCRIPTION	CODE	TOTAL NUMBER	GPD per Unit[1, 2, 3]	GPD	EDU PER CODE	TOTAL EDU
Agricultural	Agricultural vacant land (productive)	105	4	0	0	0	0
Agricultural	Field crops	120	0	0	0	0	0
Agricultural	Vineyards	152	0	0	0	0	0
Residential	Residential Properties[6]	210	182	268.4	48849	1	182
Vacant Land	Vacant Land	300	1	0	0	T Hector Water charged 0.5 Debt Service on tax bill Landlocked parcels without access are NOT billed.	0.5
Vacant Land	Residential vacant land	311	10	0	0		5
Vacant Land	Residential land including a small improvement (not used for living accommodations)	312	9	0	0		4.5
Vacant Land	Rural vacant lots of 10 acres or less	314	9	0	0		4.5
Vacant Land	Abandoned agricultural land	321	0	0	0		0
Vacant Land	Residential vacant land over 10 acres	322	2	0	0		1
Vacant Land	Vacant land located in commercial areas	330	1	0	0		0.5
Commercial	Commercial	400	1	268.4	268	1	1
Commercial	Apartments	411	1	268.4	268	1	1
Commercial	Inns, lodges, boarding and rooming houses, tourist homes, fraternity and sorority houses	418	0	0.0	0	0.0	0
Commercial	Restaurants - Demolished	421	1	0	0	0.5	0.5
Commercial	Diners and luncheonettes	422	1	536.8	537	2	2
Commercial	Bar	425	0	0	0	0	0
Commercial	Auto body, tire shops, other related auto sales	433	1	268.4	268	1	1
Commercial	Storage, warehouse and distribution facilities	440	1	268.4	268	1	1
Commercial	Mini warehouse (self–storage)	442	1	0	0	0	0
Commercial	Other storage, warehouse and distribution facilities	449	2	268.4	403	0.5 and 1 [4]	1
Commercial	Small retail outlet	457	0	0	0	0	0
Commercial	Office building	464	1	268.4	805	1	3
Commercial	Miscellaneous services	470	1	0	0	0	0
Commercial	Downtown row type (with common wall)	481	1	268.4	537	2	2
Commercial	Downtown row type (detached)	482	0	0	0	0	0
Commercial	Converted residence	483	4	268.4	1745	2, 1, 2, 1.5 [4]	6
Commercial	One story small structure	484	4	see below	4556	see below	17
Commercial	Minimart	486	1	536	501		2
Community Services	Other educational facilities	615	0	0	0	0	0
Community Services	Religious	620	2	150	300	1	2
Community Services	Office building	652	1	268.4	268	1	1
Community Services	Police and fire protection, electrical signal	662	2	268.4	537	1	2
Community Services	Recreational facilities	682	0	0	0	0	0
Community Services	Cemeteries	695	1	0	0	0	0
Public Services	Water treatment facilities	823	0	0	0	0	0
Public Services	Telephone	831	0	0	0	0	0
Public Services	Water	845	1	268.4	268	1	1
Wild, forested, conservation lands and public parks	City, town, or village public parks and recreation areas	963	2	268.4	537	1	2
No Assigned Land Use Code			5	0	0	0	0
		TOTAL	253		60,916		244

Basis of Design Flows		
EDUs	244	
Average Daily Flow per EDU	268	gpd
Design Average Daily Flow	65,000	gpd
Peaking Factor	3.67	Per Ten States
Design Peak Hourly Flow	239,000	gpd

1 2014 NYS Design Standards for Intermediate-sized WWTPs.pdf
2 DP02: Selected Social ... - Census Bureau Table 2.44 persons per household
3 Hector Water District Consumption, printed 9/20/2024, average of four most recent billings per account
4 Based on Schuyler County Tax Parcel Water District Units
5 Per conversation with Town of Hector Billing, Seasonal are required to pay at least 4 months then they can shut off, utilize 4 months
6 Per conversation with Larry Jaynes and Charlotte, Village includes 182 taxed residential parcels

Appendix E: Flow Calculation & Basis of Design Pumps

Conveyance Capacity Design Calculations

Design Data		
Average Daily Flow	149,000	gpd
Average Daily Flow	103	gpm
Equivalent Population Served (100 gpd / capita)	1569	persons
10 SS Peaking Factor	3.67	
Peak Hourly Flow	**379**	**gpm**

Sewer Capacity

Mannings Formula

$V=(1.49/n)R_h^{2/3}S^{1/2}$

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$ $Q=V \times A$

$R_h=A/P$

A=cross sectional area

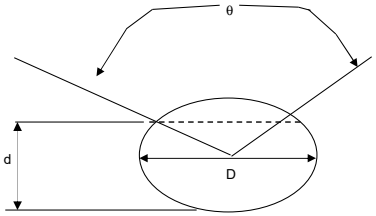
P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

Q=Flow

V=Velocity



Pipe ID	Diameter, in	Mannings Number	Slope, ft/ft	Percent	Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	Flow, cfs	Flow Capacity, gpm
Tributary PVC (Side Street)	8	0.012	0.005	0.50%	0.3491	2.0944	0.1667	2.6590	0.9282	417
Trunk Line (Main Line Sewer)	12	0.012	0.005	0.50%	0.7854	3.1416	0.2500	3.4843	2.7366	1228

Self Priming Centrifugal Pumps

Ultra V Series® Basic Pump w/UltraMate® Second Stage

Model VS3A60-B

Size 4" x 3"

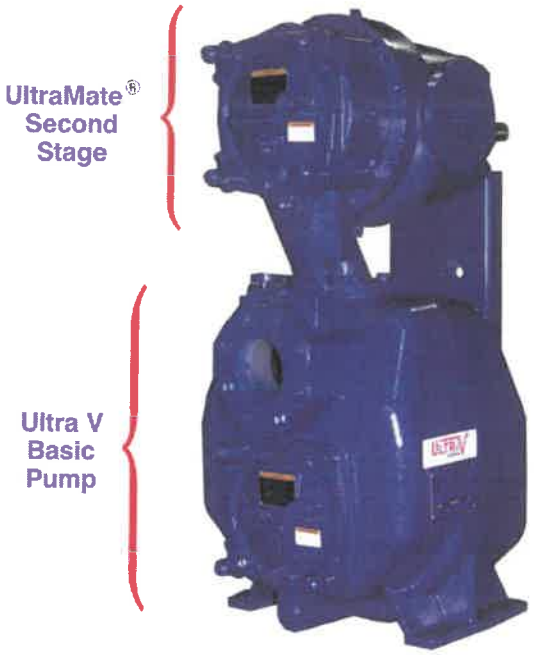
ULTRA V® SERIES

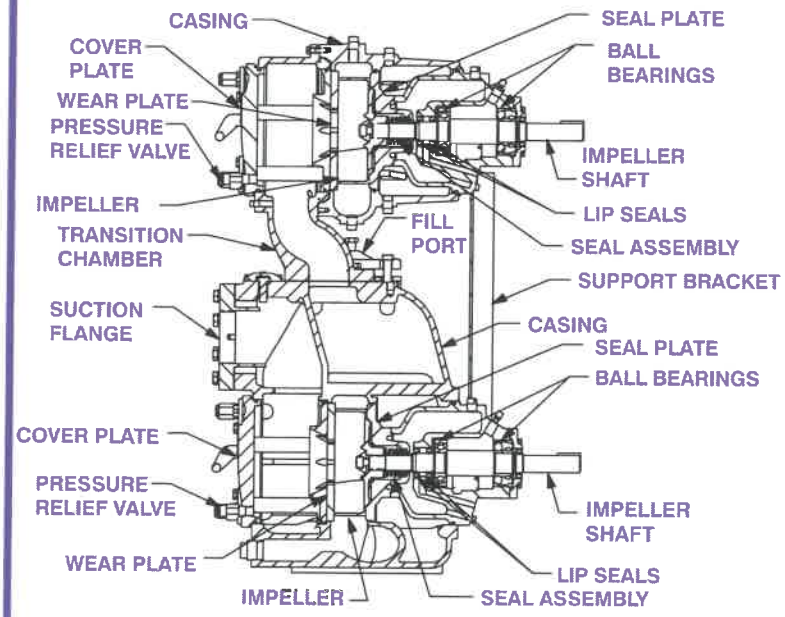
VARIOUS PATENTS APPLY

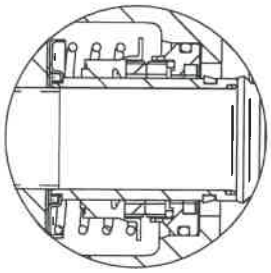
5 YEAR WARRANTY ULTRA V SERIES®

PUMP SPECIFICATIONS

Size: 4" x 3" (102 mm x 76 mm) – Flanged.**
Casings: Gray Iron 30.
Maximum Operating Pressure 249 psi (1717 kPa).*
Semi-Open Type, Two Vane Impellers: Ductile Iron 65-45-12.
Handles 2-1/2" (63,5 mm) Diameter Spherical Solids.
Impeller Shafts: Alloy Steel 4150.
Self-Cleaning Replaceable Wear Plates: Carbon Steel 1015.
Shimless Adjustable Cover Plates: Gray Iron 30.
Suction Flange: Gray Iron 30.
Bearing Housings: Gray Iron 30.
Seal Plates: Gray Iron 30.
Shaft Sleeves: Alloy Steel 4130.
Radial Bearings: Open Single Row Ball.
Thrust Bearings: Open Double Row Ball.
Bearing and Seal Cavity Lubrication: SAE 30 Non-Detergent Oil.
Gaskets: Buna-N, Compressed Synthetic Fibers, Vegetable Fiber, PTFE, Cork, and Rubber.
O-Rings: Buna-N.
Transition Chamber: Ductile Iron 65-45-12.
Hardware: Standard Plated Steel.
Brass Pressure Relief Valves.
Bearing and Seal Cavity Oil Level Sight Gauges.
Optional Equipment: Automatic Air Release Valve. High Pump Temperature Shutdown Kit. Stainless Steel/G-R Hard Iron Impellers, Wear Plates and Seal Plates. 120/240 Volt Casing Heater.
** Optional Gray Iron 30 Flange Kits Available as Follows (See Price Sheets):
3" Female NPT Discharge Flange Kit.
4" and 3" ASA Suction/Discharge Spool Flange Kits.
100 mm and 80 mm DIN 2527 (PN 16) Suction/Discharge Spool Flange Kits.







SEAL DETAIL

Cartridge Type, Mechanical, Oil-Lubricated, Double Floating, Self-Aligning. Silicon Carbide Rotating and Stationary Faces. Stainless Steel 316 Stationary Seat. Fluorocarbon Elastomers (DuPont Viton® or Equivalent). Stainless Steel 18-8 Cage and Spring. Maximum Temperature of Liquid Pumped, 160°F (71°C).*

*** Consult Factory for Applications Exceeding Maximum Pressure and/or Temperature Indicated.***

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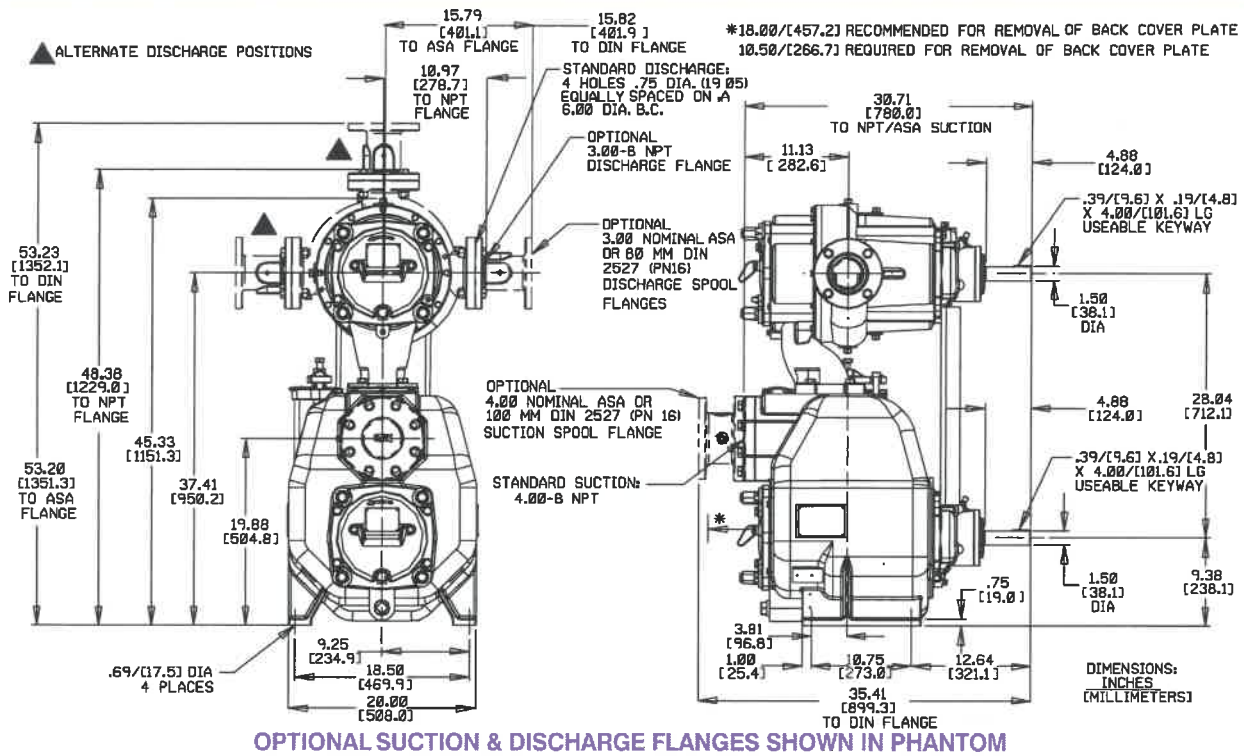
Specification Data

SECTION 55, PAGE 3000

APPROXIMATE DIMENSIONS and WEIGHTS

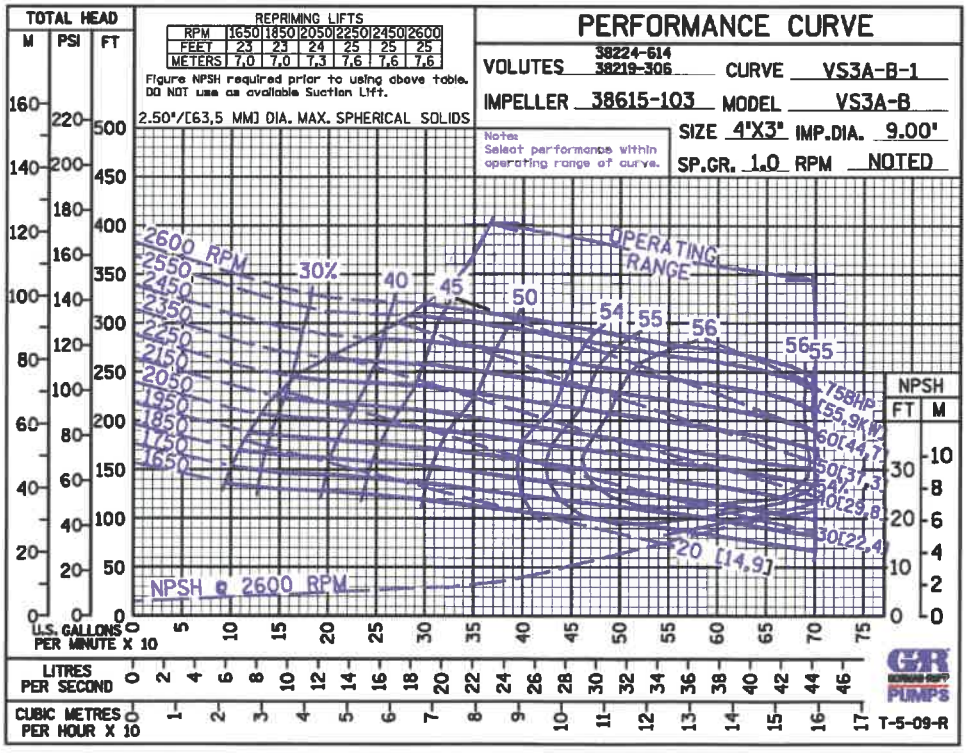
NET WEIGHT:	1040 LBS.	(472 KG.)*
SHIPPING WEIGHT:	1175 LBS.	(533 KG.)*
EXPORT CRATE:	42.9 CU. FT.	(1,2 CU. M.)

*WEIGHTS DO NOT INCLUDE OPTIONAL FLANGE KITS.



OPTIONAL SUCTION & DISCHARGE FLANGES SHOWN IN PHANTOM

TOTAL COMBINED H.P. SHOWN



GORMAN-RUPP PUMPS

www.grpumps.com

Specifications Subject to Change Without Notice

Printed in U.S.A.

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Pump Data Sheet - Gorman-Rupp SEW 60Hz

Company:
Name:
Date: 02/04/2020

GORMAN-RUPP PUMPS

Pump:

Size:	VS3A-B-1	Dimensions:	Suction:	4 in
Type:	V&VS-SERIES		Discharge:	3 in
Synch Speed:	Adjustable			
Dia:	9 in			
Curve:	VS3A-B-1			
Impeller:	38615-103			

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F		

Search Criteria:

Flow:	260 US gpm	Near Miss:	---
Head:	150 ft	Static Head:	0 ft

Pump Limits:

Temperature:	---	Sphere Size:	2.5 in
Wkg Pressure:	---		

Motor:

Consult Gorman-Rupp SEW 60Hz to select a motor for this pump.

Pump Selection Warnings:

None

--- Duty Point ---

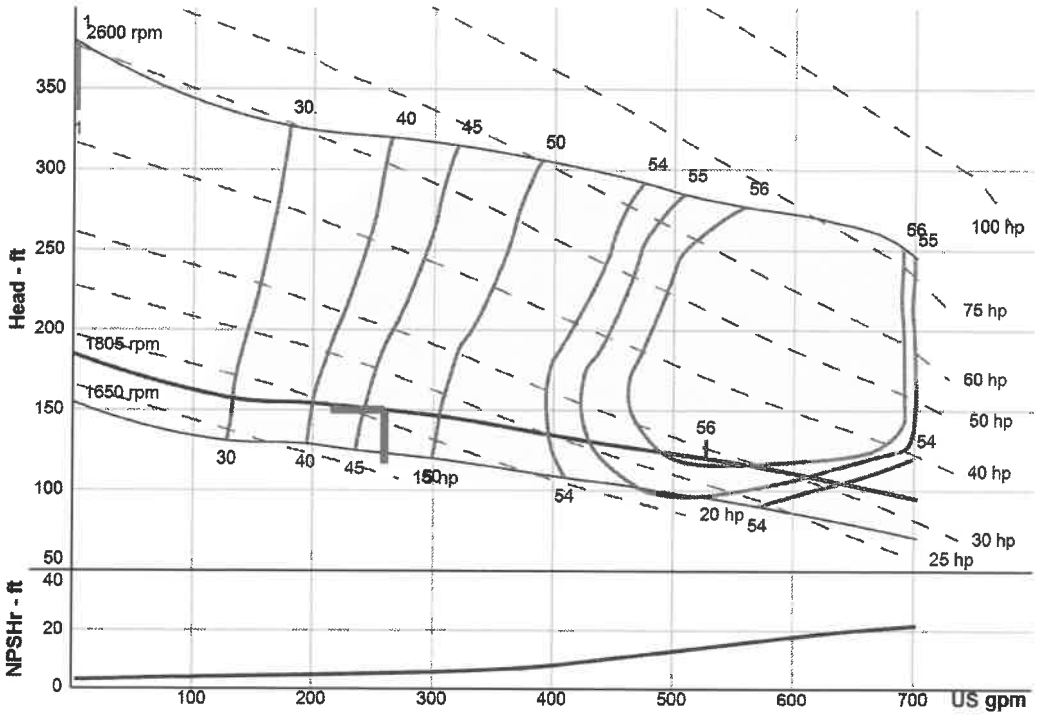
Flow:	260 US gpm
Head:	150 ft
Eff:	46.4%
Power:	21.2 hp
NPSHr:	5.33 ft
Speed:	1805 rpm

--- Design Curve ---

Shutoff Head:	185 ft
Shutoff dP:	80.1 psi
Min Flow:	--- US gpm

BEP: 56% @ 527 US gpm
NOL Power:
33.2 hp @ 702 US gpm

--- Max Curve ---



This curve is provided for preliminary selection only. Please consult factory before making final pump or motor selections.

Performance Evaluation:

Flow	Speed	Head	Efficiency	Power	NPSHr
US gpm	rpm	ft	%	hp	ft
312	1805	145	50	22.7	5.89
260	1805	150	46	21.2	5.33
208	1805	154	41	19.7	4.84
156	1805	156	33	18.3	4.4
104	1805	163	24	17.5	3.93

PERFORMANCE CURVE

REPRIMING LIFTS						
RPM	1650	1850	2050	2250	2450	2600
FEET	23	23	24	25	25	25
METERS	7,0	7,0	7,3	7,6	7,6	7,6

Figure NPSH required prior to using above table.
DO NOT use as available Suction Lift.

2.50"/[63,5 MM] DIA. MAX. SPHERICAL SOLIDS

VOLUTES 38224-614 / 38219-306 CURVE VS3A-B-1

IMPELLER 38615-103 MODEL VS3A-B

SIZE 4"X3" IMP.DIA. 9.00"

SP.GR. 1.0 RPM NOTED

Note:
Select performance within operating range of curve.

TOTAL HEAD

M: 0 20 40 60 80 100 120 140 160

PSI: 0 20 40 60 80 100 120 140 160 180 200 220

FT: 0 50 100 150 200 250 300 350 400 450 500

2600 RPM
2550
2450
2350
2250
2150
2050
1950
1850
1750
1650

30% 40 45 50 54 55 56 56 55

OPERATING RANGE

75BHP [55,9KW]
60[44,7]
50[37,3]
54%
40[29,8]
30[22,4]
20 [14,9]

NPSH @ 2600 RPM

NPSH

FT: 0 10 20 30

M: 0 2 4 6 8 10

U.S. GALLONS PER MINUTE X 10: 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

LITRES PER SECOND: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46

CUBIC METRES PER HOUR X 10: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

GORMAN-RUPP PUMPS

T-5-09-R

FILE NO. vs3ab.s01

SYSTEM HEAD CURVE

Enter desired increments of flow (GPM)

SUCTION SIDE

Pipe Dia ID (in)	C Factor	Total Eq Lgth (ft)	Static Elevation (ft)
4	120	55.00	14.16

STATION PIPING

Pipe Dia ID (in)	C Factor	Total Eq Lgth (ft)	Static Elevation (ft)
4	120	100.00	0.00

Capacity (GPM)	Friction Total Pipe	Static Elevation (ft)	TDSL or TDSH	Capacity (GPM)	Friction Total Pipe	Static Elevation (ft)	TDDH
0	0.00	14.16	14.16	0	0.00	0.00	0.00
104	0.52	14.16	14.68	104	0.94	0.00	0.94
156	1.10	14.16	15.26	156	2.00	0.00	2.00
208	1.87	14.16	16.03	208	3.40	0.00	3.40
260	2.82	14.16	16.98	260	5.14	0.00	5.14
312	3.96	14.16	18.12	312	7.20	0.00	7.20

DISCHARGE SIDE

Pipe Dia ID (in)	C Factor	Total Eq Lgth (ft)	Static Elevation (ft)
6.963	120	9200.00	72.84

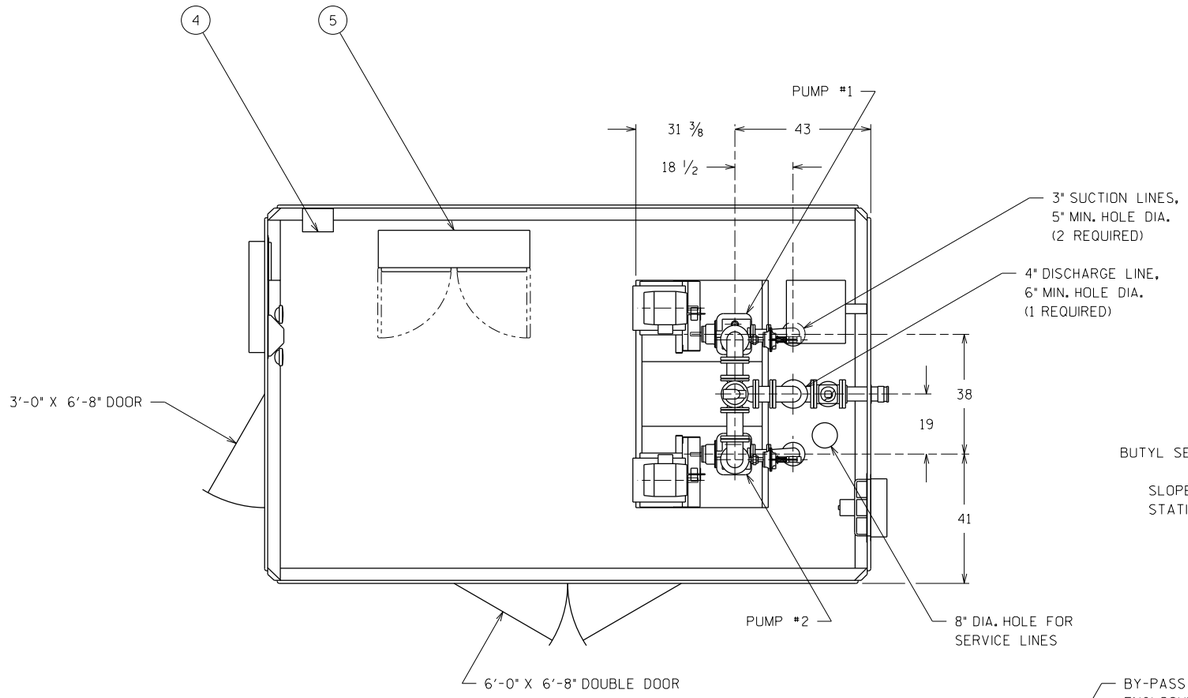
Capacity (GPM)	Friction Total Pipe	Static Elevation (ft)	TDDH
0	0	72.84	72.84
104	5.846253	72.84	78.69
156	12.377885	72.84	85.22
208	21.075753	72.84	93.92
260	31.84686	72.84	104.69
312	44.622298	72.84	117.46

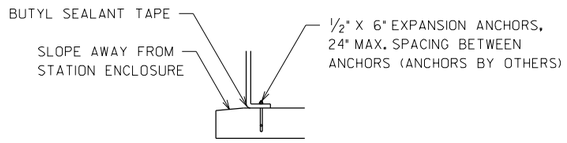
Total TDHs

Capacity (GPM)	TDH
0	**87.00**
104	**94.31**
156	**102.47**
208	**113.34**
260	**126.81**
312	**142.78**

Prperty of The Gorman-Rupp Company

REVISIONS				
SYM.	DATE	RECORD	DR.	CK.





MOUNTING DETAIL

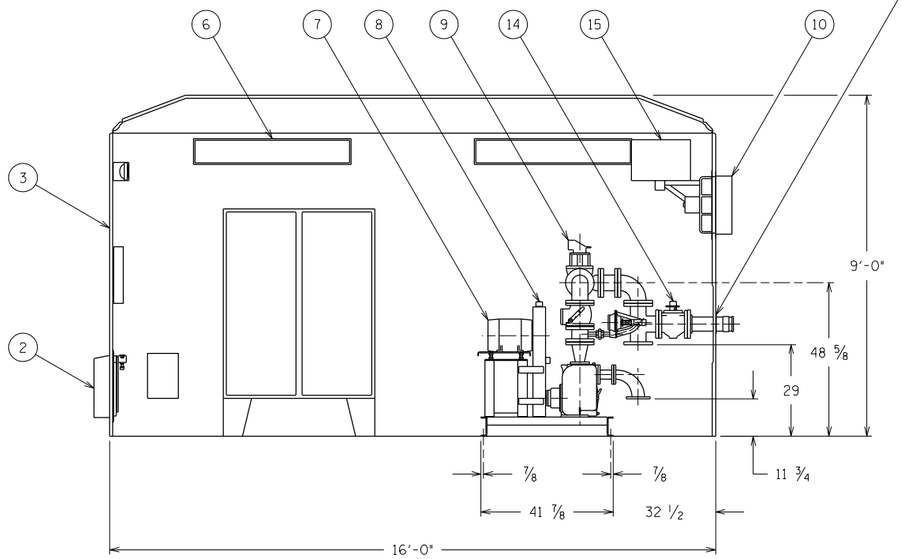
SCALE: NONE

ITEM	DESCRIPTION	MATERIAL & SIZE
1	PUMP	CAST IRON T2A-B
2	INTAKE VENT ASSY	ALUMINUM (2 SHUTTERS)
3	STATION ENCLOSURE	FIBERGLASS 10' X 16'
4	POWER TRANSFORMER	5 KVA
5	STATION CONTROL PANEL	STAINLESS STEEL
6	FLUORESCENT LIGHT FIXTURE	64 WATT FIXTURE
7	MOTOR	CAST IRON
8	BELT GUARD ASSY	STEEL
9	DISCHARGE PLUG VALVE	CAST IRON 4" 3-WAY
10	EXHAUST FAN ASSY	1600 CFM
11	DISCHARGE CHECK VALVE	CAST IRON 4"
12	LOAD CENTER	STEEL
13	PUMP & MOTOR BASE ASSY	STEEL
14	BY-PASS PLUG VALVE	CAST IRON 4"
15	STATION HEATER ASSY	7.5 KW
16	OPW ADAPTER	ALUMINUM 4"
17	EMERGENCY LIGHT FIXTURE	12 VOT D.C.

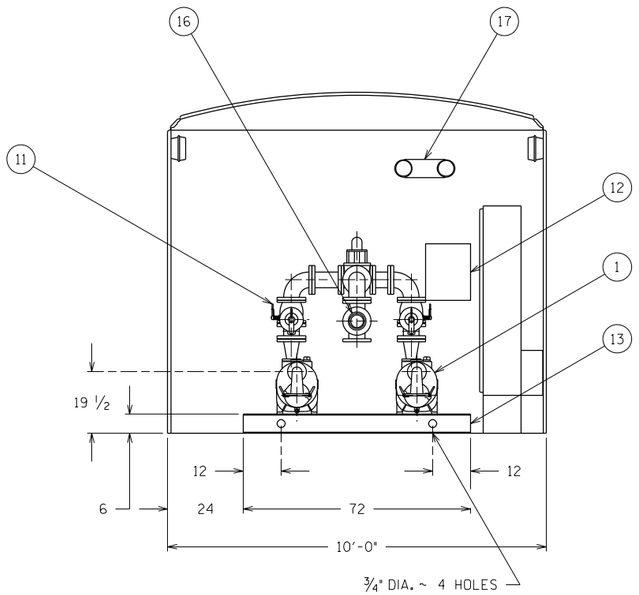
NOTES

SEAL ALL OPENINGS THRU CONCRETE PAD INTO STATION ENCLOSURE GAS TIGHT.

GAS TIGHT FLOOR DRAIN RECOMMENDED FOR PUMP MAINTENANCE.



BY-PASS PIPING HOLE IN ENCLOSURE WALL TO BE LOCATED AND CUT AT INSTALLATION



T2A-B, 3" X 4" X 4"
WITH 4" BY-PASS
WITH 10' X 16' FIBERGLASS
ENCLOSURE

602811.S01.DGN

GORMAN-RUPP

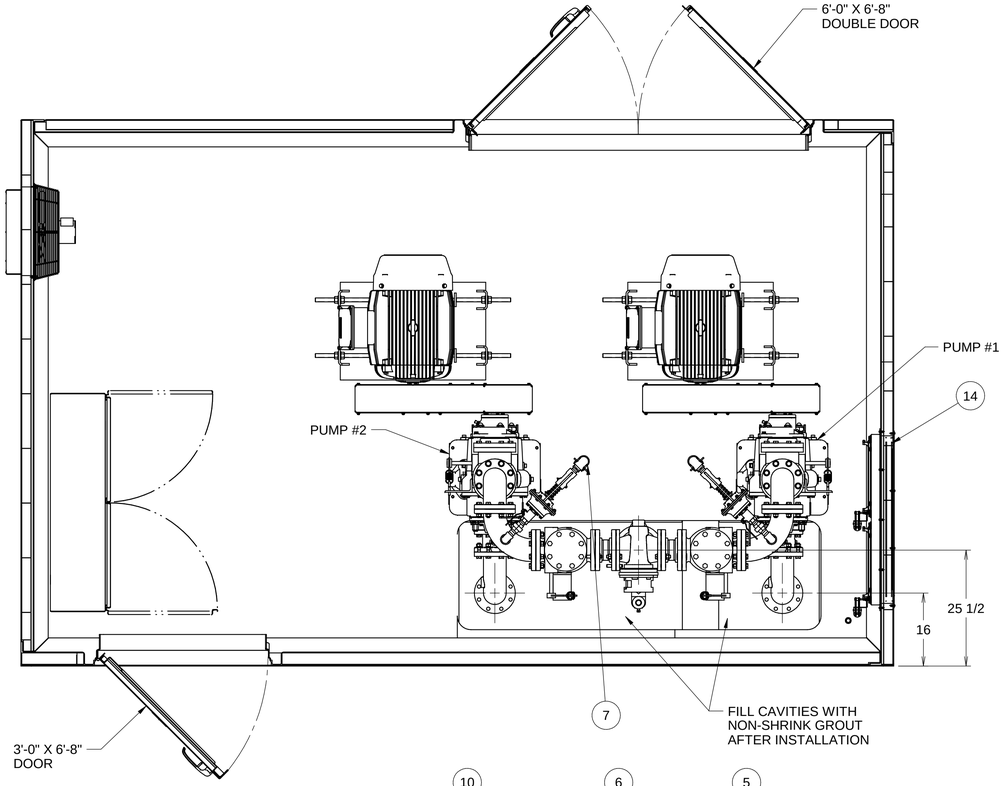
THE GORMAN-RUPP CO.
MANSFIELD, OHIO ST. THOMAS, ONTARIO

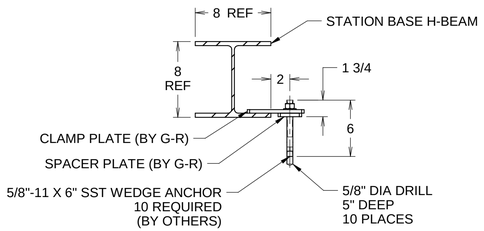
NAME
BASE MOUNTED DUPLEX PUMP
UNIT, WITH FIBERGLASS ENCLOSURE

DRN.	CHK.	APP.	DATE
WC	PKW	AA	8-26-16

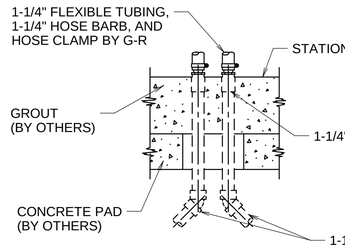
D | 60-2811 | SERIAL NO.

-





ANCHOR DETAIL

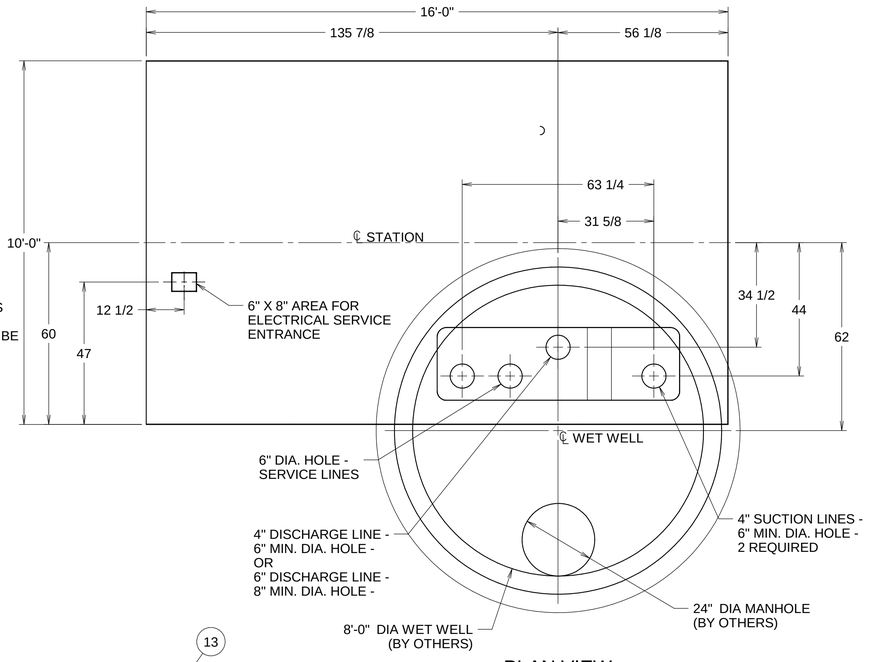


AIR RELEASE LINE
INSTALLATION DETAIL

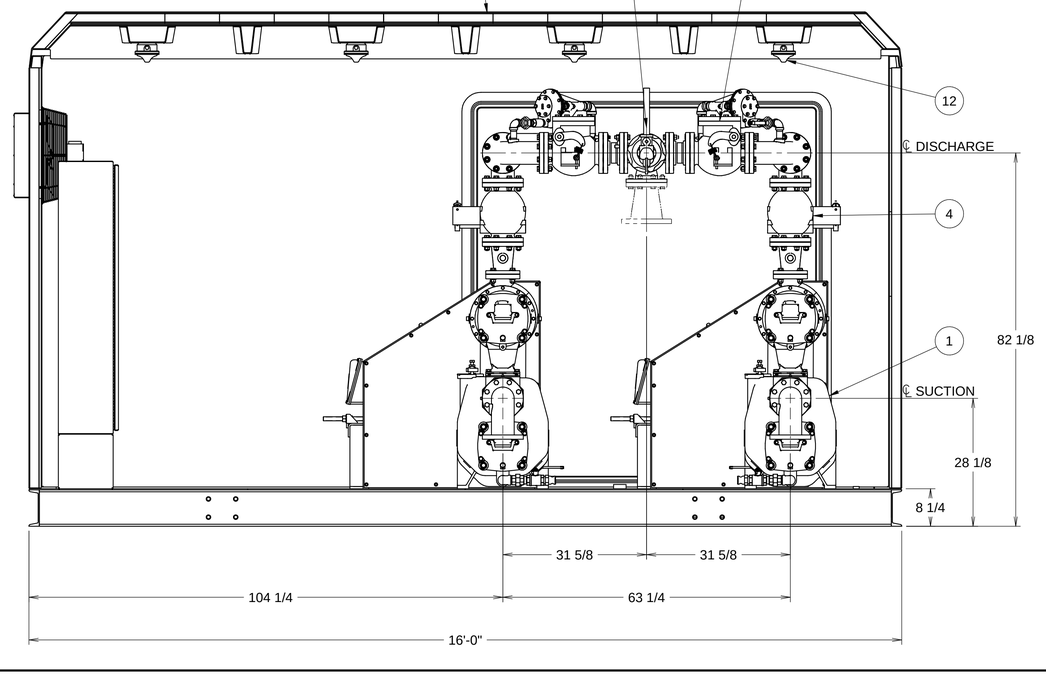
SCALE: NONE

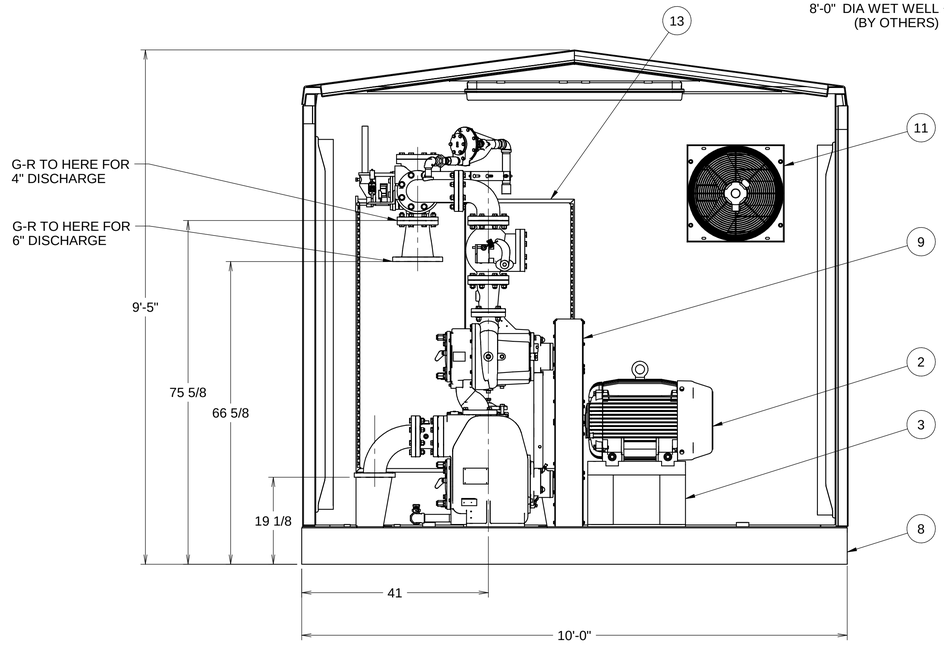
ITEM	DESCRIPTION	MATERIAL & SIZE	
1	PUMP	CAST IRON	VS3-B
2	MOTOR	CAST IRON	
3	MOTOR STAND ASSEMBLY	STEEL	
4	PRIMARY DISCHARGE CHECK VALVE	CAST IRON	4"
5	SECONDARY DISCHARGE CHECK VALVE	CAST IRON	4"
6	DISCHARGE PLUG VALVE	CAST IRON	4" 3-WAY
7	AIR RELEASE VALVE	CAST IRON	1"
8	STATION BASE ASSEMBLY	STEEL	
9	BELT GUARD ASSEMBLY	ALUMINUM	
10	STATION ENCLOSURE ASS'Y	FRP	10' X 16'
11	EXHAUST FAN	STEEL	1600 CFM
12	LED LIGHT FIXTURE	4000 LUMENS	
13	MOTOR CONTROL PANEL	STAINLESS	
14	INTAKE VENT ASEMBLY	ALUMINUM	

REVISIONS				
SYM.	DATE	RECORD	DR.	CK.



PLAN VIEW





DUPLEX VS3-B
4X4X4 AS SHOWN
4X4X6 WITH INCREASER

45113105.dft

GORMAN-RUPP

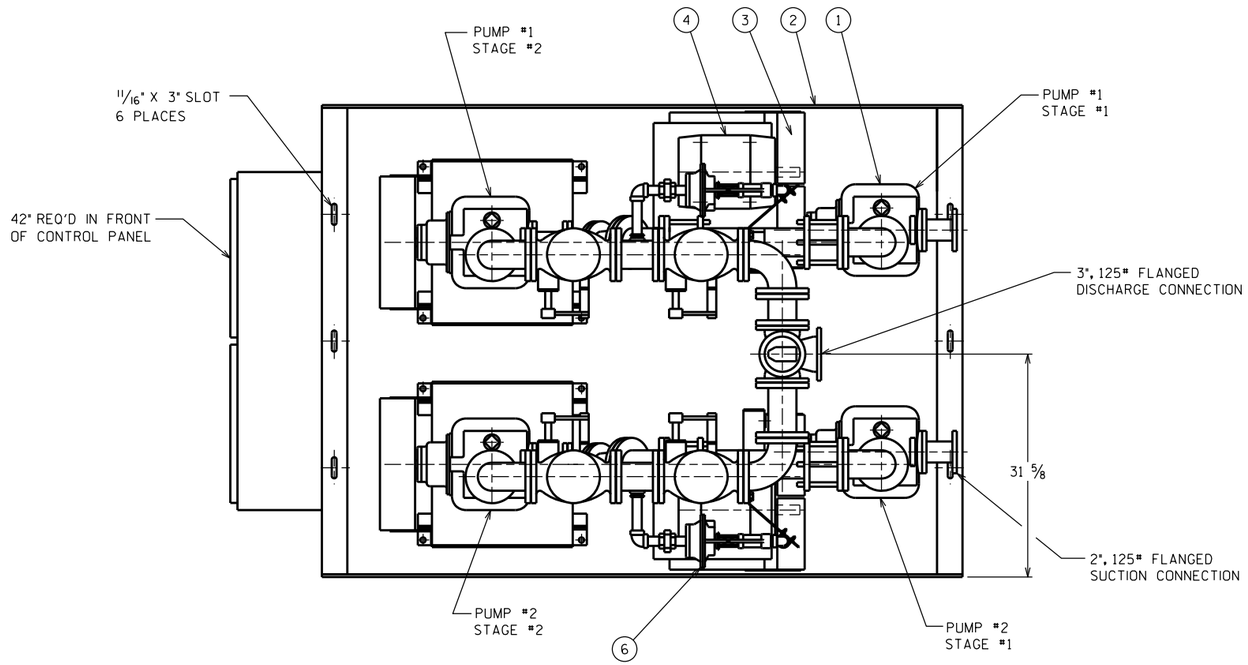
THE GORMAN-RUPP CO.
MANSFIELD, OHIO ST. THOMAS, ONTARIO

MODULAR ABOVE GROUND PUMP UNIT
WITH DUPLEX VS3-B PUMPS

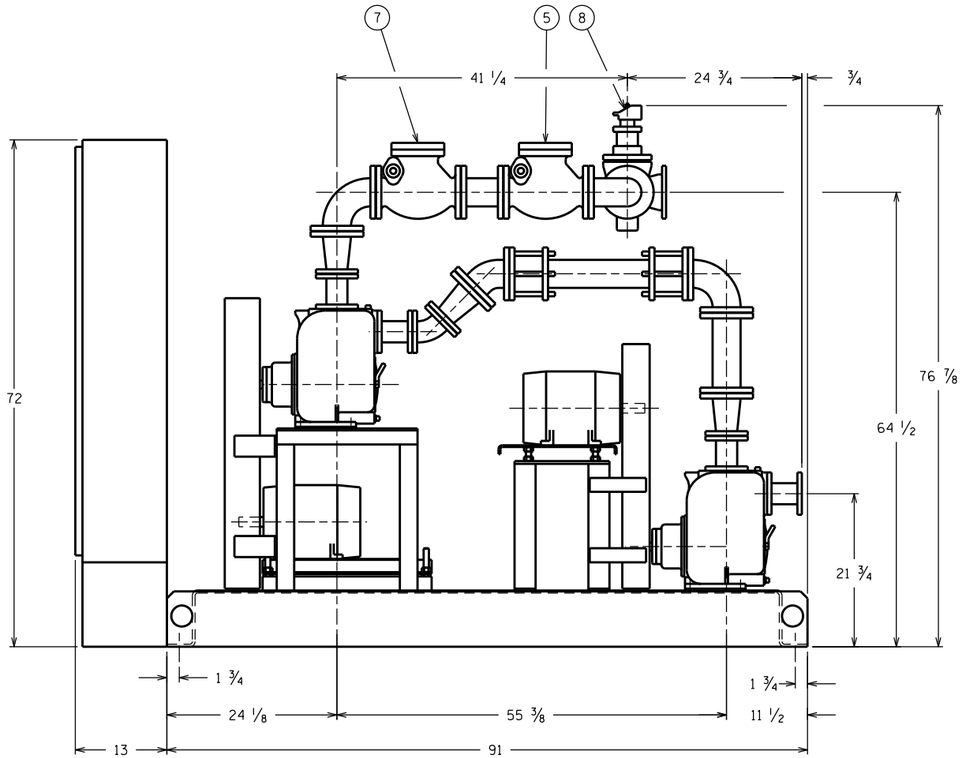
DWN.	CHK.	APP.	DATE
MDB	JMR	JMR	9/14/2018

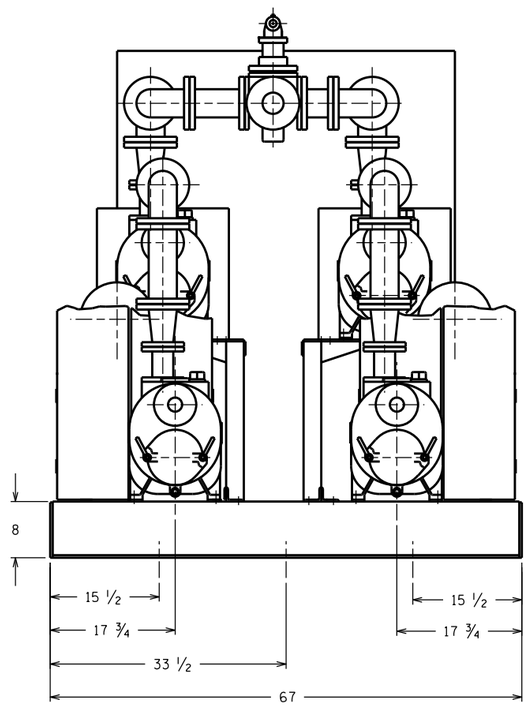
D	45113-105	SERIAL NO. -

REVISIONS				
SYM.	DATE	RECORD	DR.	CK.



ITEM	DESCRIPTION	MATERIAL & SIZE
1	PUMP	CAST IRON T2A-B
2	PUMP & MOTOR BASE ASSY	STEEL
3	BELT GUARD ASSY	STEEL
4	MOTOR	CAST IRON
5	PRIMARY CHECK VALVE	CAST IRON 3"
6	AIR RELEASE VALVE	CAST IRON 1"
7	SECONDARY CHECK VALVE	CAST IRON 3"
8	PLUG VALVE	CAST IRON 3" 3-WAY
9	FLANGE ADAPTOR	CAST IRON 3"
10	CONTROL PANEL	STEEL





T2A-B, 2" X 3" X 3"
CENTER DISCHARGE
AS SHOWN

602125.S01.DGN

THE GORMAN-RUPP CO.
MANSFIELD, OHIO ST. THOMAS, ONTARIO

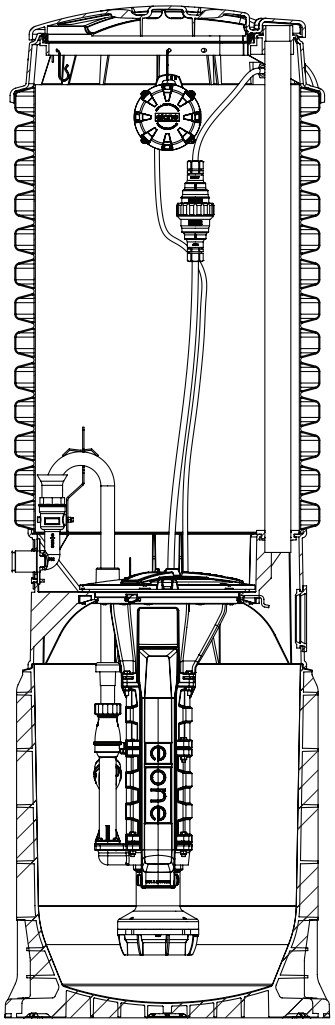
NAME BASE MOUNTED DUPLEX PUMP UNIT
T2A-B, SERIES CONNECTED

DRN.	CHK.	APP.	DATE
BW	BM	BM	12-18-07

D 60-2125 SERIAL NO.

E/ONE EXTREME SERIES

DH071



General Features

The model DH071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel. A single DH071 is a popular choice for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 700 gpd (2650 lpd)
- 70 gallons (265 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 61 inches to 160 inches

The DH071 has a cable that connects the motor controls to the level controls through watertight penetrations.

Operational Information

Motor
1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections
4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections
Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge
15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

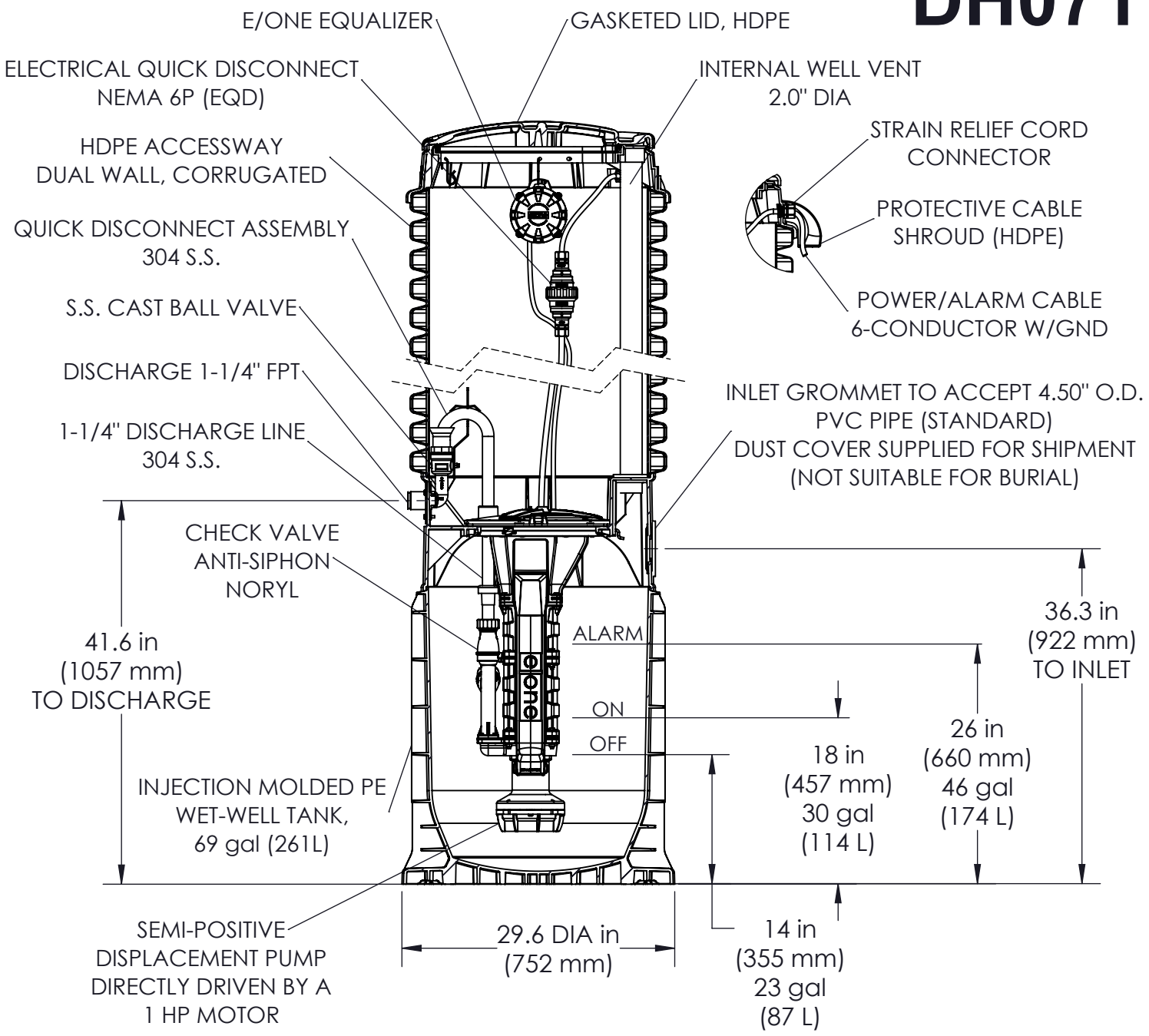
E/One requires that the Uni-Lateral, E/One's own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

NA0050P02

DH071



CONCRETE BALLAST NOT REQUIRED

NOTE: DIMENSIONS ARE FOR REF ONLY

FIELD JOINT REQUIRED FOR MODELS
DH071-129 / DH071-160

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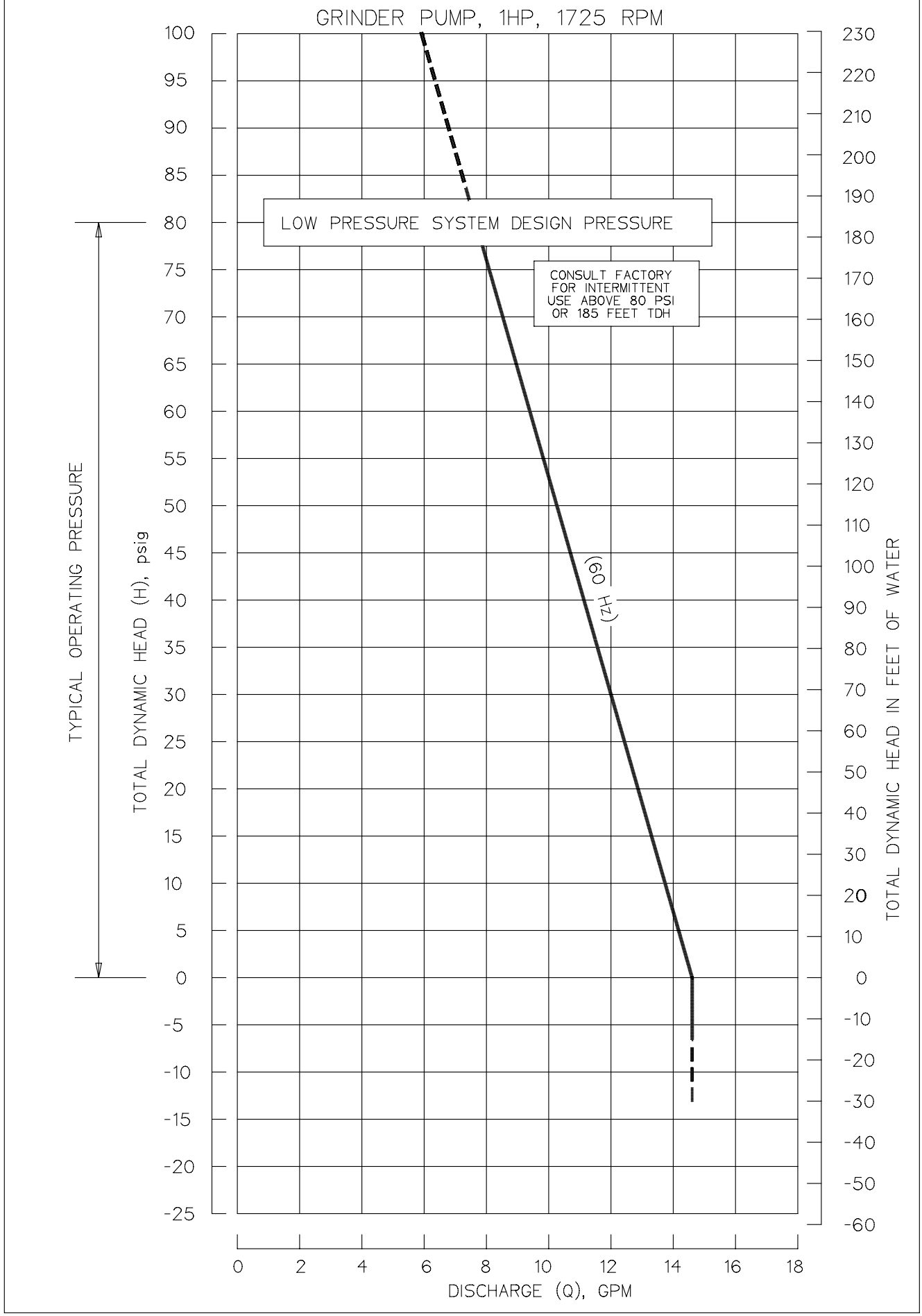
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

MODEL DH071
DETAIL SHEET

NA0050P02

E|ONE SPD PUMP PERFORMANCE CURVE



Grinder Pump Station Ballast Calculations and Assumptions

Using the Universal Wet Well Without Concrete Anchor

Any buried vessel that is submerged or partially submerged in water will be acted on by an upward buoyant force that attempts to return the vessel to a non-submerged state. The magnitude of this buoyant force is equal to the volume of the vessel that is submerged multiplied by the density of water. To counteract this buoyant force, a suitable ballast is required.

Unique to the E/One models DH071 and WH101 incorporating an injection molded Universal Wet Well, the bottom flange of the tank is designed to capture a suitable column of backfilled soil to resist the upward buoyant force. The weight of the backfill soil along with the soil shear resistance of the soil can retain the DH071 and WH101 tank in the ground – when properly installed in suitable soil conditions.

The amount of ballast force needed is equal to the weight it would take to counterbalance the buoyant force that is exerted on the station.

The total ballast force is a combination of the weight of the soil column acting on the bottom flange of the tank, the weight of the tank, and the soil shear resistance. The ballast force, the force resisting uplift of the station, must be greater than the buoyant force, the force pushing the station up, to have an acceptable installation.

Ballast Forces > Buoyant Force

Step 1: Calculate the Buoyant Force

Buoyant Force = Station Volume x Weight of Water

Example: WH101-92 Grinder Pump Station

- Station Volume: 25.85 cubic feet (known, from table)
- Empty weight of station: 153 pounds (known, from table)
- Weight of Water: 62.4 pounds per cubic foot

Buoyant Force = 25.85 cubic feet x 62.4 pounds per cubic foot = 1613 pounds

Net Buoyant Force = Buoyant Force – Weight of Station (empty)

Net Buoyant Force = 1613 pounds – 153 pounds = ***1,460 lbs***

Step 2: Calculate the Ballast Forces

Ballast Forces = Weight of Annular Soil Column + Soil Shear Resistance

A. Calculate Weight of Annular Soil Column

Weight of Annular Soil Column = Volume of Contributing Soil x Weight of Saturated Soil

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Volume of Contributing Soil = (Cylinder of Soil Acting on Base Flange – Volume of Tank)

Example: WH101-92

- Diameter of Universal Wet Well Base (D_{base}): 29.6”
- Nominal exterior diameter of station ($D_{station}$): 25.6”
- Height of Station: 85.6” (burial depth of station)

$$V_{soil} = H\ x\ \pi\ x \left(\frac{{D_{base}}^2}{4} - \frac{{D_{station}}^2}{4} \right)$$

$$V_{soil} = 85.6\ x\ 3.14\ x \left(\frac{29.6^2}{4} - \frac{25.6^2}{4} \right)$$

$$V_{soil} = 14{,}844\ in^3 = 8.59\ ft^3$$

$$W_{soil} = 8.59\ ft^3\ x\ 70 \frac{lbs}{ft^3} = \mathbf{601\ lbs}$$

B. Calculate Soil Shear Resistance

Soil shear resistance can be simplified and represented as the resistance to movement or friction of soil granules against adjacent granules.

E/One’s soil shear resistance method is adapted from Foundation Analysis and Design (Joseph E. Bowles, 1996). The loading case is *Bearing Capacity of Foundations with Uplift of Tension Forces*.

Simplified Formulas:

For shallow base (tank burial depth, H, is less than the depth of the failure zone, X), H ≤ X :

$$R_{Shear\ Resistance} = s_f\ x\ \pi\ x\ D_1\ x\ Unit\ Weight_{Soil_Bouyant}\ x \left(\frac{H^2}{2} \right) x\ \mathrm{K}_u\ x\ \tan\varphi$$

For deep base (tank burial depth, H, is greater than the depth of the failure zone, X), H ≥ X :

$$R_{Shear\ Resistance} = s_f\ x\ \pi\ x\ D_1\ x\ Unit\ Weight_{Soil_Bouyant}\ x\ (2\ x\ H\ - X)\ x\ \frac{X}{2}\ x\ \mathrm{K}_u\ x\ \tan\varphi$$

$$Where:\ K_u = K_a = tan^2(45° - \tfrac{\varphi}{2})\ \text{**from text, lateral earth pressure coefficient**}$$

Variables:

- Angle of internal friction between soil (ϕ)
- Shape factor (empirical, lookup from table, s_f)
- Diameter of tank base flange (D_1)
- Height of tank below grade (H)
- Depth of Soil Failure (X)
- Density of Saturated Soil ($UnitWeight_{Soil_bouyant}$) – 70 lbs/ft^3 assumed

	Angle of Internal Friction of Compacted Backfill Soil, ϕ (degrees)						
	20	**25**	**30**	**35**	**40**	**45**	**48**
X/D_1	2.5	3	4	5	7	9	11
s_f	1.12	1.3	1.6	2.25	4.45	5.5	7.6

Soil Shear Resistance Calculation Process:

1. Assume an angle of internal friction
2. Calculate depth of soil failure (X)
3. Determine which Soil Shear Resistance formula to use (deep base or shallow base)
4. Calculate Soil Shear Resistance

Example (WH101-92)

1. Assume an angle of internal friction.
    a. E/One suggests using an angle of 30 degrees for recommended ASTM D2321 Class 1 and Class 2 backfill.
2. Calculate depth of soil failure
    a. From table, 30-degree soil failure correlates to a X/D1 ratio of 4
    b. Therefore:

$$\frac{X}{D_1} = 4 \; or \; 4 * D_1 = X \; or \; X = 4 * 29.5 = 118 \; inches = 9.83 \; ft$$

3. Determine if "deep base" or "shallow base" condition.
    a. H = 85.6 inches or 7.13 feet, X = 118 inches or 9.83 feet
    b. Since H < X, <u>shallow base condition exists</u> – use appropriate soil shear equation.
4. Calculate Soil Shear Resistance using shallow base equation:

$$R_{Shear\ Resistance} = s_f \; x \; \pi \; x \; D_1 \; x \; Unit\ Weight_{Soil_Bouyant} \; x \left(\frac{H^2}{2}\right) x \; \mathrm{K}_u \; x \; \tan\varphi$$

$$Where: \; K_u = K_a = tan^2(45° - \tfrac{\varphi}{2})$$

$$R_{Shear\ Resistance} = 1.6 \; x \; \pi \; x \; 2.46 \; feet \; x \; 70 \frac{lbs}{ft^3} \; x \left(\frac{7.13^2}{2}\right) x \; 0.33 \; x \; \tan(30°) = \mathbf{4,192 \; lbs}$$

Buoyance Summary

The ballast forces (the forces resisting uplift of the station) must be greater than the buoyant force (the force pushing the station up) to have an acceptable installation.

(Weight of Soil Column + Soil Shear Resistance) > Net Buoyant Force

From Example:

- *Weight of Soil Column: 601 lbs*
- *Soil Shear Resistance: 4,192 lbs*
- *Net Buoyant Force: 1,460 lbs*

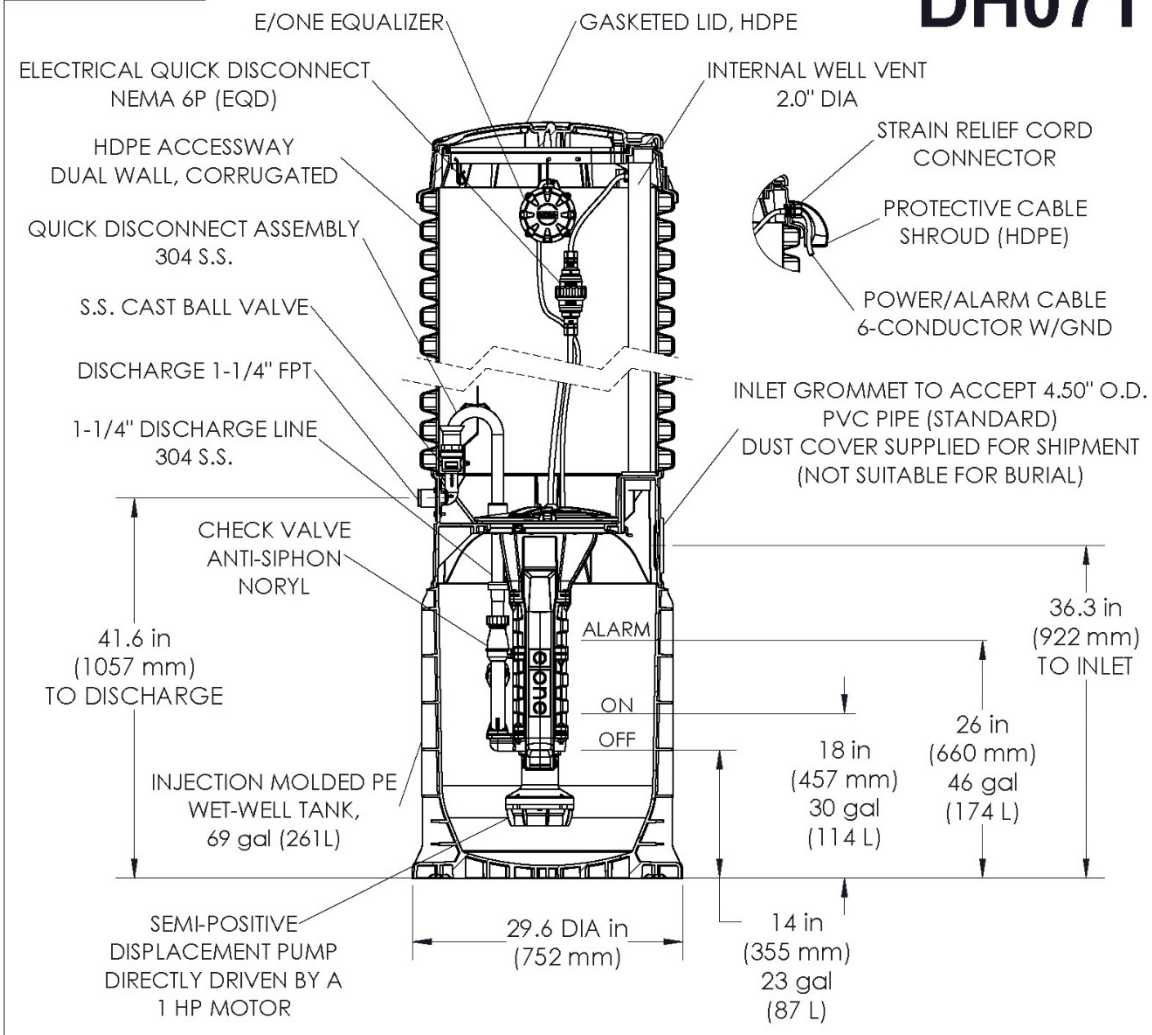
(601 lbs + 4,192 lbs) > 1,460 lbs

*****Disclaimer*****

Ballast assumptions and example calculations are provided for reference only. The E/One Universal Wet Well is capable of installation without a concrete anchor if it is properly installed in accordance with E/One installation instructions, including the utilization of suitable backfill materials (ASTM D2321 Class I or Class II material). For these materials, E/One recommends an angle of internal friction of 30 degrees or greater for use in soil shear resistance calculations. Different materials may necessitate different assumptions and different methods for calculating ballast requirements. The engineer of record is ultimately responsible for designing and dictating the suitable ballast requirements for a particular product, site, or project.

NA0050P02

DH071



CONCRETE BALLAST NOT REQUIRED

NOTE: DIMENSIONS ARE FOR REF ONLY

FIELD JOINT REQUIRED FOR MODELS DH071-129 / DH071-160

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DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

MODEL DH071
DETAIL SHEET

NA0050P02

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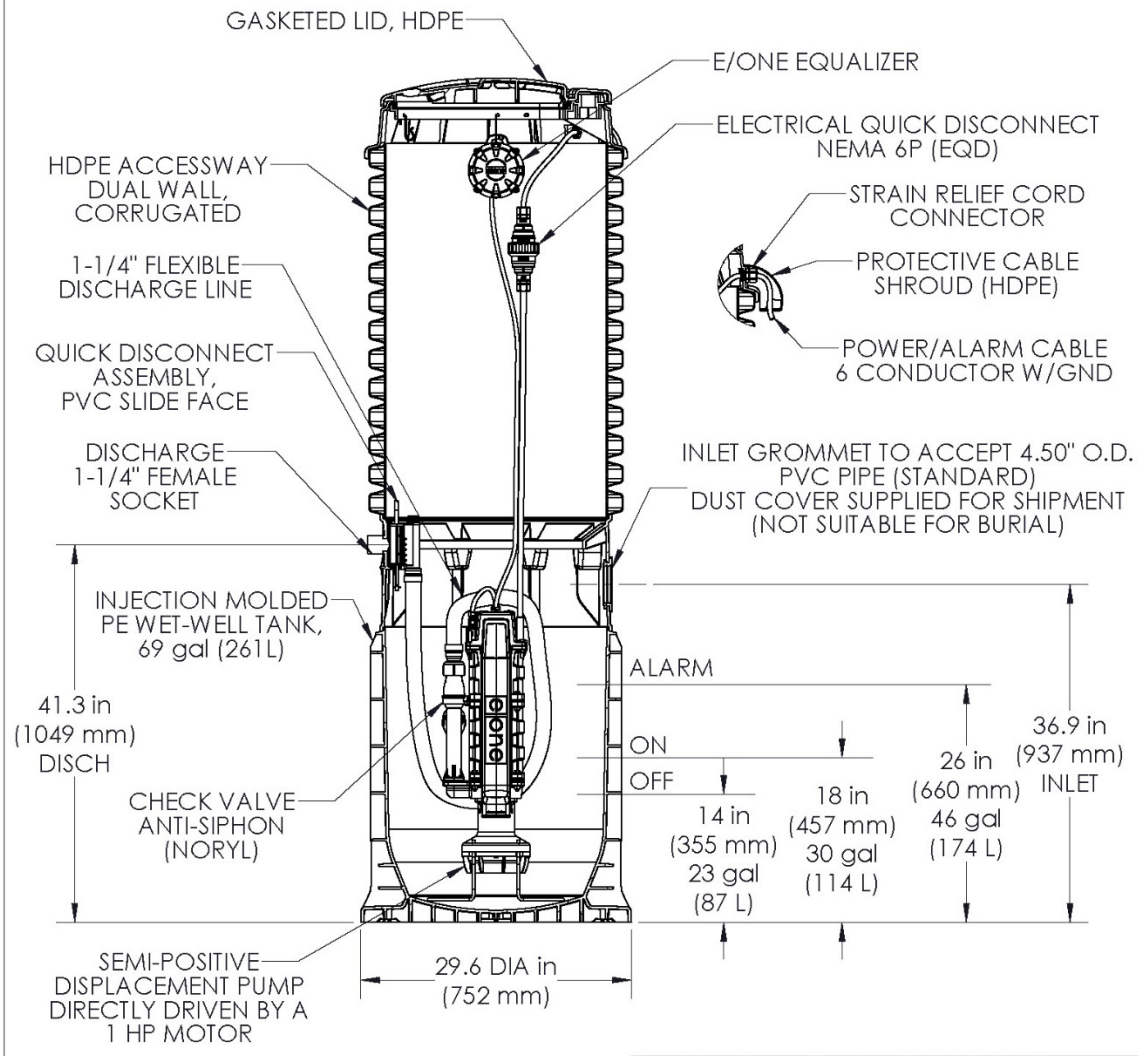
WH101



JV	JG	7/26/2023	H	1:16
DR BY	CHK'D	DATE	ISSUE	SCALE

CONCRETE BALLAST NOT REQUIRED

NOTE: DIMENSIONS ARE FOR REF ONLY

SEWER SYSTEMS

MODEL WH101
DETAIL SHEET

NA0057P02

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DH071/WH101 Nominal Weights and Volumes

Station Model *DH071 (WH101)*	**Weight** *lbs (kg)*	**Volume** *ft^3 (m^3)*	**Burial Depth** *ft (m)*
DH071-61 (WH101-60)	120 (54.4)	16.1 (0.456)	4.5 (1.37)
DH071-74 (WH101-74)	129 (58.5)	19.6 (0.555)	5.5 (1.68)
DH071-93 (WH101-92)	153 (69.4)	25.9 (0.733)	7.1 (2.16)
DH071-124 (WH101-124)	178 (80.7)	36.1 (1.022)	9.7 (2.96)
DH071-129 (WH101-130)	191 (86.6)	37.5 (1.062)	10.1 (3.08)
DH071-160 (WH101-159)	221 (100.2)	47.8 (1.353)	12.7 (3.87)

*** Values are nominal and may vary slightly due to minor manufacturing variability. Most common tank configurations are shown. Interpolate as necessary for any intermediate sizes. ***

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Appendix F: Alternatives & Life Cycle Cost Analysis

Opinion of Probable Construction Cost				
Item Description	*Unit Cost*	*Units*	*Quantity*	*Ext. Cost*
12" PVC Gravity Sewer Main	$ 215	LF	47,000	$ 10,105,000
8" PVC Gravity Sewer Main	$ 175	LF	17,000	$ 2,975,000
Sanitary Sewer Manholes (5' dia)	$ 15,000	EA	210	$ 3,150,000
4" PVC Gravity Sewer Laterals	$ 150	LF	13,000	$ 1,950,000
8" HDPE Forcemain	$ 165	LF	37,100	$ 6,121,500
6" HDPE Forcemain	$ 155	LF	7,000	$ 1,085,000
Flushing Air Vac and Release Structure	$ 15,500	EA	33	$ 511,500
HDPE Low Pressure Sewer Main	$ 50	LF	12,000	$ 600,000
HDPE Low Pressure Sewer Laterals	$ 35.00	LF	12,420	$ 434,700
Grinder Pumps	$ 7,500	EA	106	$ 792,000
Grinder Pump Alarm Panels	$ 2,500	EA	106	$ 264,000
Pump Stations	$ 525,000	EA	28	$ 14,700,000
Flow Meter Pit	$ 15,000	EA	1	$ 15,000
Sanitary Sewer Clean Outs	$ 414	EA	414	$ 171,400
Low Pressure Sewer Curb and Check Valve Assembly	$ 1,000	EA	106	$ 105,600
Full Depth Road Restoration	$ 54	SY	74,000	$ 3,999,600
Mill and Overlay	$ 15.00	SY	300,000	$ 4,500,000
Pavement Striping	$ 3.00	LF	215,300	$ 645,900
Rock Excavation	$ 150.00	CY	14,000	$ 2,100,000
Odor Control Stations	$ 70,000.00	EA	10	$ 700,000
BIDDING & GENERAL REQUIREMENTS				
General Conditions	2.0%		-	$ 1,099,000
Mobilization/Demobilization	4.0%		-	$ 2,198,000
MPOT	2.5%			$ 1,374,000
SUBTOTAL CONSTRUCTION COSTS (2024 PRESENT VALUE)				**$ 59,597,000**
SUBTOTAL CONTRUCTION COSTS (escalated to mid-2027; est. constr. midpoint)	6.0%			**$ 63,173,000**
ASSOCIATED COSTS				
Construction Contingency	30%		-	$ 18,952,000
Engineering, Bidding and Construction Services	20%			$ 12,635,000
Administration, Financial, Bonding and Legal Services	5%		-	$ 3,159,000
Design & Engineering Contingency	5%		-	$ 3,159,000
SUBTOTAL ASSOCIATED COSTS				**$ 34,746,000**
TOTAL OPINION OF PROBABLE CAPITAL COST				**$ 97,919,000**
State Revolving Fund (SRF) Issuance Cost			-	
TOTAL COSTS				**$ 97,920,000**

Public Sewer System Costs

Total Operating Costs (Present Value)			
Sewer Administration	$	41,500	
Pump Station Electrical Cost	$	100,638	
Pump Station Odor Control Refills	$	207,000	
Employee Benefits	$	117,900	
Watkins Water Reclamation Cost	$	805,000	Based on current Watkins Glen Out-of-District User Cost
SUBTOTAL	**$**	**1,272,038**	

Maintenance and Short-Lived Asset Costs					Projection Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	Annual Inflation	3%				100%	103%	106%	109%	112%	115%	118%	121%	124%	127%	130%	133%	136%	139%	142%	145%	148%	151%	154%	157%	160%	163%	166%	169%	172%	175%	178%	181%	184%	187%	190%	193%	196%
Equipment	Maintenance Item	Quantity	Replacement Frequency (years)	Present Unit Cost	Total Present Cost	Year and Replacement Cost																														
						2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056
Anticipated Maintenance Costs (online 2027)																																				
Flow Meters	Calibration/Servicing	1	2	$ 800	$ 800					$ 896		$ 944		$ 992		$ 1,040		$ 1,088		$ 1,136		$ 1,184		$ 1,232		$ 1,280		$ 1,328		$ 1,376		$ 1,424		$ 1,472		$ 1,520		$ 1,568
Air Relief, Pressure Relief & Vacuum Relief Valve	Calibration/Servicing	33	1	$ 500	$ 16,500				$ 17,985	$ 18,480	$ 18,975	$ 19,470	$ 19,965	$ 20,460	$ 20,955	$ 21,450	$ 21,945	$ 22,440	$ 22,935	$ 23,430	$ 23,925	$ 24,420	$ 24,915	$ 25,410	$ 25,905	$ 26,400	$ 26,895	$ 27,390	$ 27,885	$ 28,380	$ 28,875	$ 29,370	$ 29,865	$ 30,360	$ 30,855	$ 31,350	$ 31,845	$ 32,340
Sewage Pumps	Inspection	56	1	$ 1,000	$ 56,000				$ 61,040	$ 62,720	$ 64,400	$ 66,080	$ 67,760	$ 69,440	$ 71,120	$ 72,800	$ 74,480	$ 76,160	$ 77,840	$ 79,520	$ 81,200	$ 82,880	$ 84,560	$ 86,240	$ 87,920	$ 89,600	$ 91,280	$ 92,960	$ 94,640	$ 96,320	$ 98,000	$ 99,680	$ 101,360	$ 103,040	$ 104,720	$ 106,400	$ 108,080	$ 109,760
Flushing and Low Pressure Sewer Main	Flushing and Cleaning	1	5	$ 10,000	$ 10,000								$ 12,100					$ 13,600					$ 15,100				$ 16,600			$ 18,100						$ 19,600
Emergency Backup Generators	Calibration / Servicing	28	1	$ 1,250	$ 35,000				$ 38,150	$ 39,200	$ 40,250	$ 41,300	$ 42,350	$ 43,400	$ 44,450	$ 45,500	$ 46,550	$ 47,600	$ 48,650	$ 49,700	$ 50,750	$ 51,800	$ 52,850	$ 53,900	$ 54,950	$ 56,000	$ 57,050	$ 58,100	$ 59,150	$ 60,200	$ 61,250	$ 62,300	$ 63,350	$ 64,400	$ 65,450	$ 66,500	$ 67,550	$ 68,600
SCADA Controls	Subscription	28	1	$ 290	$ 8,120				$ 8,851	$ 9,094	$ 9,338	$ 9,582	$ 9,825	$ 10,069	$ 10,312	$ 10,556	$ 10,800	$ 11,043	$ 11,287	$ 11,530	$ 11,774	$ 12,018	$ 12,261	$ 12,505	$ 12,748	$ 12,992	$ 13,236	$ 13,479	$ 13,723	$ 13,966	$ 14,210	$ 14,454	$ 14,697	$ 14,941	$ 15,184	$ 15,428	$ 15,672	$ 15,915
TOTAL MAINTENANCE COST						$ -	$ -	$ -	**$ 126,026**	**$ 130,390**	**$ 132,963**	**$ 137,376**	**$ 152,000**	**$ 144,361**	**$ 146,837**	**$ 151,346**	**$ 153,775**	**$ 171,931**	**$ 160,712**	**$ 165,316**	**$ 167,649**	**$ 172,302**	**$ 189,686**	**$ 179,287**	**$ 181,523**	**$ 186,272**	**$ 188,461**	**$ 209,857**	**$ 195,398**	**$ 200,242**	**$ 202,335**	**$ 207,228**	**$ 227,372**	**$ 214,213**	**$ 216,209**	**$ 221,198**	**$ 223,147**	**$ 247,783**
Anticipated Short-Lived Asset Costs (online 2027)																																				
Flow Meters	Replacement	1	15	$ 8,500	$ 8,500																		$ 12,835														$ 8,330
Air Relief, Pressure Relief & Vacuum Relief Valve	Replacement	33	20	$ 5,000	$ 165,000																				$ 86,350					$ 96,250						
Emergency Backup Generator	Replacement	28	20	$ 75,000	$ 2,100,000																			$ 646,800		$ 672,000		$ 697,200		$ 722,400		$ 747,600				
TOTAL SHORT LIVED ASSET COST						$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 12,835**	**$ 646,800**	**$ 86,350**	**$ 672,000**	**$ 89,650**	**$ 697,200**	$ -	**$ 722,400**	**$ 96,250**	**$ 747,600**	$ -	$ -	$ -	$ -	$ -	**$ 8,330**

Annual Costs		Projection Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
		Annual Inflation	3%	100%	103%	106%	109%	113%	116%	119%	123%	127%	130%	134%	138%	143%	147%	151%	156%	160%	165%	170%	175%	181%	186%	192%	197%	203%	209%	216%	222%	229%	236%
		Present Value (2024) Cost															Year and Cost (1)															
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Debt Service Costs																																
Existing Annual Debt Service		$0																														
Loan Rate		4.00%																														
Loan Period (years)		30																														
Capital Project Costs (Project Start		$ 97,920,000																														
Proposed Project Annual Debt Service		$ 5,662,723	$ -	$ -	$ -	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000	$ 5,663,000
TOTAL DEBT SERVICE			**$0**	**$0**	**$0**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**	**$5,663,000**
Proposed Operating Costs																																
Sewer Administration		$ 41,500	$ 42,000	$ 43,000	$ 44,000	$ 45,000	$ 47,000	$ 48,000	$ 50,000	$ 51,000	$ 53,000	$ 54,000	$ 56,000	$ 57,000	$ 59,000	$ 61,000	$ 63,000	$ 65,000	$ 67,000	$ 69,000	$ 71,000	$ 73,000	$ 75,000	$ 77,000	$ 80,000	$ 82,000	$ 84,000	$ 87,000	$ 89,000	$ 92,000	$ 95,000	$ 98,000
Pump Station Electrical Cost		$ 100,638	$ 101,000	$ 104,000	$ 107,000	$ 110,000	$ 113,000	$ 117,000	$ 120,000	$ 124,000	$ 127,000	$ 131,000	$ 135,000	$ 139,000	$ 143,000	$ 148,000	$ 152,000	$ 157,000	$ 161,000	$ 166,000	$ 171,000	$ 176,000	$ 182,000	$ 187,000	$ 193,000	$ 199,000	$ 205,000	$ 211,000	$ 217,000	$ 224,000	$ 230,000	$ 237,000
Pump Station Odor Control Refills		$ 207,000	$ 207,000	$ 213,000	$ 220,000	$ 226,000	$ 233,000	$ 240,000	$ 247,000	$ 255,000	$ 262,000	$ 270,000	$ 278,000	$ 287,000	$ 295,000	$ 304,000	$ 313,000	$ 322,000	$ 332,000	$ 342,000	$ 352,000	$ 363,000	$ 374,000	$ 385,000	$ 397,000	$ 409,000	$ 421,000	$ 433,000	$ 446,000	$ 460,000	$ 474,000	$ 488,000
Employee Benefits		$ 117,900	$ 118,000	$ 121,000	$ 125,000	$ 129,000	$ 133,000	$ 137,000	$ 141,000	$ 145,000	$ 149,000	$ 154,000	$ 158,000	$ 163,000	$ 168,000	$ 173,000	$ 178,000	$ 184,000	$ 189,000	$ 195,000	$ 201,000	$ 207,000	$ 213,000	$ 219,000	$ 226,000	$ 233,000	$ 240,000	$ 247,000	$ 254,000	$ 262,000	$ 270,000	$ 278,000
Watkins Water Reclamation Cost		$ 805,000	$ 805,000	$ 829,000	$ 854,000	$ 880,000	$ 906,000	$ 933,000	$ 961,000	$ 990,000	$ 1,020,000	$ 1,050,000	$ 1,082,000	$ 1,114,000	$ 1,148,000	$ 1,182,000	$ 1,218,000	$ 1,254,000	$ 1,292,000	$ 1,331,000	$ 1,370,000	$ 1,412,000	$ 1,454,000	$ 1,498,000	$ 1,542,000	$ 1,589,000	$ 1,636,000	$ 1,685,000	$ 1,736,000	$ 1,788,000	$ 1,842,000	$ 1,897,000
Subtotal Proposed Operating Costs			***$ 1,273,000***	***$ 1,310,000***	***$ 1,350,000***	***$ 1,390,000***	***$ 1,432,000***	***$ 1,475,000***	***$ 1,519,000***	***$ 1,565,000***	***$ 1,611,000***	***$ 1,659,000***	***$ 1,709,000***	***$ 1,760,000***	***$ 1,813,000***	***$ 1,868,000***	***$ 1,924,000***	***$ 1,982,000***	***$ 2,041,000***	***$ 2,103,000***	***$ 2,165,000***	***$ 2,231,000***	***$ 2,298,000***	***$ 2,366,000***	***$ 2,438,000***	***$ 2,512,000***	***$ 2,586,000***	***$ 2,663,000***	***$ 2,742,000***	***$ 2,826,000***	***$ 2,911,000***	***$ 2,998,000***
Subtotal Proposed Maintenance Costs			***$ -***	***$ -***	***$ -***	***$ 126,026***	***$ 130,390***	***$ 132,963***	***$ 137,376***	***$ 152,000***	***$ 144,361***	***$ 146,837***	***$ 151,346***	***$ 153,775***	***$ 171,931***	***$ 160,712***	***$ 165,316***	***$ 167,649***	***$ 172,302***	***$ 189,686***	***$ 179,287***	***$ 181,523***	***$ 186,272***	***$ 188,461***	***$ 209,857***	***$ 195,398***	***$ 200,242***	***$ 202,335***	***$ 207,228***	***$ 227,372***	***$ 214,213***	***$ 216,209***
TOTAL OPERATING AND MAINTENANCE COSTS			**$ 1,273,000**	**$ 1,310,000**	**$ 1,350,000**	**$ 1,516,026**	**$ 1,562,390**	**$ 1,607,963**	**$ 1,656,376**	**$ 1,717,000**	**$ 1,755,361**	**$ 1,805,837**	**$ 1,860,346**	**$ 1,913,775**	**$ 1,984,931**	**$ 2,028,712**	**$ 2,089,316**	**$ 2,149,649**	**$ 2,213,302**	**$ 2,292,686**	**$ 2,344,287**	**$ 2,412,523**	**$ 2,484,272**	**$ 2,554,461**	**$ 2,647,857**	**$ 2,707,398**	**$ 2,786,242**	**$ 2,865,335**	**$ 2,949,228**	**$ 3,053,372**	**$ 3,125,213**	**$ 3,214,209**
Short Lived Asset Costs			***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ 12,835***	***$ 646,800***	***$ 86,350***	***$ 672,000***	***$ 89,650***	***$ 697,200***	***$ -***	***$ -***	-
Subtotal Short Lived Asset Costs			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,835	$ 646,800	$ 86,350	$ 672,000	$ 89,650	$ 697,200	$ -	$ 722,400	$ 96,250	$ 747,600	$ -	$ -	-
Short Lived Asset Reserve Fund																																
Simple Annual Average - Short Lived Asset Costs		$ 126,000																														
Annual Reserve Deposit			$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 130,000	$ 130,000	$ 130,000	$ 130,000	$ 130,000	$ 140,000	$ 140,000	$ 140,000	$ 140,000	$ 140,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000	$ 155,000
Cumulative Reserve Deposits			$ 120,000	$ 240,000	$ 360,000	$ 480,000	$ 600,000	$ 730,000	$ 860,000	$ 990,000	$ 1,120,000	$ 1,250,000	$ 1,390,000	$ 1,530,000	$ 1,670,000	$ 1,810,000	$ 1,950,000	$ 2,100,000	$ 2,250,000	$ 2,400,000	$ 2,537,165	$ 2,045,365	$ 2,114,015	$ 1,597,015	$ 1,662,365	$ 1,120,165	$ 1,275,165	$ 707,765	$ 766,515	$ 173,915	$ 328,915	$ 483,915
Subtract Annual Short Lived Asset Costs			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (12,835)	$ (646,800)	$ (86,350)	$ (672,000)	$ (89,650)	$ (697,200)	$ -	$ (722,400)	$ (96,250)	$ (747,600)	$ -	$ -	-
Net Maintenance Reserve			$ 120,000	$ 240,000	$ 360,000	$ 480,000	$ 600,000	$ 730,000	$ 860,000	$ 990,000	$ 1,120,000	$ 1,250,000	$ 1,390,000	$ 1,530,000	$ 1,670,000	$ 1,810,000	$ 1,950,000	$ 2,100,000	$ 2,250,000	$ 2,387,165	$ 1,890,365	$ 1,959,015	$ 1,442,015	$ 1,507,365	$ 965,165	$ 1,120,165	$ 552,765	$ 611,515	$ 18,915	$ 173,915	$ 328,915	$ 483,915
TOTAL SHORT LIVED ASSET RESERVE FUND			**$ 120,000**	**$ 120,000**	**$ 120,000**	**$ 120,000**	**$ 120,000**	**$ 130,000**	**$ 130,000**	**$ 130,000**	**$ 130,000**	**$ 130,000**	**$ 140,000**	**$ 140,000**	**$ 140,000**	**$ 140,000**	**$ 140,000**	**$ 150,000**	**$ 150,000**	**$ 150,000**	**$ 150,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**	**$ 155,000**
GRAND TOTAL ANNUAL COST			**$1,393,000**	**$1,430,000**	**$1,470,000**	**$7,299,026**	**$7,345,390**	**$7,400,963**	**$7,449,376**	**$7,510,000**	**$7,548,361**	**$7,598,837**	**$7,663,346**	**$7,716,775**	**$7,787,931**	**$7,831,712**	**$7,892,316**	**$7,962,649**	**$8,026,302**	**$8,105,686**	**$8,157,287**	**$8,230,523**	**$8,302,272**	**$8,372,461**	**$8,465,857**	**$8,525,398**	**$8,604,242**	**$8,683,335**	**$8,767,228**	**$8,871,372**	**$8,943,213**	**$9,032,209**
EDUs		556																														
Cost per EDU			$2,505	$2,572	$2,644	$13,128	$13,211	$13,311	$13,398	$13,507	$13,576	$13,667	$13,783	$13,879	$14,007	$14,086	$14,195	$14,321	$14,436	$14,579	$14,671	$14,803	$14,932	$15,058	$15,226	$15,333	$15,475	$15,618	$15,768	$15,956	$16,085	$16,245

Year	Total Debt Service	O&M Costs	Short Lived Asset Cost	Annual Total	Annual Total EDU	Annual Total Cost per EDU
2024	$0	$1,273,000	$120,000	$1,393,000	556	$ 2,505
2025	$0	$1,310,000	$120,000	$1,430,000	556	$ 2,572
2026	$0	$1,350,000	$120,000	$1,470,000	556	$ 2,644
2027	$5,663,000	$1,516,026	$120,000	$7,299,026	556	$ 13,128
2028	$5,663,000	$1,562,390	$120,000	$7,345,390	556	$ 13,211
2029	$5,663,000	$1,607,963	$130,000	$7,400,963	556	$ 13,311
2030	$5,663,000	$1,656,376	$130,000	$7,449,376	556	$ 13,398
2031	$5,663,000	$1,717,000	$130,000	$7,510,000	556	$ 13,507
2032	$5,663,000	$1,755,361	$130,000	$7,548,361	556	$ 13,576
2033	$5,663,000	$1,805,837	$130,000	$7,598,837	556	$ 13,667
2034	$5,663,000	$1,860,346	$140,000	$7,663,346	556	$ 13,783
2035	$5,663,000	$1,913,775	$140,000	$7,716,775	556	$ 13,879
2036	$5,663,000	$1,984,931	$140,000	$7,787,931	556	$ 14,007
2037	$5,663,000	$2,028,712	$140,000	$7,831,712	556	$ 14,086
2038	$5,663,000	$2,089,316	$140,000	$7,892,316	556	$ 14,195
2039	$5,663,000	$2,149,649	$150,000	$7,962,649	556	$ 14,321
2040	$5,663,000	$2,213,302	$150,000	$8,026,302	556	$ 14,436
2041	$5,663,000	$2,292,686	$150,000	$8,105,686	556	$ 14,579
2042	$5,663,000	$2,344,287	$150,000	$8,157,287	556	$ 14,671
2043	$5,663,000	$2,412,523	$155,000	$8,230,523	556	$ 14,803
2044	$5,663,000	$2,484,272	$155,000	$8,302,272	556	$ 14,932
2045	$5,663,000	$2,554,461	$155,000	$8,372,461	556	$ 15,058
2046	$5,663,000	$2,647,857	$155,000	$8,465,857	556	$ 15,226
2047	$5,663,000	$2,707,398	$155,000	$8,525,398	556	$ 15,333
2048	$5,663,000	$2,786,242	$155,000	$8,604,242	556	$ 15,475
2049	$5,663,000	$2,865,335	$155,000	$8,683,335	556	$ 15,618
2050	$5,663,000	$2,949,228	$155,000	$8,767,228	556	$ 15,768
2051	$5,663,000	$3,053,372	$155,000	$8,871,372	556	$ 15,956
2052	$5,663,000	$3,125,213	$155,000	$8,943,213	556	$ 16,085
2053	$5,663,000	$3,214,209	$155,000	$9,032,209	556	$ 16,245

Opinion of Probable Construction Cost				
Item Description	*Unit Cost*	*Units*	*Quantity*	*Ext. Cost*
12" PVC Gravity Sewer Main	$ 215	LF	53,000	$ 11,395,000
8" PVC Gravity Sewer Main	$ 175	LF	15,600	$ 2,730,000
Sanitary Sewer Manholes (5' dia)	$ 15,000	EA	201	$ 3,015,000
4" PVC Gravity Sewer Laterals	$ 150	LF	13,000	$ 1,950,000
8" HDPE Forcemain	$ 165	LF	48,000	$ 7,920,000
6" HDPE Forcemain	$ 155	LF	6,442	$ 998,500
Flushing Air Vac and Release Structure	$ 15,500	EA	37	$ 573,500
HDPE Low Pressure Sewer Main	$ 50	LF	11,063	$ 553,200
HDPE Low Pressure Sewer Laterals	$ 35.00	LF	12,243	$ 428,500
Grinder Pumps	$ 7,500	EA	106	$ 792,000
Grinder Pump Alarm Panels	$ 2,500	EA	106	$ 264,000
Pump Stations	$ 525,000	EA	28	$ 14,700,000
Flow Meter Pit	$ 15,000	EA	1	$ 15,000
Sanitary Sewer Clean Outs	$ 414	EA	414	$ 171,400
Low Pressure Sewer Curb and Check Valve Assembly	$ 1,000	EA	106	$ 105,600
Full Depth Road Restoration	$ 54	SY	82,000	$ 4,432,000
Mill and Overlay	$ 15.00	SY	200,000	$ 3,000,000
Pavement Striping	$ 3.00	LF	226,500	$ 679,500
Rock Excavation	$ 150.00	CY	15,000	$ 2,250,000
Odor Control Stations	$ 70,000.00	EA	10	$ 700,000
Wastewater Treatment Facility				
Land Acquisition	$ 100,000	LS	1	$ 100,000
Influent Building (Masonry; influent channel)	$ 550	SF	1,050	$ 577,500
SBR Control Building (PEMB)	$ 400	SF	1,250	$ 500,000
Effluent & Service Building (Pole Barn; channels for disc filter & UV)	$ 450	SF	2,000	$ 900,000
Building Systems (Electrical, HVAC, Plumbing)	$ 125	SF	4,300	$ 537,500
Access (Stairs, Walkways, Railings, Platforms)	$ 50,000	LS	1	$ 50,000
Major Process Equipment				$ -
Influent Screen	$ 259,500	LS	1	$ 259,500
Sequencing Batch Reactors (including influent & waste sludge pumps)	$ 3,053,750	LS	1	$ 3,053,800
Chemical Storage & Feed	$ 75,000	LS	1	$ 75,000
Equalization Tank & Pumps	$ 150,000	LS	1	$ 150,000
Disc Filters	$ 847,500	LS	1	$ 847,500
UV Disinfection	$ 217,500	LS	1	$ 217,500
Distribution Tank & Pumps & Valve Vault	$ 150,000	LS	1	$ 150,000
Subsurface Dispersal Beds	$ 215	LF	2,700	$ 580,500
Sludge Thickener & Thickened Sludge Pumps	$ 900,000	LS	1	$ 900,000
Tanker Truck (to haul thickened sludge)	$ 200,000	LS	1	$ 200,000
Process Piping & Valves	$ 850,000	LS	1	$ 850,000
Process Electrical	$ 680,000	LS	1	$ 680,000
Backup Generator & Auto. Transfer Switch	$ 150,000	LS	1	$ 150,000
Instrumentation and Metering	$ 150,000	LS	1	$ 150,000
Additional Site Work & Site Features	$ 574,000	LS	1	$ 574,000
BIDDING & GENERAL REQUIREMENTS				
General Conditions	2.0%		-	$ 1,364,000
Mobilization/Demobilization	4.0%		-	$ 2,728,000
MPOT	2.5%			$ 1,705,000
SUBTOTAL CONSTRUCTION COSTS (2024 PRESENT VALUE)				**$ 73,973,000**
SUBTOTAL CONTRUCTION COSTS (escalated to mid-2027; est. constr. midpoint)	6.0%			**$ 78,412,000**
ASSOCIATED COSTS				
Construction Contingency	30%		-	$ 23,524,000
Engineering, Bidding and Construction Services	20%			$ 15,682,000
Administration, Financial, Bonding and Legal Services	5%		-	$ 3,920,600
Design & Engineering Contingency	5%		-	$ 3,920,600
SUBTOTAL ASSOCIATED COSTS				**$ 47,047,200**
TOTAL OPINION OF PROBABLE CAPITAL COST				**$ 125,459,200**
State Revolving Fund (SRF) Issuance Cost			-	
TOTAL COSTS				**$ 125,460,000**

Public Sewer System Costs

Cost/KWh $0.0700 Estimated

PROPOSED EQUIPMENT ENERGY COSTS

Equipment	Quantity	Power hp	Energy kW	Capacity running	Operating time h/d	Energy rate kWh/yr	Annual cost	
Mechanical Influent Screen Drive	1	1	0.7	100%	24	6,532	$457	*Estimated*
Mechanical Influent Screen Washing Compactor	1	1	0.7	100%	24	6,532	$457	*Estimated*
Raw Sewage Pumps	2	15	22.4	75%	12	73,489	$5,144	*Estimated*
SBR Blowers	2	15	22.4	100%	8	65,323	$4,573	*Estimated*
SBR Decant Drive Unit	2	1	1.5	100%	3	1,633	$114	*Estimated*
SBR Submersible Mixer	2	10	14.9	100%	3	16,331	$1,143	*Estimated*
Alum Feed Pump	1	0.25	0.2	50%	24	817	$57	*Estimated*
Alum Transfer Pump	1	2	1.1	100%	0.1	41	$3	*Estimated*
Disc Filter	1	1	0.7	100%	24	6,532	$457	*Estimated*
UV Disinfection	1	-	2	100%	24	17,520	$1,226	*Estimated*
Dispersal Bed Distribution Pumps	2	15	22.4	20%	12	20,025	$1,402	*Estimated*
Waste Activated Sludge Pumps	2	5	7.5	20%	0.1	56	$4	*Estimated*
Sludge Thickener Drive	1	1	0.7	100%	24	6,532	$457	*Estimated*
Building Electric Unit Heaters							$3,500	*Estimated*
						Total	**$18,995**	

PROPOSED CHEMICAL TREATMENT COSTS

System	Quantity, gal	Quantity, lb	Unit Cost	**Total Cost**
Aluminum Sulfate (Phosphorous removal)	4,868		$ 1.50	$ 7,302
			Total	**$7,302**

PROPOSED SLUDGE DISPOSAL COSTS

System	TSS %	Thickened Sludge gal/yr	Trips per year 4,500 gal each	Haul unit cost $/trip	CVWRF unit cost $/trip	Annual cost	
Haul to CVWRF	2%	465,375	103	$ 20	$ 1,350	$ 141,680.83	*Estimated*
					Total	**$141,681**	

Total Operating Costs (Present Value)

Sewer Administration	$	166,000
Pump Station Electrical Cost	$	100,638
Pump Station Odor Control Refills	$	207,000
Employee Benefits	$	176,850
Proposed Equipment Energy Costs	$	18,995
Proposed Chemical Treatment Costs	$	7,302
Proposed Sludge Disposal Costs	$	141,681
SUBTOTAL	**$**	**818,466**

Village of Burdett and Town of Hector
Wastewater System Feasibility Study

Asset Investment Schedule
Alt. 3 - Maint. & SLA Costs

Labella Project No. 2243745
4/28/2025

Maintenance and Short-Lived Asset Costs					Projection Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	Annual Inflation	3%				100%	103%	106%	109%	112%	115%	118%	121%	124%	127%	130%	133%	136%	139%	142%	145%	148%	151%	154%	157%	160%	163%	166%	169%	172%	175%	178%	181%	184%	187%	190%	193%	196%
Equipment	Maintenance Item	Quantity	Replacement Frequency (years)	Present Unit Cost	Total Present Cost	Year and Replacement Cost																														
						2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056
Anticipated Maintenance Costs (online 2027)																																				
Flow Meters	Calibration/Servicing	1	2	$ 800	$ 800					$ 896		$ 944		$ 992		$ 1,040		$ 1,088		$ 1,136		$ 1,184		$ 1,232		$ 1,280		$ 1,328		$ 1,376		$ 1,424		$ 1,472		$ 1,520		$ 1,568
Air Relief, Pressure Relief & Vacuum Relief Valve	Calibration/Servicing	33	1	$ 500	$ 16,500				$ 17,985	$ 18,480	$ 18,975	$ 19,470	$ 19,965	$ 20,460	$ 20,955	$ 21,450	$ 21,945	$ 22,440	$ 22,935	$ 23,430	$ 23,925	$ 24,420	$ 24,915	$ 25,410	$ 25,905	$ 26,400	$ 26,895	$ 27,390	$ 27,885	$ 28,380	$ 28,875	$ 29,370	$ 29,865	$ 30,360	$ 30,855	$ 31,350	$ 31,845	$ 32,340
Sewage Pumps	Impeller	56	1	$ 1,000	$ 56,000				$ 61,040	$ 62,720	$ 64,400	$ 66,080	$ 67,760	$ 69,440	$ 71,120	$ 72,800	$ 74,480	$ 76,160	$ 77,840	$ 79,520	$ 81,200	$ 82,880	$ 84,560	$ 86,240	$ 87,920	$ 89,600	$ 91,280	$ 92,960	$ 94,640	$ 96,320	$ 98,000	$ 99,680	$ 101,360	$ 103,040	$ 104,720	$ 106,400	$ 108,080	$ 109,760
Flushing and Low Pressure Sewer Main	Flushing and Cleaning	1	5	$ 10,000	$ 10,000								$ 12,100					$ 13,600					$ 15,100					$ 16,600					$ 18,100				$ 19,660
Emergency Backup Generators	Calibration / Servicing	28	1	$ 1,250	$ 35,000				$ 38,150	$ 39,200	$ 40,250	$ 41,300	$ 42,350	$ 43,400	$ 44,450	$ 45,500	$ 46,550	$ 47,600	$ 48,650	$ 49,700	$ 50,750	$ 51,800	$ 52,850	$ 53,900	$ 54,950	$ 56,000	$ 57,050	$ 58,100	$ 59,150	$ 60,200	$ 61,250	$ 62,300	$ 63,350	$ 64,400	$ 65,450	$ 66,500	$ 67,550	$ 68,600
SCADA Controls	Subscription	28	1	$ 290	$ 8,120				$ 8,851	$ 9,094	$ 9,338	$ 9,582	$ 9,825	$ 10,069	$ 10,312	$ 10,556	$ 10,800	$ 11,043	$ 11,287	$ 11,530	$ 11,774	$ 12,018	$ 12,261	$ 12,505	$ 12,748	$ 12,992	$ 13,236	$ 13,479	$ 13,723	$ 13,966	$ 14,210	$ 14,454	$ 14,697	$ 14,941	$ 15,184	$ 15,428	$ 15,672	$ 15,915
Mechanical Screen & Washer Compactor	Grease takeup bearings (screen)	2	0.019	$ 2.00	$ 208.00				$ 227	$ 233	$ 239	$ 245	$ 252	$ 258	$ 264	$ 270	$ 277	$ 283	$ 289	$ 295	$ 302	$ 308	$ 314	$ 320	$ 327	$ 333	$ 339	$ 345	$ 352	$ 358	$ 364	$ 370	$ 376	$ 383	$ 389	$ 395	$ 401	$ 408
	Lubricate main chain (screen)	2	0.019	$ 10.00	$ 1,020.00				$ 567	$ 582	$ 598	$ 614	$ 629	$ 645	$ 660	$ 676	$ 691	$ 707	$ 723	$ 738	$ 754	$ 770	$ 785	$ 801	$ 816	$ 832	$ 848	$ 863	$ 879	$ 894	$ 910	$ 926	$ 941	$ 957	$ 972	$ 988	$ 1,004	$ 1,019
	Grease rake arm bearings (screen)	3	0.019	$ 2.00	$ 312.00				$ 340	$ 349	$ 359	$ 368	$ 378	$ 387	$ 396	$ 406	$ 415	$ 424	$ 434	$ 443	$ 452	$ 462	$ 471	$ 480	$ 490	$ 499	$ 509	$ 518	$ 527	$ 537	$ 546	$ 555	$ 565	$ 574	$ 583	$ 593	$ 602	$ 612
	Grease tailshaft bearing (screen)	2	0.019	$ 2.00	$ 208.00				$ 227	$ 233	$ 239	$ 245	$ 252	$ 258	$ 264	$ 270	$ 277	$ 283	$ 289	$ 295	$ 302	$ 308	$ 314	$ 320	$ 327	$ 333	$ 339	$ 345	$ 352	$ 358	$ 364	$ 370	$ 376	$ 383	$ 389	$ 395	$ 401	$ 408
	Grease pivot block guides (screen)	2	0.019	$ 2.00	$ 208.00				$ 227	$ 233	$ 239	$ 245	$ 252	$ 258	$ 264	$ 270	$ 277	$ 283	$ 289	$ 295	$ 302	$ 308	$ 314	$ 320	$ 327	$ 333	$ 339	$ 345	$ 352	$ 358	$ 364	$ 370	$ 376	$ 383	$ 389	$ 395	$ 401	$ 408
	Grease wiper bearings (screen)	2	0.083	$ 2.00	$ 48.00				$ 52	$ 54	$ 55	$ 57	$ 58	$ 60	$ 61	$ 62	$ 64	$ 65	$ 67	$ 68	$ 70	$ 71	$ 72	$ 74	$ 75	$ 77	$ 78	$ 80	$ 81	$ 83	$ 84	$ 85	$ 87	$ 88	$ 90	$ 91	$ 93	$ 94
	Lubricate small primary gear box (screen)	1	0.5	$ 10.00	$ 20.00				$ 22	$ 22	$ 23	$ 24	$ 24	$ 25	$ 25	$ 26	$ 27	$ 27	$ 28	$ 28	$ 29	$ 30	$ 30	$ 31	$ 31	$ 32	$ 33	$ 33	$ 34	$ 34	$ 35	$ 36	$ 36	$ 37	$ 38	$ 39	$ 39	$ 39
	Lubricate large secondary gear box (screen)	1	0.5	$ 10.00	$ 20.00				$ 22	$ 22	$ 23	$ 24	$ 24	$ 25	$ 25	$ 26	$ 27	$ 27	$ 28	$ 28	$ 29	$ 30	$ 30	$ 31	$ 31	$ 32	$ 33	$ 33	$ 34	$ 34	$ 35	$ 36	$ 36	$ 37	$ 38	$ 39	$ 39	$ 39
	Grease motor bearings (screen)	1	1	$ 2.00	$ 2.00				$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4
	Grease lubricated seals (compactor/conveyor	1	0.019	$ 2.00	$ 104.00				$ 113	$ 116	$ 120	$ 123	$ 126	$ 129	$ 132	$ 135	$ 138	$ 141	$ 145	$ 148	$ 151	$ 154	$ 157	$ 160	$ 163	$ 166	$ 170	$ 173	$ 176	$ 179	$ 182	$ 185	$ 188	$ 191	$ 194	$ 198	$ 201	$ 204
	Replace gear reducer oil (compactor/conveyor	1	0.5	$ 100.00	$ 200.00				$ 218	$ 224	$ 230	$ 236	$ 242	$ 248	$ 254	$ 260	$ 266	$ 272	$ 278	$ 284	$ 290	$ 296	$ 302	$ 308	$ 314	$ 320	$ 326	$ 332	$ 338	$ 344	$ 350	$ 356	$ 362	$ 368	$ 374	$ 380	$ 386	$ 392
	Grease motor bearings (compactor/conveyor	1	1	$ 2.00	$ 2.00				$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4
	Clean module disks & divertes	1	1	$ 2.00	$ 2.00				$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4
	Inspect wash water accessories	1	1	$ 2.00	$ 2.00				$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4
Raw Sewage Pumps	Lubricate motor & pump; replace oi	3	1	$ 500.00	$ 1,500.00				$ 1,635	$ 1,680	$ 1,725	$ 1,770	$ 1,815	$ 1,860	$ 1,905	$ 1,950	$ 1,995	$ 2,040	$ 2,085	$ 2,130	$ 2,175	$ 2,220	$ 2,265	$ 2,310	$ 2,355	$ 2,400	$ 2,445	$ 2,490	$ 2,535	$ 2,580	$ 2,625	$ 2,670	$ 2,715	$ 2,760	$ 2,805	$ 2,850	$ 2,895	$ 2,940
Aeration Blowers & Diffused Air System	Replace blower drive motor oil	2	1	$ 120.00	$ 240.00				$ 262			$ 283		$ 305			$ 326				$ 348			$ 370			$ 391			$ 413			$ 434			$ 456	
	Replace blower drive belt	2	3	$ 950.00	$ 1,900.00				$ 2,071			$ 2,242		$ 2,413			$ 2,584				$ 2,755			$ 2,926			$ 3,097			$ 3,268			$ 3,439			$ 3,610	
Phosphorous Removal System	Replace feed pump tubing	1	1	$ 125.00	$ 125.00				$ 136	$ 140	$ 144	$ 148	$ 151	$ 155	$ 159	$ 163	$ 166	$ 170	$ 174	$ 178	$ 181	$ 185	$ 189	$ 193	$ 196	$ 200	$ 204	$ 208	$ 211	$ 215	$ 219	$ 223	$ 226	$ 230	$ 234	$ 238	$ 241	$ 245
	Replace feed pump rollers	1	5	$ 250.00	$ 250.00				$ 273					$ 310					$ 348					$ 385					$ 423					$ 460			
	Replace skid piping and fittings	1	1	$ 250.00	$ 250.00				$ 273	$ 280	$ 288	$ 295	$ 303	$ 310	$ 318	$ 325	$ 333	$ 340	$ 348	$ 355	$ 363	$ 370	$ 378	$ 385	$ 393	$ 400	$ 408	$ 415	$ 423	$ 430	$ 438	$ 445	$ 453	$ 460	$ 468	$ 475	$ 483	$ 490
	Replace transfer pump components	1	3	$ 250.00	$ 250.00				$ 273					$ 310					$ 348					$ 385					$ 423					$ 460			
UV Disinfection	Replace lamps	5.7	1	$ 300.00	$ 1,710.00				$ 1,864	$ 1,915	$ 1,967	$ 2,018	$ 2,069	$ 2,120	$ 2,172	$ 2,223	$ 2,274	$ 2,326	$ 2,377	$ 2,428	$ 2,480	$ 2,531	$ 2,582	$ 2,633	$ 2,685	$ 2,736	$ 2,787	$ 2,839	$ 2,890	$ 2,941	$ 2,993	$ 3,044	$ 3,095	$ 3,146	$ 3,198	$ 3,249	$ 3,300	$ 3,352
	Replace scraper	18.9	1	$ 150.00	$ 2,835.00				$ 3,090	$ 3,175	$ 3,260	$ 3,345	$ 3,430	$ 3,515	$ 3,600	$ 3,686	$ 3,771	$ 3,856	$ 3,941	$ 4,026	$ 4,111	$ 4,196	$ 4,281	$ 4,366	$ 4,451	$ 4,536	$ 4,621	$ 4,706	$ 4,791	$ 4,876	$ 4,961	$ 5,046	$ 5,131	$ 5,216	$ 5,301	$ 5,387	$ 5,472	$ 5,557
	Replace ballast	9.5	1	$ 750.00	$ 7,125.00				$ 7,766	$ 7,980	$ 8,194	$ 8,408	$ 8,621	$ 8,835	$ 9,049	$ 9,263	$ 9,476	$ 9,690	$ 9,904	$ 10,118	$ 10,331	$ 10,545	$ 10,759	$ 10,973	$ 11,186	$ 11,400	$ 11,614	$ 11,828	$ 12,041	$ 12,255	$ 12,469	$ 12,683	$ 12,896	$ 13,110	$ 13,324	$ 13,538	$ 13,751	$ 13,965
	Replace quartz sleeve	1	1	$ 175.00	$ 175.00				$ 191	$ 196	$ 201	$ 207	$ 212	$ 217	$ 222	$ 228	$ 233	$ 238	$ 243	$ 249	$ 254	$ 259	$ 264	$ 270	$ 275	$ 280	$ 285	$ 291	$ 296	$ 301	$ 306	$ 312	$ 317	$ 322	$ 327	$ 333	$ 338	$ 343
Sludge Thickener Drive	Lubricate drive bearings/turntable	0.083	1	$ 2,000.00	$ 220.00				$ 131	$ 134	$ 138	$ 142	$ 145	$ 149	$ 152	$ 156	$ 160	$ 163	$ 167	$ 170	$ 174	$ 178	$ 181	$ 185	$ 188	$ 192	$ 196	$ 199	$ 203	$ 206	$ 210	$ 214	$ 217	$ 221	$ 224	$ 228	$ 232	$ 235
	Replace drive gear reducer oil	1	0.25	$ 80.00	$ 320.00				$ 349	$ 358	$ 368	$ 378	$ 387	$ 397	$ 406	$ 416	$ 426	$ 435	$ 445	$ 454	$ 464	$ 474	$ 483	$ 493	$ 502	$ 512	$ 522	$ 531	$ 541	$ 550	$ 560	$ 570	$ 579	$ 589	$ 598	$ 608	$ 618	$ 627
	Lubricate drive gear reducer bearings	2	0.083	$ 10.00	$ 120.00				$ 131	$ 134	$ 138	$ 142	$ 145	$ 149	$ 152	$ 156	$ 160	$ 163	$ 167	$ 170	$ 174	$ 178	$ 181	$ 185	$ 188	$ 192	$ 196	$ 199	$ 203	$ 206	$ 210	$ 214	$ 217	$ 221	$ 224	$ 228	$ 232	$ 235
	Replace drive motor oil	1	0.5	$ 80.00	$ 160.00				$ 174	$ 179	$ 184	$ 189	$ 194	$ 198	$ 203	$ 208	$ 213	$ 218	$ 222	$ 227	$ 232	$ 237	$ 242	$ 246	$ 251	$ 256	$ 261	$ 266	$ 270	$ 275	$ 280	$ 285	$ 290	$ 294	$ 299	$ 304	$ 309	$ 314
	Lubricate gears	3	0.25	$ 10.00	$ 40.00				$ 44	$ 45	$ 46	$ 47	$ 48	$ 50	$ 51	$ 52	$ 53	$ 54	$ 56	$ 57	$ 58	$ 59	$ 60	$ 62	$ 63	$ 64	$ 65	$ 66	$ 68	$ 69	$ 70	$ 71	$ 72	$ 73	$ 75	$ 76	$ 77	$ 78
	Lubricate shear pins	1	1	$ 10.00	$ 10.00				$ 11	$ 11	$ 11	$ 12	$ 12	$ 12	$ 13	$ 13	$ 13	$ 14	$ 14	$ 14	$ 14	$ 15	$ 15	$ 15	$ 15	$ 16	$ 16	$ 16	$ 17	$ 17	$ 17	$ 18	$ 18	$ 18	$ 19	$ 19	$ 19	$ 20
TOTAL MAINTENANCE COST						$ -	$ -	$ -	$ 146,721	$ 148,698	$ 151,761	$ 159,189	$ 171,779	$ 165,250	$ 170,315	$ 172,596	$ 175,515	$ 197,072	$ 184,128	$ 188,528	$ 194,454	$ 196,494	$ 214,369	$ 208,525	$ 207,187	$ 212,426	$ 218,593	$ 236,992	$ 223,868	$ 232,038	$ 230,941	$ 236,323	$ 260,832	$ 245,209	$ 246,776	$ 256,221	$ 254,694	$ 279,821
Anticipated Short-Lived Asset Costs (online 2027)																																				
Flow Meters	Replacement	1	15	$ 8,500	$ 8,500																																$ 8,330
Air Relief, Pressure Relief & Vacuum Relief Valve	Replacement	33	20	$ 5,000	$ 165,000																				$ 86,350						$ 96,250				
Emergency Backup Generator	Replacement	28	20	$ 75,000	$ 2,100,000																			$ 646,800		$ 672,000		$ 697,200		$ 722,400		$ 747,600				
Mech. Influent Screen, Wash Compactor,	Replace links and wear parts (screen)	1	5	$ 1,000.00	$ 1,000.00								$ 1,210																								
and Wash Module	Replace rake (screen)	1	20	$ 15,000.00	$ 15,000.00																				$ 23,550												
	Rebuild auger (compactor)	1	15	$ 5,000.00	$ 5,000.00																	$ 7,250															
	Replace solenoid valves (wash mod.)	3	10	$ 370.00	$ 1,110.00											$ 1,443										$ 1,776											
Pumping Systems	Rebuild pump bearing frame (bearings, gaskets, o-rir	3	15	$ 10,000.00	$ 30,000.00																$ 42,600															
Aeration System	Replace blower	2	25	$ 38,000.00	$ 76,000.00																														$ 133,000		
	Replace diffuser assemblies	80	25	$ 730.00	$ 58,400.00																														$ 102,200		
	Replace membranes	80	12	$ 685.00	$ 54,800.00													$ 74,528										$ 92,612									
	Concrete repair	10000	20	$ 40.00	$ 400,000.00																						$ 640,000										
Phosphorous Removal System	Replace bulk tanks	3	15	$ 6,000.00	$ 18,000.00																	$ 26,100															
	Replace day tank	1	15	$ 3,000.00	$ 3,000.00																	$ 4,350															
	Replace feed pump	1	15	$ 4,400.00	$ 4,400.00																	$ 6,380															
	Replace transfer pump	1	15	$ 3,000.00	$ 3,000.00																	$ 4,350															
UV Disinfection	Recoat concrete channel wall	492	20	$ 22.35	$ 10,997.65																						$ 17,926										
Sludge Thickener	Replace drive bearings and lower steady bearing	1	20	$ 2,100.00	$ 2,100.00																								$ 3,486								
	Replace skimmer assembly and pivot bearing	1	5	$ 500.00	$ 500.00								$ 605				$ 680						$ 755						$ 830				$ 905				$ 980
	Concrete repair	5000	20	$ 40.00	$ 200,000.00																									$ 338,000							
Flow Meters	Replace flow meter	4	15	$ 6,500.00	$ 26,000.00																													$ 38,480			
Influent & Effluent Samplers	Replace samplers	2	15	$ 8,450.00	$ 16,900.00																														$ 25,519		
TOTAL SHORT LIVED ASSET COST						$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,815	$ -	$ -	$ -	$ 1,443	$ -	$ 75,208	$ -	$ 42,600	$ 48,430	$ 38,480	$ 39,109	$ 646,800	$ 109,900	$ 1,313,776	$ 107,576	$ 701,516	$ 430,612	$ 722,400	$ 331,450	$ 747,600	$ 905	$ -	$ -	$ -	$ 9,310

Annual Costs		Projection Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Annual Inflation	3%	100%	103%	106%	109%	113%	116%	119%	123%	127%	130%	134%	138%	143%	147%	151%	156%	160%	165%	170%	175%	181%	186%	192%	197%	203%	209%	216%	222%	229%	236%
		Present Value (2024) Cost	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	Year and Cost (1) 2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Debt Service Costs																																
Existing Annual Debt Service		$0																														
Loan Rate		4.00%																														
Loan Period (years)		30																														
Capital Project Costs (Project Start)		$ 125,460,000																														
Proposed Project Annual Debt Service		$ 7,255,364	$ -	$ -	$ -	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000	$ 7,255,000
TOTAL DEBT SERVICE			**$0**	**$0**	**$0**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**	**$7,255,000**
Proposed Operating Costs																																
Sewer Administration		$ 166,000	$ 166,000	$ 171,000	$ 176,000	$ 181,000	$ 187,000	$ 192,000	$ 198,000	$ 204,000	$ 210,000	$ 217,000	$ 223,000	$ 230,000	$ 237,000	$ 244,000	$ 251,000	$ 259,000	$ 266,000	$ 274,000	$ 283,000	$ 291,000	$ 300,000	$ 309,000	$ 318,000	$ 328,000	$ 337,000	$ 348,000	$ 358,000	$ 369,000	$ 380,000	$ 391,000
Pump Station Electrical Cost		$ 100,638	$ 101,000	$ 104,000	$ 107,000	$ 110,000	$ 113,000	$ 117,000	$ 120,000	$ 124,000	$ 127,000	$ 131,000	$ 135,000	$ 139,000	$ 143,000	$ 148,000	$ 152,000	$ 157,000	$ 161,000	$ 166,000	$ 171,000	$ 176,000	$ 182,000	$ 187,000	$ 193,000	$ 199,000	$ 205,000	$ 211,000	$ 217,000	$ 224,000	$ 230,000	$ 237,000
Pump Station Odor Control Refills		$ 207,000	$ 207,000	$ 213,000	$ 220,000	$ 226,000	$ 233,000	$ 240,000	$ 247,000	$ 255,000	$ 262,000	$ 270,000	$ 278,000	$ 287,000	$ 295,000	$ 304,000	$ 313,000	$ 322,000	$ 332,000	$ 342,000	$ 352,000	$ 363,000	$ 374,000	$ 385,000	$ 397,000	$ 409,000	$ 421,000	$ 433,000	$ 446,000	$ 460,000	$ 474,000	$ 488,000
Employee Benefits		$ 176,850	$ 177,000	$ 182,000	$ 188,000	$ 193,000	$ 199,000	$ 205,000	$ 211,000	$ 218,000	$ 224,000	$ 231,000	$ 238,000	$ 245,000	$ 252,000	$ 260,000	$ 268,000	$ 276,000	$ 284,000	$ 292,000	$ 301,000	$ 310,000	$ 319,000	$ 329,000	$ 339,000	$ 349,000	$ 359,000	$ 370,000	$ 381,000	$ 393,000	$ 405,000	$ 417,000
Subtotal Proposed Operating Costs			***$ 651,000***	***$ 670,000***	***$ 691,000***	***$ 710,000***	***$ 732,000***	***$ 754,000***	***$ 776,000***	***$ 801,000***	***$ 823,000***	***$ 849,000***	***$ 874,000***	***$ 901,000***	***$ 927,000***	***$ 956,000***	***$ 984,000***	***$ 1,014,000***	***$ 1,043,000***	***$ 1,074,000***	***$ 1,107,000***	***$ 1,140,000***	***$ 1,175,000***	***$ 1,210,000***	***$ 1,247,000***	***$ 1,285,000***	***$ 1,322,000***	***$ 1,362,000***	***$ 1,402,000***	***$ 1,446,000***	***$ 1,489,000***	***$ 1,533,000***
Subtotal Proposed Maintenance Costs			***$ -***	***$ -***	***$ -***	***$ 146,721***	***$ 148,698***	***$ 151,761***	***$ 159,189***	***$ 171,779***	***$ 165,250***	***$ 170,315***	***$ 172,596***	***$ 175,515***	***$ 197,072***	***$ 184,128***	***$ 188,528***	***$ 194,454***	***$ 196,494***	***$ 214,369***	***$ 208,525***	***$ 207,187***	***$ 212,426***	***$ 218,593***	***$ 236,992***	***$ 223,868***	***$ 232,038***	***$ 230,941***	***$ 236,323***	***$ 260,832***	***$ 245,209***	***$ 246,776***
TOTAL OPERATING AND MAINTENANCE COSTS			**$ 651,000**	**$ 670,000**	**$ 691,000**	**$ 856,721**	**$ 880,698**	**$ 905,761**	**$ 935,189**	**$ 972,779**	**$ 988,250**	**$ 1,019,315**	**$ 1,046,596**	**$ 1,076,515**	**$ 1,124,072**	**$ 1,140,128**	**$ 1,172,528**	**$ 1,208,454**	**$ 1,239,494**	**$ 1,288,369**	**$ 1,315,525**	**$ 1,347,187**	**$ 1,387,426**	**$ 1,428,593**	**$ 1,483,992**	**$ 1,508,868**	**$ 1,554,038**	**$ 1,592,941**	**$ 1,638,323**	**$ 1,706,832**	**$ 1,734,209**	**$ 1,779,776**
Short Lived Asset Costs			***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ 1,815***	***$ -***	***$ -***	***$ 1,443***	***$ -***	***$ 75,208***	***$ -***	***$ 42,600***	***$ 48,430***	***$ 38,480***	***$ 39,109***	***$ 646,800***	***$ 109,900***	***$ 1,313,776***	***$ 107,576***	***$ 701,516***	***$ 430,612***	***$ 722,400***	***$ 331,450***	***$ 747,600***	***$ 905***	***$ -***	-
Subtotal Short Lived Asset Costs			**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,815**	**$ -**	**$ -**	**$ 1,443**	**$ -**	**$ 75,208**	**$ -**	**$ 42,600**	**$ 48,430**	**$ 38,480**	**$ 39,109**	**$ 646,800**	**$ 109,900**	**$ 1,313,776**	**$ 107,576**	**$ 701,516**	**$ 430,612**	**$ 722,400**	**$ 331,450**	**$ 747,600**	**$ 905**	**$ -**	**$ -**
Short Lived Asset Reserve Fund																																
Simple Annual Average - Short Lived Asset Costs		$ 179,000																														
Annual Reserve Deposit			$ 170,000	$ 170,000	$ 170,000	$ 170,000	$ 170,000	$ 185,000	$ 185,000	$ 185,000	$ 185,000	$ 185,000	$ 195,000	$ 195,000	$ 195,000	$ 195,000	$ 195,000	$ 215,000	$ 215,000	$ 215,000	$ 215,000	$ 215,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000
Cumulative Reserve Deposits			$ 170,000	$ 340,000	$ 510,000	$ 680,000	$ 850,000	$ 1,035,000	$ 1,220,000	$ 1,405,000	$ 1,588,185	$ 1,773,185	$ 1,968,185	$ 2,161,742	$ 2,356,742	$ 2,476,534	$ 2,671,534	$ 2,843,934	$ 3,010,504	$ 3,187,024	$ 3,362,915	$ 2,931,115	$ 3,046,215	$ 1,957,439	$ 2,074,863	$ 1,598,347	$ 1,392,735	$ 895,335	$ 788,885	$ 266,285	$ 490,380	$ 715,380
Subtract Annual Short Lived Asset Costs			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (1,815)	$ -	$ -	$ (1,443)	$ -	$ (75,208)	$ -	$ (42,600)	$ (48,430)	$ (38,480)	$ (39,109)	$ (646,800)	$ (109,900)	$ (1,313,776)	$ (107,576)	$ (701,516)	$ (430,612)	$ (722,400)	$ (331,450)	$ (747,600)	$ (905)	$ -	$ -
Net Maintenance Reserve			$ 170,000	$ 340,000	$ 510,000	$ 680,000	$ 850,000	$ 1,035,000	$ 1,220,000	$ 1,403,185	$ 1,588,185	$ 1,773,185	$ 1,966,742	$ 2,161,742	$ 2,281,534	$ 2,476,534	$ 2,628,934	$ 2,795,504	$ 2,972,024	$ 3,147,915	$ 2,716,115	$ 2,821,215	$ 1,732,439	$ 1,849,863	$ 1,373,347	$ 1,167,735	$ 670,335	$ 563,885	$ 41,285	$ 265,380	$ 490,380	$ 715,380
TOTAL SHORT LIVED ASSET RESERVE FUND			**$ 170,000**	**$ 170,000**	**$ 170,000**	**$ 170,000**	**$ 170,000**	**$ 185,000**	**$ 185,000**	**$ 185,000**	**$ 185,000**	**$ 185,000**	**$ 195,000**	**$ 195,000**	**$ 195,000**	**$ 195,000**	**$ 195,000**	**$ 215,000**	**$ 215,000**	**$ 215,000**	**$ 215,000**	**$ 215,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**	**$ 225,000**
GRAND TOTAL ANNUAL COST			**$821,000**	**$840,000**	**$861,000**	**$8,281,721**	**$8,305,698**	**$8,345,761**	**$8,375,189**	**$8,412,779**	**$8,428,250**	**$8,459,315**	**$8,496,596**	**$8,526,515**	**$8,574,072**	**$8,590,128**	**$8,622,528**	**$8,678,454**	**$8,709,494**	**$8,758,369**	**$8,785,525**	**$8,817,187**	**$8,867,426**	**$8,908,593**	**$8,963,992**	**$8,988,868**	**$9,034,038**	**$9,072,941**	**$9,118,323**	**$9,186,832**	**$9,214,209**	**$9,259,776**
EDUs		556																														
Cost per EDU			$1,477	$1,511	$1,549	$14,895	$14,938	$15,010	$15,063	$15,131	$15,159	$15,215	$15,282	$15,335	$15,421	$15,450	$15,508	$15,609	$15,665	$15,752	$15,801	$15,858	$15,949	$16,023	$16,122	$16,167	$16,248	$16,318	$16,400	$16,523	$16,572	$16,654

Year	Total Debt Service	O&M Costs	Short Lived Asset Cost	Annual Total	Annual Total EDU	Annual Total Cost per EDU
2024	$0	$ 651,000	$ 170,000	$821,000	556	$ 1,477
2025	$0	$ 670,000	$ 170,000	$840,000	556	$ 1,511
2026	$0	$ 691,000	$ 170,000	$861,000	556	$ 1,549
2027	$7,255,000	$ 856,721	$ 170,000	$8,281,721	556	$ 14,895
2028	$7,255,000	$ 880,698	$ 170,000	$8,305,698	556	$ 14,938
2029	$7,255,000	$ 905,761	$ 185,000	$8,345,761	556	$ 15,010
2030	$7,255,000	$ 935,189	$ 185,000	$8,375,189	556	$ 15,063
2031	$7,255,000	$ 972,779	$ 185,000	$8,412,779	556	$ 15,131
2032	$7,255,000	$ 988,250	$ 185,000	$8,428,250	556	$ 15,159
2033	$7,255,000	$ 1,019,315	$ 185,000	$8,459,315	556	$ 15,215
2034	$7,255,000	$ 1,046,596	$ 195,000	$8,496,596	556	$ 15,282
2035	$7,255,000	$ 1,076,515	$ 195,000	$8,526,515	556	$ 15,335
2036	$7,255,000	$ 1,124,072	$ 195,000	$8,574,072	556	$ 15,421
2037	$7,255,000	$ 1,140,128	$ 195,000	$8,590,128	556	$ 15,450
2038	$7,255,000	$ 1,172,528	$ 195,000	$8,622,528	556	$ 15,508
2039	$7,255,000	$ 1,208,454	$ 215,000	$8,678,454	556	$ 15,609
2040	$7,255,000	$ 1,239,494	$ 215,000	$8,709,494	556	$ 15,665
2041	$7,255,000	$ 1,288,369	$ 215,000	$8,758,369	556	$ 15,752
2042	$7,255,000	$ 1,315,525	$ 215,000	$8,785,525	556	$ 15,801
2043	$7,255,000	$ 1,347,187	$ 215,000	$8,817,187	556	$ 15,858
2044	$7,255,000	$ 1,387,426	$ 225,000	$8,867,426	556	$ 15,949
2045	$7,255,000	$ 1,428,593	$ 225,000	$8,908,593	556	$ 16,023
2046	$7,255,000	$ 1,483,992	$ 225,000	$8,963,992	556	$ 16,122
2047	$7,255,000	$ 1,508,868	$ 225,000	$8,988,868	556	$ 16,167
2048	$7,255,000	$ 1,554,038	$ 225,000	$9,034,038	556	$ 16,248
2049	$7,255,000	$ 1,592,941	$ 225,000	$9,072,941	556	$ 16,318
2050	$7,255,000	$ 1,638,323	$ 225,000	$9,118,323	556	$ 16,400
2051	$7,255,000	$ 1,706,832	$ 225,000	$9,186,832	556	$ 16,523
2052	$7,255,000	$ 1,734,209	$ 225,000	$9,214,209	556	$ 16,572
2053	$7,255,000	$ 1,779,776	$ 225,000	$9,259,776	556	$ 16,654

Opinion of Probable Construction Cost				
Item Description	*Unit Cost*	*Units*	*Quantity*	*Ext. Cost*
12" PVC Gravity Sewer Main	$ 215	LF	12,200	$ 2,623,000
8" PVC Gravity Sewer Main	$ 175	LF	10,200	$ 1,785,000
Sanitary Sewer Manholes (5' dia)	$ 15,000	EA	67	$ 1,008,000
4" PVC Gravity Sewer Laterals	$ 150	LF	9,000	$ 1,350,000
8" HDPE Forcemain	$ 165	LF	6,300	$ 1,039,500
6" HDPE Forcemain	$ 155	LF	4,700	$ 728,500
Flushing Air Vac and Release Structure	$ 15,500	EA	5	$ 77,500
Pump Stations	$ 525,000	EA	11	$ 5,775,000
Flow Meter Pit	$ 15,000	EA	1	$ 15,000
Sanitary Sewer Clean Outs	$ 290	EA	290	$ 84,100
Full Depth Road Restoration	$ 54	SY	22,000	$ 1,189,100
Mill and Overlay	$ 15.00	SY	100,000	$ 1,500,000
Pavement Striping	$ 3.00	LF	60,500	$ 181,500
Rock Excavation	$ 150.00	CY	11,000	$ 1,650,000
Odor Control Stations	$ 70,000.00	EA	5	$ 350,000
BIDDING & GENERAL REQUIREMENTS				
General Conditions	2.0%		-	$ 388,000
Mobilization/Demobilization	4.0%		-	$ 775,000
MPOT	2.5%			$ 484,000
SUBTOTAL CONSTRUCTION COSTS (2024 PRESENT VALUE)				**$ 21,003,000**
SUBTOTAL CONTRUCTION COSTS (escalated to mid-2027; est. constr. midpoint)	6.0%			**$ 22,264,000**
ASSOCIATED COSTS				
Construction Contingency	30%		-	$ 6,680,000
Engineering, Bidding and Construction Services	20%			$ 4,453,000
Administration, Financial, Bonding and Legal Services	5%		-	$ 1,113,000
Design & Engineering Contingency	5%		-	$ 1,113,000
SUBTOTAL ASSOCIATED COSTS				**$ 12,246,000**
TOTAL OPINION OF PROBABLE CAPITAL COST				**$ 34,510,000**
State Revolving Fund (SRF) Issuance Cost			-	
TOTAL COSTS				**$ 34,510,000**

Public Sewer System Costs

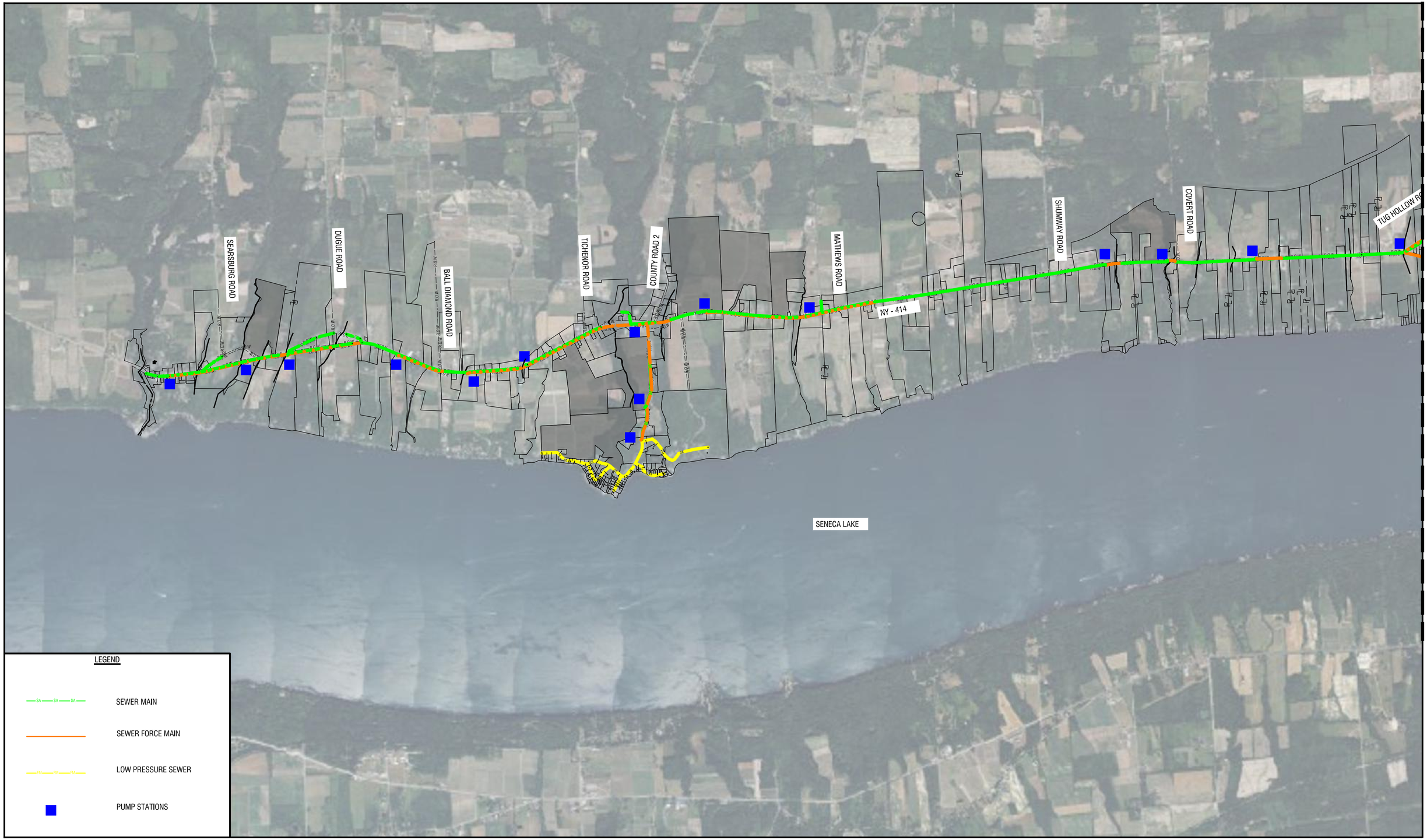
Total Operating Costs (Present Value)			
Sewer Administration	$	41,500	
Pump Station Electrical Cost	$	39,600	
Pump Station Odor Control Refills	$	103,500	
Employee Benefits	$	117,900	
Watkins Water Reclamation Cost	$	416,250	Based on current Watkins Glen Out-of-District User Cost
SUBTOTAL	**$**	**718,750**	

Maintenance and Short-Lived Asset Costs					Projection Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	Annual Inflation	3%				100%	103%	106%	109%	112%	115%	118%	121%	124%	127%	130%	133%	136%	139%	142%	145%	148%	151%	154%	157%	160%	163%	166%	169%	172%	175%	178%	181%	184%	187%	190%	193%	196%
Equipment	Maintenance Item	Quantity	Replacement Frequency (years)	Present Unit Cost	Total Present Cost	Year and Replacement Cost																														
						2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056
Anticipated Maintenance Costs (online 2027)																																				
Flow Meters	Calibration/Servicing	1	2	$ 800	$ 800					$ 896		$ 944		$ 992		$ 1,040		$ 1,088		$ 1,136		$ 1,184		$ 1,232		$ 1,280		$ 1,328		$ 1,376		$ 1,424		$ 1,472		$ 1,520		$ 1,568
Air Relief, Pressure Relief & Vacuum Relief Valve	Calibration/Servicing	5	1	$ 500	$ 2,500				$ 2,725	$ 2,800	$ 2,875	$ 2,950	$ 3,025	$ 3,100	$ 3,175	$ 3,250	$ 3,325	$ 3,400	$ 3,475	$ 3,550	$ 3,625	$ 3,700	$ 3,775	$ 3,850	$ 3,925	$ 4,000	$ 4,075	$ 4,150	$ 4,225	$ 4,300	$ 4,375	$ 4,450	$ 4,525	$ 4,600	$ 4,675	$ 4,750	$ 4,825	$ 4,900
Sewage Pumps	Inspection	22	1	$ 1,000	$ 22,000				$ 23,980	$ 24,640	$ 25,300	$ 25,960	$ 26,620	$ 27,280	$ 27,940	$ 28,600	$ 29,260	$ 29,920	$ 30,580	$ 31,240	$ 31,900	$ 32,560	$ 33,220	$ 33,880	$ 34,540	$ 35,200	$ 35,860	$ 36,520	$ 37,180	$ 37,840	$ 38,500	$ 39,160	$ 39,820	$ 40,480	$ 41,140	$ 41,800	$ 42,460	$ 43,120
Emergency Backup Generators	Calibration / Servicing	11	1	$ 1,250	$ 13,750				$ 14,988	$ 15,400	$ 15,813	$ 16,225	$ 16,638	$ 17,050	$ 17,463	$ 17,875	$ 18,288	$ 18,700	$ 19,113	$ 19,525	$ 19,938	$ 20,350	$ 20,763	$ 21,175	$ 21,588	$ 22,000	$ 22,413	$ 22,825	$ 23,238	$ 23,650	$ 24,063	$ 24,475	$ 24,888	$ 25,300	$ 25,713	$ 26,125	$ 26,538	$ 26,950
SCADA Controls	Subscription	11	1	$ 290	$ 3,190				$ 3,477	$ 3,573	$ 3,669	$ 3,764	$ 3,860	$ 3,956	$ 4,051	$ 4,147	$ 4,243	$ 4,338	$ 4,434	$ 4,530	$ 4,626	$ 4,721	$ 4,817	$ 4,913	$ 5,008	$ 5,104	$ 5,200	$ 5,295	$ 5,391	$ 5,487	$ 5,583	$ 5,678	$ 5,774	$ 5,870	$ 5,965	$ 6,061	$ 6,157	$ 6,252
TOTAL MAINTENANCE COST						**$ -**	**$ -**	**$ -**	**$ 45,170**	**$ 47,309**	**$ 47,656**	**$ 49,843**	**$ 50,142**	**$ 52,378**	**$ 52,629**	**$ 54,912**	**$ 55,115**	**$ 57,446**	**$ 57,602**	**$ 59,981**	**$ 60,088**	**$ 62,515**	**$ 62,574**	**$ 65,050**	**$ 65,061**	**$ 67,584**	**$ 67,547**	**$ 70,118**	**$ 70,034**	**$ 72,653**	**$ 72,520**	**$ 75,187**	**$ 75,006**	**$ 77,722**	**$ 77,493**	**$ 80,256**	**$ 79,979**	**$ 82,790**
Anticipated Short-Lived Asset Costs (online 2027)																																				
Flow Meters	Replacement	1	15	$ 8,500	$ 8,500																		$ 12,835														$ 8,330
Air Relief, Pressure Relief & Vacuum Relief Valve	Replacement	5	20	$ 5,000	$ 25,000																				$ 13,083												
Emergency Backup Generator	Replacement	11	20	$ 75,000	$ 825,000																			$ 254,100		$ 264,000		$ 273,900		$ 283,800		$ 293,700					
TOTAL SHORT LIVED ASSET COST						**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 12,835**	**$ 254,100**	**$ 13,083**	**$ 264,000**	**$ 13,583**	**$ 273,900**	**$ -**	**$ 283,800**	**$ 14,583**	**$ 293,700**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 8,330**

Annual Costs		Projection Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Annual Inflation	3%	100%	103%	106%	109%	113%	116%	119%	123%	127%	130%	134%	138%	143%	147%	151%	156%	160%	165%	170%	175%	181%	186%	192%	197%	203%	209%	216%	222%	229%	236%
		Present Value (2024) Cost	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	Year and Cost (1) 2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Debt Service Costs																																
Existing Annual Debt Service		$0																														
Loan Rate		0.00%	Based on hardship loan																													
Loan Period (years)		30																														
Capital Project Costs (Project Start		$ 34,510,000																														
Proposed Project Annual Debt Service		$ 1,150,333	$ -	$ -	$ -	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	$ 1,150,000
TOTAL DEBT SERVICE			**$0**	**$0**	**$0**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**	**$1,150,000**
Proposed Operating Costs																																
Sewer Administration		$ 41,500	$ 42,000	$ 43,000	$ 44,000	$ 45,000	$ 47,000	$ 48,000	$ 50,000	$ 51,000	$ 53,000	$ 54,000	$ 56,000	$ 57,000	$ 59,000	$ 61,000	$ 63,000	$ 65,000	$ 67,000	$ 69,000	$ 71,000	$ 73,000	$ 75,000	$ 77,000	$ 80,000	$ 82,000	$ 84,000	$ 87,000	$ 89,000	$ 92,000	$ 95,000	$ 98,000
Pump Station Electrical Cost		$ 39,600	$ 40,000	$ 41,000	$ 42,000	$ 43,000	$ 45,000	$ 46,000	$ 47,000	$ 49,000	$ 50,000	$ 52,000	$ 53,000	$ 55,000	$ 56,000	$ 58,000	$ 60,000	$ 62,000	$ 64,000	$ 65,000	$ 67,000	$ 69,000	$ 72,000	$ 74,000	$ 76,000	$ 78,000	$ 80,000	$ 83,000	$ 85,000	$ 88,000	$ 91,000	$ 93,000
Pump Station Odor Control Refills		$ 103,500	$ 104,000	$ 107,000	$ 110,000	$ 113,000	$ 116,000	$ 120,000	$ 124,000	$ 127,000	$ 131,000	$ 135,000	$ 139,000	$ 143,000	$ 148,000	$ 152,000	$ 157,000	$ 161,000	$ 166,000	$ 171,000	$ 176,000	$ 181,000	$ 187,000	$ 193,000	$ 198,000	$ 204,000	$ 210,000	$ 217,000	$ 223,000	$ 230,000	$ 237,000	$ 244,000
Employee Benefits		$ 117,900	$ 118,000	$ 121,000	$ 125,000	$ 129,000	$ 133,000	$ 137,000	$ 141,000	$ 145,000	$ 149,000	$ 154,000	$ 158,000	$ 163,000	$ 168,000	$ 173,000	$ 178,000	$ 184,000	$ 189,000	$ 195,000	$ 201,000	$ 207,000	$ 213,000	$ 219,000	$ 226,000	$ 233,000	$ 240,000	$ 247,000	$ 254,000	$ 262,000	$ 270,000	$ 278,000
Watkins Water Reclamation Cost		$ 416,250	$ 416,000	$ 429,000	$ 442,000	$ 455,000	$ 468,000	$ 483,000	$ 497,000	$ 512,000	$ 527,000	$ 543,000	$ 559,000	$ 576,000	$ 593,000	$ 611,000	$ 630,000	$ 649,000	$ 668,000	$ 688,000	$ 709,000	$ 730,000	$ 752,000	$ 774,000	$ 798,000	$ 822,000	$ 846,000	$ 872,000	$ 898,000	$ 925,000	$ 952,000	$ 981,000
Subtotal Proposed Operating Costs			***$ 720,000***	***$ 741,000***	***$ 763,000***	***$ 785,000***	***$ 809,000***	***$ 834,000***	***$ 859,000***	***$ 884,000***	***$ 910,000***	***$ 938,000***	***$ 965,000***	***$ 994,000***	***$ 1,024,000***	***$ 1,055,000***	***$ 1,088,000***	***$ 1,121,000***	***$ 1,154,000***	***$ 1,188,000***	***$ 1,224,000***	***$ 1,260,000***	***$ 1,299,000***	***$ 1,337,000***	***$ 1,378,000***	***$ 1,419,000***	***$ 1,460,000***	***$ 1,506,000***	***$ 1,549,000***	***$ 1,597,000***	***$ 1,645,000***	***$ 1,694,000***
Subtotal Proposed Maintenance Costs			***$ -***	***$ -***	***$ -***	***$ 45,170***	***$ 47,309***	***$ 47,656***	***$ 49,843***	***$ 50,142***	***$ 52,378***	***$ 52,629***	***$ 54,912***	***$ 55,115***	***$ 57,446***	***$ 57,602***	***$ 59,981***	***$ 60,088***	***$ 62,515***	***$ 62,574***	***$ 65,050***	***$ 65,061***	***$ 67,584***	***$ 67,547***	***$ 70,118***	***$ 70,034***	***$ 72,653***	***$ 72,520***	***$ 75,187***	***$ 75,006***	***$ 77,722***	***$ 77,493***
TOTAL OPERATING AND MAINTENANCE COSTS			**$ 720,000**	**$ 741,000**	**$ 763,000**	**$ 830,170**	**$ 856,309**	**$ 881,656**	**$ 908,843**	**$ 934,142**	**$ 962,378**	**$ 990,629**	**$ 1,019,912**	**$ 1,049,115**	**$ 1,081,446**	**$ 1,112,602**	**$ 1,147,981**	**$ 1,181,088**	**$ 1,216,515**	**$ 1,250,574**	**$ 1,289,050**	**$ 1,325,061**	**$ 1,366,584**	**$ 1,404,547**	**$ 1,448,118**	**$ 1,489,034**	**$ 1,532,653**	**$ 1,578,520**	**$ 1,624,187**	**$ 1,672,006**	**$ 1,722,722**	**$ 1,771,493**
Short Lived Asset Costs			***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ 12,835***	***$ 254,100***	***$ 13,083***	***$ 264,000***	***$ 13,583***	***$ 273,900***	***$ -***	***$ 283,800***	***$ 14,583***	***$ 293,700***	***$ -***	***$ -***	-
Subtotal Short Lived Asset Costs			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,835	$ 254,100	$ 13,083	$ 264,000	$ 13,583	$ 273,900	$ -	$ 283,800	$ 14,583	$ 293,700	$ -	$ -	-
Short Lived Asset Reserve Fund																																
Simple Annual Average - Short Lived Asset Costs		$ 47,000																														
Annual Reserve Deposit			$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 45,000	$ 45,000	$ 45,000	$ 45,000	$ 45,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000
Cumulative Reserve Deposits			$ 40,000	$ 80,000	$ 120,000	$ 160,000	$ 200,000	$ 245,000	$ 290,000	$ 335,000	$ 380,000	$ 425,000	$ 475,000	$ 525,000	$ 575,000	$ 625,000	$ 675,000	$ 740,000	$ 805,000	$ 870,000	$ 922,165	$ 733,065	$ 784,982	$ 585,982	$ 637,398	$ 428,498	$ 493,498	$ 274,698	$ 325,115	$ 96,415	$ 161,415	$ 226,415
Subtract Annual Short Lived Asset Costs			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (12,835)	$ (254,100)	$ (13,083)	$ (264,000)	$ (13,583)	$ (273,900)	$ -	$ (283,800)	$ (14,583)	$ (293,700)	$ -	$ -	-
Net Maintenance Reserve			$ 40,000	$ 80,000	$ 120,000	$ 160,000	$ 200,000	$ 245,000	$ 290,000	$ 335,000	$ 380,000	$ 425,000	$ 475,000	$ 525,000	$ 575,000	$ 625,000	$ 675,000	$ 740,000	$ 805,000	$ 857,165	$ 668,065	$ 719,982	$ 520,982	$ 572,398	$ 363,498	$ 428,498	$ 209,698	$ 260,115	$ 31,415	$ 96,415	$ 161,415	$ 226,415
TOTAL SHORT LIVED ASSET RESERVE FUND			**$ 40,000**	**$ 80,000**	**$ 120,000**	**$ 160,000**	**$ 200,000**	**$ 245,000**	**$ 290,000**	**$ 335,000**	**$ 380,000**	**$ 425,000**	**$ 475,000**	**$ 525,000**	**$ 575,000**	**$ 625,000**	**$ 675,000**	**$ 740,000**	**$ 805,000**	**$ 857,165**	**$ 668,065**	**$ 719,982**	**$ 520,982**	**$ 572,398**	**$ 363,498**	**$ 428,498**	**$ 209,698**	**$ 260,115**	**$ 31,415**	**$ 96,415**	**$ 161,415**	**$ 226,415**
GRAND TOTAL ANNUAL COST			**$760,000**	**$781,000**	**$803,000**	**$2,020,170**	**$2,046,309**	**$2,076,656**	**$2,103,843**	**$2,129,142**	**$2,157,378**	**$2,185,629**	**$2,219,912**	**$2,249,115**	**$2,281,446**	**$2,312,602**	**$2,347,981**	**$2,396,088**	**$2,431,515**	**$2,465,574**	**$2,504,050**	**$2,540,061**	**$2,581,584**	**$2,619,547**	**$2,663,118**	**$2,704,034**	**$2,747,653**	**$2,793,520**	**$2,839,187**	**$2,887,006**	**$2,937,722**	**$2,986,493**
EDUs		244	Village only																													
Cost per EDU			$3,115	$3,201	$3,291	$8,279	$8,387	$8,511	$8,622	$8,726	$8,842	$8,957	$9,098	$9,218	$9,350	$9,478	$9,623	$9,820	$9,965	$10,105	$10,262	$10,410	$10,580	$10,736	$10,914	$11,082	$11,261	$11,449	$11,636	$11,832	$12,040	$12,240

Year	Total Debt Service	O&M Costs	Short Lived Asset Cost	Annual Total	Annual Total Village EDU	Annual Total Cost per Village EDU
2024	$0	$720,000	$40,000	$760,000	244	$ 3,115
2025	$0	$741,000	$40,000	$781,000	244	$ 3,201
2026	$0	$763,000	$40,000	$803,000	244	$ 3,291
2027	$1,150,000	$830,170	$40,000	$2,020,170	244	$ 8,279
2028	$1,150,000	$856,309	$40,000	$2,046,309	244	$ 8,387
2029	$1,150,000	$881,656	$45,000	$2,076,656	244	$ 8,511
2030	$1,150,000	$908,843	$45,000	$2,103,843	244	$ 8,622
2031	$1,150,000	$934,142	$45,000	$2,129,142	244	$ 8,726
2032	$1,150,000	$962,378	$45,000	$2,157,378	244	$ 8,842
2033	$1,150,000	$990,629	$45,000	$2,185,629	244	$ 8,957
2034	$1,150,000	$1,019,912	$50,000	$2,219,912	244	$ 9,098
2035	$1,150,000	$1,049,115	$50,000	$2,249,115	244	$ 9,218
2036	$1,150,000	$1,081,446	$50,000	$2,281,446	244	$ 9,350
2037	$1,150,000	$1,112,602	$50,000	$2,312,602	244	$ 9,478
2038	$1,150,000	$1,147,981	$50,000	$2,347,981	244	$ 9,623
2039	$1,150,000	$1,181,088	$65,000	$2,396,088	244	$ 9,820
2040	$1,150,000	$1,216,515	$65,000	$2,431,515	244	$ 9,965
2041	$1,150,000	$1,250,574	$65,000	$2,465,574	244	$ 10,105
2042	$1,150,000	$1,289,050	$65,000	$2,504,050	244	$ 10,262
2043	$1,150,000	$1,325,061	$65,000	$2,540,061	244	$ 10,410
2044	$1,150,000	$1,366,584	$65,000	$2,581,584	244	$ 10,580
2045	$1,150,000	$1,404,547	$65,000	$2,619,547	244	$ 10,736
2046	$1,150,000	$1,448,118	$65,000	$2,663,118	244	$ 10,914
2047	$1,150,000	$1,489,034	$65,000	$2,704,034	244	$ 11,082
2048	$1,150,000	$1,532,653	$65,000	$2,747,653	244	$ 11,261
2049	$1,150,000	$1,578,520	$65,000	$2,793,520	244	$ 11,449
2050	$1,150,000	$1,624,187	$65,000	$2,839,187	244	$ 11,636
2051	$1,150,000	$1,672,006	$65,000	$2,887,006	244	$ 11,832
2052	$1,150,000	$1,722,722	$65,000	$2,937,722	244	$ 12,040
2053	$1,150,000	$1,771,493	$65,000	$2,986,493	244	$ 12,240

Appendix G: Alternative 2 & Alternative 3 WWTP Figures



LaBella
Powered by partnership.

VILLAGE OF BURDETT & TOWN OF HECTOR WASTEWATER

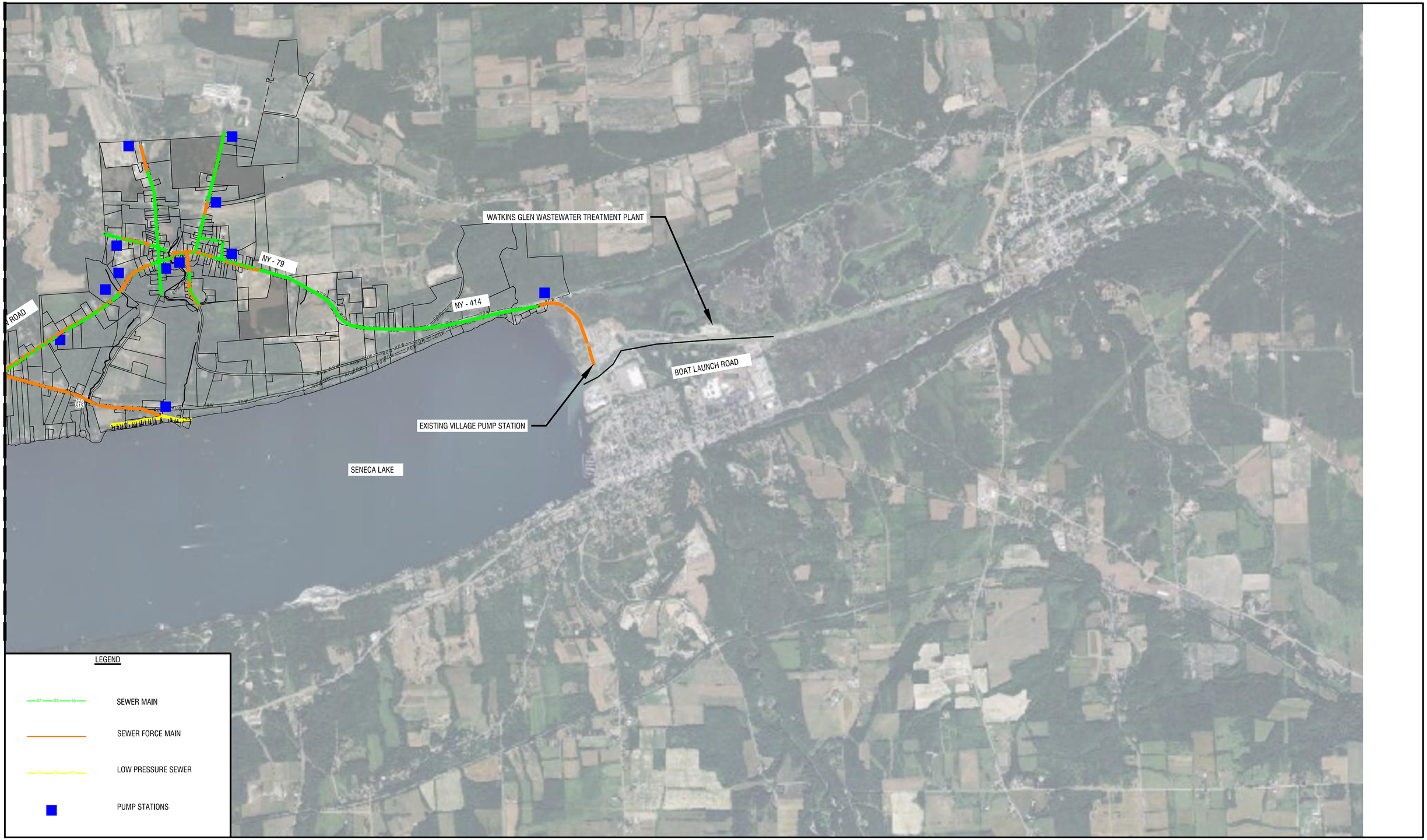
DATE: NOVEMEBR 2024

FIG 01 OVERALL MAP ALTERNATIVE 2

1250' 0' 1250' 2500'

SCALE: 1250'

N



LaBella
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VILLAGE OF BURDETT & TOWN OF HECTOR WASTEWATER

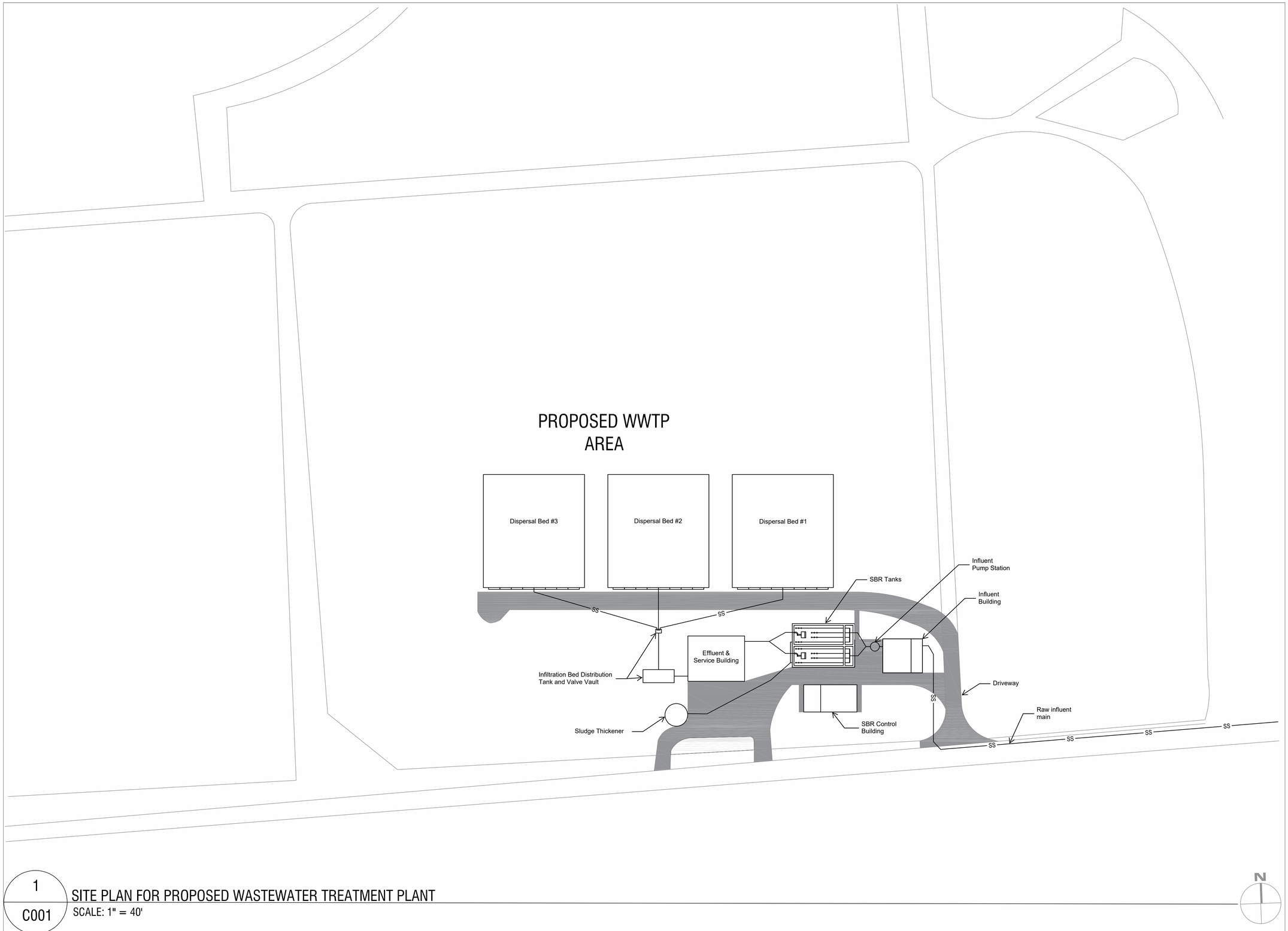
DATE: NOVEMBER 2024

FIG 02 OVERALL MAP ALTERNATIVE 2

1250' 0' 1250' 2500'

SCALE: 1250'

N



1
C001

SITE PLAN FOR PROPOSED WASTEWATER TREATMENT PLANT

SCALE: 1" = 40'

N

4/25/2025 3:32:33 PM
B:\GLOBAL\Projects\Burdett, Village of\2243745 - Burdett Hector Wastewater Feas Study\06_Drawings\CivilX-WWTP SITE PLAN.dwg

LaBella
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300 State Street, Suite 201
Rochester, NY 14614
585-454-6110

labellapc.com

NOT FOR CONSTRUCTION

EXP: ##/##/20## EXP: ##/##/20##

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING: 018281
LAND SURVEYING: 017976
GEOLOGICAL: 018750

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered; the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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VILLAGE OF BURDETT
Client Address

BURDETT & HECTOR WASTEWATER FEASABILITY STUDY
4124 LAKE AVENUE, BURDETT, NY 14818

NO:	DATE:	DESCRIPTION:
Revisions		

PROJECT NUMBER: 2243745

DRAWN BY: TK

REVIEWED BY: MH

ISSUED FOR: ISSUED FOR REVIEW

DATE:

DRAWING NAME:

DRAWING NUMBER:

Appendix H: Community Engagement

Survey for Interest in Municipal Wastewater Services

The Village of Burdett and Town of Hector are studying the feasibility of building a public sewer system to serve the Village and certain areas of the Town. We are distributing this survey to understand residents' interest in receiving municipal wastewater collection and treatment services.

The Village and Town sincerely want your input, and your response to this survey may help to secure grant funding.

Please submit by December 5, 2024.

We invite you to complete this survey and return it using one of the following options:

1. Return by mail using the enclosed pre-stamped, pre-addressed envelope.
2. Drop off at Village of Burdett Village Office (4124 Lake Avenue) or the Town of Hector (5097 NY- 227).
3. Complete and submit the survey online by scanning the following QR code

If you have any questions, please contact Larry Jaynes, Village of Burdett Board Member, at 607-742-9135. The Village and Town will hold a public information session about this study in early 2025 and will soon release the session date and time.

General Information

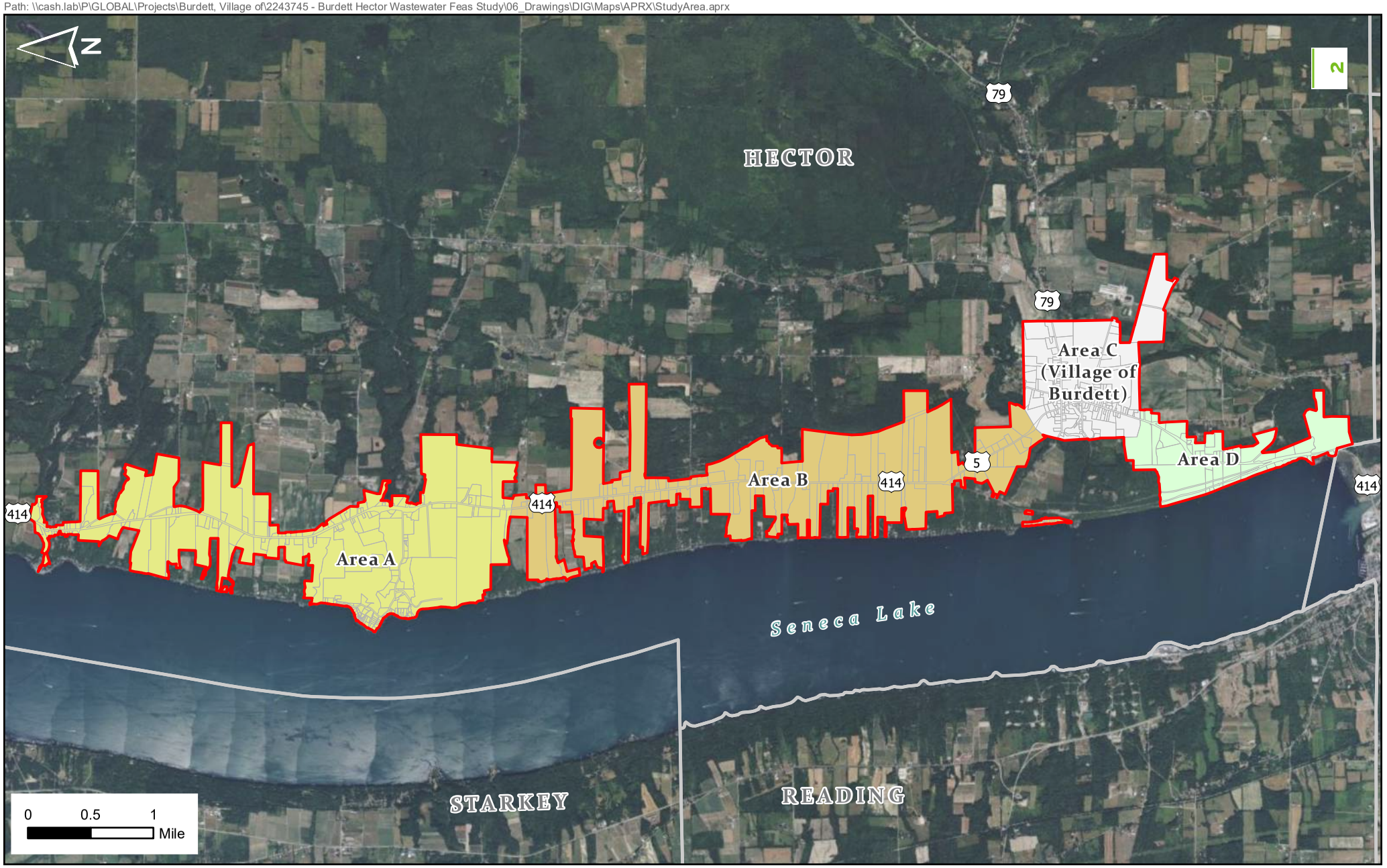
1. Please refer to the map on page 2 and circle below which area your property lies within.

   Area A Area B Area C Area D

2. Are you the property owner? YES NO
3. Please circle one or more options below to indicate how you use your property.
   a. Residential
   b. Commercial. If yes, please note type of business: _____
   c. Institutional. If yes, please note specific use: _____
   d. Agricultural. If yes, please circle to indicate: Livestock Crops Both
   e. Vacant
   f. Other: _____

Please proceed to the next page. →

Path: \\cash.lab\P\GLOBAL\Projects\Burdett, Village of\2243745 - Burdett Hector Wastewater Feas Study\06_Drawings\DIG\Maps\APRX\StudyArea.aprx



Map Key:

- Study Limits
- Parcels
- Town Boundary
- Area A
- Area B
- Area C (Village of Burdett)
- Area D

Wastewater Feasibility Study
Study Area Map

Map Creation Date: 11/5/2024

LaBella
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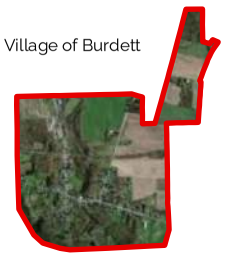
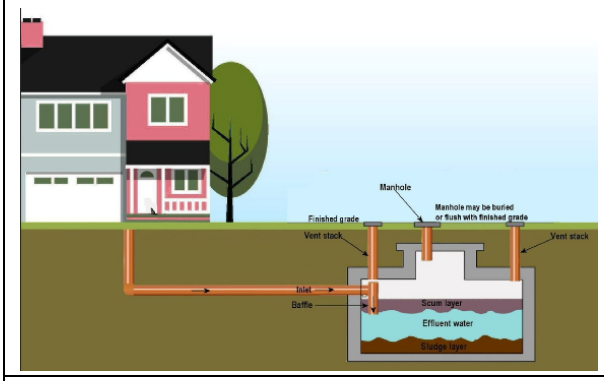


Sources: Land Use & Parcel Boundary Regrid, 2024; Study Limits: LaBella, 2024; Town Boundary: NYS GIS Clearinghouse, 2024; Basemap: Bing, 2024

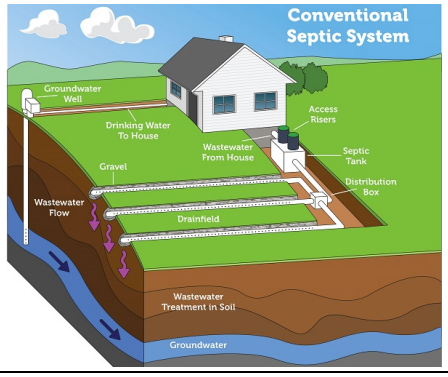
Wastewater

1. Please insert a checkmark in one of the boxes below to indicate how you currently dispose of wastewater generated on your property.

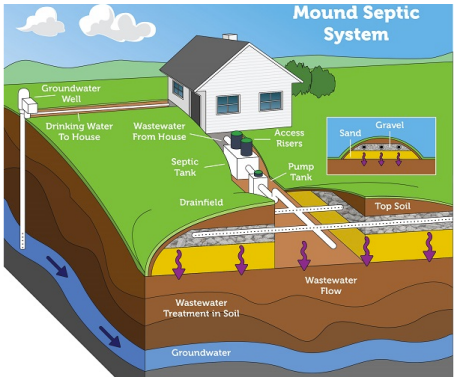
☐ On-site cesspool (holding tank)



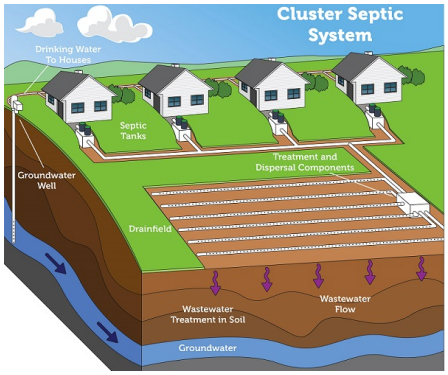
☐ On-site Septic System



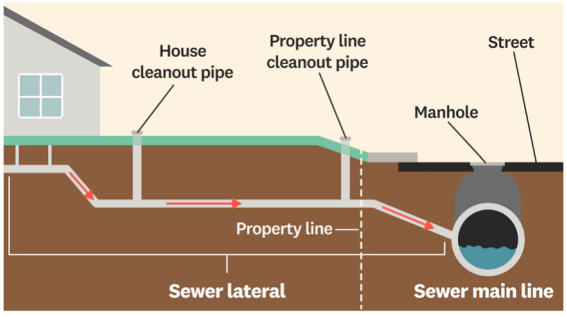
☐ Mound Septic System



☐ Shared Septic System



☐ Connection to Municipal System



☐ Other. Please describe.

_____

_____

_____

_____

_____

_____

Please proceed to the next page. →

2. If you use a cess pool or septic system, please answer the following. If you do not know, please give your best estimate (and state that you are estimating).
    a. When was it installed? _____
    b. When was it most recently inspected? _____
    c. When was it most recently pumped out? _____
    d. When was it most recently fixed/serviced/repaired? _____
    e. Has it backed up into the home, or is otherwise struggling to function? _____
    f. Please note any problems you are aware of: _____
    _____
3. If your septic system has had any problems, have you been able to successfully fix them?
    YES NO
    a. If No, please select one or more options below to describe the barrier(s):
        i. Fixing the system is too expensive.
        ii. Fixing the system is not possible due to lot size restrictions.
        iii. Fixing the system is not possible for another reason. (Please indicate reason(s) in "Other" field below.)
        iv. I don't know who to contact to fix the system.
        v. I plan to fix it, but haven't had time yet.
        vi. Other: _____
4. Have you experienced recent septic system failures or had to limit activities due to your septic system? _____

Surface Water

Many homeowners rely on septic systems for safe and effective treatment of their wastewater. Household wastewater is treated by a septic system before it filters into the soil. Recycled water from a septic system can help replenish groundwater supplies; however, if the system is not working properly, it can contaminate nearby waterbodies.

1. What is the distance from your septic system to the nearest drainage ditch, creek, river, lake, or other surface water body? _____
2. Is there visible sign of seepage from your septic system to a surface water body? _____
3. Are you aware of algal blooms (visible patches of blue-green algae) in a surface water near your septic system? _____

Please proceed to the next page. →

Drinking Water

Septic systems provide wastewater treatment for many homeowners who also often get their drinking water from private wells. If a septic system is malfunctioning or located too close to a drinking water well, contaminants from the wastewater can end up in drinking water.

1. Please circle an option below to indicate your property's current drinking water source(s).
    a. On-site water well
    b. Off-site water well
    c. Connection to municipal water system
    d. Other source(s): _____
2. Do you treat water at your home to improve water quality? YES NO
    a. If YES: What treatment method(s) do you use? _____
3. Is the quality of water at your home acceptable? YES NO
    a. If NO: Please circle options below to indicate typical problems.
        i. Unpleasant look, smell, or taste.
        ii. Change in land use near your well such as construction or farming.
        iii. Concerns about local contaminants.
        iv. Well was recently flooded or damaged by extreme weather.
        v. Concerns about contamination from gasoline, heating oil, or chemicals.
        vi. Well is less than 25 feet from a stream, lake, watercourse, drainage ditch, or wetland.
        vii. Well is less than 50 feet from a septic system.
        viii. Well is too close to another source of contamination. (If yes, please indicate contamination source in the "other concerns" field below.)
        ix. Other concerns: _____
        _____
4. Have you tested your water for bacteria and/or other contaminants? YES NO
    a. If NO: Are you interested in water testing? YES NO
    b. If YES:
        i. How many years ago? _____
        ii. Are you willing to share copy of your test results? YES NO
        iii. Please list any contaminants identified: _____
        _____

Please proceed to the next page. →

Interest and Cost

1. Are you interested in using a public sewer system instead of your septic system? A public sewer system would be designed to receive all wastewater generated and convey it to a central location for treatment. YES NO
    a. If NO: Please circle an option or write the reason(s).
        i. My existing private system is sufficient.
        ii. I believe it would be too expensive.
        iii. I oppose installation of wastewater service infrastructure.
        iv. Other: _____
        _____
    b. If YES: Please place a checkmark in the applicable box to indicate the maximum amount you would be willing to pay for wastewater collection and treatment services.

        ☐ $34 per month (approx. $100 per quarter; $400 per year)
        ☐ $42 per month (approx. $125 per quarter; $500 per year)
        ☐ $50 per month (approx. $150 per quarter; $600 per year)
        ☐ $59 per month (approx. $175 per quarter; $700 per year)
        ☐ Other amount: _____

Additional Thoughts

We invite you to provide additional comments related to the Village of Burdett and Town of Hector wastewater feasibility study.

_____
_____
_____
_____
_____
_____

This is the end of the survey. Please submit using one of the options on page 1.

INTEREST AND COST

								Of the respondents who are interested in WW Service				
Area	No. of Survey Responses	On-Site Well	Off-Site Well	Municipal	Other	No. of Respondents Interested in WW Service	Percent of Respondents Interested in WW Service	% WTP $34/mo ($400/yr)	% WTP $42/mo ($500/yr)	% WTP $50/mo ($600/yr)	% WTP $59/mo ($700/yr)	% WTP Not Indicated or Other Amount
A	64	5	0	47	12	34	53%	85%	56%	41%	18%	18%
B	34	1	0	31	2	18	53%	94%	67%	44%	28%	6%
C	72	7	0	60	5	36	50%	100%	64%	47%	22%	0%
D	14	13	0	1	0	10	71%	100%	80%	20%	20%	0%
Overall	184	26	0	139	19	98	53%	94%	63%	42%	21%	6%

Note: "WTP" = Willingness to pay.

EXISTING CONDITIONS

									Of Respondents	w/ previous problems	
Area	No. of Survey Responses	On-Site Well	Off-Site Well	Municipal	Other	No. of Respondents with Septic/Cesspool System	% of Respondents with Struggling Septic/Cesspool Systems	% of Respondents who previously had problems with their Septic/Cesspool Systems	% of Respondents who were able to fix their problems	% of Respondents who weren't able to fix their problem	% of Respondents who never had any issues
A	64	5	0	47	12	60	8%	38%	96%	4%	52%
B	34	1	0	31	2	31	6%	41%	86%	14%	53%
C	72	7	0	60	5	67	4%	44%	88%	13%	50%
D	14	13	0	1	0	14	7%	50%	86%	14%	50%
Overall	184	26	0	139	19	172	6%	42%	90%	10%	51%

We also own a plot of land on the waterfront on 414 that appears to be outside of the area - but why? It can be developed with utilities.
I would hope the fee charged to customers would be based on usage and/or home size.
We believe the health benefits will out way the cost.
I could expand business and bring in more tax revenue if I had public water and sewer
I am fully in favor of public sewer

The aerobic system I have is maintained every year by sheesleys sewer service. Because it is aerobic we cannot put any cleaning chemicals like bleach down drain so it is a challenge to keep clothes clean, etc.
The residence is a cottage we use 6 months out of the year although it is set up to be used all year round.

Love the progress thanks for your work â€¦ Gl with the survey and have a blessed thanksgiving

I would like to see the village get public septic as the properties are much smaller. For the remainder of Hector, while I like the idea from an environmental perspective I
Thank you for investigating this as a possibility
would like municipal water too
We would be interested in town water for sure and sewer later on.

What brought this on?
The Hector Water Department has been an abomination. They have driven up the monthly cost of our water to more than homes in California and Nevada pay. We and

This will grow the community and make it more viable for future generations. Also easier on future small business since septic cost are never cheap

As member of Seneca Lake Pine Water Association, I believe (ineligible) that pollute the lake should be tackled and system installed
Long past due considering the development in the Town of Hector in the past twenty years, wineries, lake front development, vacation rentals

I don’t feel where I live, I need a public Sewer System, I've paid a lot to have a private system havent had any problems. Thank you

It just makes sense along the lake!
Even though our septic system is working fine, we would still consider going with a municipal wastewater system to help the greater good of the community + enhance development in this area. Our waterway esp. the lake are under ecological stress, (bacteria etc.)

Property - 5437 Peach Crchsrd Pt Road

If there were a municipal waste system, I could probably build an additional one or two small units. The cost of excavating and installing a septic system has made the cc
Would improve several operation issues with septic including pumping and designated (ineligible) we are unable to develop due to septic infrastructure

This would help keep our lakes clean

only really interested if the cost would be within my budget on a fixed (ineligible). And if I'd have to pay have it connected.

Whoever possible we gladly participate in supporting public water and sewer systems

This property is north of the bridge in Valois. Water was NOT brought across. If it had been we would have tied in without any hesitation - same with public sewer
Need more bathrooms of current septic system won't support more

Cost of Pump stations, over flow of treatment sites

Many houses amennd ours on Lake (Peach Orchad) Have very old systems and little if any drainage. We often smell septic systems in the summer/fall if the wind is

When I heard this was in possibility I was over joyed!! I legit cant wait for you fuucs to make this happen. Anything we can do to speed this up let us know!!

Having recently had to spend quite a bit before selling a lake cottage in Lodi to bring its system up to code, I think this is a very valuable service for village and lake-adjacent homes. They often have too little space, and high occupancy. We are 2 people on a 2 acre lot with gravel soil, and would rather not pay for both water in/out,

I feel fortunate to be combined to municipal water, but feel hector is too rural for a sewer system to be cost effective. I would be in favor of additional funds for increase
I don't think it would be fair to property owners that have maintained or replaced their system to pay for others that neglected theirs. The payment burden of this sytem should be placed on the business owners along 414 that benefit the most from it. Long term residents and ones on fixed incomes will be hurt the most as the

My existing private "expensive" system is sufficient - Blair Horner

Sorry to be vague with answer, I just sold my propert to Ashly + Dave - ineligible. I'm renting apt from casey creamer in old school house. Keep our beautiful lake area as

I would be interested if you could have more than 1 connection per property

Retired, live alone. Taxes and Water cost already cause me to consider how long I can do this. Make laBaugade put in a better wastewater system

Especially interested in public water extended to lake front properties
We own 7 1/2 acres from rt414 to lake. Would waste water requirement encumber whole tract or only current residential lot?

"Treatment" is so crude. If you developed a land based approach so nutrients don't reach the lake, the good idea. Otherwise bad idea, increaseing houses and increasing

Maybe you should look into upgrades to the municipal water system first. It would be nice to have clean, safe water to drink.

Put zoning into place! That would eliminate the ability for people to do exactly what they want where they want [La Bourgade!] all the new wineries, brewies, resraunts.
This is a must do project for the village of burdett many homes do not have adequate systems.
I would rather see funds dedicated to extending the municipal water. Ineligible especially to extend down Rf79 to WG. Would pay $34 per month

The town of Hector is too large to do municipal sewer unless it is totally funded by grants. I think your plan is to complete a sewer system for Burdett at our expense of Hector residents + it would make zoning come into play for larger developments the we don't want in our community.
When you come down the Rt 79 Hill with the wastewater line please acquire enough ROW to install public water in the ROW.

Get the farms under control! I can smell the manuer down here frequently - It runs down hill into the lake. Nobody really wants the blame but the vineyards are constan
My neighbor to the south has a marginac system that is too close to the lake. They would bencert from a sewer system. I worked as a realtor in the area and sold a number of lake properties, I believe that there are many properties that have not relenty sold that have poor septic systems. Only the properties that sell have theri

All lake properties should be required to comply with current septic system regulations.

Currently there is no regulations (Inspection or process) for the home septic systems having a municipal system would help keep our ground water less contaminated.
And how much will we have to pay to run a line and hook up. Things are very tough right now with groceries up 30%
Decreasing nutrient loading into the lake is key to reducing HAB's and improving water quality. Agricultural runoff of nutrients and pesticides/herbicides is a larger probl
great idea to get this information for a study good luck, would pay $50 per month

1. Need more information. It might be worth it if monthly costs were under $50. 2. I thought we were working on expanding the water supply system. I would be very in

Retired - living on a Limited Fixed Income. Can Not Afford.

In order to expand winery programming we would need to build a new septic system which is too expensive and thus limits our expansion. Would much prefer municipa
Cost starts out Low of withing time becomes expensive just like municipal water
I would be interested in wastewater treatment provided I was also on town water. Where I used to live (oneonta), I paid for water + sewage combined once a year. Seer

How about a drinking water line coming down the hill

Cannot say a price per month have no reference point, Without the lake in a healthy state, this area would have nothing to offer. We must do all ive can to pake the lake

Other amount: 14 subdivided x 15 ineligible, A municipal sewer system would protect the aquafer from damage done by municipal water being pumped in and not relie

Any wastewater or municipal water systems will only be as effective on the amount of cost analysis + planning invensted

But again, my house is outside the village _ not in the maps shown, I am wondering how the acres to be included in the enclosed map was decided. A feasibility study is

Our business (finger lakes distillery) is very unique with respect to wastewater. I'll be happy to be a part of the dialouge as it relates to this project Brian ineligible 607-73

What is the cost? How much will fall on the tax payers?
I think this would be great for our village. I support public wastewater management

For the Health+public safety of our community this infrastructure improvement is a critical need. The environment of our lake which is regional, state national assesst is

Installation of public sewers will accelerate development (especially commercial development on RT 414 and nearby) on the other hand public sewers will protect Senec
Wastewater collection would be the primary concern. Location, cost, feasibility roadways interuption.

Would be very interested in wastewater treatment if we can have municiple water laid in. I believe neighbors would be more interested if water + sewage were combin

I pay the Village and county enough
We pay way too much for city (Hecotr) water already. Promises were made when that "system" was put in + not our monthly bills are 3x's higher! No trust, no need

There are a few properties in Burdett that need ot fix their septic systems. Most people here would find it difficult to afford another large expense - funding the septic s
I think that focusing on dairy waste would accomplish a lot more, and cost a lot less.

I am not opposed ot the village of burdett having a municipal sewage system, but not the other areas in question

It would be helpful to receive inormation regarding the different costs of each option, the pros and cons of it functionality, and a timeline of the construction. Will the ys
Please make it so :)!

No comments on wastewater
Thank you for looking into the feasibility of this

It is my opinion that installing + the operation of a municipal septic system is a detriment to the enviornment. It's too expensive and takes far more energy to run and op

Public water and sewer would be a great benifit to the Hector Community.

I think this would really help Burdett specifically grow as a village.
Like the Village of Watkins Glen and Montour Falls did, it's time we pay the piper and do what is right for our environment. Yes, that comes with a cost but a very small t

I generally support this because of all the development on 414 and Burdett but the costs are huge I'm retired wastewater treatment operator and I still work in the field
desire clean, contaminate free water
Not interested in a system that is controlled by any municipal government or board. Flat fees regardless of usage is theft, and my newer septic system works perfectly fi
This is a huge waste of money Shame on you
$98 million project is not feasible for this area as the average income is $60K or fixed retirement income and the cost with a grant would be too high for the annual cost

I am not currently within the map Boundary, but would like to be added. 5888 NY 414, at the south corner of Fausold Road Intersection.
We are so exited to hopefully get this system in place !! If there is anything we can do to speed this up ! Please let us know !! We are in need to this project immediately

LaBella
Powered by partnership.

VILLAGE OF BURDETT
TOWN OF HECTOR
WASTEWATER FEASIBILITY STUDY

February 2025

STUDY REQUEST:

The intent of the study is to identify and evaluate options for establishing wastewater infrastructure, wastewater management, and organizational frameworks that will best meet the municipalities' needs.

FINANCED BY:
NYS ENGINEERING PLANNING GRANT

SCHUYLER COUNTY, TOWN OF HECTOR, VILLAGE OF BURDETT

N
HECTOR
STARKEY
HECTOR
READING
0
3,000
6,000
Feet
Bing

WHAT WE HEARD:

Challenge — Septic System Failures

- Environmental – Lake Water Quality
- Economic Development – Community Character

Cost — Affordable Solution

- Control over Future O&M Costs
- Competing Capital Expenses
- Annual Rates – Rate Structure – Opt Out Option

Operation — Long Term Commitment

- Who will Operate
- What Equipment will be Visible
- What are Threats, Emergency Responses

TELL US MORE:

EVALUATION SCOPE

Data Collection

- Existing septic system and drinking water records
- Topography, geologic conditions, waterbodies, wetlands, flood zones, GIS
- Regional reports, regulations, community survey, and stakeholder interviews

Technical Evaluation

- Basis of design flow and loading parameters
- Evaluation of most efficient conveyance routes and hydraulic calculations
- Capacity and treatment requirements

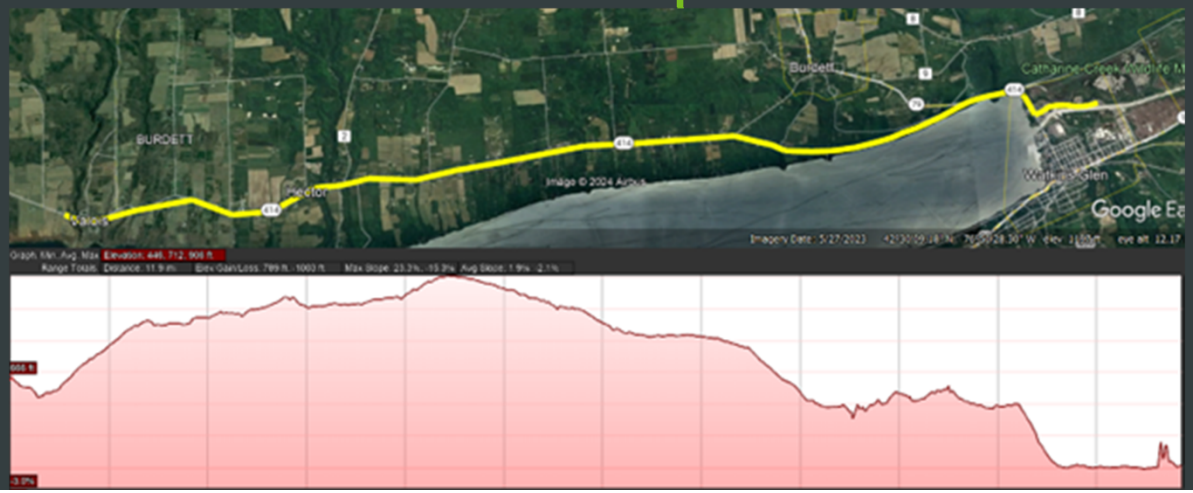
Preliminary Engineering Report

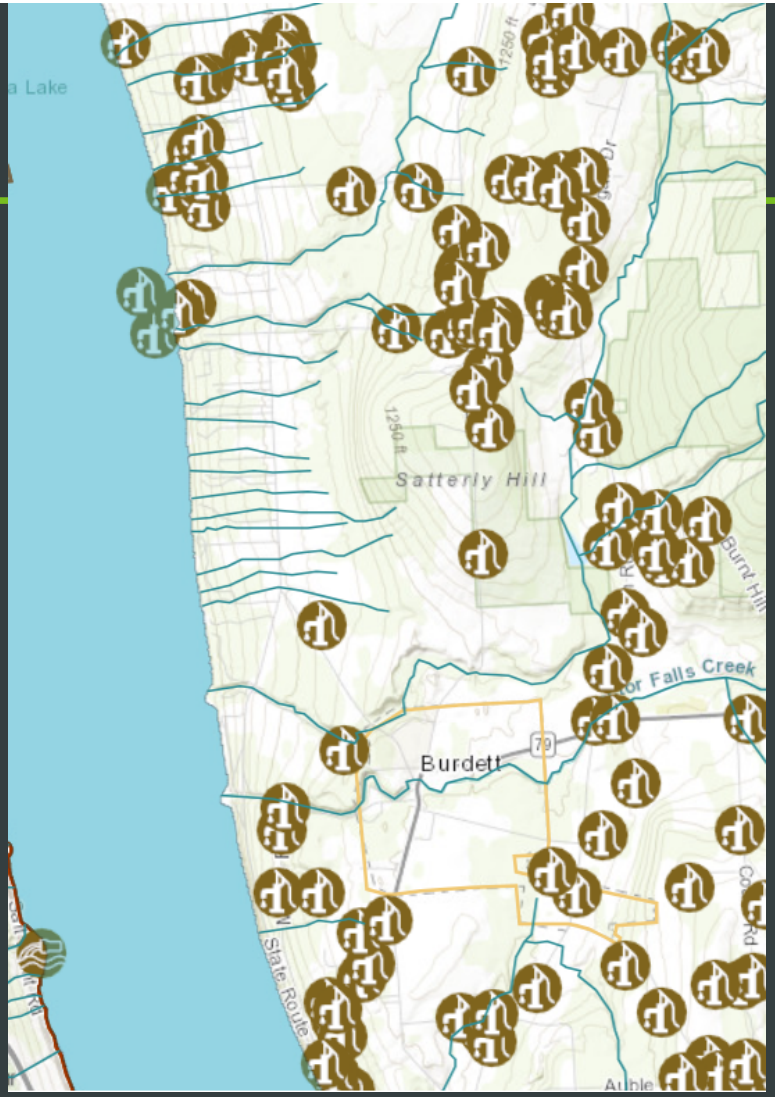
- Document analysis and tool for funding acquisition

Funding Opportunity Recommendations

EXISTING CONDITIONS

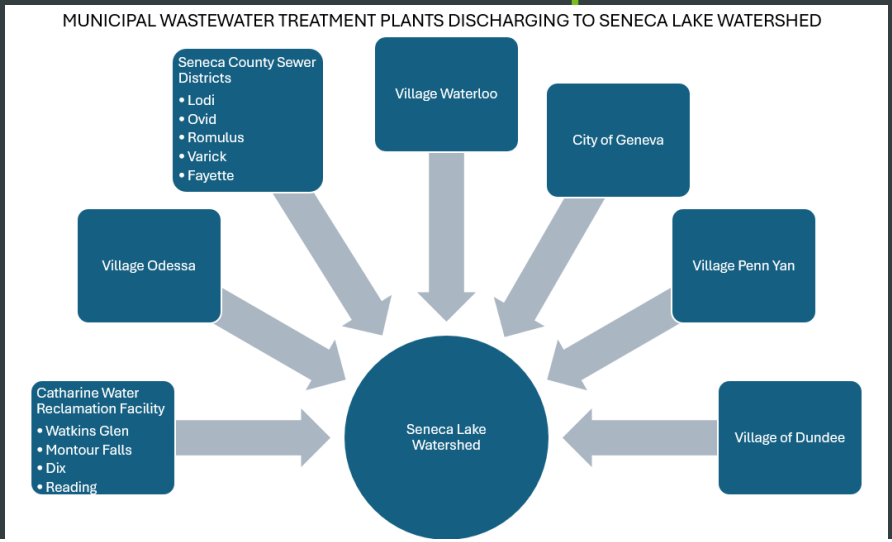
- Demographics
- Topography
- USGS Web Soil Survey
- Waterbodies
- Aquifers
- Wetlands
- Endangered Species
- Floodplains

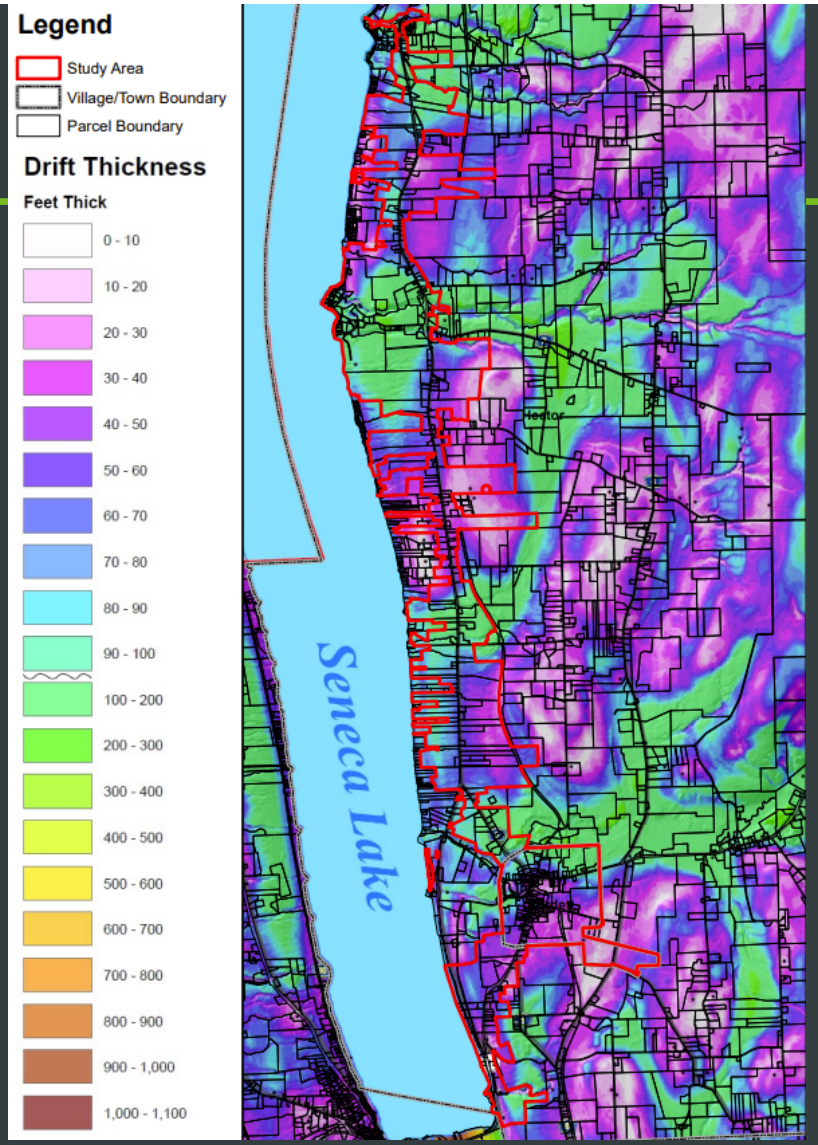


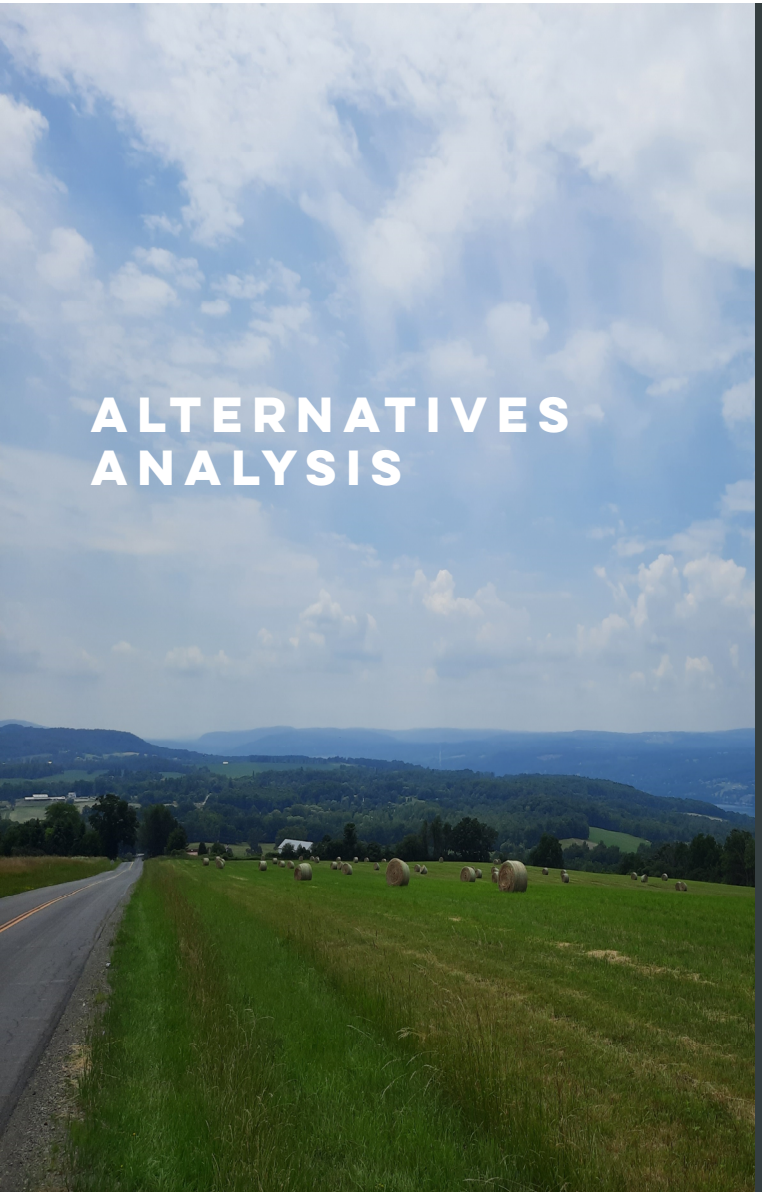


EXISTING CONDITIONS

- Suitability for onsite septic systems
- Lot size analysis
- County septic system data
- Regional municipal sewer data
- Constructability challenges for municipal sewer







ALTERNATIVES ANALYSIS

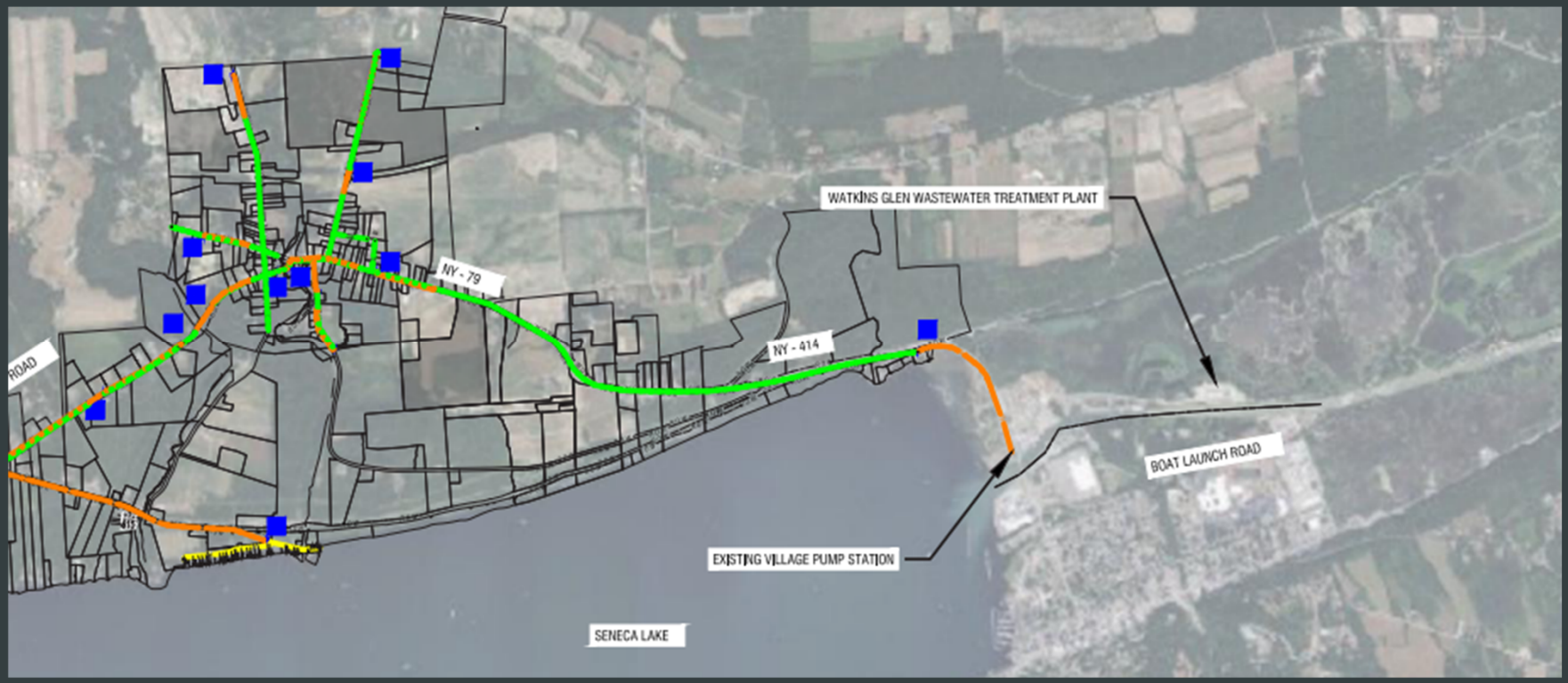
NO ACTION

CONSTRUCT COLLECTION SYSTEM
CONNECT TO CVWRF

CONSTRUCT COLLECTION SYSTEM
BUILD NEW WWTP

DEVELOPMENT OF COLLECTION SYSTEM-NORTH

DEVELOPMENT OF COLLECTION SYSTEM - SOUTH



CONNECT TO CATHARINE VALLEY WATER RECLAMATION FACILITY

ELEMENTS

- Define sewer district
- Construct collection system
- Construct pump stations
- Connect to CVWRF at Clute Park Pump Station
- Intermunicipal Agreement with Village Watkins Glen and Village of Montour Falls: Joint Plan Committee
- Long term staffing for maintenance of collection system

BENEFITS

- CVWRF designed for Regional Sewer service
- Adequate capacity
- Shared services/cost savings
- Allows for growth and expansion of sewer district
- Provides health and environmental protection

CHALLENGES

- Capital costs
- Operating costs

CONSTRUCT NEW DEDICATED WASTEWATER TREATMENT PLANT

ELEMENTS

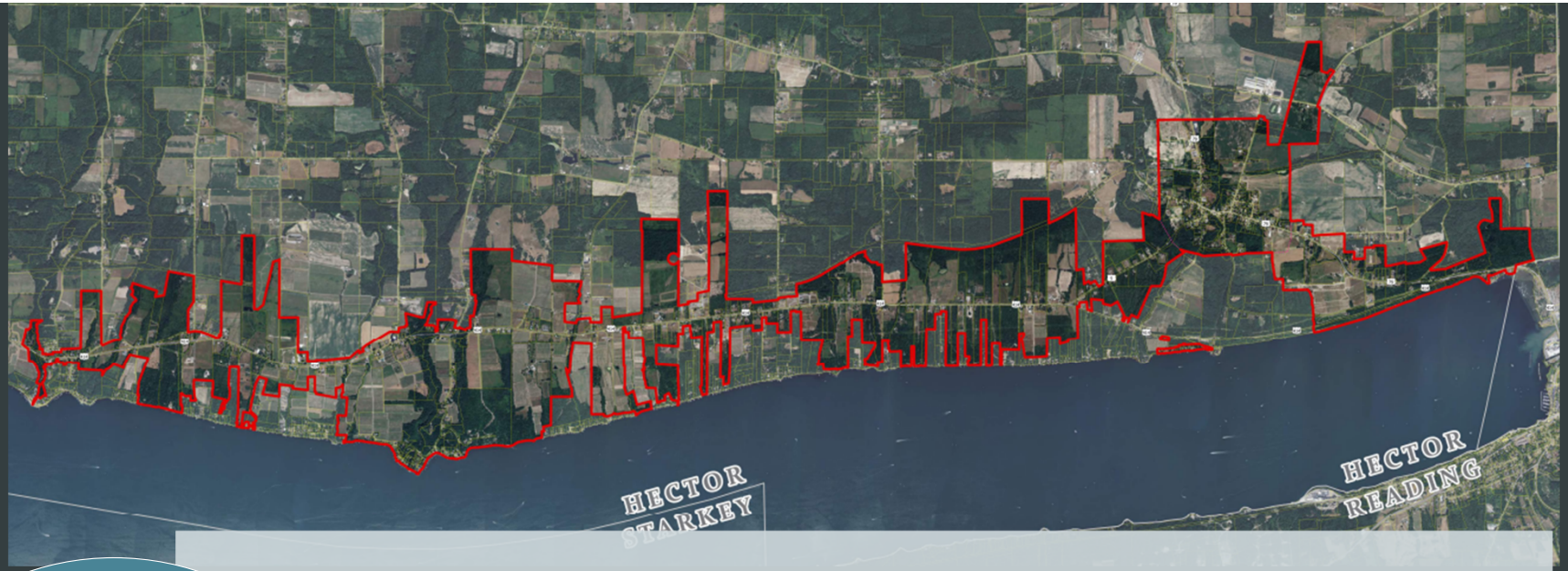
- Create sewer district
- Construct collection system
- Construct pump stations
- Construct new wastewater treatment plant
- Intermunicipal Agreement between Town of Hector and Village of Burdett
- Long term staffing for maintenance of collection system and wastewater treatment plant

BENEFITS

- Allows for limited growth of sewer district
- Provides health and environmental protection

CHALLENGES

- Land acquisition
- Permits and approvals
- Capital costs
- Operation resources and expenditures



Project Study Area

Alternative 2: Connection to CVWRF

Estimated Construction Cost	$59.6 M
Estimated Inflation (to mid-2027)	$3.6 M
Construction Contingency	$19.0 M (30%)
Estimated Associated Costs	$15.8 M
Total Estimated Project Cost	**$98 M**

Project Capital Cost FAQs

(Answers based solely on the current concept)

Question	Answer
Are you really proposing to advance a $98M project?	No. This is only a feasibility study. Much more study, investigation, community engagement, and grant funding would be needed before any project would move forward.
Is this happening right away?	
Who would have to pay?	System users would pay for the service, which is anticipated to include the entire Village and the portion of Town within the study area.
If some version of this project were to move forward, would the Town have to form a sewer district?	Yes. Financial aspects of district formation process must receive NYS Comptroller approval, which protects district residents.
Aren't there any strategies to reduce capital cost?	To be discussed on next slides.
What about ongoing operation and maintenance costs?	To be discussed on next slides.

Strategies to Create an Actionable Project

Target Service Area	Value Engineer	Obtain Grant Funding	Intermunicipal Shared Services
• Phased Approach • High Priority Areas • Small Lots	• Investigate Cost Savings (Capital and Operational) • Evaluate Areas with high cost per mile	• Evaluate Community Characteristics • Identify Competitive Programs	• O&M of Collection System • Treatment of Wastewater • Billing and Admin

Village of Burdett – Phase 1

- Estimated Construction Cost $21.0 M
- Estimated Inflation (to mid-2027) $1.3 M
- Construction Contingency $6.7 M (30%)
- Estimated Associated Costs $5.5 M

- **Total Estimated Project Cost $34.5 M**

- Project Capital Cost Funding Strategy
  - Qualifies for more grant programs and lower interest long term loan as compared to whole project area
  - Annual Debt Service Per User with NO Grants: $3,454 per year (NOT FEASIBLE)
  - Annual Debt Service Per User with ALL Grants shown at right: $417

Appalachian Regional Commission
Max Award $500,000

Bipartisan Infrastructure Law
Max Award (50%) $17,255,000

Water Quality Improvement Program
Max Award $10,000,000

Local Government Efficiency
Max Award $750,000

Water Infrastructure Improvement Act
Max Award (50% Net Eligible) $1,340,000

Congressionally Directed Spending
Typical Award $500,000

CWSRF Long Term Financing (Hardship) 0% Interest 30 Year Loan

Village of Burdett – Phase 1

- System O&M Costs
  - Largely unknown at this point
  - Requires coordination with municipalities and Joint Project Commission.

Operation

Sewer Administration, Power, Odor Control, Employee Benefits	$302,500 per year

Sewer and Transmission Maintenance

Flow Meters, Valves, Pumps, Generators, SCADA	$63,812 per year

Short Lived Assets

Flow Meters, Valves, Generators	$47,738 per year

Estimated O&M Total Annual Fee based on preliminary design:

$572,863 per year
$1,720 per user

Catharine Valley Water Reclamation Facility

Joint Project Commission: Annual contribution to be determined. Current Watkins Glen Out of District User Cost is $1,250 per year

NEXT STEPS

UNDERSTAND
Regulatory
Community

GOALS
Community
Project

INVESTIGATE

ALTERNATIVES
Propose and
Compare

RECOMMEND
Investments
and Grant
Strategy

IMPLEMENT

CONSTRUCT

- Holistic View of Community
- Know Regulatory Requirements
- Place in Context
- Understand Funding Landscape

- Existing Conditions
- Pending Regulatory Compliance
- Community Priorities
- Social Benefits
- Technical Outcomes

- Preliminary Engineering Report
- Stakeholder Engagement
- Regulatory Engagement
- Income Survey
- Environment

- Rank Goals
- Establish Criteria
- Create Performance Ranges
- Benefit to Cost Analysis
- Lifecycle Costs

- Select Alternative
- Design
- Grants
- Financing
- Program Compliance

- Environmental
- District Formation
- Bond Financing
- Secure Grants
- Close Financing

- Bidding
- Construction Oversight
- Construction Administration
- Substantial Completion
- Inspection
- Operation

Current Actions

Provide Additional Feedback

Sewer Study Area Survey

- Mailed to all Addresses in Study Area
- Available in hard copy
- Available online

Boards in Room

- Write down your ideas
- Identify your priorities

Talk to our Team

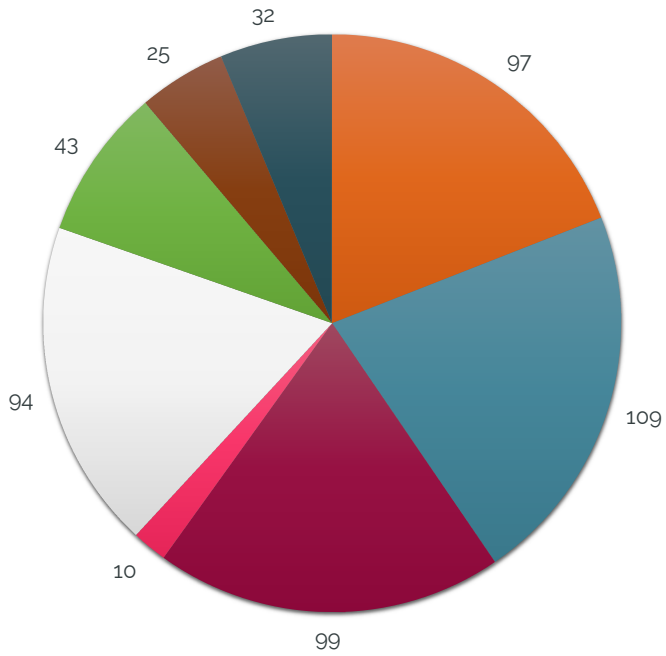
- We are here to listen
- Talk to us one-to-one

Local Representatives

- Village – Larry
- Town - Justin

DISCUSSION

Project Area - Lot Sizes



Advanced System (smaller lakeside lots)
Total Cost over Useful Life $43,370
Average Annual Total $1,735 per year

Approximately $30,000 - $40,000	• New Installation • Anticipated Useful Life 20-30 years
$250 - $500	• Inspection • Recommended every 3-5 years • Required at time of property transfer
$250 - $400	• Pumping • Recommended every 3-5 years • Required at time of property transfer
Repairs	• Pump repairs/replacement $500-$800 • Inlet or outlet baffles $250-$500 • Pipe repair $1,000 - $5,000

Conventional System
Total Cost over Useful Life $30,870
Average Annual Total $1,235 per year

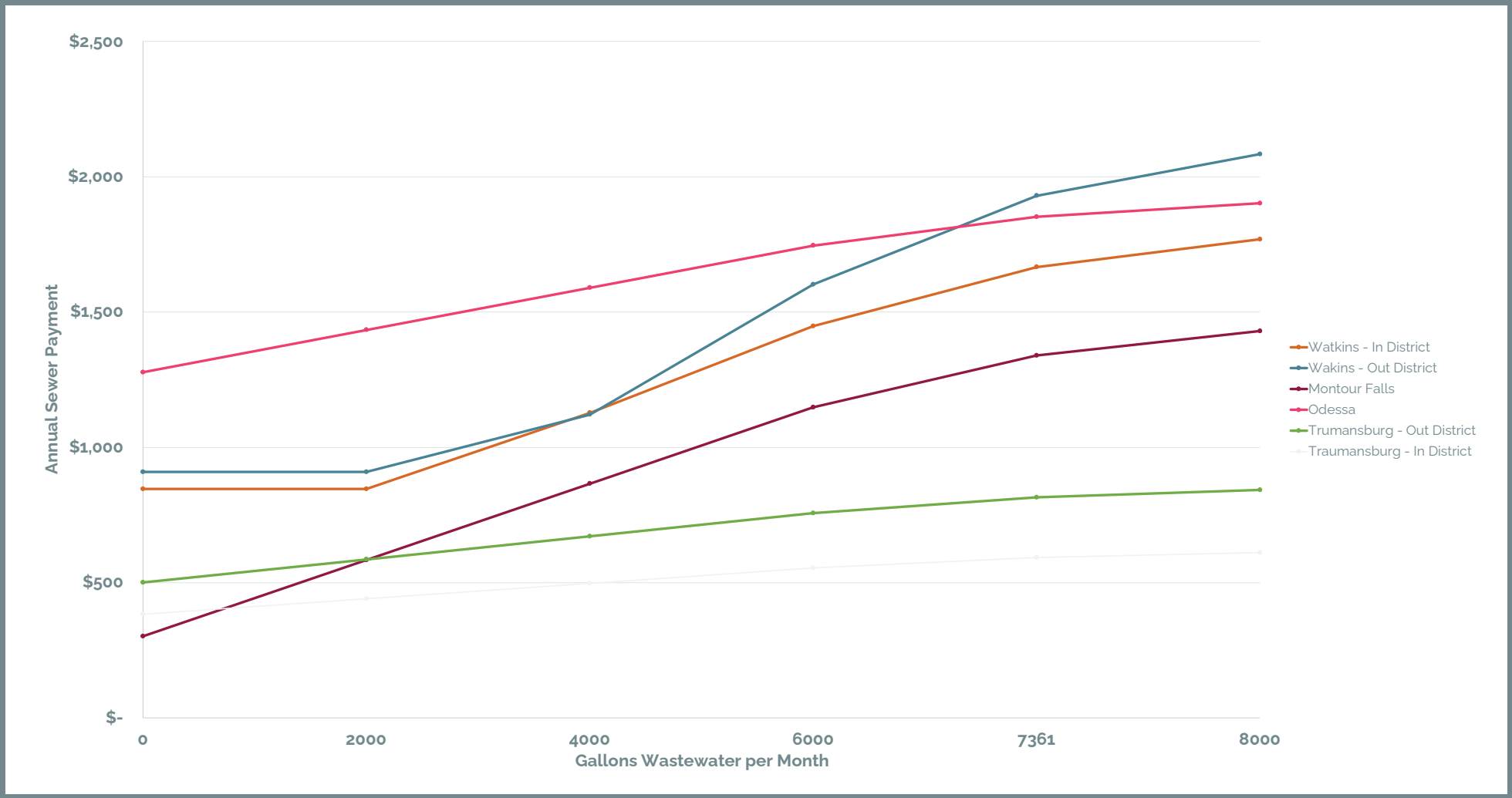
Approximately $25,000	• New Installation • Anticipated Useful Life 20-30 years
$250 - $500	• Inspection • Recommended every 3-5 years • Required at time of property transfer
$250 - $400	• Pumping • Recommended every 3-5 years • Required at time of property transfer
Repairs	• Tank lid $100 • Inlet or outlet baffles $250-$500 • Pipe repair $1,000 - $5,000

Septic System O&M

Traditional Sand Filter 1,000 gallon tank																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Capital Cost	$20,000																			
Design and Permits	$5,000																			
Operating & Maintenance Costs																				
Inspection			250			250			250			250			250			250		
Pumping				300				300				300				300				300
Tank Lid																				$70
Inlet Outlet Baffles										500										500
Pipe Repair															1000					
ANNUAL COST	$25,000	$0	$250	$300	$0	$250	$0	$300	$250	$500	$0	$550	$0	$0	$1,250	$300	$0	$250	$0	$870
Total Cost over Lifetime	$30,870																			
Simple Annual Average Total Cost over 25 years	$1,235																			

More Complex Replacement System																				
Initial Capital Cost	$30,000																			
Design and Permits	$7,500																			
Operating & Maintenance Costs																				
Inspection			250			250			250			250			250			250		
Pumping				300				300				300				300				300
Tank Lid																				$70
Inlet Outlet Baffles										500										500
Pipe Repair															1000					
Pump Replacement															600					
ANNUAL COST	$37,500	$0	$250	$300	$0	$250	$0	$300	$250	$500	$0	$550	$0	$0	$1,250	$300	$0	$250	$0	$870
Total Cost over Lifetime	$43,370																			
Simple Annual Average Total Cost over 25 years	$1,735																			

Regional Residential Sewer Rates and Debt Services					
	In-District Residential Rates	Out-District Residential Rates	Debt Service	Total Annual Fee Based on Estimated Residential Annual Consumption	
Village of Watkins Glen	Base Charge $15.50/month Usage Charge $35 plus $10/unit	Base Charge $23.25/month Usage Charge $52.50 plus $15/unit	In-District $20/month Out-District None	In-District: Base: $186 Usage: $1,240 Debt: $240 TOTAL: $1,666	Out District: Base: $279 Usage: $1,651 Debt: $0 TOTAL: $1,930
Village of Montour Falls	Base Charge $3.56/2-month billing cycle Usage Charge $11.75/1,000 gallons	Not Applicable	$280.74/year	Base: $21 Usage: $1038 Debt: $280 TOTAL: $1,340	
Village of Odessa	Base Charge $35/2-month billing cycle Usage Charge $6.50/1,000 gallons	Not Applicable	$178/2-month Billing Cycle	Base: $210 Usage: $576 Debt: $1,068 TOTAL: $1,854	


$2,500
$2,000
$1,500
$1,000
$500
$-
Annual Sewer Payment
0
2000
4000
6000
7361
8000
Gallons Wastewater per Month
Watkins - In District
Wakins - Out District
Montour Falls
Odessa
Trumansburg - Out District
Traumansburg - In District

	Alternative 2: Connect to the Existing Catherine Valley Water Reclamation Plant	Alternative 3: Install and connect to a new wastewater treatment facility within the project area
Major Difference(s)	• Collection system connects to existing Catherine Valley Water Reclamation Plant in Watkins Glen. • The Town of Hector and/or Village of Burdett do not own/operate a separate treatment facility.	• Collection system connects to a new treatment facility located within the project area. • The Town of Hector and/or Village of Burdett own and operate its own wastewater treatment plant.
Compliance Differences	• The Town of Hector and/or Village of Burdett must maintain the collection system, ensuring compliance with NYSDEC standards. • The receiving plant (Catherine Valley) assumes the primary treatment and effluent compliance burden.	• The Town of Hector and/or Village of Burdett must maintain both a collection system and a treatment facility. • The Town of Hector and/or Village of Burdett WWTP must comply with NYSDEC effluent limits and associated permitting, testing, and reporting requirements for wastewater treatment.
Interagency Coordination	• Coordinate with V Watkins Glen and V Montour Falls Joint Project Commission for connection fees, flow monitoring, and capacity-sharing agreements. • Cooperative oversight of plant operations, maintain good intermunicipal relations.	• Ongoing coordination with NYSDEC for the facility's discharge permit, effluent monitoring, and compliance enforcement. • Potentially more complex coordination if changes to discharge limits or state/federal regulations occur.

	Alternative 2: Connect to the Existing Catherine Valley Water Reclamation Plant	Alternative 3: Install and connect to a new wastewater treatment facility within the project area
Pros	• Reduced Regulatory Burden: Primary treatment responsibility lies with the existing regional plant. • Lower Staffing Needs: Fewer skilled operators are required • Supports Regional Approach: Aligns with NYSDEC's preference for larger, regional wastewater solutions. • Easier to Permit: Fewer separate permits for the treatment component. • Higher Likelihood of Community Support: Odors, noise, and other treatment-related impacts are off-site. • Adaptability: The existing plant may have the capacity or the ability to expand more easily if needed. The existing plant will be more capable of adapting to future regulatory requirements.	• Local Control of Costs: Long-term control over treatment fees. • Direct Management: The Village can optimize operations based on local priorities.
Cons	• Annual User Costs: The Town of Hector and/or Village of Burdett must negotiate ongoing user fees with Watkins Glen and Montour Falls Joint Project Commission. • Less Direct Control: Dependent on the regional plant's policies, capacities, and operational decisions.	• Much greater regulatory burden. • Lower likelihood of community support. • Less adaptable for future economic and population growth. • Does not comply with NYSDEC preference of regional wastewater facilities. • Less adaptable to future regulatory requirements.

EDU – Project Area

TYPE	DESCRIPTION	CODE	TOTAL NUMBER	GPD per Unit[1, 2, 3]	GPD	EDU PER CODE	TOTAL EDU
Agricultural	Agricultural vacant land (productive)	105	10				
Agricultural	Field crops	120	2				
Agricultural	Vineyards	152	8				
Residential	One family year-round residence	210	330	268.4	88572	1	330
Residential	Two family year-round residence	220	14	536.8	7515	2	28
Residential	Three family year-round residence	230	4	805.2	2416	1 to 3 [4]	9
Residential	Rural residence with acreage	240	35	268.4	9394	1	35
Residential	Seasonal residences	260	24	268.4	2147	0.3 [5]	7
Residential	Mobile home	270	10	220	2200	1.0	10
Residential	Multiple mobile homes	271	2	220	880	1	4
Residential	Residential (Multipurpose)	280	7	268.4	1879	1	7
Residential	Multiple residences - La Bourgade Ln	281	1	268.4	15030	56	56
Residential	Residence with incidental commercial use	283	12	268.4	3221	1	12
Vacant Land	Vacant Land	300	3	0	0	T Hector Water charged 0.5 Debt Service on tax bill Landlocked parcels without access are NOT billed.	1.5
Vacant Land	Residential vacant land	311	23	0	0		11.5
Vacant Land	Residential land including a small improvement (not used for living accommodations)	312	38	0	0		19
Vacant Land	Rural vacant lots of 10 acres or less	314	35	0	0		17.5
Vacant Land	Abandoned agricultural land	321	2	0	0		1
Vacant Land	Residential vacant land over 10 acres	322	9	0	0		4.5
Vacant Land	Vacant land located in commercial areas	330	2	0	0		1
Commercial	Commercial	400	2	268.4	537	1	2
Commercial	Apartments	411	1	268.4	268	1	1
Commercial	Inns, lodges, boarding and rooming houses, tourist homes, fraternity and sorority houses	418	2	1732.2	3464	6.5	13
Commercial	Restaurants - Demolished	421	1	0	0	0.5	0.5
Commercial	Diners and luncheonettes	422	2	268.4	1074	2	4
Commercial	Bar	425	1	268.4	268	1	1
Commercial	Auto body, tire shops, other related auto sales	433	1	268.4	268	1	1
Commercial	Storage, warehouse and distribution facilities	440	2	268.4	523	1	2
Commercial	Mini warehouse (self–storage)	442	1	0	0	0	0
Commercial	Other storage, warehouse and distribution facilities	449	2	268.4	403	0.5 and 1 [4]	1.5
Commercial	Small retail outlet	457	2	268.4	537	1	2
Commercial	Office building	464	3	268.4	805	1	3
Commercial	Miscellaneous services	470	1	0	0	0	0
Commercial	Downtown row type (with common wall)	481	1	268.4	537	2	2
Commercial	Downtown row type (detached)	482	1	268.4	268	1	1
Commercial	Converted residence	483	4	268.4	1745	2, 1, 2, 1.5 [4]	6.5
Commercial	One story small structure	484	12	see below	7236	see below	27
Commercial	Minimart	486	2	536	501		2
Community Services	Other educational facilities	615	1	150	150	1	1
Community Services	Religious	620	3	150	450	1	3
Community Services	Office building	652	1	268.4	268	1	1
Community Services	Police and fire protection, electrical signal	662	3		1280		5
Community Services	Recreational facilities	682	1	1027	1027		4
Community Services	Cemeteries	695	2	0	0	0	0
Public Services	Water treatment facilities	823	1	263	263	1	1
Public Services	Telephone	831	3	268.4	805	1	3
Public Services	Water	845	1	268.4	268	1	1
Wild, forested, conservation lands and public parks	City, town, or village public parks and recreation areas	963	2	268.4	537	1	2
No Assigned Land Use Code			13	0	0	0	0
		TOTAL	643		156,739		644

Opinion of Probable Construction Cost				
Item Description	*Unit Cost*	*Units*	*Quantity*	*Ext. Cost*
12" PVC Gravity Sewer Main	$ 215	LF	47,000	$ 10,105,000
8" PVC Gravity Sewer Main	$ 175	LF	17,000	$ 2,975,000
Sanitary Sewer Manholes (5' dia)	$ 15,000	EA	210	$ 3,150,000
4" PVC Gravity Sewer Laterals	$ 150	LF	13,000	$ 1,950,000
8" HDPE Forcemain	$ 165	LF	37,100	$ 6,121,500
6" HDPE Forcemain	$ 155	LF	7,000	$ 1,085,000
Flushing Air Vac and Release Structure	$ 15,500	EA	33	$ 511,500
HDPE Low Pressure Sewer Main	$ 50	LF	12,000	$ 600,000
HDPE Low Pressure Sewer Laterals	$ 35.00	LF	12,420	$ 434,700
Grinder Pumps	$ 7,500	EA	106	$ 792,000
Grinder Pump Alarm Panels	$ 2,500	EA	106	$ 264,000
Pump Stations	$ 525,000	EA	28	$ 14,700,000
Flow Meter Pit	$ 15,000	EA	1	$ 15,000
Sanitary Sewer Clean Outs	$ 414	EA	414	$ 171,400
Low Pressure Sewer Curb and Check Valve Assembly	$ 1,000	EA	106	$ 105,600
Full Depth Road Restoration	$ 54	SY	74,000	$ 3,999,600
Mill and Overlay	$ 15.00	SY	300,000	$ 4,500,000
Pavement Striping	$ 3.00	LF	215,300	$ 645,900
Rock Excavation	$ 150.00	CY	14,000	$ 2,100,000
Odor Control Stations	$ 70,000.00	EA	10	$ 700,000
BIDDING & GENERAL REQUIREMENTS				
General Conditions	2.0%		-	$ 1,099,000
Mobilization/Demobilization	4.0%		-	$ 2,198,000
MPOT	2.5%			$ 1,374,000
SUBTOTAL CONSTRUCTION COSTS (2024 PRESENT VALUE)				**$ 59,597,000**
SUBTOTAL CONTRUCTION COSTS (escalated to mid-2027; est. constr. midpoint)	6.0%			**$ 63,173,000**
ASSOCIATED COSTS				
Construction Contingency	30%		-	$ 18,952,000
Engineering, Bidding and Construction Services	20%			$ 12,635,000
Administration, Financial, Bonding and Legal Services	5%		-	$ 3,159,000
Design & Engineering Contingency	5%		-	$ 3,159,000
SUBTOTAL ASSOCIATED COSTS				**$ 34,746,000**
TOTAL OPINION OF PROBABLE CAPITAL COST				**$ 97,919,000**
State Revolving Fund (SRF) Issuance Cost			-	
TOTAL COSTS				**$ 97,920,000**

TOTAL OPERATING COSTS (PRESENT VALUE)		
Sewer Administration	$	41,500
Power Cost	$	100,638
Odor Control Refills	$	207,000
Employee Benefits	$	117,900
Watkins Water Reclamation Cost	$	805,000
SUBTOTAL	$	1,272,038

Additional Maintenance and Short-Lived Asset Costs		Installation Cost	20%			Projection Year	
		Annual Inflation	3%				
Equipment	Maintenance Item	Quantity	Replacement Frequency (years)	Present Unit Cost		Total Present Cost	Total Annulized Cost
Sewer and Transmission							
Anticipated Additional Maintenance Costs (online 2027)							
Flow Meters	Calibration/Servicing	1	2	$	800	$ 800	$ 616
Air Relief, Pressure Relief & Vacuum Relief Valves	Calibration/Servicing	33	1	$	500	$ 16,500.0	$ 25,162.5
Sewage Pumps	Inspection	56	1	$	1,000	$ 56,000	$ 85,400
Flushing and Low Pressure Sewer Main	Flushing and Cleaning	1	5	$	10,000	$ 10,000	$ 3,170
Emergency Backup Generators	Calibration / Servicing	28	1	$	1,250	$ 35,000	$ 53,375
SCADA Controls	Subscription	28	1	$	290	$ 8,120	$ 12,383
TOTAL MAINTENANCE COST							$ 180,106.50
Anticipated Additional Short-Lived Asset Costs (online 2027)							
Flow Meters	Replacement	1	15	$	8,500	$ 8,500.0	$ 705.5
Air Relief, Pressure Relief & Vacuum Relief Valves	Replacement	33	20	$	5,000	$ 165,000.0	$ 9,130.0
Emergency Backup Generator	Replacement	28	15	$	75,000	$ 2,100,000.0	$ 116,200.0
TOTAL SHORT LIVED ASSET COSTS							$ 126,035.5
Anticipated Public Sewer System Costs (online 2027)							
Sewer Administration	Yearly Cost					$ 41,500.0	$ 63,287.5
Power Cost	Yearly Cost					$ 100,638.4	$ 153,473.5
Odor Control Refills	Yearly Cost					$ 207,000.0	$ 315,675.0
Employee Benefits	Yearly Cost					$ 117,900.0	$ 179,797.5
Watkins Water Reclamation Cost	Yearly Cost					$ 805,000.0	$ 1,227,625.0
TOTAL PUBLIC SEWER SYSTEM COSTS							$1,939,858.5
TOTAL ANNUAL PROJECT MAINTENANCE & SYSTEM COSTS							$2,246,000.5

VILLAGE ONLY – PHASE 1

EDU – Village Only

TYPE	DESCRIPTION	CODE	TOTAL NUMBER	GPD per Unit[1, 2, 3]	GPD	EDU PER CODE	TOTAL EDU
Agricultural	Agricultural vacant land (productive)	105	4	0	0	0	0
Agricultural	Field crops	120	0	0	0	0	0
Agricultural	Vineyards	152	0	0	0	0	0
Residential	One family year-round residence	210	204	268.4	54754	1	204
Residential	Two family year-round residence	220	10	536.8	5368	2	20
Residential	Three family year-round residence	230	3	805.2	2416	3	9
Residential	Rural residence with acreage	240	18	268.4	4831	1	18
Residential	Seasonal residences	260	7	268.4	626	0.3 [5]	2
Residential	Mobile home	270	5	220	1100	1	5
Residential	Multiple mobile homes	271	2	220	880	1	4
Residential	Residential (Multipurpose)	280	3	268.4	805	1	3
Residential	Multiple residences - La Bourgade Ln	281	0	0	0	0	0
Residential	Residence with incidental commercial use	283	5	268.4	1342	1	5
Vacant Land	Vacant Land	300	1	0	0	T Hector Water charged 0.5 Debt Service on tax bill Landlocked parcels without access are NOT billed.	0.5
Vacant Land	Residential vacant land	311	10	0	0		5
Vacant Land	Residential land including a small improvement (not used for living accommodations)	312	9	0	0		4.5
Vacant Land	Rural vacant lots of 10 acres or less	314	9	0	0		4.5
Vacant Land	Abandoned agricultural land	321	0	0	0		0
Vacant Land	Residential vacant land over 10 acres	322	2	0	0		1
Vacant Land	Vacant land located in commercial areas	330	1	0	0		0.5
Commercial	Commercial	400	1	268.4	268	1	1
Commercial	Apartments	411	1	268.4	268	1	1
Commercial	Inns, lodges, boarding and rooming houses, tourist homes, fraternity and sorority houses	418	0	0.0	0	0.0	0
Commercial	Restaurants - Demolished	421	1	0	0	0.5	0.5
Commercial	Diners and luncheonettes	422	1	536.8	537	2	2
Commercial	Bar	425	0	0	0	0	0
Commercial	Auto body, tire shops, other related auto sales	433	1	268.4	268	1	1
Commercial	Storage, warehouse and distribution facilities	440	1	268.4	268	1	1
Commercial	Mini warehouse (self-storage)	442	1	0	0	0	0
Commercial	Other storage, warehouse and distribution facilities	449	2	268.4	403	0.5 and 1 [4]	1.5
Commercial	Small retail outlet	457	0	0	0	0	0
Commercial	Office building	464	1	268.4	805	1	3
Commercial	Miscellaneous services	470	1	0	0	0	0
Commercial	Downtown row type (with common wall)	481	1	268.4	537	2	2
Commercial	Downtown row type (detached)	482	0	0	0	0	0
Commercial	Converted residence	483	4	268.4	1745	2, 1, 2, 1.5 [4]	6.5
Commercial	One story small structure	484	4	see below	4556	see below	17
Commercial	Minimart	486	1	536	501		2
Community Services	Other educational facilities	615	0	0	0	0	0
Community Services	Religious	620	2	150	300	1	2
Community Services	Office building	652	1	268.4	268	1	1
Community Services	Police and fire protection, electrical signal	662	2	268.4	537	1	2
Community Services	Recreational facilities	682	0	0	0	0	0
Community Services	Cemeteries	695	1	0	0	0	0
Public Services	Water treatment facilities	823	0	0	0	0	0
Public Services	Telephone	831	0	0	0	0	0
Public Services	Water	845	1	268.4	268	1	1
Wild, forested, conservation lands and public parks	City, town, or village public parks and recreation areas	963	2	268.4	537	1	2
No Assigned Land Use Code			5	0	0	0	0
		TOTAL	328		84,189		333

Capital Cost– Village Only

Opinion of Probable Construction Cost				
Item Description	*Unit Cost*	*Units*	*Quantity*	*Ext. Cost*
12" PVC Gravity Sewer Main	$ 215	LF	12,200	$ 2,623,000
8" PVC Gravity Sewer Main	$ 175	LF	10,200	$ 1,785,000
Sanitary Sewer Manholes (5' dia)	$ 15,000	EA	67	$ 1,008,000
4" PVC Gravity Sewer Laterals	$ 150	LF	9,000	$ 1,350,000
8" HDPE Forcemain	$ 165	LF	6,300	$ 1,039,500
6" HDPE Forcemain	$ 155	LF	4,700	$ 728,500
Flushing Air Vac and Release Structure	$ 15,500	EA	5	$ 77,500
Pump Stations	$ 525,000	EA	11	$ 5,775,000
Flow Meter Pit	$ 15,000	EA	1	$ 15,000
Sanitary Sewer Clean Outs	$ 290	EA	290	$ 84,100
Full Depth Road Restoration	$ 54	SY	22,000	$ 1,189,100
Mill and Overlay	$ 15.00	SY	100,000	$ 1,500,000
Pavement Striping	$ 3.00	LF	60,500	$ 181,500
Rock Excavation	$ 150	CY	11,000	$ 1,650,000
Odor Control Stations	$ 70,000	EA	5	$ 350,000
BIDDING & GENERAL REQUIREMENTS				
General Conditions	2.0%		-	$ 388,000
Mobilization/Demobilization	4.0%		-	$ 775,000
MPOT	2.5%			$ 484,000
SUBTOTAL CONSTRUCTION COSTS (2024 PRESENT VALUE)				**$ 21,003,000**
SUBTOTAL CONTRUCTION COSTS (escalated to mid-2027; est. constr. midpoint)	6.0%			**$ 22,264,000**
ASSOCIATED COSTS				
Construction Contingency	30%		-	$ 6,680,000
Engineering, Bidding and Construction Services	20%			$ 4,453,000
Administration, Financial, Bonding and Legal Services	5%		-	$ 1,113,000
Design & Engineering Contingency	5%		-	$ 1,113,000
SUBTOTAL ASSOCIATED COSTS				**$ 12,246,000**
TOTAL OPINION OF PROBABLE CAPITAL COST				**$ 34,510,000**
State Revolving Fund (SRF) Issuance Cost			-	
TOTAL COSTS				**$ 34,510,000**

O&M COSTS – VILLAGE ONLY

Total Yearly System Costs (Present Value)		
Sewer Administration	$	41,500
Power Cost	$	39,600
Odor Control Refills	$	103,500
Employee Benefits	$	117,900
Watkins Water Reclamation Yearly Fee	$	362,500
SUBTOTAL	**$**	**665,000**

Additional Maintenance and Short-Lived Asset Costs	Installation Cost	20%			Projection Year	
	Annual Inflation	3%				
Equipment	Maintenance Item	Quantity	Replacement Frequency (years)	Present Unit Cost	Total Present Cost	Total Annulized Cost
Sewer and Transmission						
Anticipated Additional Maintenance Costs (online 2027)						
Flow Meters	Calibration/Servicing	1	2	$ 800	$ 800	$ 616
Air Relief, Pressure Relief & Vacuum Relief Valves	Calibration/Servicing	5	1	$ 500	$ 2,500.0	$ 3,812.5
Sewage Pumps	Inspection	22	1	$ 1,000	$ 22,000	$ 33,550
Emergency Backup Generators	Calibration / Servicing	11	1	$ 1,250	$ 13,750	$ 20,969
SCADA Controls	Subscription	11	1	$ 290	$ 3,190	$ 4,865
TOTAL MAINTENANCE COST						**$ 63,812.00**
Anticipated Additional Short-Lived Asset Costs (online 2027)						
Flow Meters	Replacement	1	15	$ 8,500	$ 8,500.0	$ 705.5
Air Relief, Pressure Relief & Vacuum Relief Valves	Replacement	5	20	$ 5,000	$ 25,000.0	$ 1,383.3
Emergency Backup Generator	Replacement	11	15	$ 75,000	$ 825,000.0	$ 45,650.0
TOTAL SHORT LIVED ASSET COSTS						**$ 47,738.8**
Anticipated Public Sewer System Costs (online 2027)						
Sewer Administration	Yearly Cost				$ 41,500.0	$ 63,287.5
Power Cost	Yearly Cost				$ 39,600.0	$ 60,390.0
Odor Control Refills	Yearly Cost				$ 103,500.0	$ 157,837.5
Employee Benefits	Yearly Cost				$ 117,900.0	$ 179,797.5
Watkins Water Reclamation Yearly Fee	Yearly Cost				$ 362,500.0	$ 552,812.5
TOTAL PUBLIC SEWER SYSTEM COSTS						**$1,014,125.0**
TOTAL ANNUAL PROJECT MAINTENANCE & SYSTEM COSTS						**$1,125,675.8**

PRESENTATION OUTLINE

EVALUATION SCOPE

Identify and evaluate options for wastewater infrastructure.

EXISTING CONDITIONS

Understand existing reports, site conditions, current wastewater, and community ideas.

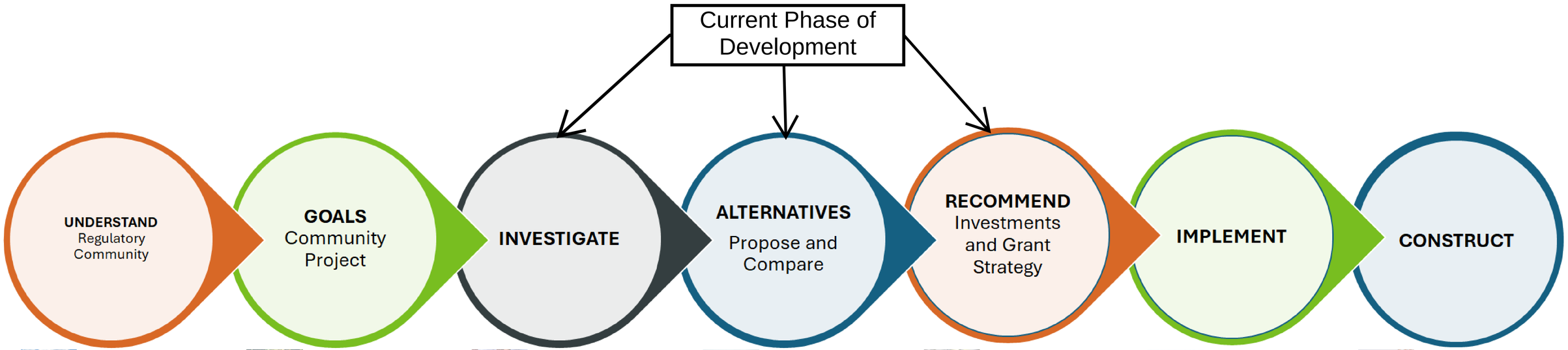
ALTERNATIVES ANALYSIS

Consider multiple conceptual alternatives to protect health and the environment.

Project

Overview

Village of Burdett and Town of Hector
Wastewater Feasibility Study



VIEW

- Holistic View of Community
- Know Regulatory Requirements
- Place in Context
- Understand Funding Landscape

SCOPING

- Existing Conditions
- Pending Regulatory Compliance
- Community Priorities
- Social Benefits
- Technical Outcomes

PLANNING

- Preliminary Engineering Report
- Stakeholder Engagement
- Regulatory Engagement
- Income Survey
- Environment

EVALUATION

- Rank Goals
- Establish Criteria
- Create Performance Ranges
- Benefit to Cost Analysis
- Lifecycle Costs

ADVANCE

- Selected Alternative
- Design
- Grants
- Financing
- Program Compliance

FORMALIZE

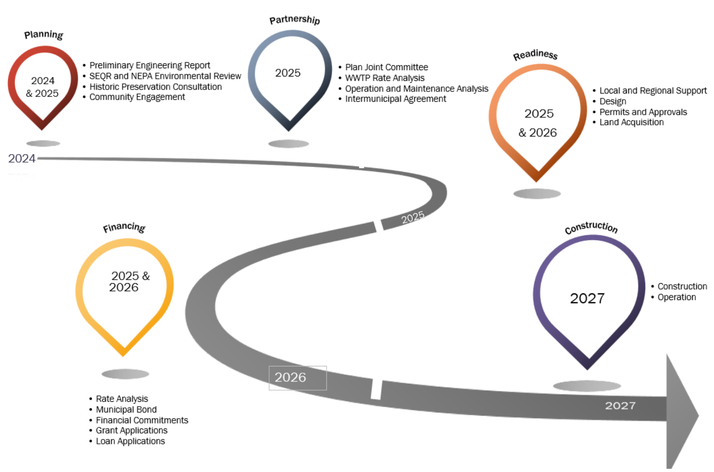
- Environmental
- District Formation
- Bond Financing
- Secure Grants
- Close Financing

BUILD

- Bidding
- Construction Oversight
- Construction Administration
- Substantial Completion
- Inspection
- Operation

Next Implementation Steps - Phase 1 Village of Burdett

Phased Development



Start	End	Task Description	Notes	Village Board Action
Planning				
Sep-24	Mar-25	Preliminary Engineering Report	Required for Grant Applications	✓
Mar-25	Apr-25	SEQR Full EAF with Coordinated Review	Required for Municipal Bond, EFC Grant Applications, Permits, Approvals	✓
Mar-25	Apr-25	Historic Preservation SHPO	Required for EFC Grant Applications	
Feb-25	Oct-27	Community Engagement - Introduction		
Partnership				
Mar-25	May-25	NYS DEC Review and Approval of PER		
Apr-25	Jun-25	CVWRF Rate Analysis		✓
Apr-25	Jun-25	Collection System O&M Rate Analysis		✓
Feb-25	Jun-25	CVWRF Joint Plan Committee Intermunicipal Agreement	Required for EFC IMG Grant Eligibility	✓
Jul-25	Jul-26	Town of Hector Agreement for route Village to CVWRF		✓
Jul-25	Jul-26	Landowner Engagement for potenital land acquisition for pump stations and conveyance to CVWRF		✓
Readiness				
Mar-25	Apr-25	RFP for Engineering Design Services	Advancing to design will support more accurate cost estimate and demonstrate project readiness. Design expenditures that were completed following RFP process approved by EFC will enable reimbursement with future grant and loan financing.	✓
Mar-25	Jun-25	Stakeholder Engagement - Letters of Support and/or Commitment	•SCOPED •STREDC •Village Watkins Glen •Village Montour Falls •Town Hector •Schuyler County Planning •Schuyler County Watershed Protection •Seneca Pure Waters •Finger Lakes Institute •Local Businesses	
May-25	Mar-26	Engineering Design		
Apr-25	5/30/2025	List Project on NYSEFC Intended Use Plan	Submission deadline id May 30, 2025	
Jan-25	Jul-26	Land Acquistion for pump station and conveyance to CVWRF		✓
Mar-26	Dec-26	Permits and Approvals	•Village Board •Schuyler County Watershed Protection/Health •NYSDEC Stream Disturbance •NYSDEC General Construction, SWPPP •NYSDOT •US ACE	✓

Grants and Financing

Capital Costs

- **Phase 1 – Village of Burdett Only - $34,510,000**
- Refine Service Area based on public feedback and constructability
- Complete Detailed Design to inform costs
- Secure Bond Financing to pursue grants
- Secure Grants to minimize long term financing

Cost Per User with NO Grants: $3,454 per year

Cost Per User with Below Grants: $417 per year

- Appalachian Regional Commission — Max Award $500,000
- Bipartisan Infrastructure Law — Max Award (50%) $17,255,000
- Water Quality Improvement Program — Max Award $10,000,000
- Local Government Efficiency — Max Award $750,000
- Water Infrastructure Improvement Act — Max Award (50% Net Eligible) $1,340,000
- Congressionally Directed Spending — Typical Award $500,000
- CWSRF Long Term Financing (Hardship) 0% Interest 30 Year Loan

Operation and Maintenance

Operation and Maintenance

- Complete Detailed Design to inform costs
- Evaluate Shared Service agreements to reduce cost of operation and maintenance for collection system
- Evaluate Intermunicipal Agreement with V Watkins Glen and V Montour Falls for shared operational costs for Catharine Valley Water Reclamation

Requires further intermunicipal coordination and design evaluation to establish reasonable rates

Cost Per User for O&M: $1,720 per year

Operation	
Sewer Administration, Power, Odor Control, Employee Benefits, opportunity to reduce this expense with shared services	$302,500 per year

Sewer and Transmission Maintenance	
Flow Meters, Valves, Pumps, Generators, SCADA	$63,812 per year

Short Lived Assets	
Flow Meters, Valves, Generators	$47,738 per year

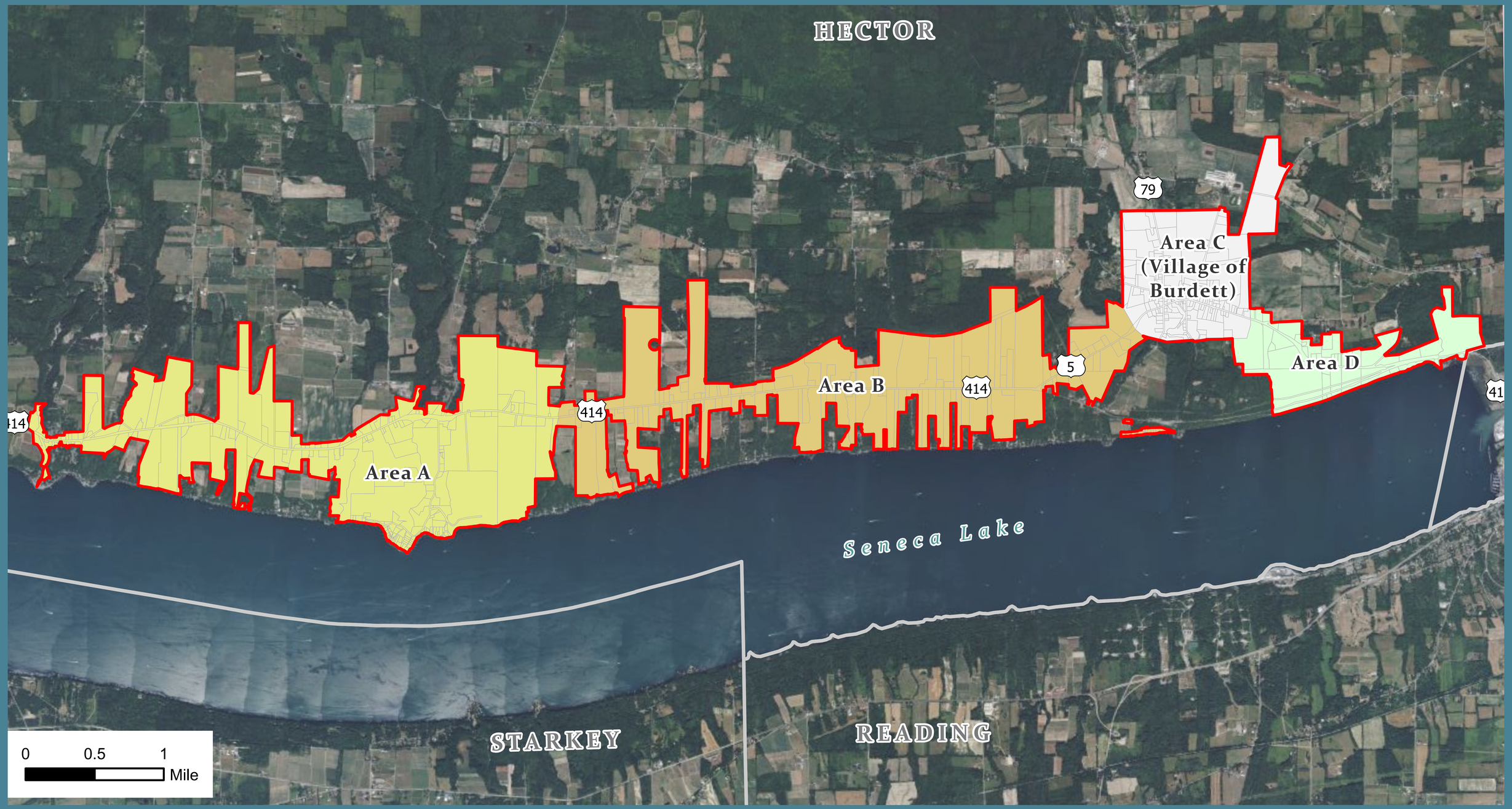
Estimated O&M Total Annual Fee based on preliminary design:
$572,863 per year
$1,720 per user

Catharine Valley Water Reclamation Facility	
Joint Sewer Commission, requires coordination and agreements with Village Watkins Glen and Village Montour Falls	Annual contribution to be determined.

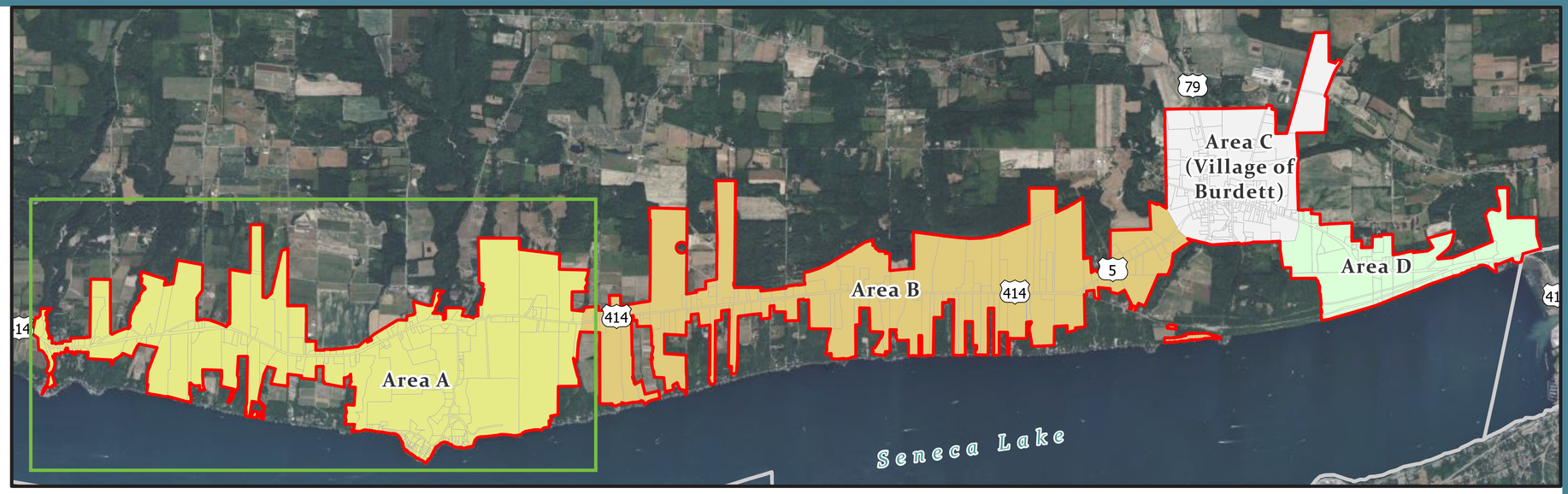
Cost Per User for CVWRF to be determined, Out of District User Fee is $1,250 per year, anticipate shared cost for facility will be lower.

Community Feedback

Survey Area Map



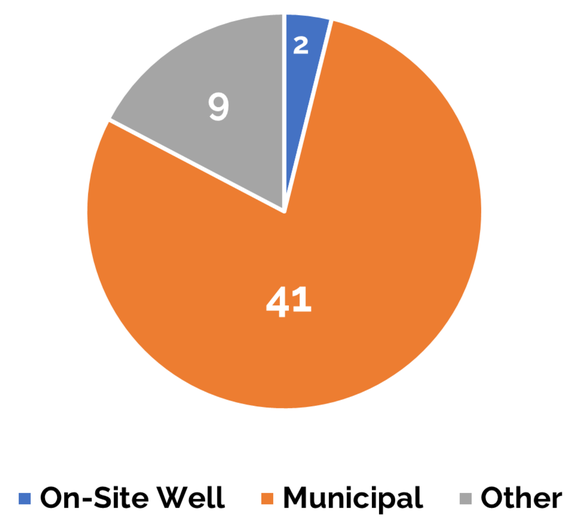
Area A



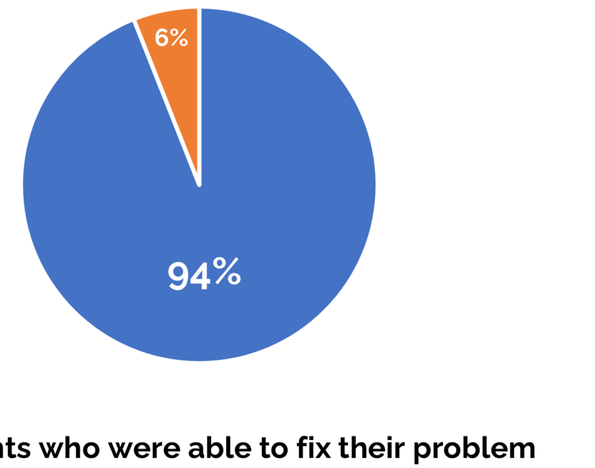
52
Total Responses

54%
Total Respondents Interested in Wastewater Service

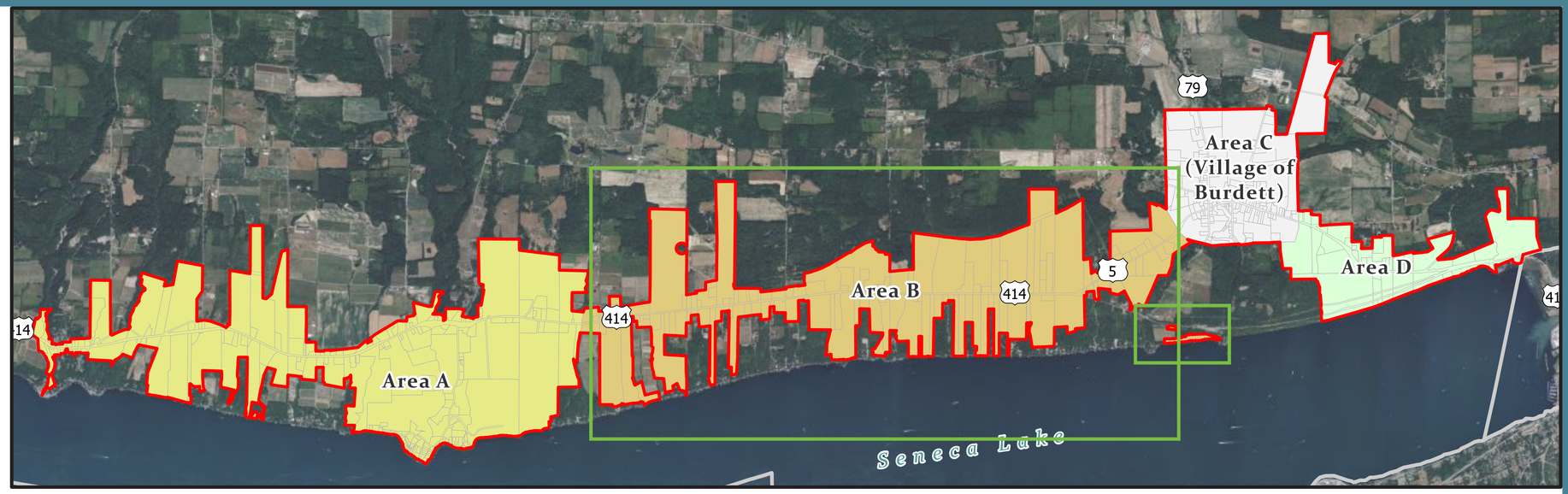
Drinking Water Source for Area A



35%
Total respondents who previously had problems with their Septic/Cesspool Systems



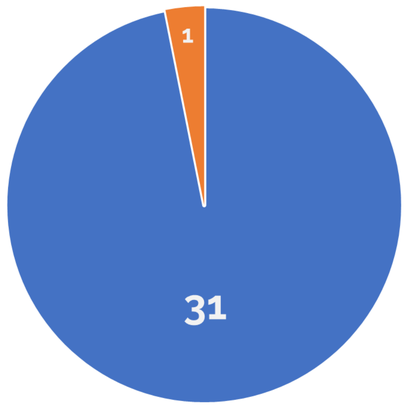
Area B



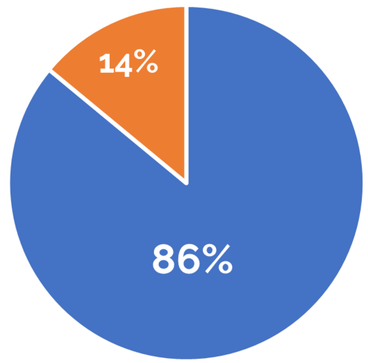
32
Total Responses

56%
Total Respondents Interested in Wastewater Service

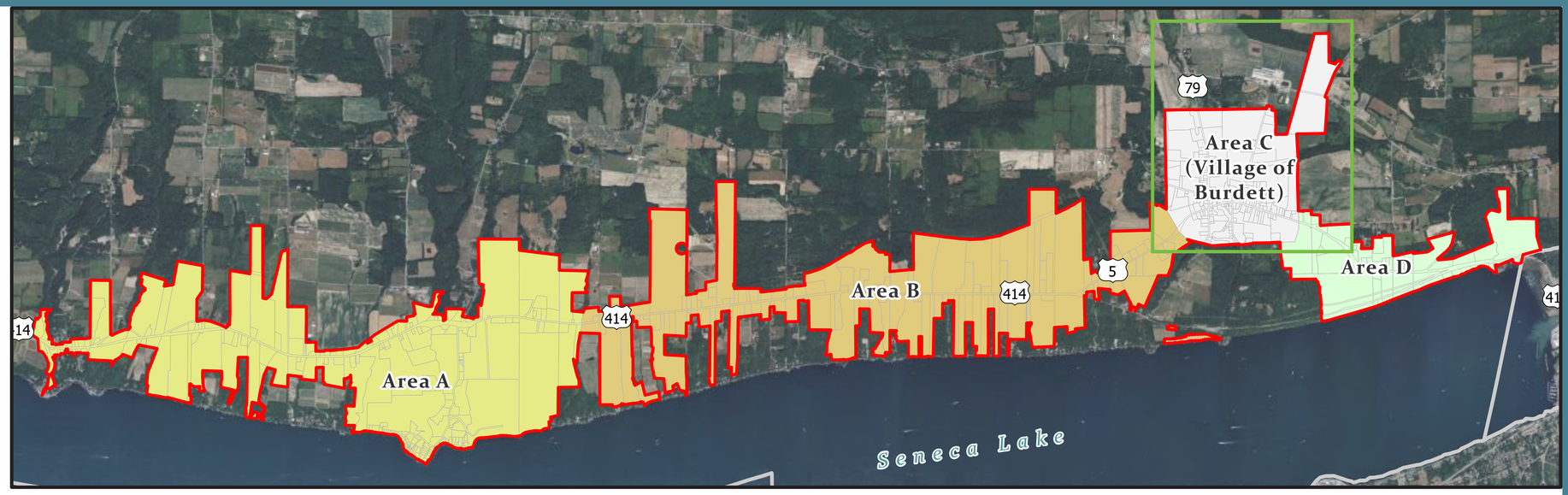
Drinking Water Source for Area B



48%
Total respondents who previously had problems with their Septic/Cesspool Systems



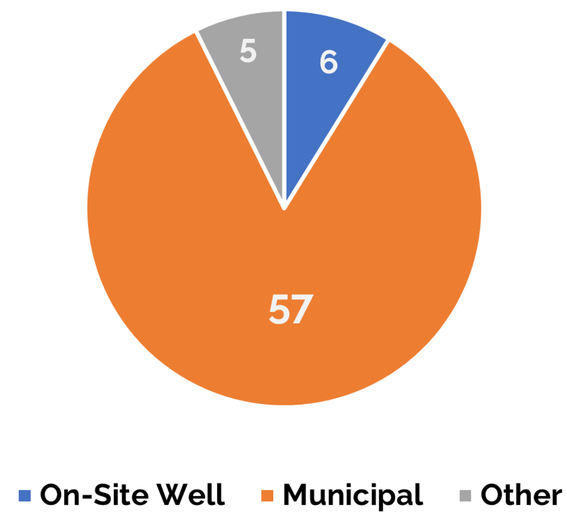
Area C



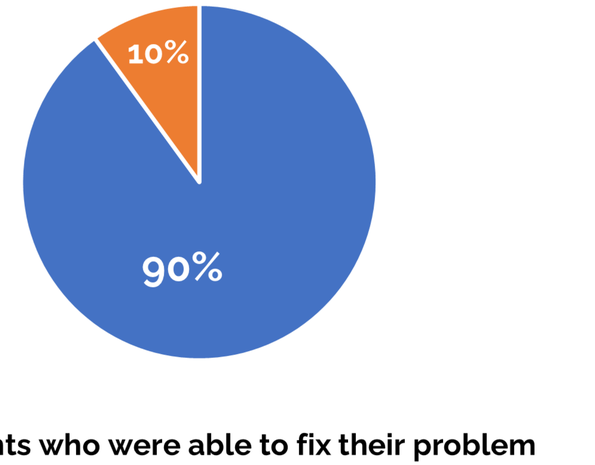
68
Total Responses

50%
Total Respondents Interested in Wastewater Service

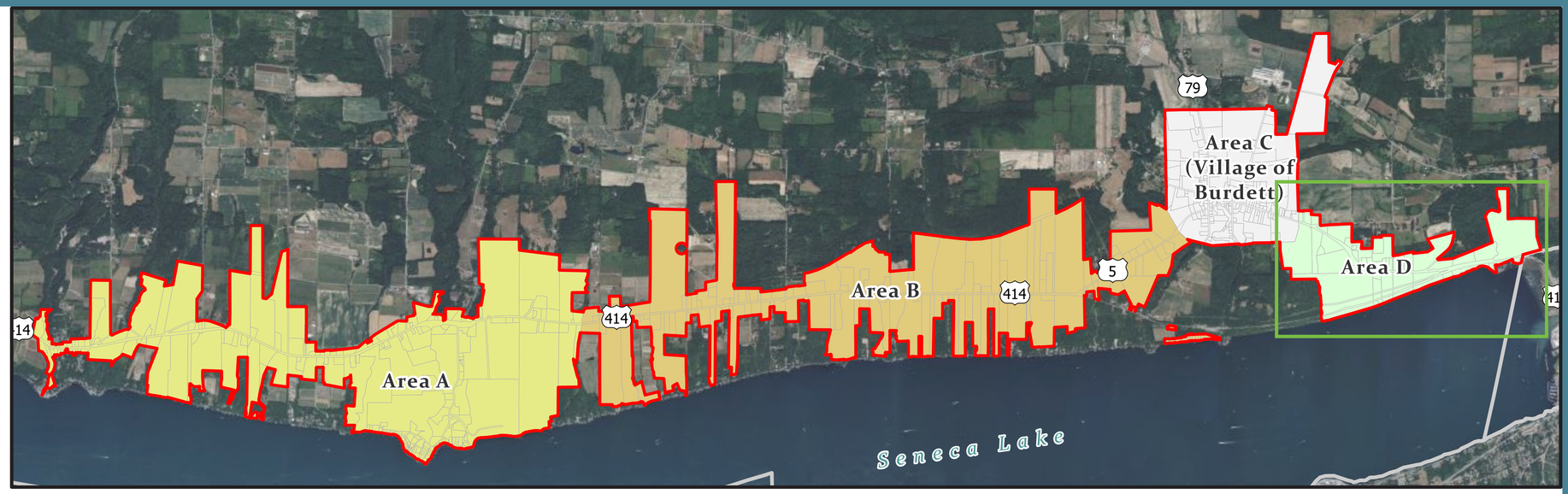
Drinking Water Source for Area C



48%
Total respondents who previously had problems with their Septic/Cesspool Systems



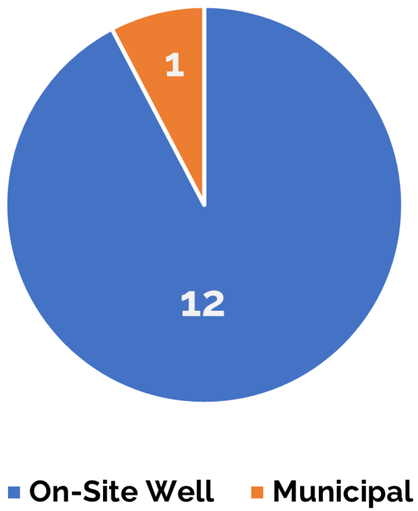
Area D



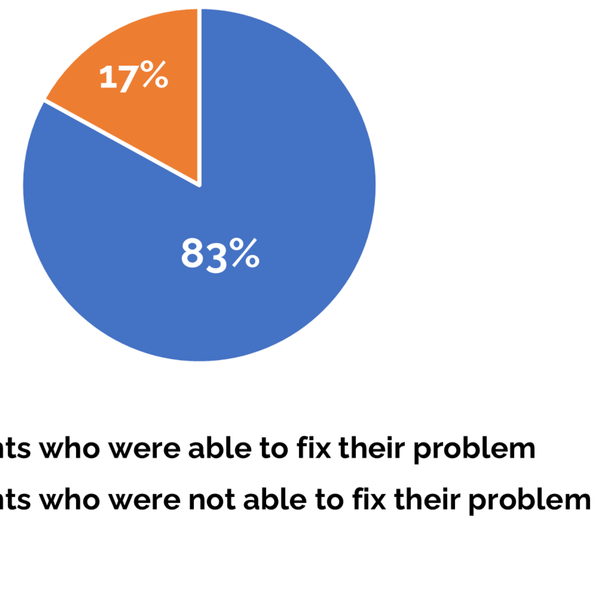
13
Total Responses

69%
Total Respondents Interested in Wastewater Service

Drinking Water Source for Area D



46%
Total respondents who previously had problems with their Septic/Cesspool Systems

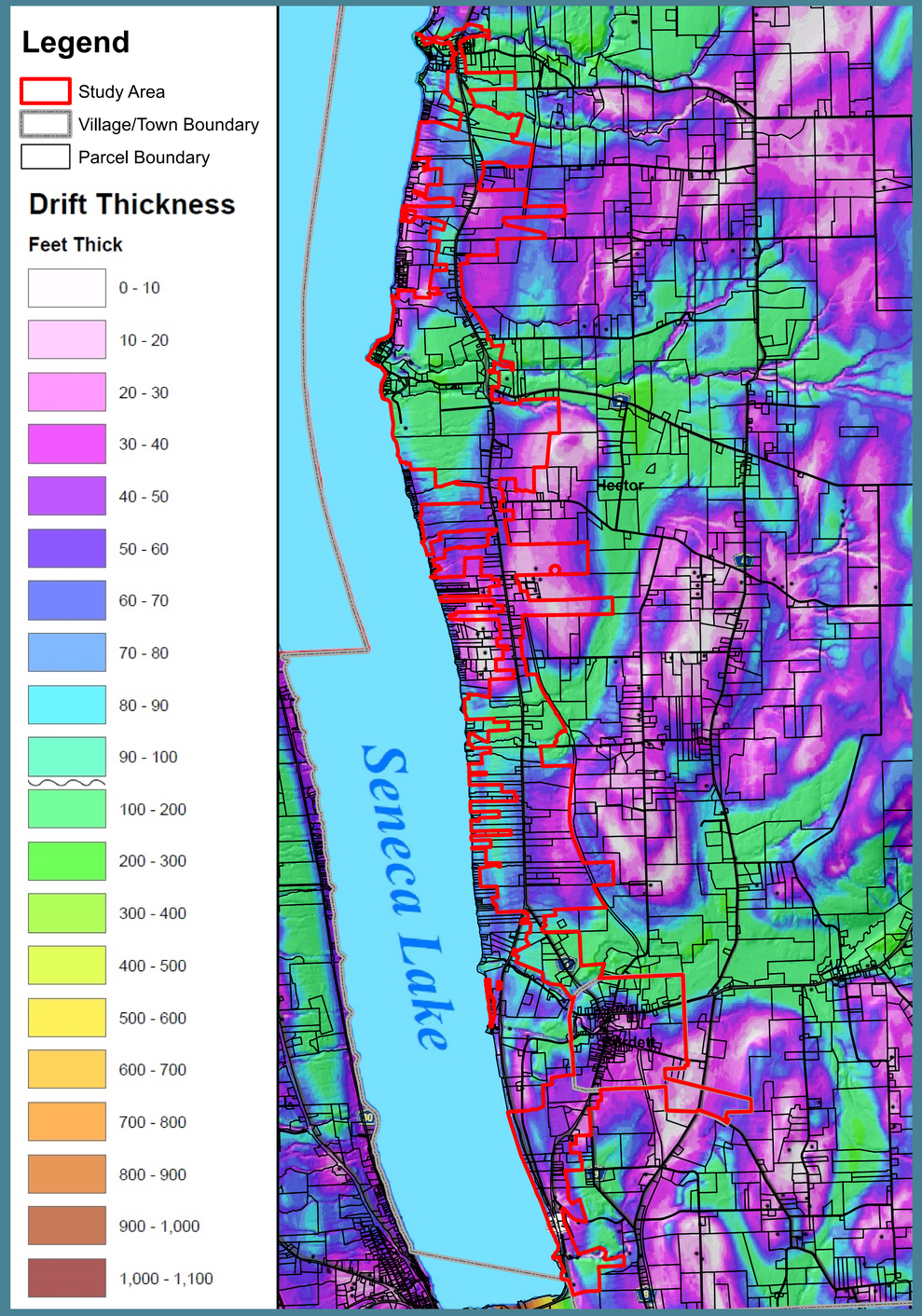


Project Area

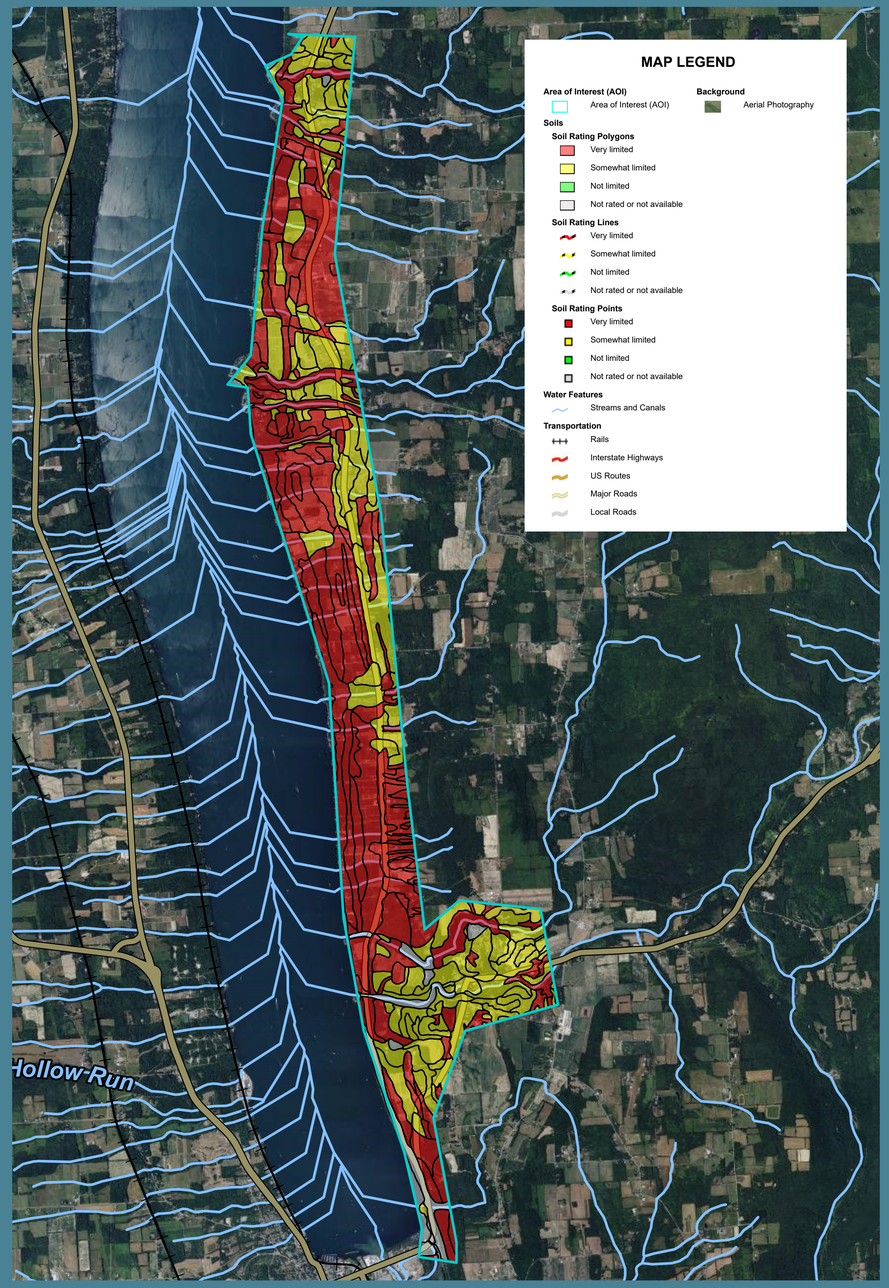
Existing Conditions

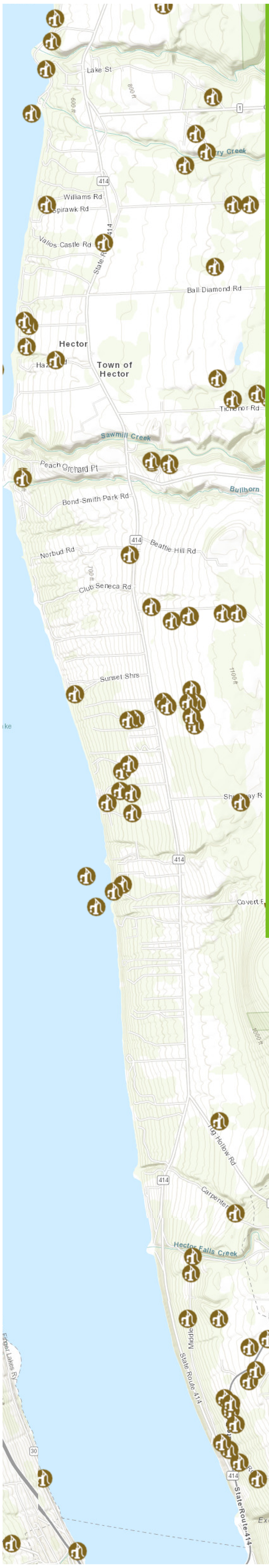
Project Area Map

Drift Thickness



Suitability for Septic Tank Absorption





PROJECT AREA

PRIVATE DRINKING WATER WELLS

NYS DOH Part 5, Subpart 5-1 Standards for Water Wells - Appendix 5-B

Table 1 Required Minimum Separation Distances to Protect Water Wells From Contamination

Contaminant Source	Distance (Feet)[1]
Chemical storage sites not protected from the elements (e.g., salt and sand/salt storage)[2]	300
Landfill waste disposal area, or hazardous or radiological waste disposal area[2]	300
Land surface application or subsurface injection of effluent or digested sludge from a Municipal or public wastewater treatment facility	200
Land surface application or subsurface injection of septage waste	200
Land surface spreading or subsurface injection of liquid or solid manure [3]	200
Storage Areas for Manure piles [4]	200
Barnyard, silo, barn gutters and animal pens [5, 6]	100
Cesspools (i.e. pits with no septic tank pretreatment)	200
Wastewater treatment absorption systems located in coarse gravel or in the Direct path of drainage to a well	200
Fertilizer and/or pesticide mixing and/or clean up areas	150
Seepage pit (following septic tank) [5]	150
Underground single walled chemical or petroleum storage vessels	150
Absorption field or bed [5]	100
Contained chemical storage sites protected from the elements (e.g. salt and sand/salt storage within covered structures) [7]	100
Septic system components (non-watertight) [5]	100
Intermittent sand filter without a watertight liner [5]	100
Sanitary Privy pit [5]	100
Surface wastewater recharge absorption system constructed to discharge storm water from parking lots, roadways or driveways [5]	100
Cemeteries	100
Sanitary privy with a watertight vault	50
Septic tank, aerobic unit, watertight effluent line to distribution box	50
Sanitary sewer or combined sewer	50
Surface water recharge absorption system with no automotive-related Wastes (e.g., clear-water basin, clear-water dry well)	50
Stream, lake, watercourse, drainage ditch, or wetland	25
All known sources of contamination otherwise not shown above	100

NYS DOH Appendix 75-A Wastewater Treatment Standards - Residential Onsite Systems

TABLE 2

SEPERATION DISTANCES FROM WASTEWATER SYSTEM COMPONENTS (in Feet)

System Components	*Well or Suction Line[(e)(g)]*	*To Stream, Lake, watercourse[(b)], or Wetland*	*Dwelling*	*Property Line*
House sewer (watertight joints)	25 if cast iron sewer pipe, 50 otherwise	25	3	10
Septic tank or watertight ETU	50	50	10	10
Effluent line to distribution box	50	50	10	10
Distribution box	100	100	20	10
Absorption field[(c)(d)]	100[(a)]	100	20	10
Seepage pit[(d)]	150[(a)]	100	20	10
Raised or mound system[(c)(d)]	100[(a)]	100	20	10
Intermittent Sand Filter[(d)]	100[(a)(f)]	100[(f)]	20	10
Non-Waterborne Systems with offsite residual disposal	50	50	20	10
Non-Waterborne Systems with onsite discharge	100	50	20	10

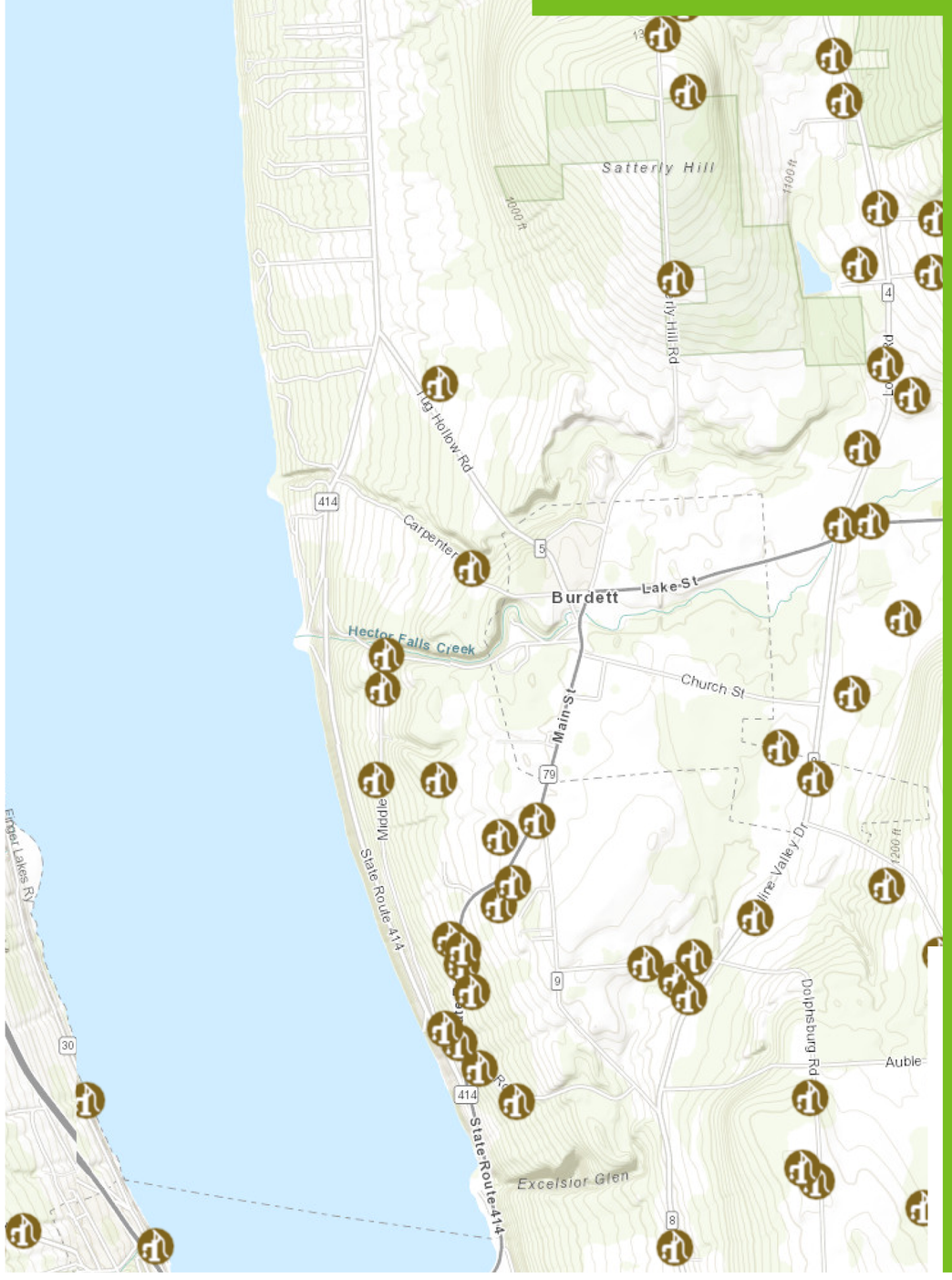
The Schuyler County Watershed Protection Law, Section Q includes minimum lot sizes:

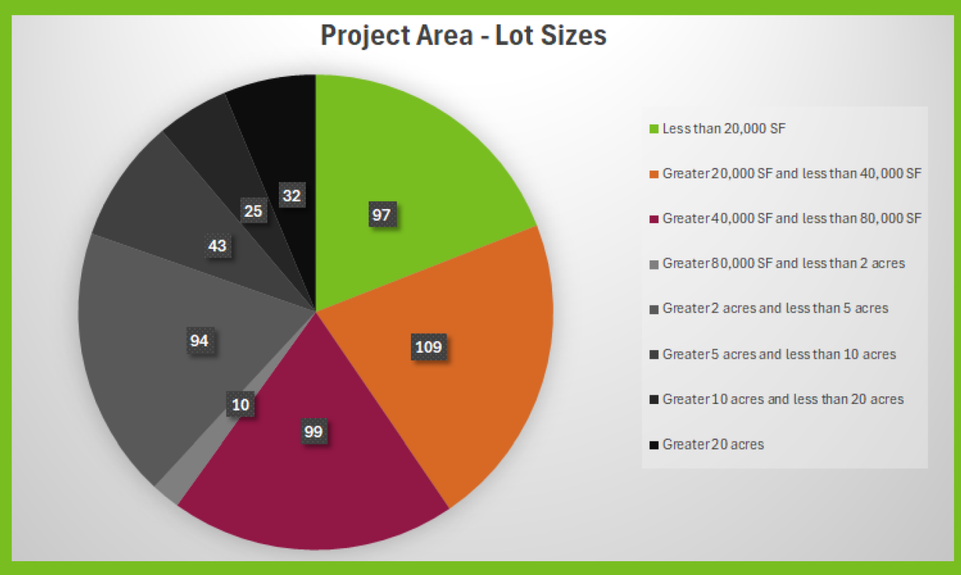
Alternative Wastewater Treatment System

- 80,000 SF of usable land with a minimum of 150 feet diameter circle for wastewater system
- 40,000 SF of usable land with a minimum of 150 feet diameter circle for wastewater system allowed if connected to public water system, lake, or off-site private water supply

Conventional Sewage Disposal System

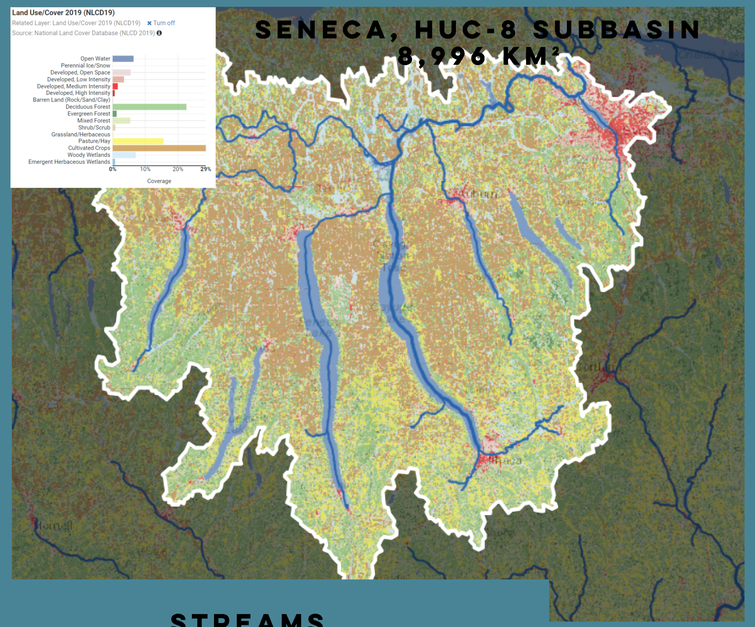
- 40,000 SF of usable land with a minimum of 100 feet diameter circle for wastewater system
- 20,000 SF of usable land with a minimum of 100 feet diameter circle for wastewater system allowed if connected to public water system, lake, or off-site private water supply





PRIVATE WELL AND CONVENTIONAL ONSITE SEPTIC SYSTEM MINIMUM SEPARATION DISTANCE - 100 FEET

WATER QUALITY



WATER QUALITY MONITORING PARTNERSHIPS

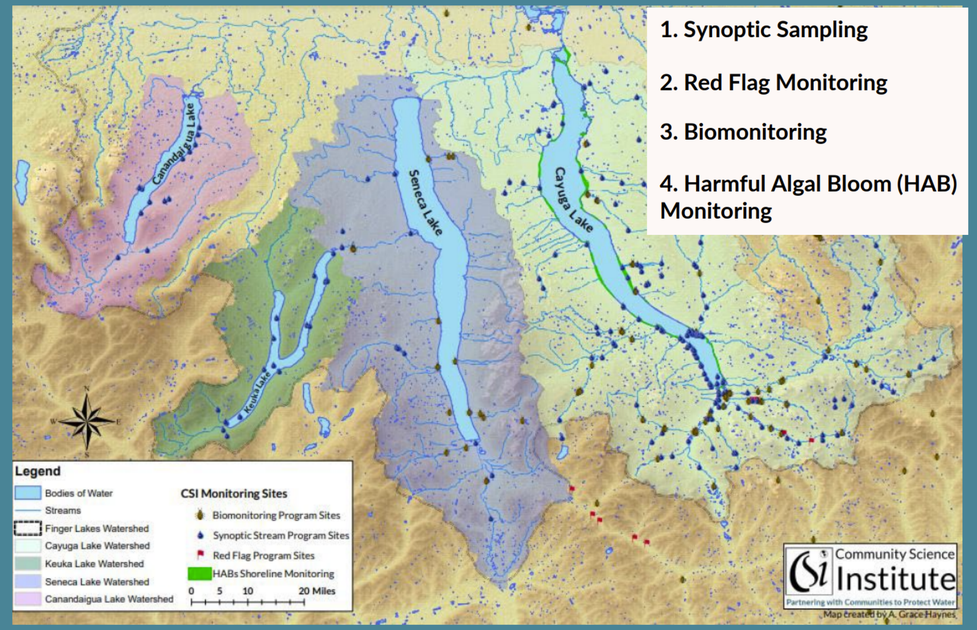
COMMUNITY SCIENCE INSTITUTE

SENECA LAKE PURE WATERS ASSOCIATION

FINGER LAKES INSTITUTE

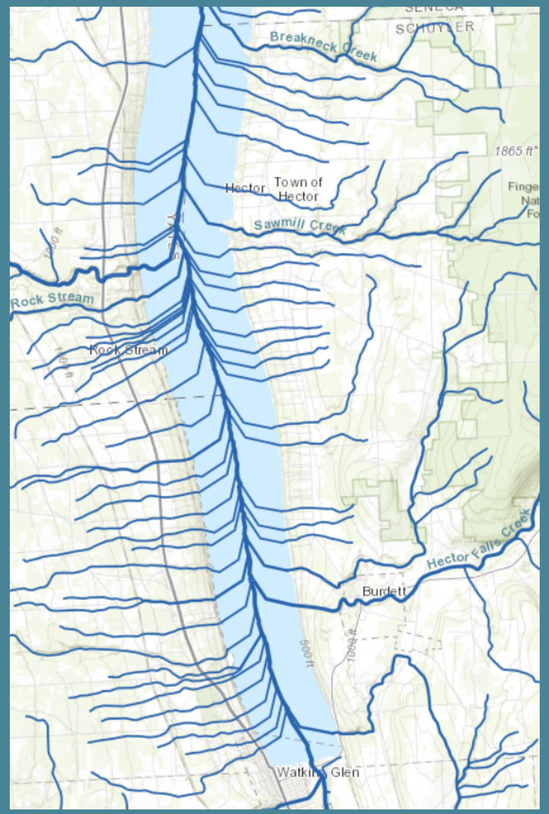
NYSDEC

NYS FEDERATION OF LAKE ASSOCIATIONS



1. Synoptic Sampling
2. Red Flag Monitoring
3. Biomonitoring
4. Harmful Algal Bloom (HAB) Monitoring

STREAMS

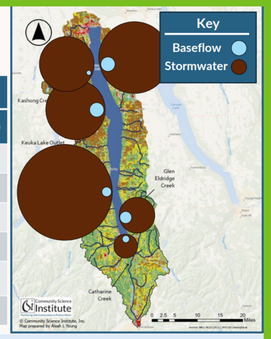


Poorly installed, sited, or improperly maintained septic systems can fail and negatively impact water quality including surface water and drinking water sources. E. coli is an indicator organism, used to identify the presence of fecal contamination and the possible presence of disease causing bacteria and viruses.

Median *E.coli* Counts

Contact Recreation Limit = 235 colonies/100 mL

Stream (North to South)	Baseflow		Stormwater	
	Counts (colonies/100 mL)	% CRL Exceedances	Counts (colonies/100 mL)	% CRL Exceedances
Reeder Creek	150	31%	8,875	100%
Kashong Creek	40	21.1%	6,400	100%
Keuka Outlet	150	39.1%	7,700	100%
Big Stream	75	20.8%	10,000	100%
Glen Eldridge Creek	92	22.2%	630	100%
Catharine Creek	50	7.7%	500	83.3%

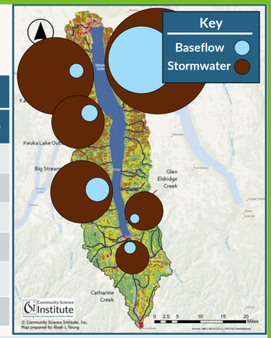


Phosphorus is normally the limiting nutrient for growth of phytoplankton (defined as microscopic algae and cyanobacteria) that form the base of the lake's food web. Phosphorus availability is a key determinant of trophic state for most lakes. Seepage from septic systems contribute to phosphorus loading. Septic sytems are estimated to create 2,900 lbs/year (1%) of Phosphorus load based on Seneca-Keuka Nine Element Plan modeling.

Median Total Phosphorus

Guidance Value = 20 ug/L

Stream (North to South)	Baseflow		Stormwater	
	Concentration (ug/L)	% GV Exceedances	Concentration (ug/L)	% GV Exceedances
Reeder Creek	276.0	100%	508.5	100%
Kashong Creek	24.2	70%	295.5	100%
Keuka Outlet	27.4	68%	199.5	100%
Big Stream	51.3	96%	245.0	100%
Glen Eldridge Creek	14.2	35.3%	63.7	50%
Catharine Creek	19.3	43.8%	53.4	75%

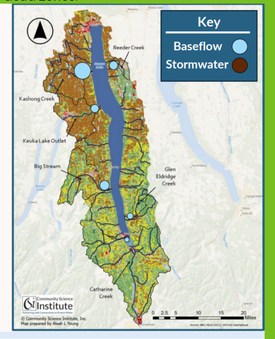


Excess nitrogen and/or phosphorus can cause an overgrowth of blue-green algae or cyanobacteria in a short period of time, triggering algae blooms. The overgrowth of algae consumes oxygen and blocks sunlight from underwater plants. When the algae eventually die, the oxygen in the water is consumed. This can cause fish and other aquatic organisms to die and create regional "dead zones."

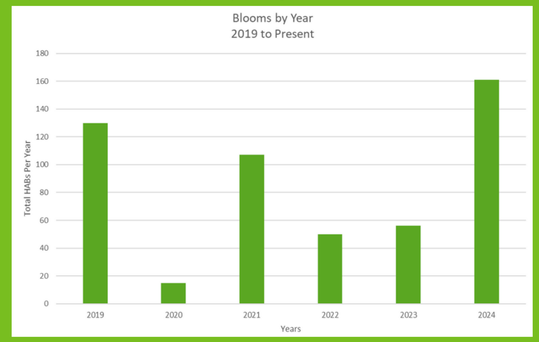
Median Total Nitrogen

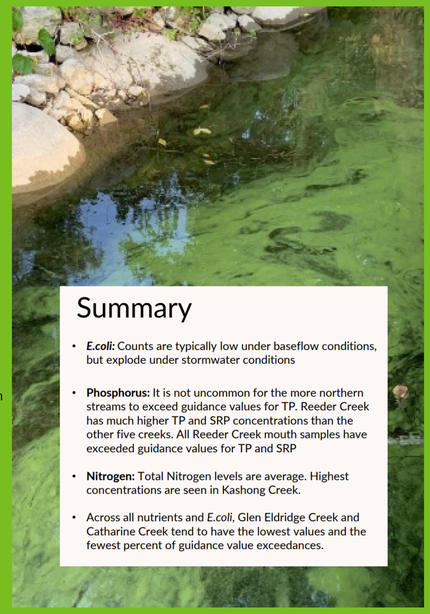
NOx + Total Kjeldahl Nitrogen = Total Nitrogen

Stream (North to South)	Baseflow (mg/L)
Reeder Creek	1.16
Kashong Creek	2.62
Keuka Outlet	1.08
Big Stream	1.43
Glen Eldridge Creek	0.60
Catharine Creek	0.39



Harmful Algal Blooms - Cyanobacteria are microscopic organisms that occur naturally in New York lakes, ponds and streams. Under certain conditions they can multiply quickly to form dense, unsightly blooms on the water surface. Cyanobacteria are sometimes called "blue-green algae" or "harmful algal blooms" (HABs) but are in fact bacteria that use sunlight to create their own food (photosynthesis). Under certain conditions, cyanobacteria multiply very quickly leading to the formation of blooms.





Summary

- ***E.coli:*** Counts are typically low under baseflow conditions, but explode under stormwater conditions
- **Phosphorus:** It is not uncommon for the more northern streams to exceed guidance values for TP. Reeder Creek has much higher TP and SRP concentrations than the other five creeks. All Reeder Creek mouth samples have exceeded guidance values for TP and SRP
- **Nitrogen:** Total Nitrogen levels are average. Highest concentrations are seen in Kashong Creek.
- Across all nutrients and *E.coli*, Glen Eldridge Creek and Catharine Creek tend to have the lowest values and the fewest percent of guidance value exceedances.

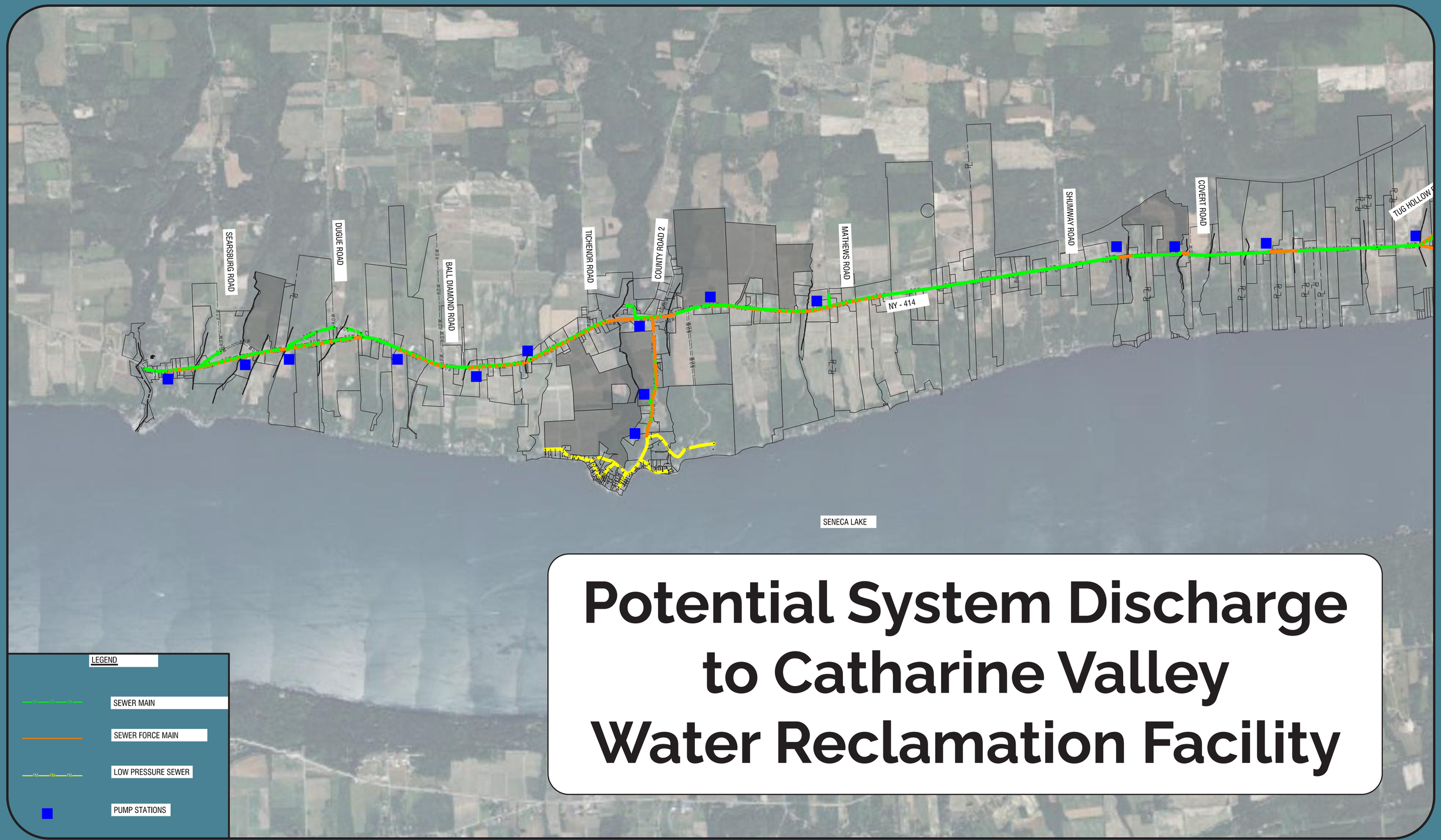
Sewage from lakeside homes on inadequate septic systems are a nutrient source to lakes and streams. Properly maintaining or replacing inadequate septic systems is critical for homeowners and can greatly reduce the amount of nutrients in a stream or lake.

Where would you like to see water quality related municipal investments in the next decade?

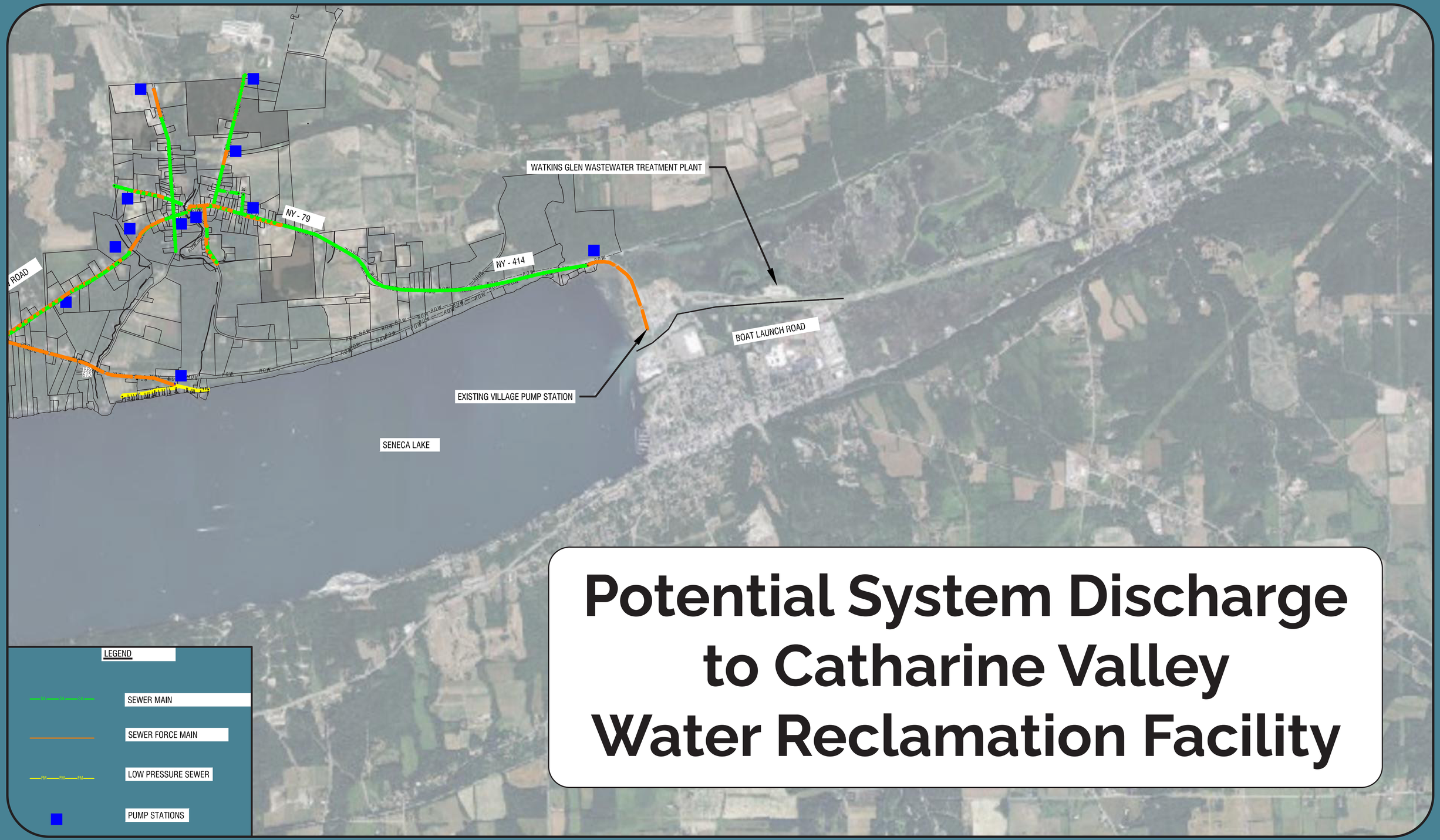
(Please mark your top two priorities and write in comments)

Municipal Wastewater Collection and Treatment	Private Septic System Inspection Program
Municipal Water Expansion	Green Infrastructure Practices to intercept stormwater entering waterways
Conserve High Value Natural Resources that provide resiliency to precipitation and flooding	Increase Best Management Practices on agricultural and non-agricultural working lands (acquisition, easements, cover crops, field erosion control, control of land application, etc)

Potential Wastewater Systems



Potential System Discharge to Catharine Valley Water Reclamation Facility



Potential System Discharge to Catharine Valley Water Reclamation Facility

The collection and treatment of domestic sewage and wastewater is vital to public health and clean water.
Over 75 percent of the nation's population is served by centralized wastewater collection and treatment systems.
The remaining population uses septic or other onsite systems.

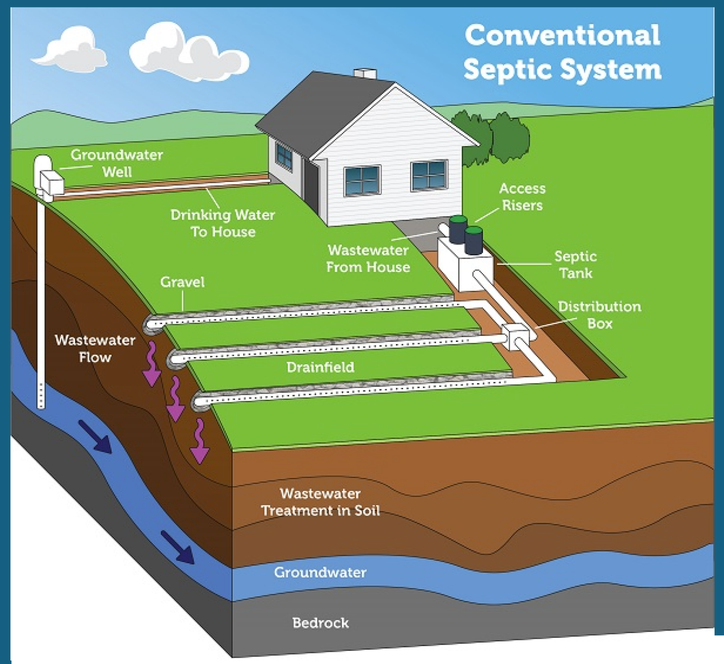
Is it important for you to have...

(Please mark your top two priorities and write in comments)

Municipal Wastewater Collection and Treatment	Private Septic System Inspection Program
Reduction of stressors and sources of impairments or threats to Seneca Lake water quality	Opportunities for development on small lots and economic growth that is currently limited by available onsite wastewater treatment systems

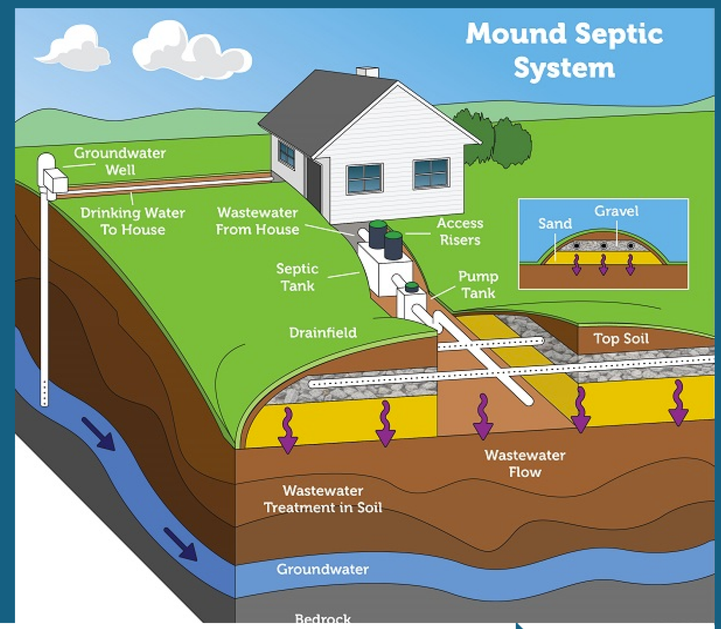
Regional Municipal Wastewater Systems

PRIVATE
ONSITE SEPTIC SYSTEMS



Homeowner Maintenance

- Schedule Pumping every 1 to 3 years
- Schedule Inspections every 3-5 years
- Maintain record of pumping, inspections, maintenance, and repairs
- Clear vegetation, routine mowing
- Keep area clear of heavy vehicles or equipment
- Keep area clear of structures such as decks, patios, driveways, etc
- Don't flush or use strong chemicals and bacteria destroying products
- Don't flush materials that don't degrade
- Avoid septic tank additives
- Avoid garbage disposals and grinders
- Direct drainage away from the septic from roof, sump pump, and surface waters



Conventional System
Total Cost over Useful Life $30,870
Average Annual Total $1,235 per year

Approximately $25,000	• New Installation • Anticipated Useful Life 20-30 years
$250 - $500	• Inspection • Recommended every 3-5 years • Required at time of property transfer
$250 - $400	• Pumping • Recommended every 3-5 years • Required at time of property transfer
Repairs	• Tank lid $100 • Inlet or outlet baffles $250-$500 • Pipe repair $1,000 - $5,000

Advanced System (smaller lakeside lots)
Total Cost over Useful Life $43,370
Average Annual Total $1,735 per year

Approximately $30,000 - $40,000	• New Installation • Anticipated Useful Life 20-30 years
$250 - $500	• Inspection • Recommended every 3-5 years • Required at time of property transfer
$250 - $400	• Pumping • Recommended every 3-5 years • Required at time of property transfer
Repairs	• Pump repairs/replacement $500-$800 • Inlet or outlet baffles $250-$500 • Pipe repair $1,000 - $5,000

REGIONAL MUNICIPAL SEWER RATES

Volumetric Charges - Usage Customers pay an amount proportional to water usage.

- Can be uniform across all amounts of water consumed or tied to an increasing or decreasing block structure.

Fixed Fee – Base Charge Charges paid by customers irrespective of volume of usage.

- Often include costs associated with maintaining infrastructure.
- May include a minimum charge for opportunity to connect.

Fixed Fee - Debt Service Charges paid by customer irrespective of volume of usage.

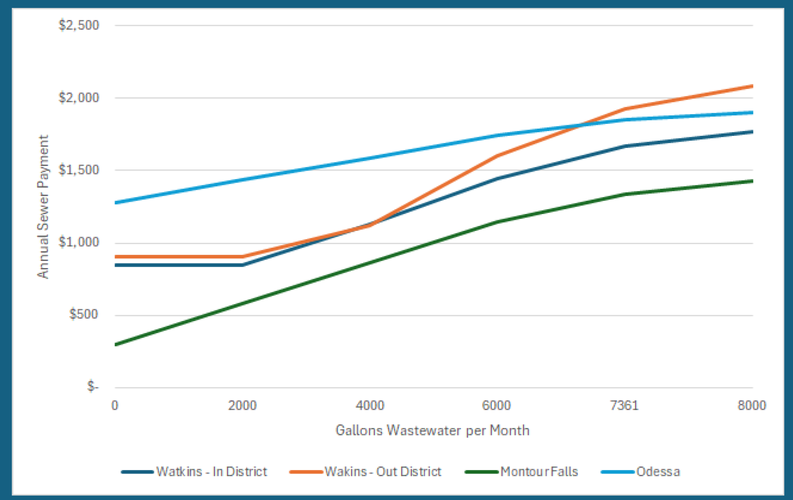
- Debt Service associated with specific capital investments that benefit user.

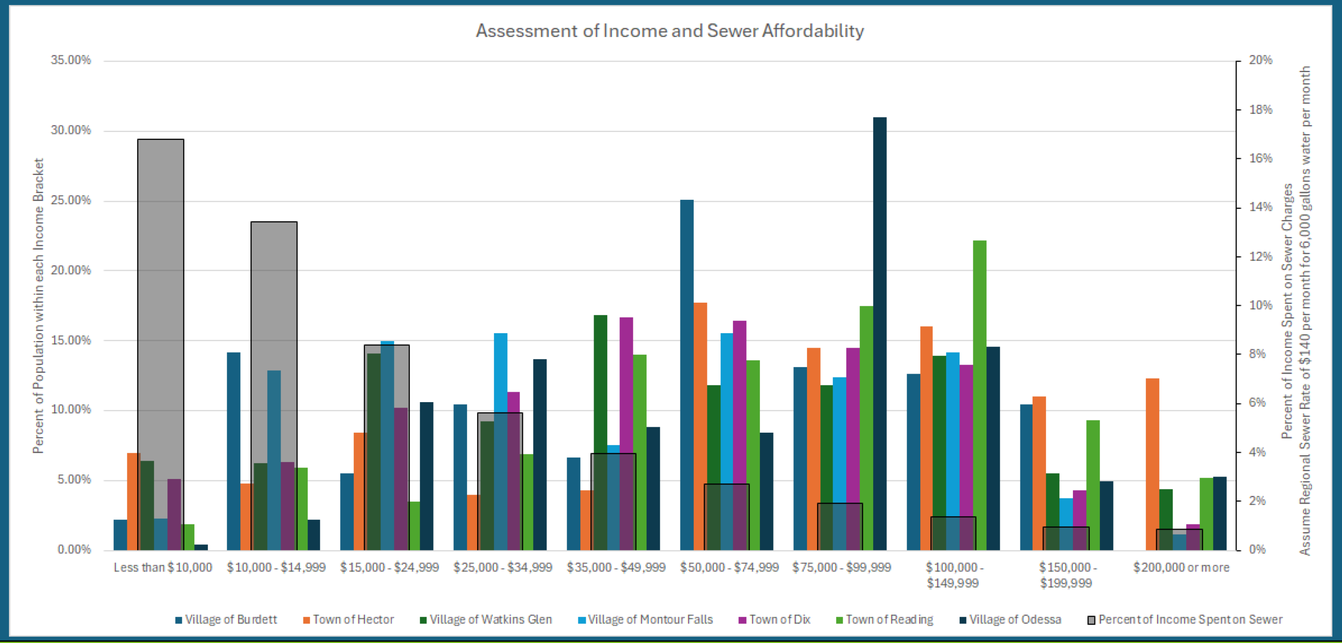
Startup and Service Fees Paid when customer establishes account or requires service.

- Often associated with administrative costs such as billing.
- Often associated with service fee such as new connection, change to connection.

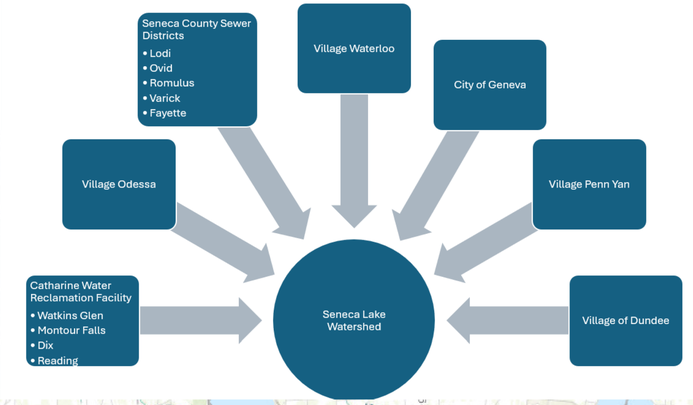
Regional Residential Sewer Rates and Debt Services

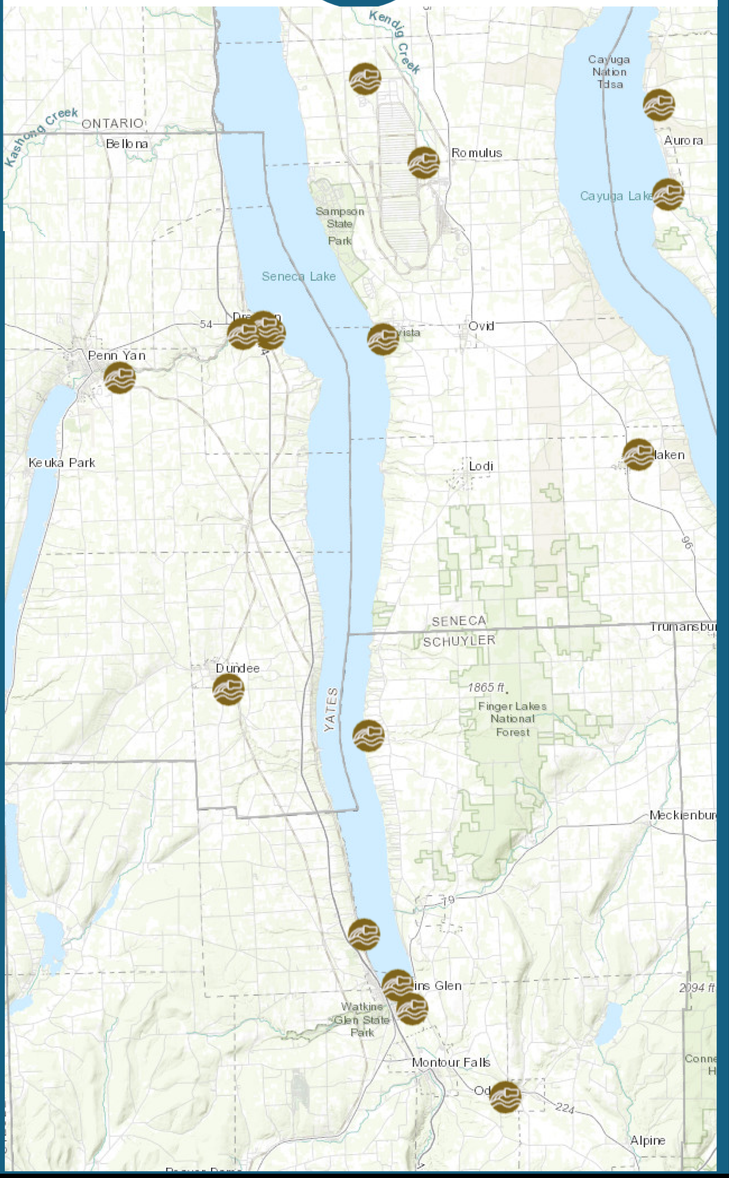
	In-District Residential Rates	Out-District Residential Rates	Debt Service	Total Annual Fee Based on Estimated Residential Annual Consumption	
Village of Watkins Glen	Base Charge $15.50/month Usage Charge $35 plus $10/unit	Base Charge $23.25/month Usage Charge $52.50 plus $15/unit	In-District $20/month Out-District None	In-District: Base: $186 Usage: $1,240 Debt: $240 TOTAL: $1,666	Out District: Base: $279 Usage: $1,651 Debt: $0 TOTAL: $1,930
Village of Montour Falls	Base Charge $3.56/2-month billing cycle Usage Charge $11.75/1,000 gallons	Not Applicable	$280.74/year	Base: $21 Usage: $1038 Debt: $280 TOTAL: $1,340	
Village of Odessa	Base Charge $35/2-month billing cycle Usage Charge $6.50/1,000 gallons	Not Applicable	$178/2-month Billing Cycle	Base: $210 Usage: $576 Debt: $1,068 TOTAL: $1,854	





MUNICIPAL WASTEWATER TREATMENT PLANTS DISCHARGING TO SENECA LAKE WATERSHED





Sewage Public Feedback

How long has it been since your last septic system inspection?
(Place sticker next to the time period that best matches)

Within last year

Less than 3 years

3-5 years

5-10 years

More than 10 years

I don't know

Sewage Public Feedback

Have you changed how your system is used since it was installed?
(Place sticker next to the changes that best match)

Number of people living in the home

Pouring fats or oils down the sink

Leaking faucets or toilets

Use garbage disposal frequently

Running a business out of home

New landscaping in drain field area

Heavy loads over drain field, like vehicle movement or parking

Roof drains or landscaping direct water to drain field

Sewage Public Feedback

What municipal sewer benefits interest you?

Write your comments down on sticky notes and place them below.

Sewage Public Feedback

Identify your concerns about municipal sewer.
Write your comments down on sticky notes and place them below.

Village of Burdett and Town of Hector

Wastewater System Feasibility Study

Open House Sign-In Sheet

February 5, 2025, ~~6:00~~ pm – 7:30 pm, Village of ~~Burdett~~ Fire House, 4124 Lake Ave

Welcome to the Wastewater System Feasibility Study Open House! We appreciate your interest and participation. Please sign in below to help us track attendance and provide you with updates and information related to the project.

Name	Group/Affiliation, if any	Phone	Email
Jason Ebbs	LBA	295-6627	JEbbs@labellapc.com
Scott S. Adrian			adriansandr@gmail.com
RICHARD TAYLOR			RTAYLOR1820@GMAIL.COM
Ann Barford	Seneca Scenic Byway	6843857	abarford7@gmail.com
Dan Russell	First Presbyterian Church	Thehectorchurch@gmail.com	
JOHN WALTZ		546-5224	
David & Kate LaMoreaux		2757050	kalamoreaux@gmail.com
Don Pinney		814-242-7130	DPinney1649@AOL.com
ERIKA ECKSTROM	Painted Bar Stables		erika@paintedbarstables.com
KATY DUNLAP	STONECAT CAFE	6075465000	Katy@stonecatcafe.com
Becky Sims	RCAP Solutions	6072333824	bsims@rcapsolutions.org
Brittany Thorpe		6073519953	overlookatburdettfalls@gmail.com
Ben Riccardi	Remote	607-591-6972	benjaminriccardi@gmail.com
Lynn V Mosher		607-591-0871	Lynnmosher@gmail.com

Village of Burdett and Town of Hector

Wastewater System Feasibility Study

Open House Sign-In Sheet

February 5, 2025, ~~6:00~~ pm – 7:30 pm, Village of Burdett Fire House, 4124 Lake Ave

Welcome to the Wastewater System Feasibility Study Open House! We appreciate your interest and participation. Please sign in below to help us track attendance and provide you with updates and information related to the project.

Name	Group/Affiliation, if any	Phone	Email
Kathy Nyquist			
Bettina King		6077426200	bhking15@gmail.com
Gary (Scott) Housekneckt		607-346-758[illegible]	MadTrapper58@yahoo.com
Lou LICARI		607-341-183	LLICARI@YAHOO.COM
KRISTY LICARI		"	"
Mathew Mangus		607-229-8323	amymatMangus@gmail.com
Ed & Deb Kelley			KelleyKidracing@live.com
Mike Schamel		6073791492	mjschamel@hotmail.com
Jessica Rodgers		6072732555	jessicarodgers@hectorny.us
Jon Nupp		6075922588	jon@twogoatsbrewing.com
Tim Horrocks		607-379-372[illegible]	—
LuAnn Horrocks		607-262-4059	luannhorrocks57@gmail.com
Johnathan Wasson		607-220-[illegible]583	

Village of Burdett and Town of Hector

Wastewater System Feasibility Study

Open House Sign-In Sheet

February 5, 2025, ~~6:00~~ pm – 7:30 pm, Village of Burdett Fire House, 4124 Lake Ave

Welcome to the Wastewater System Feasibility Study Open House! We appreciate your interest and participation. Please sign in below to help us track attendance and provide you with updates and information related to the project.

Name	Group/Affiliation, if any	Phone	Email
Chris + Eileen Roppel		605 546-2053	
Paul Clifford			pablocliffordo@gmail.com
Dylan Houseknecht			
Laury Ward		717-307-0244	LauryPoland@gmail.com
Ryan Bessett			
Martha Evans	Trustee Village of Burdett	607-592-9696	mdevans3@aol.com
Jan Arcangel	Village of Burd	546 4217	arcangeljan@htva.net
Ashley Jones		617 835-4492	acjones55@gmail.com
Ronald Klinczar		716-954-0121	rjklinczar@gmail.com

Village of Burdett and Town of Hector

Wastewater System Feasibility Study

Open House Sign-In Sheet

February 5, 2025, ~~6:00~~ pm – 7:30 pm, Town of Hector Fire Hall, 5736 State Route 414

Welcome to the Wastewater System Feasibility Study Open House! We appreciate your interest and participation. Please sign in below to help us track attendance and provide you with updates and information related to the project.

Name	Group/Affiliation, if any	Phone	Email
Rose Anne & John Dineen	———	570-991-1879	RJDineen@email
Tom Phillips		607-738-1898	tphillips1962@gmail.com
Clay Kisner		607-351-5948	ClayKisner@Gmail.com
Kate Kisner		607-351-5223	kkisner2014@gmail.com
Tom Horrocks		607-546-2141	THorrocks2[illegible]@gmail.com
LuAnn Horrocks		607-220-4059	luannhorrocks57@gmail.com
KRISTINA HANSEN		607-280-6874	evergreenelc@gmail.com
Scott & Mary Kanus		(607)425-3556	scottkanusexcavation@gmail
BILL SCHEUER		6316810917	WILLIAMSCHEUER172@GMAIL.COM
Bryan Schickel		607-287-4791	Info@Schickelconstruction.com
Steve + Elizabeta Williams		607-546-2022	williams38[illegible]@empireaccess.net

Scoping Call Outline

CWSRF Engineering Planning Grants

Instructions: The Awardee completes this form once an engineering consultant has been selected. The information provided is as an outline for the scoping call. Please return this form to EPG@efc.ny.gov no later than Friday, November 15, 2024.

Awardee: Village of Burdett	
EPG No.: 128945	**Award Amount:** $50,000.00
County: Schuyler	**NYSDEC Region:** 8
Engineering Consultant: LaBella Associates	
Project Name: Village of Burdett and Town of Hector Wastewater System Feasibility Study	
Force Account:	Is there an approved technical and/or administrative force account? ☐ Yes ☐ No ☒ N/A
Scope:	An engineering study will be conducted to evaluate the feasibility of constructing a new wastewater collection system to serve the Village of Burdett and the Town of Hector along State Route 414. The report will evaluate collection and treatment alternatives and make a recommendation to the Village. Implementation of this project will provide further water quality protection measures for Seneca Lake.
Schedule:	The engineering report submission deadline is specified in the Grant Agreement. The Awardee must notify their consulting engineer of the deadline. Report submission to EFC for review expected by: 2/28/25 Field work/investigations expected to be complete by: ☒ N/A
Report:	The submitted report **must:** ☐ Follow the EFC/DEC Engineering Report Outline (ERO). ☐ Evaluate green infrastructure alternatives (see ERO). ☐ Recommend a capital improvement project to address the water quality issue identified in the EPG application. ☐ Be submitted to EPG@efc.ny.gov by email or using EFC's file upload tool. Include engineering invoices and force account documents with report submission. ☐ Inflow/Infiltration (I/I) projects: Discuss the size/extent of the overall sewer system, any proposed phasing of evaluation, and specify which work/area is evaluated in the submitted report.
Attendees:	Andrea Prockup – EFC Alex Brunelle – EFC Tara Blum (DEC) Larry Jaynes (Village of Burdett) Joann Lindstrom (Schuyler County Planning) Matthew Higgins (LaBella) Jason Ebbs (LaBella)

Scoping Call Outline

CWSRF Engineering Planning Grants

Notes: **November 18, 2024**

Once the grant agreement is executed, the village will receive the first 25% of the grant.

- Disbursement Schedule: 25% of the grant will be received when the grant agreement is executed. 25% will be received when an acceptable engineering report is submitted. 50% will be received upon review and acceptance of the engineering report.

EFC published an updated version of the Engineering Report Outline, which can be found at https://efc.ny.gov/epg

- The Engineering Report should be submitted to EPG@efc.ny.gov

EFC discussed the Project Listing Process.

- PLUS (Project Listing and Update System) is found at https://plus.efc.ny.gov/
- For questions about PLUS, reach out to Alex Brunelle at (518) 402-7396

The Village will discuss effluent limits with DEC.
EFC confirmed the project scope during the call.

Call with DEC, 10/9/24

- Participants: Jake, Jason, Matt, Kim Merchant, Scott Feindel, Tara Blum (Div. of Water)
- Introductions
- Preliminary conceptual design
    - ADF of 100,000 gpd
    - Collection system alternatives
        - LPS system with grinder pumps due to the lengths of the project and undulating topography and the rock and the multiple stream crossings
    - Treatment system alternatives
        - Send flow to CV WRF
        - WWTP near Peach Orchard or Hector Falls
- Overall permitting requirements
    - WWTPs – very high level
        - Tara: In order of preference, DEC's preference is in support of regional WWTPs and using existing WWTPs which is a very new WWTP that Tara thinks is doing very well and operating well. So just from that big picture, that's probably the DEC's preference. Of course we'd have to run the numbers and see.
        - Jake notes it's about 10 miles long with a bunch of crossings that makes it challenging.
        - Tara says yes, that probably makes this a bit unique compared to other regional consolidation projects. Tara thinks the 10 miles can be overcome, but with the elevation changes here, it'd be a challenge.
        - Tara says people have submitted the NY-2A just to get preliminary limits, but recognizing that maybe the entire app doesn't need to be filled out to get those limits.
        - Seneca / Keuka is in a 9E plan, so definitely will be nutrient limits (P limit below 1 mg/L) and ammonia limits will be low, she'd think.
- Can you refer us to a document that discusses surface water discharge vs. groundwater discharge?
    - Is there a flow threshold? No, there's no set restriction. As we get up to really high numbers, economically and finding the space is challenging.
    - Jake notes we're anticipating 100,000 gpd. Tara suggests we look at Hammondsport (has a groundwater system) and there are several permits within the past few years as examples. Tara can get back to us on that and thinks there is some precedent for 100,000 gpd discharges to groundwater.
- Defining need for project is key for funding, Tara notes
    - HABs in lake – check NYHABS website, try to document some sort of contribution from failing systems
    - Document failing existing septic systems
- Possibly fulfilling NY-2A form – Fill it out as best we can. Brad will walk us through it.
    - Some info on potential outfall we'd propose – where it'd be
    - Submit two of them: one for Seneca Lake discharge, one for groundwater discharge
        - Maybe we don't need one for groundwater; maybe we can use a similar one nearby as an example
    - Two month turnaround for DEC to get back to us with preliminary limits
- Action items

- Tara to talk to Brad Chaffee and send us info on municipal groundwater discharges that they've recently permitted
- LaBella to fill out NY-2A for Lake discharge. Tara advises that when we send it in, submit it with a cover letter just saying we're looking for preliminary limits to inform a study and that we understand these are subject to change
- Kim Merchant to send us a preliminary list of some permitting needed related to wetlands, streams, sensitive environmental areas and/or species. Scott Feindel will kick us out some preliminary concerns knowing that it's a proposed route and not definitive.
- LaBella to look into / contact:
    - Schuyler County Soil and Water Conservation District – info on impacts from failing septic systems to Lake and/or other envr resources
    - DOH (Hornell District Office?) for information on failing septic systems
    - Seneca Lake Watershed Plan (some sort of planning report?) for documentation of problems
- Jake to send participants the PDF and kmz file

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

Date & Time:	November 20, 2024 at 1:00 PM
Location:	Catharine Valley Water Reclamation Facility (CVWRF)
Attendees:	Terry Wilcox, CVWRF Joanne Lindstrom, Schuyler County Director of Planning Darrel Sturges, Schuyler County Watershed Inspector Michael Lausell, Schuyler County Legislator Laurie DeNardo, Mayor Village of Watkins Glen Justin Boyette, Supervisor Town of Hector Larry Jaynes, Board Member Village of Burdett Matt Higgins, PM LaBella Jake Bower, LaBella Jenn Vaughn, LaBella

ITEMS

1. Introductions
2. Burdett/Hector Wastewater Feasibility Study project description and scope
    a. Funded by grant from NYS EFC/DEC Engineering Planning Grant
    b. Evaluating Three Alternatives:
        i. Collection System with discharge to CVWRF
        ii. Collection System with discharge to Town WWTP to groundwater
        iii. Collection System with discharge to Town WWTP to surface water
    c. Schedule: Draft in January, Public Engagement in February, Final late-Feb./early-Mar. 2025
3. Catharine Valley WRF existing conditions
    a. Service area: Village of Watkins Glen, portions of Town of Dix, portions of Town of Reading, Village of Montour Falls, Watkins Glen International Speedway (few events per year, they utilize onsite holding tanks to enable controlled discharge)
        i. Joint Sewer Plan Committee (JPC)
        ii. Intermunicipal Agreement Montour Falls and Watkins Glen
            1. Currently 70/30 split based on anticipated flows, revisiting based on measured flows for capital and debt service
        iii. Watkins Glen is lead agency on SPDES Permit
        iv. Annual O&M reserve contribution of $188,000/year for future capital improvements
        v. No hauled waste accepted
    b. Upgrade history and current/upcoming projects
        i. Plant constructed recently: began construction 2018, online in 2020
        ii. Clute Park Sewer Lift Station Improvement (Engineering Services LDG). Village states that station will be designed with capacity for Burdett/Hector flows.

iii. Anticipate sludge handling to be modified in near future in compliance with anticipated changes to regulations, currently haul dewatered sludge to landfill

iv. CVWRF limits include Susquehanna River Basin, Great Lakes, and State

v. Discharge to Chemung Canal (Old Barge Canal Channel) Trout Stream, Class C(T)

vi. Initiating Industrial Pretreatment Program

c. Current unit processes

i. Process flow: Screening, Grit Removal, SBRs (3 total, 2 routinely in use), Post-SBR Equalization (2 tanks), Filtration, UV – seasonal

1. Dosing Epic 58 PACl for phosphorous removal

ii. Sludge: Integrated Surge Anoxic Mix (ISAM), sludge conditioning tank, Screw Press dewatering, haul to landfill

d. Flows and capacity

i. No combined sewer
ii. Average Observed Daily Flow: 0.28 MGD
iii. Peak Observed Daily Flow: 0.45 MGD
iv. Permitted Flow: 1.2 MGD

e. Challenges

i. Compliant with SPDES; only challenges are those that are typical/routine to WRFs

4. Concept involving CVWRF receiving Burdett/Hector flows

a. Concerns (effluent limits, capacity, other)

i. Village has no concerns related to SPDES permit compliance and capacity as related to accepting Burdett/Hectors flows (estimated as an average of 156,000 gal/day with a peak of 500,000 gal/day).

ii. Comment, need to slow flow down the hill on way to pump station

iii. Wineries and breweries would likely require individual meters with individual pretreatment program compliance

b. Need for upgrades (if any)

i. None other than currently underway Clute Park Pump Station

5. Conceptual collection system tie-in point for Burdett/Hector flows

a. Location

i. Recommend existing pump station at Clute Park

ii. Requirements will include flow monitoring with direct communication to CVWRF SCADA

b. Flow path (gravity vs. pumped) and hydraulic capacity from tie-in point

c. Any concerns

6. CVWRF Site Tour conducted

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

Catherine Rees - RCAP Solutions
Joann Lindstrom – County
Jenn Vaughn - LaBella

Date & Time: 11/26/2024, 4:00 pm
Location: Teams Virtual

ITEMS

Catherine Rees helped with Town of Hector Water System extension to Valois, funded with SRF with previous supervisor Ben Dickens. Then worked with Alvin White considering extending water to County Road 8, 9 SR 79 and Middle Road for water service. In that area some wells don't have capacity and don't have quality that people would prefer. Began with needs assessment survey – one page on water needs, one page on sewer needs – they only did the one page format and included the question of separation distance between water supply and septic leach field – 74% indicated 100-feet or greater separation distance. Board decided to do an RFP for water project and Alvin passed away unexpectedly – the project stalled based on DEC notice of inadequate source capacity. Catherine recommended that they could plan to expand water project to include additional water capacity.

Background of Hector/Burdett Wastewater project provided, Collection system – shared conceptual figure of potential collection system including: approximately 28 pump stations, gravity sewer, forcemain to serve the requested area. Three discharge options:

1) Catherine Valley WRF
2) WWTP with groundwater discharge
3) WWTP with surface water discharge

Survey – Catherine asked if one had been prepared and completed as that is a service she can provide. The survey was advanced by Town and LaBella and results are anticipated in early December.

Discussion of process to begin the feasibility study – Request for Proposal Engineering Planning Grant

Town, Village, County $10,000 total

EFC Funds $50,000

Discussion of next step after Intended Use Plan to include listing

Discussion of funding considerations:

1) CDBG – not eligible based income of community
2) SRF – no hardship, no BIL, could pursue WIIA and SRF Financing market rate
3) USDA RD – no poverty rate
   - May get market rate loan and may get grant funds for median rate if applicable
   - Market rate has been better than a bank
   - Would require ERR
   - RCAP can help with application
4) EDA Grant – economic development
5) ESD Grant – economic development
6) ESD Pro-housing grant – economic development
7) ARC Grant – economic development

Other Avenues to Demonstrate Need

1) County Health Department – pictures of failing septic system, documentation
   a. Waivers- which systems have waivers
2) Code Enforcement Office
3) Dye Testing – ideal, has Schuyler County done any dye testing?
4) Property sale records
5) Water Testing – drinking water
6) Inspections Septic, rules regarding inspections, pumping requirements

Follow Up Actions:

- Share information with Town and recommend they continue to engage RCAP Solutions as needs align with their services.

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

Emily DeBolt, Association Director
Emily DeBolt <director@senecalake.org>
Seneca Lake Pure Waters Association

Date & Time: 11/26/2024, 12:30 pm
Location: Teams Virtual

ITEMS

Background of project provided, Collection system – shared conceptual figure of potential collection system including: approximately 28 pump stations, gravity sewer, forcemain to serve the requested area. Three discharge options:

1) Catherine Valley WRF
2) WWTP with groundwater discharge
3) WWTP with surface water discharge

Seneca Pure Waters Data is all available online:

Community Science Institute Community Science Institute Database, CSLAP and

CSLAP data: Seneca Lake Pure Waters Association - Publications & Reports

Phosphorous – increasing

HABs – Seneca Lake Pure Waters Association - Bloom Monitoring

DOW Monitoring Data Portal

increasing in Seneca Lake HABs

Have monitored HABs for last 5-years using same method

Previous monitoring program was different and can't be compared to present data

Seneca Lake Pure Initiative includes Lake Friendly living outreach – septic maintenance and care, grants available at County level to improve septic systems.

Discussion of WWTP regional: Watkins Glen recent improvements and in compliance. Seneca County WWTP has existing compliance orders based on I&I.

Seneca Lake Pure Waters is watching the following initiatives:

Sludge handling land application – watch for DEC land application report in 2025

Watching PFAS from WWTP as future concern

Follow Up Actions:

- Emily to provide HABs charts
- John Haffman contact info retired HWS professor, 40 years of data available
- Ian Smith – watershed steward FLI/HWS Seneca Watershed Intermunicipal Organization
    - May have data on land applications
- Lisa - Finger Lakes Institute across region, Finger Lakes Partnerships for Regional Invasive Species
- Jenn to provide Emily with Draft report when available.
- Jenn to request letter of support from organization at later date.

Seneca Lake PURE WATERS Association

Village of Burdett, NY
PO Box 234
4124 Lake Avenue
Burdett, NY 14818

March 3, 2025

Town of Hector, NY
5097 NY 227
Burdett, NY 14818

Dear Officials in Burdett and Hector,

A former Seneca Lake Pure Waters Association board member attended the recent Public Information Meeting at the Burdett Village Fire Hall on February 12, 2025. He observed that the town, village, and consulting firm's representatives clearly presented the objectives and findings of the ongoing Sewer System Feasibility Study for the Village and Town.

Seneca Lake Pure Waters supports continued efforts to find a solution to the septic issues in the Burdett/Hector area. It is well known that a well-designed and maintained sewage system significantly reduces nutrients and helps improve water quality in the local environment.

Pure Waters is cognizant that installing a sewer system carries a significant upfront cost for home and business owners, which even with grant money available can serve as a deterrent to implementation. We also note that replacing septic systems is equally or more expensive, but that monthly sewage treatment bills may make this option more attractive.

We encourage authorities and owners to consider the water quality and environmental value the sewer system offers when the time comes to decide whether to pursue the sewage system or not.
If it will help procure a grant to continue this effort, Pure Waters is happy to provide a letter of support.

Sincerely,

William H. Roege
President
Seneca Lake Pure Waters Association

Cc: LaBella Associates
300 State Street, Suite 201
Rochester, NY 14614
Attn: Matthew Higgins, PE, Wastewater Project Manager

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

Judy McKinney Cherry - SCOPED
Larry Jaynes - Burdett
Jenn Vaughn - LaBella

Date & Time: 12/3/2024, 4:00 pm
Location: Teams Virtual

DISCUSSION ITEMS

Background of Hector/Burdett Wastewater project provided, Collection system – shared conceptual figure of potential collection system including: pump stations, gravity sewer, forcemain to serve the requested area. Three discharge options:

1) Catherine Valley WRF
2) WWTP with groundwater discharge
3) WWTP with surface water discharge

Discussion of Economic Opportunities and parcels within proposed sewer district:

- Parcel near fire station within Village of Burdett – redevelopment 10 acres

- Casey Creamers Seneca Saw Works - old school redevelopment opportunity – need high value manufacturer

- Community more likely to support something going into existing building than remove to green space and redevelopment

- Regional studies outside of New York, indicate that brewery and distilleries development is waning, looking out 5-10 years, should not anticipate additional growth, example NJ Distilleries are beginning to close – anticipate this as a harbinger of things to come.

- Discussion of highest and best use for Larry Jaynes parcels on south of study area in Village – based on prime location and walkability to central Burdett – best use housing or higher-end hotel and not manufacturing.

- Parcels sold in last month out on Church Street on left hand side, don't know what new owner will utilize the parcel for.

- Newmark had identified the Church Street parcel as possibility, however, just sold.

Discussion of Planning Vision

- Correct time to ask the question of Village Planning Board – what is outlook for next 20-years. See example of Montour Falls, was charming Village, major employer left, and now working to come back.

- Judy really likes taking into account the lake water quality in long term vision – consideration of HABS and aerosols and Parkinsons and ALS – that is one thing the study should be looking at. A collection system that can stop contaminants. HABs in Seneca Lake more occurrences and longer season – concern – continuous impact health concerns.

- A lot to be learned by what Odessa did in that the leach field is very limited and believe that the cost to tie into regional and creating independent – long term challenges anticipated and limitations on development.

- Regional studies showing that upcoming Gen Alphas moving away from Airbnb, anticipate swinging back to hotel utilization.

- What does the community want to see for hotel/resorts in area – Judy has three coming online if they pull in the funding $20 million, $10 million, $30 million projects two have sites, none are in the project area – but believe that a charming attractive stone high end hotel would be good development opportunity on Larry's parcel or other parcel in study area.

- Economic development is being driven by power availability. Identify where power lines are and within ¼ to ½ mile of the lines are the spots for light industrial development or lodging/boutique hotel.

- As a community relying on relationships we have had for forty years, need entrepreneurs to come to Schuyler county to come and stay. Need to demonstrate that the local support is here. Need to create community that embraces entrepreneurs and newcomers to create and maintain economic development which accepts change.

- Burdett has the greatest number of young entrepreneurs in the 1-mile stretch that can change the trajectory of the community. Create business association and bring young entrepreneurs to community,

Regional Economic Priorities

- Very focused on food manufacturing, Hillick & Hobbs in Burdett is primarily producing in Seneca County but is coming into the Schuyler County Business Park. Not producing on their Burdett site.

- Regional level – two big pushes
    1) Housing – need for mid-level housing – would need housing identified and if dependent on infrastructure – Southern Tier Region only grants available funds are $50,000,000
        a. North of Burdett feel there are housing possibilities
        b. Village of Burdett does not have zoning
        c. Town has draft zoning – it would be smart to finalize and include areas for additional housing development
    2) Ready Sites for industrial and manufacturing – including clean energy –

3) Innovation – tied to agriculture, trying to carve out $10 million to stimulate research and ingenuity from colleges to start business here and keep it here. How to create anchor for businesses to stay.

- Regionally economy driven by sun and weather – ag, wineries, tourism – concern that fatalities linked to lake could have significant impact on the economic viability of the community. Currently Finger Lakes perception is clean – this needs to be guarded.

Larger Economic Trends

- Anticipate at start of year, may see businesses bringing employees back into the office – all tech companies are initiating 3-day per week in office in January including google meta and this is a productivity issue – this will impact housing in the area. Anticipate more housing will stand empty for larger portions of the year. More seasonal housing with less people.

- Anticipate infrastructure BIL should remain as every state benefitted.

Questions on service area

- Initial reaction – not growing area to support stand alone WWTP don't have the EDUs to carry debt service
- Village of Burdett is high priority area for sewer with perspective of protection of the lake
- Population is going down in area – additional concern for hiring professionals to maintain over long term
- Connection to Lodi could be an opportunity as two counties to benefit
- Grist Iron – is an important producer – would test the concept with him as he is astute and is adding capacity
- Anticipate more seasonal housing
- Hector is the largest growing township in Schuyler?? New EMS services growing on at highest rate. Are they second homes or being lived in, people are moving in from Ithaca.
- Housing value increase when have public water and public sewer

Grant Funding

- Federal Relationships will need to be rebuilt for funding opportunities
  ARC
  USDA

- State Funding
  CFA
  Income Survey of year-round residents – could prove to be beneficial

- Judy will write REDC letter of support, would appreciate advance notice

Recommended Follow Up Conversations

- Hector Winery
- Grist Iron

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

Ian Smith
Smith, Ian <ISMITH@hws.edu>
Seneca Watershed Steward
Hobart and William Smith Colleges Finger Lakes Institute
Jenn Vaughn - LaBella

Date & Time: 12/3/2024, 9:00 am
Location: Teams Virtual

DISCUSSION ITEMS

Background of Hector/Burdett Wastewater project provided, Collection system – shared conceptual figure of potential collection system including: pump stations, gravity sewer, forcemain to serve the requested area. Three discharge options:

1) Catherine Valley WRF
2) WWTP with groundwater discharge
3) WWTP with surface water discharge

2020 Initial Draft Zoning Hector – does the sewer area align with zoning map?

Completed LWRP Development of Zoning – STC and Town worked together
Have LWRP in-place but need to adopt zoning
Would like to see Zoning District to align with Sewer District
Would also want to see sewer district align with commercial/residential area
Would not want to see sewer sprawl to create opportunity for subdivision development along lakefront and increase erosion – want to avoid encourage high density development in steep slope areas.

Discussion on wetland area near Watkins Treatment

Discussed existing pump station at Clute Park and planned improvement, so no impact to wetland would be required for connection to Watkins Glen

Agricultural Wineries/Breweries

- Wine Industry has synthetic compounds within agricultural production, chemical spray holding what is ease with which it dissipates
- General dispersed application, collects and transports to a point provides opportunity for control
- Opportunity to manage and collect any wastewater as opposed to field applications
- Highly acidic wastewater – requires pretreatment
- Generally don't worry about acidification because lake is already slightly alkaline

- Don't believe there is P or N concerns from this wastestream, instead principal concerns would be pesticides and herbicides – Seneca Lake Pure Waters has done some pesticide sampling

Impact of Septic on Lake:

- Nine Element Plan – Utilized State Approved Theoretical Analysis to define impact of septic systems on lake
- The steep terrain indicates that concern for failing septic systems – references to development on steep terrain in Nine E and local laws – to limit concentrated development on steep terrain
- Some optical testing has indicated septic failure in rough geographical concerns – sample area did not include analysis of our study area
- Growth and development indicates that Hector/Burdett area are an area of concern as put high pressure on the area – have seen a lot of growth and more indicated

Example of Discharge to Groundwater: Odessa

Community that recently completed rate analysis: Fayette completed rate analysis in previous year

Mary Jump Seneca County Department of Health – <mjump@co.seneca.ny.us> can she provide local numbers for three year septic system inspection for every property can provide more realistic projection of failure rates and maintenance costs

Public Education – important to inform potential users that rates are correlated to volume of water used

Keuka Watershed Cooperative – formed specifically to do septic system inspections – failure rate is less than 1% - challenge of intermittent loadings associated with summer use and Air BNB high use.

Septic Systems are contributor to HABs but not controlling -

PFAS, pharmaceuticals future concerns

Seneca Lake Guardians – completed testing on local wells and municipal water supplies, and identified, recommend consider their findings

Municipal Water withdrawals for PFAS testing could be indicator of human based concern, see Nine E and AWQR

- Watkins Glen
    - Montour Falls
- Geneva
- Waterloo City – distribute quite far outside limits
- Ovid

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

12/11/2024

Darrel Sturges
Watershed Inspector
Schuyler County

Jenn Vaughn, LaBella

Phone

DISCUSSION ITEMS

Soil Conditions

- Limited good sand and gravel sites in project area for development of large scale septic
    - Near Dandy Minimart
    - Peach Orchard area
    - County Route 1 in Valois
    - Spotty good soils – lots of silt/clay and bedrock
- Subsurface would be difficult for subsurface discharge – would need good soil conditions and large parcel

Sewer Collection System Development

- Sewer – municipal water would need to be aware of crossing
- Rock excavation anticipated, expensive
- Don't think there are any gas lines to worry about
- Would look at topos and how roads lay out, get a gist for layout of collection system
- Concerns for cost of initial construction to build and paying to operate and hiring operator

Schuyler County Septic Monitoring Program

- Septic Monitoring Program – Have program in County Lamoka and Waneta Lake every five years inspection and pumping
- Land spreading for brewery/winery production holding tanks is a common practice – septic system are for household type waste and production waste is land spread

- Have local law for real estate property – been to every property in area and systems have been upgraded over time – feel the septics are in good shape
- Systems last approximately 25-40 years in area
- Believe some of the large systems are being overloaded and the health department is involved in at least three to design and build of larger systems
- Worth looking at larger businesses – where are they and can there be local small sized collection system and subsurface discharge
- Regulated by health department for food service facilities – over 1,000 gallons wastewater
- County does small business and private landowner –
- New construction cost for 3 bedroom house – gravity fed septic with sand filter system $18,000-$20,000
- More complex replacement systems of residential with existing infrastructure on lake lots, with separation from well to septic pumps, $25,000 - $30,000
- May be some parcels that are small, and require special design - maybe on Peach Orchard may have some smaller lots – Peach Orchard has municipal water system so separation distance not a problem
- Most parcels are 2-acres or more, can only think of a few small lots – Lake St Valois; Peach Orchard, Village of Burdett – but they have municipal water

Need and Importance of Municipal Sewer in Area

- Darrel's opinion on importance of a municipal collection system – only few hard parcels and most areas have municipal water – so can usually find a solution.
- Lake Street – no public water and private septic – perhaps they could buy property and would need lift station to build small community sewer system
- Typically consider that community is better off developing municipal water system first.
- Economic Development – not really seeing major need for municipal sewer based on limited expectation of growth
- Businesses Air BNB – maybe hotel – not a large driver for need for sewer

Suggestions for Next Steps

- Recommend talk to Town of Dix, currently considering expansion from track for municipal sewer/water
- Recommend talk to some of the contractors – Shamo Brothers – they have done zillions of projects in area for understanding of soil and constructability of septic

Action Items

- Send Darrel – map of proposed study area with pump stations
- Send Darrel - List of small lots with private well and sewer

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

12/13/2024

Daniel Schmalzel
Seneca County Sewer District
dschmalzel@co.seneca.ny.us

Jenn Vaughn, LaBella

Phone

DISCUSSION ITEMS

Project Background

Town of Hector and Village of Burdett are completing a Feasibility Study for municipal sewer. The study is considering development of a collection system as indicated in the attached map. The study will investigate various discharge options, including:

1. Discharge to Catharine Valley WRF in Watkins Glen 2
2. Construction of new WWTP with groundwater discharge
3. Construction of new WWTP with surface water discharge

Discussion of Seneca County Sewer District #1

1. Willard WWTP, anticipated improvements to maintain capacity but bring into compliance.
2. Formerly run by Department of Corrections, Seneca County now operates
3. Uncertain on southern extent of collection system, does include Village of Lodi
4. Have available capacity to accept more wastewater
5. County formally developing Seneca County Water and Sewer Authority, municipalities will have opportunity to opt in and SC will take over operation and maintenance of the their existing sewer infrastructure.
6. County interest in expanding sewer service area

Request County provide the following

1. Rates for municipal sewer in the County
2. EDUs for communities in sewer districts
3. Structure of how Seneca County and municipalities work together to determine rates now and proposed in future

4. Available Capacity of Willard Plant
5. Brief Description of Willard Plant planned improvements and anticipated schedule
6. If available, information on southern reach of sewer collection system from the Village of Lodi

Action Items

- Send Daniel – map of proposed study area with pump stations

WASTEWATER SYSTEM FEASIBILITY STUDY
VILLAGE OF BURDETT & TOWN OF HECTOR
MEETING MINUTES

12/19/2024

Steven Siptrott
Superintendent of Public Works

Jenn Vaughn, LaBella

Phone

DISCUSSION ITEMS

Existing System

- Huber Package WWTP.
- Operational challenges from the start, received no training nor operational information. System operates with a ¾ inch water line feeding the system, was a challenge to get water to the site as it wasn't planned for in design. Initially ran without water and it did not work. Water required to keep brushes clean
- Worked with C&S Engineers, were not pleased with process
- Recommend enclose system in a building as have had trouble with freezing. Below zero temperature screen failed, needed to pull together cover similar to what is used for wet cement to keep warm and avoid failure due to freezing
- Building requires opening in roof to pull out unit for brush cleaning.
- Maintenance
    - Every 600-800 hours requires brush replacement – every 3 years – do not have staff, confined space entry, nor crane to maintain, no regional experts, no regional maintenance. Requires maintenance team from North Carolina ($20,000) every three years
    - Training required
    - Equipment required – pressure washer, crane
    - Requires 1-person to maintain, not required to have WW operation license
    - Requires backup generator
    - Autodial function for system alerts did not work – disabled – and now check manually few times per week
    - Generally low maintenance until there is a problem
    - Sludge is collected in a continuous plastic bag inside a drum, heavy, needs to be emptied on routine basis, is placed in trash for landfill disposal.
    - No knowledge on electricity needs
- System has highest flow during school year, collect from Business District and school.

- Report quarterly usage and pH, needed to have pH test kit – stated to EPA
- Report quarterly to DEC BOD and TSS
- Leach field has not been a problem
- If implement a system like these, need to get people trained on all electronics and mechanical components – no regional maintenance available
- Might recommend other package WWTP, but not this one. This one was selected due to DEC approval, had looked at algal system but DEC not approve

Rates

- Users are paying $98/2-months
- Hard for people on fixed income
- Had planned to expand sewer collection system, but now public doesn't want expansion
- Cost increased up to 20% from design to current

Action Items

- Coordinate with Hector and Burdett and do a site visit, available most any time.

Appendix I: Recommended Alternative

Village of Burdett - Phase 1 Collection System

Start	End	Task Description	Notes	Village Board Action
Planning				
Sep-24	Apr-25	Preliminary Engineering Report	Required for Grant Applications	✓
Oct-25	Mar-26	SEQR Full EAF with Coordinated Review	Required for Municipal Bond, EFC Grant Applications, Permits, Approvals	✓
Nov-25	Dec-25	NYS DOS Local Government Efficiency Grant Application	Planning Project for Shared Services, Regional Sewer Rate Analysis	✓
Oct-25	Dec-25	Historic Preservation SHPO	Required for EFC Grant Applications	
Partnership				
May-25	Aug-25	NYS DEC Review and Approval of PER		
Jul-25	Sep-26	Village of Hector Rate Analysis		✓
Jul-25	Sep-26	Village of Hector Rate Analysis		✓
Oct-26	Dec-26	CVWRF Joint Plan Committee Intermunicipal Agreement	Required for EFC IMG Grant Eligibility	✓
Oct-26	Dec-26	Town of Hector Agreement for route Village to CVWRF		✓
Oct-26	Jul-27	Landowner Engagement for potenital land acquisition for pump stations and conveyance to CVWRF		✓
Readiness				
Jan-27	Feb-27	RFP for Engineering Design Services	Advancing to design will support more accurate cost estimate and demonstrate project readiness. Design expenditures that were completed following RFP process approved by EFC will enable reimbursement with future grant and loan financing.	✓
Jun-25	Feb-27	Stakeholder Engagement - Letters of Support and/or Commitment	• SCOPED • STREDC • Village Watkins Glen • Village Montour Falls • Town Hector • Schuyler County Planning • Schuyler County Watershed Protection • Seneca Pure Waters • Finger Lakes Institute • Local Businesses	
Mar-27	Aug-27	Engineering Design		
Apr-26	May-26	List Project on NYSEFC Intended Use Plan	Submission deadline id May 30, 2025	
Oct-26	Jul-27	Land Acquistion for pump station and conveyance to CVWRF		✓
Aug-27	Oct-27	Permits and Approvals	• Village Board • Schuyler County Watershed Protection/Health • NYSDEC Stream Disturbance • NYSDEC General Construction, SWPPP • NYSDOT • US ACE	✓
Financing				
Anticipated July 2025		Water Quality Improvement Grant Application	CFA Application	✓
Anticipated August 2025		USDA RD Grant Application	Rolling Application	✓
Apr-26	May-26	Municipal Bond for Capital Investment	Required for EFC Financing Application, WIIA Grant, IMG Grant	✓
Anticipated June 2026		CWSRF Financing Application	Required for WIIA grant when all funds are not secured	✓
Anticipated June 2026		WIIA and IMG Grant Application	IMG requires corresponding IMA - may not be eligible for Village only as VWG and VMF will not contribute to project cost.	✓
Anticipated July 2026		ESD Grant Application	Document economic development opportunity	✓
Anticipated September 2026		ARC Area Development Grant Application	Document economic development opportunity	✓
Anticipated November 2026		Local Government Efficiency		✓
Anticipated February 2027		Congressionally Direct Spending		✓

Village of Burdett - Phase 1 Collection System

Start	End	Task Description	Notes	Village Board Action
		Other Grants as Identified	Less competitive, but eligible programs include: • ESD Grant Funds - Quarterly Submission • ESD Pro Housing Grant Funds - July CFA • EDA Public Works and Economic Development Program	✓
Dec-25	Jun-27	Grant Award Announcements	Dependent of funding program - Contract Execution	✓
Construction				
Oct-27	Dec-27	Bidding		✓
Apr-28		Begin Construction		
	Nov-28	Substantial Completion		

A Village only Phase 1 with development of collection system in Village and conveyance to CVWRF at Clute Park Pump Station will enable the maximum opportunity for grant funds. The Village is anticipated to be eligible for hardship and poverty rate grant support.

Appendix J: EFC Requirements

EFC Eligibility Requirements
Confirm engineering report includes the following to enable funding through the Engineering Planning Grant program, or used for funding projects through the EFC must:

- ☒ be current, meaning at the time of submission the report was prepared or updated no more than five years prior to the end of the current IUP period;
- ☒ be the final version, not a draft;
- ☒ be stamped and signed on the outside cover by a qualified professional licensed to practice in New York State;
- ☒ identify the problem and state a capital improvement project as the recommended solution;
- ☒ provide an alternatives analysis;
- ☒ provide an estimate of the total project cost;
- ☒ include or attach project location maps;
- ☒ attach the completed engineering report certification.

Preliminary review of the recently adopted 2026 IUP Scoring criteria and project knowledge results in the following anticipated score, subject to increase or decrease based on regulatory review and scoring.

Table 1 **Anticipated Clean Water Scoring Criteria, 2026**		
Proposed 2026 Clean Water Scoring Criteria		
A.2.	Waterbody currently attaining water quality standards with potential impacts to water quality: Best Use Fishing Stressed, pollutant causes pH. Source of Water Supply: Stressed cause Magnesium and Sulfate. Pollutants include Magnesium, pH, Phosphorus, Sulfate. Improperly maintained or failing on-site septic systems can contribute to elevated levels of Phosphorus, In addition impacted designation from HABs and pathogens which may also be impacted by failing on-site septic systems.	25
B.	Seneca Lake: Class AA(TS) 8 Points, Assessment Status Stressed 3 points. WQC = 8x3=24	24
C.1.a.	Project addresses water quality problem identified in Seneca-Keuka Watershed Nine Element Plan for Phosphorus. The plan states improvement of on-site septic or municipal wastewater on page 72: "Seepage from individual septic systems Is also categorized as a nonpoint source of phosphorus." Page 78 "Table 25: Septic Systems estimated with LENS tool contribute estimated 2,900 lbs/year Phosphorus Load. Page 104 "Category 3: Wastewater Management Recommended Action: Replace and/or upgrade failing septic systems addressing pollutants: Phosphorus, Nitrogen, E. coli, Organics"	15
D.1.b.	Project will replace existing residential and small business on-site wastewater treatment systems with sanitary sewers.	10
E.	Village Burdett 2023 ACS $59,821< New York State $84,578	10
F.	The project is a climate adaptation project as based on the converting individual on site septic systems to municipal wastewater will improve resiliency in the community and the potential impact associated with high precipitation events and flash floods which have historically impacted the area, are anticipated to increase, and have inundated onsite septic systems and moved stream courses in proximity to onsite septic systems.	5
Anticipated Total Score		89

Appendix K: Smart Growth

NEW YORK STATE OF OPPORTUNITY. | Department of Health | Environmental Facilities Corporation

Smart Growth Assessment Form

This form should be completed by an authorized representative of the applicant, preferably the project engineer or other design professional.[1]

Section 1 – General Applicant and Project Information

Applicant: Village of Burdett Project No.: 2243745

Project Name: Wastewater Feasibility Study

Is project construction complete? ☐ Yes, date: ☑ No

Please provide a brief project summary in plain language including the location of the area the project serves:

The Village of Burdett seeks to implement a new municipal wastewater collection and conveyance system to reduce environmental harm to Seneca Lake and nearby waterways caused by on-site septic systems, provide a cost-effective solution to users within the Village, maintain the area's inherent environmental beauty and health, provide sewer services to allow for future connection by new users, and convey sanitary flows to the nearby Catherine Valley WRF and thereby leverage regional resources to promote efficiency. The project will serve residents within the entire Village of Burdett.

Section 2 – Screening Questions

A. Prior Approvals

1. Has the project been previously approved for Environmental Facilities Corporation (EFC) financial assistance? ☐ Yes ☑ No
2. If yes to A(1), what is the project number(s) for the prior approval(s)? Project No.:
3. If yes to A(1), is the scope of the previously-approved project substantially the same as the current project? ☐ Yes ☐ No

If your responses to A(1) and A(3) are both yes, please proceed to Section 5, Signature.

B. New or Expanded Infrastructure

1. Does the project involve the construction or reconstruction of new or expanded infrastructure? ☑ Yes ☑ No

Examples of new or expanded infrastructure include, but are not limited to:

(i) The addition of new wastewater collection/new water mains or a new wastewater treatment system/water treatment plant where none existed previously;

(ii) An increase of the State Pollutant Discharge Elimination System (SPDES) permitted flow capacity for an existing wastewater treatment system; and OR

[1] If project construction is complete and the project was not previously financed through EFC, an authorized municipal representative may complete and sign this assessment.

(iii) An increase of the permitted water withdrawal or the permitted flow capacity for the water treatment system such that a Department of Environmental Conservation (DEC) water withdrawal permit will need to be obtained or modified, or result in the Department of Health (DOH) approving an increase in the capacity of the water treatment plant.

If your response to B(1) is no, please proceed to Section 5, Signature.

Section 3 –Smart Growth Criteria

Your project must be consistent will all relevant Smart Growth criteria. For each question below please provide a response and explanation.

1. Does the project use, maintain, or improve existing infrastructure?
   ☑ Yes ☑ No

   Explain your response: The sanitary collection system will convey flow to the Catherine Valley WRF for treatment, thus using existing infrastructure to reduce costs and promote overall system efficiency.

2. Is the project located in a (1) municipal center, (2) area adjacent to a municipal center, or (3) area designated as a future municipal center, as such terms are defined herein (please select one response)?

   ☑ Yes, my project is located in a municipal center, which is an area of concentrated and mixed land uses that serves as a center for various activities, including but not limited to: central business districts, main streets, downtown areas, brownfield opportunity areas (see *www.dos.ny.gov* for more information), downtown areas of local waterfront revitalization program areas (see *www.dos.ny.gov* for more information), areas of transit-oriented development, environmental justice areas (see *www.dec.ny.gov/public/899.html* for more information), and hardship areas (projects that primarily serve census tracts or block numbering areas with a poverty rate of at least twenty percent according to the latest census data).

   ☐ Yes, my project is located in an area adjacent to a municipal center which has clearly defined borders, is designated for concentrated development in the future in a municipal or regional comprehensive plan, and exhibits strong land use, transportation, infrastructure, and economic connections to an existing municipal center.

   ☐ Yes, my project is located in an area designated as a future municipal center in a municipal or comprehensive plan and is appropriately zoned in a municipal zoning ordinance

   ☐ No, my project is not located in a (1) municipal center, (2) area adjacent to a municipal center, or (3) area designated as a future municipal center.

   Explain your response and reference any applicable plans:

   The proposed project is located within the Village of Burdett in a developed area.

3. Is the project located in a developed area or an area designated for concentrated infill development in a municipally-approved comprehensive land use plan, local waterfront revitalization plan, and/or brownfield opportunity area plan?

☑Yes ☐No

Explain your response and reference any applicable plans:

Village of Burdett has developed and adopted a Comprehensive Plan.

4. Does the project protect, preserve, and enhance the State's resources, including surface and groundwater, agricultural land, forests, air quality, recreation and open space, scenic areas, and significant historic and archaeological resources?

☑Yes ☐No

Explain your response:

The project's proposed infrastructure will protect water quality within Seneca Lake and other nearby waterways, and in doing so protect public health and recreational use of the aforementioned surface waterbodies, by removing failing septic systems in favor of a new public sanitary collection system. Infrastructure will also preserve and enhance a open space and scenic areas.

5. Does the project foster mixed land uses and compact development, downtown revitalization, brownfield redevelopment, the enhancement of beauty in public spaces, the diversity and affordability of housing in proximity to places of employment, recreation and commercial development, and the integration of all income and age groups?

☑Yes ☐No

Explain your response:

Reliable sewer infrastructure promotes compact development.

6. Does the project provide mobility through transportation choices including improved public transportation and reduced automobile dependency?

☐Yes ☐No ☑N/A

Explain your response:

7. Does the project involve coordination between State and local government, intermunicipal planning, or regional planning?

☑Yes ☐No

Explain your response and reference any applicable plans:

The project will involve coordination with State agencies including Department of Environmental Conservation, Department of Health, and Department of Transportation. The project will also include intermunicipal and regional planning between the Village of Burdett, Town of Hector, Village of Watkins Glen, and Village of Montour Falls.

8. Does the project involve community-based planning and collaboration?

☑Yes ☐No

Explain your response and reference any applicable plans:

Community engagement will occur through the SEQR and Bond processes.

9. Does the project support predictability in building and land use codes?

☑Yes ☐No ☑N/A

Explain your response:

Reliable sewer infrastructure supports predictability in land use.

10. Does the project promote sustainability by adopting measures such as green infrastructure techniques, decentralized infrastructure techniques, or energy efficiency measures?

☑Yes ☐No

Explain your response and reference any applicable plans:

The proposed pump stations will use energy efficient measures.

11. Does the project mitigate future physical climate risk due to sea-level rise, storm surges, and/or flooding, based on available data predicting the likelihood of future extreme weather events, including hazard risk analysis data, if applicable?

☑Yes ☐No

Explain your response and reference any applicable plans:

The proposed project has considered future physical climate risk and presents a recommended alternative to construct critical infrastructure out of potential flood areas.

Section 4 – Miscellaneous

1. Is the project expressly required by a court or administrative consent order? ☐ Yes ☑ No

   If yes, and you have not previously provided the applicable order to EFC/DOH, please submit it with this form.

Section 5 – Signature

By signing below, you agree that you are authorized to act on behalf of the applicant and that the information contained in this Smart Growth Assessment is true, correct and complete to the best of your knowledge and belief.

Applicant: Village of Burdett	Phone Number: 607-546-2266
Name and Title of Signatory: Jason Ebbs, PE	
Signature: Jason Ebbs	Date: May 2, 2025

Appendix L: Engineering Report Certification

NEW YORK STATE | Environmental Facilities Corporation

ENGINEERING REPORT CERTIFICATION

To Be Provided by the Professional Engineer Preparing the Report

During the preparation of this Engineering Report, I have studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is being sought from the New York State Clean Water State Revolving Fund. In my professional opinion, I have recommended for selection, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of constructing the project or activity, the cost of operating and maintaining the project or activity over the life of the project or activity, and the cost of replacing the project and activity.

Title of Engineering Report: Village of Burdett and Town of Hector WW System Feasibility Study

Date of Report: 05/02/2025

Professional Engineer's Name: Jason Ebbs

Signature:

Date: 05/02/2025