Town of Barre

14317 West Barre Road
Albion, NY 1441

PRELIMINARY ENGINEERING REPORT

for the

TOWN OF BARRE

WATER DISTRICT NO. 10

STATE OF NEW YORK
SCOTT DAVID MATTSON
LICENSE No. 102494
LICENSED PROFESSIONAL ENGINEER

REG EXP. 6/30/2025
CERT. OF AUTH. 017763

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MRB Group Project No. 0203.18003

Prepared by:

MRB group
145 Culver Road, Suite #160
Rochester, NY 14620
(585) 381-9250
www.mrbgroup.com — e-mail: info@mrbgroup.com

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I. EXECUTIVE SUMMARY

The purpose of this project is to provide a safe and reliable potable water supply and fire protection for residents of the proposed Town of Barre Water District No. 10 (hereinafter referred to as the "Project, Project Area or Water District"). The Town of Barre is located in Orleans County, as shown in Figure 1. The proposed improvements consist of the installation of approximately 23,350 linear feet (LF) of 8" water main, valves, hydrants, and appurtenances along various roads in the Town of Barre. The proposed Water District will connect to existing water mains in the Town of Barre Water District No. 3 near the intersection of Oak Orchard Road and Angevine Road as well as Water District No. 4 near the intersection of East Barre Road and Angevine Road. The Boundary Map and Description for the Project is provided in Appendix A. Based on this PER, the total project cost is estimated at $2,708,000.

According to 2019 American Community (ACS) 5-year Estimate data, the total estimated population for the Town was 1,770, the Median Household Income (MHI) was $66,284, and the poverty level was 8.4%.

The PER was compiled in accordance with the New York State Environmental Facilities Corporation (NYSEFC) Engineering Report Outline for New York State Assisted Drinking Water Infrastructure Projects in order to seek funding for the recommended capital improvements. It is recommended that the Town use this PER to pursue funding assistance from multiple agencies, including but not limited to the EFC through the Drinking Water State Revolving Fund (DWSRF), and Water Infrastructure Improvements Act (WIIA).

II. PROJECT BACKGROUND & HISTORY

A. SITE INFORMATION

1. Location

The Project Area is located along the following roads within the Town of Barre:

- Angevine Road between Oak Orchard Road and East Barre Road.
- McNamar Road between Angevine Road and Transit Road.
- Transit Road between McNamar Road and Mansfield Road.

Refer to Figure 2 for a Map of the Proposed Project Location.

2. Geologic Conditions

The United States Geographical Survey (USGS) 7.5 minute series quadrangle maps and United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) were used to compile information regarding the topography, soil data, depth to any restrictive layer, depth to groundwater, and flooding considerations.

The project location has soil types that primarily consist of a mix of Appleton silt loam (AnA, AnB), and Hilton loam (HbA, HbB): both are hydrologic soil groups (HSGs) types of B/D. The depth to the water table along areas of Appleton silt loam are within 8 inches of ground surface elevation, whereas areas of Hilton loam are within 24 inches. This area is predominantly rated as having a frequency of flooding of “none”. The depth to bedrock and restrictive layers along the entirety of the project location is greater than a depth of 80 inches. Given the need to excavate to at least a five (5) foot depth for watermain frost protection, it is anticipated that groundwater may be encountered during the construction process, but that bedrock and other restrictive layers may be avoided.

An extensive geologic survey is recommended for any proposed construction. USDA-NRCS Soil Survey Maps and descriptions are included in Appendix B.

3. Surface Water Features

There are several areas within the project that are within the buffer area of the New York State and Federal designated wetlands and streams that will need to be crossed, again within the highway right-of-way, in areas already disturbed by the highway and existing utilities. Measures will be incorporated into the design to mitigate adverse impacts. The related permits and environmental protection measures will be incorporated into the project. Wetland maps are included in Appendix C.

4. Environmental Resources

There are no rare plants and animals in the project location, per the NYS Environmental Resource Mapper. The area of the proposed project is generally farmland and residential areas. There are stream crossings along each road within the project area.

5. Potential Environmental Justice Areas

There are no Potential Environmental Justice Areas (PEJAs) within the project location, per the NYS PEJA Mapper.

6. Floodplain Considerations

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), the Town of Barre is shown on Community-Panel Number 361253 0001 B, effective October 15, 1981. See Appendix D for FEMA FIRMs.

A portion of the project location will intersect with a 100-year floodplain along Angevine Road and McNamar Road, for “Oak Orchard Creek, Upper and Tributaries” (PWL ID 0301-0014). In addition, the project appears to be outside of any 500-year floodplains. This is consistent with the USDA-NRCS soil survey, which shows this area as being predominantly rated as having a frequency of flooding of “none”.

B. OWNERSHIP AND SERVICE AREA

1. Population Trends and Parcel Information

The Town Assessor has prepared the list of parcels to be included in the Project and is included in Appendix E. The Project including the following:

- Total Number of Parcels in the District = 57
- Total Number of Residences to be served (Hook-ups) = 30
- Total Chargeable Units (EDU's) = 37
- Estimated Existing Population (Based upon 2.5 people/home) = 75
- Estimated Future Population (Assume 10% growth/20 years) = 83

The estimated growth is based upon previous water projects completed within the Town. Although this may not be supported by census information, the addition of 3 additional homes would be expected given this small service area.

2. Community Engagement

The Town of Barre has been approached by numerous residents in the Project Area over the past several years. There have been informal petitions circulated by the residents to request the Town evaluate the feasibility of providing public water to their area. A formal petition has been prepared and filed with the Town.

The Town of Barre will be scheduling a Public Information Meeting and Legal Public Hearing for creation of the Water District.

3. Agricultural and Industrial Land Uses

The project is partially located within Orleans County's Agricultural District 2 as shown in Appendix F. However, the majority of work will be located within the highway right-of-way and will have no adverse impact on the agricultural properties.

4. Equivalent Dwelling Units (EDUs)

For the purposes of calculating similar system costs, the number of Equivalent Dwelling Units is summarized as follows:

Water District No. 10	Numbers	EDU Count
Agricultural Exempt Properties	9	0
Ag. Properties with Public Water	0	0
Residential Properties	30	30
Vacant Properties (Buildable)	14	7
Non-Residential (Commercial Properties)	0	0
Exempt Properties (Utility Line; Non-Buildable)	4	0
Totals	**57**	**37 EDU's**

C. EXISTING FACILITIES

1. Location and Layout

There are no existing facilities in the Project Area.

The Town of Barre owns and operates a booster pump station, storage tank, and distribution mains in seven existing water districts. The Project will receive water supply from the Village of Albion. The Village of Albion owns and operates a 2.4 MGD Water Treatment Facility on the shores of Lake Ontario, with sufficient capacity to serve this Project.

The Existing Facilities within the Town of Barre are shown on Figure 3.

2. General Description and History

The Town of Barre constructed the booster pump station located at the Village of Albion 3.0 MG Water Storage Tank and constructed the 150,000-gallon Barre Water Storage Tank as part of the Town of Barre Water District No. 1 in 1993. Also, as part of that project, the main transmission/distribution line was installed along NYS Route 98 to supply the Barre WST and the residents in Barre Water District No. 1. Barre Water Districts 2, 3 and 4 were constructed in the mid 1990's and Barre Water District No. 5 was constructed in 2012. Water District No. 6 was constructed in 2015, Water District No. 7 was constructed in 2016 and Water District No. 8 was constructed in 2018. Water District No. 9 was constructed in 2019.

The Town of Barre 150,000-gallon Water Storage Tank interior was painted in August 2008. We anticipate that the tank exterior will need to be painted within the next 3-5 years.

3. Present Condition

The existing distribution system in the Town of Barre was constructed within the last twenty-five years. All of the water main in the existing districts in the Town of Barre is DR-18 PVC and is in excellent condition. The Town of Barre owns and maintains the booster pump station and the 150,000-gallon Water Storage Tank.

The booster pump station and water storage tank are in excellent condition and can easily meet the needs of the Project Area. Future repairs and maintenance associated with those items are to be shared by all Barre Water Districts. In addition, the Town of Barre has an inter-municipal agreement to share in the operation and maintenance costs associated with those items with the Town of Albion.

4. Permit Conditions

The Project will require permits and approvals from the following agencies:

- Orleans County Health Department Approval
- Orleans County Highway Department Approval
- US Army Corp of Engineers Nationwide Permit
- NYSEFC Approval
- USDA Rural Development Approval
- NYS Department of Environmental Conservation
- Water Supply Permit Application
- Stormwater Pollution Prevention Plan (SWPPP)
- Freshwater Wetlands
- Water Quality Certification
- Stream Disturbance

D. NEED FOR PROJECT

1. Health, Sanitation, and/or Security

The residents in the Project Area typically experience the following problems:

- **Insufficient quantity** of water is available for the residential wells. Some residents must conserve water by: alternating shower days, alternating laundry days or not washing clothes in their residences at all.

- **Poor water quality** is predominant in the existing well supplies. The water quality requires some residents to either boil water for consumption or purchase bottled water for cooking and consumption. Water samples have been collected and analyzed by the Orleans County Health Department. The Orleans County Health Department is in support of the construction of the public water supply for this Project Area due to the condition of the existing private well supplies.

- **High cost** to operate and maintain existing well supplies. Several residents must purchase chemicals for softening and treatment systems and must frequently replace their plumbing systems due to corrosion of their fixtures. Several residents currently pay over $500 per year to operate and maintain their water system, which provides them with poor quality water and insufficient quantities at times.

- **Fire Protection**. Currently, there is no water system to provide fire protection in the proposed water district. Likewise, there are no significant bodies of water in the vicinity that provide an adequate supply of water for fire protection.

The completion of the proposed project would address all of these issues for the residents of the proposed Water District.

2. Aging Infrastructure

This project proposes to install new infrastructure in an area which previously had none: section is not applicable to this report.

3. Reasonable Growth

The ability to serve a growing population in the region has been addressed as part of the selection of water main size. The water mains for the Project Area have been sized to meet fire flows, which far exceed residential demand.

Insurance Services Office (ISO) requires a minimum fire flow of 500 gpm at 20 psi residual pressure for this area. Fire flows in the Project Area will exceed the ISO and NYS Department of Health requirements in all areas. As shown on Table 1, fire flows will be in excess of 677 gpm @ 20 psi in all locations.

Future residential growth within the District will not be limited as a result of available fire flows. In addition, this project is utilizing 8" diameter water mains which is generally the minimum size water mains used for rural areas providing fire flow. This Project supports the necessary fire flow, and the current and future demands, without putting an undue burden on the property owners within the Water District.

E. CAPACITY DEVELOPMENT

See Appendix G for Capacity Development Program Evaluation Form.

III. ALTERNATIVES ANALYSIS

The only alternative to address the problems of the residents of the Project Area is to install a Public Water System. No other alternatives were considered.

As part of the project planning process, a complete environmental review has taken place including the State Environmental Quality Review (SEQR) Act and the National Environmental Policy Act (NEPA).

A. Water Supply Alternatives

There are no feasible water supply alternatives to consider such as construction of wells, water treatment plant, etc. Construction of a water treatment plant to supply the needs of the Town of Barre solely would not be feasible from a financial standpoint.

Elimination of the Town of Barre water usage from the Village of Albion Water System (water supplier to the Town of Barre) would have a devastating effect on that system and would likely make the Village of Albion Water System non-viable as a supplier. It should be noted that the Village of Albion Water System provides potable water to several other Town Water Districts within Orleans County, many of which have funding from USDA RD for their water districts. Furthermore, the Town of Barre does not have any operational staff that would be licensed to operate a water treatment plant and would have to likely hire from the outside for operation staff or train existing staff. In addition, they would have to increase their town payroll and benefits to treat their own water. Therefore, no further investigation or consideration of a surface water supply is warranted at this time.

It is likely that a well supply would not be feasible since the majority of the private wells within the Town of Barre have experienced quality and quantity problems which have led to public water being installed. Therefore, no further investigation or consideration of well supply is warranted at this time.

B. Pipe Material Alternatives

The pipe material alternatives to consider include PVC pipe, ductile iron pipe (DIP) and high-density polyethylene pipe (HDPE). The Town of Barre has constructed their previous water main extensions utilizing PVC pipe. The operation and maintenance staff are most familiar with using PVC pipe and have tools for operating and maintaining PVC Pipe. Ductile iron pipe would be more costly to purchase and install, and the town would have to purchase additional equipment for tapping the DIP water main for future water services. Using HDPE for water distribution systems is a feasible alternative for crossing highways, creeks and other obstacles that require horizontal directional drilling (HDD). We recommend using a combination of PVC and HDPE pipe for the water distribution system.

At the time of preparation of this PER, the cost of 8" DIP water main (Class 52) was $45.68/LF, the cost of 8" PVC water main (DR 18) was $23.11/LF, and the cost of 8" HDPE (DR 11) for directional drilling was $13.56/LF. For this application, we anticipate the life span and operation and maintenance costs of the PVC pipe will be similar to DIP. With a cost of DIP more than that of PVC pipe, the ease of installation of PVC pipe, and the extremely limited budget, we recommend the use of PVC pipe for the majority of the areas; HDPE pipe shall be utilized only in areas which will require directional drilling, as needed.

C. Additional Areas of Service Alternatives

As part of our preliminary investigation for water main installation, we evaluated additional potential areas of service, however, they were ruled out due to cost limitations. As this is a rural area, there are no other feasible layouts available for consideration.

D. Sustainability Considerations Alternatives

The water main size will be based upon the needed fire flow and anticipated domestic water supply needs, therefore no alternative pipe size would be appropriate to consider. No other Sustainability measures are applicable to this Project.

Residents are encouraged to conserve water by installing low flow plumbing devices. The Town of Barre has standardized various materials such as fire hydrants, valves, meters, etc. which limits the necessity for keeping a large inventory of various different manufacturers products.

The Town will collect sufficient funds on an annual basis from each property owner sharing in the Project to re-pay the debt service on the Project. In addition, the water cost is sufficient to cover the purchase of water and operation and maintenance.

E. Financial Status of Existing Facilities

The financial status of the existing facilities does not relate specifically to the creation of this Water District.

The cost for routine operation and maintenance associated with the booster pump station and the water storage tank are included in the normal water rate. Future improvements such as rehabilitation/replacement will be shared by all users of the system (Barre and Albion Water Districts who benefit from those items).

F. ANNUAL OPERATING BUDGET

1. Income

The Project will purchase water from the Village of Albion at a rate of $3.34 per 1,000 gallons. It is anticipated that the Town of Barre will charge residents of the Project Area $5.75 per 1,000 gallons to cover the cost of purchasing water and associated operation and maintenance of the system.

The Town of Barre will also charge the residents of the Project area $15.00 per quarter to cover future water storage tank painting.

2. Annual Operation and Maintenance (O&M) Cost

The Town of Barre will be responsible for the Operation and Maintenance (O&M) of the proposed water system improvements. The cost for O & M is included in the water storage tank painting fee and water rate charged to each user of the system. The Town of Barre currently provides the O & M for all other Water Districts within the Town. Dale Brooks is the NYS Department of Health Licensed Water System Operator for the Town of Barre. The average household uses approximately 60,000 gallons of water per year.

The Total Cost of Water per Year is calculated as follows:

$ 5.75/1,000 Gallons x 60,000 Gallons/Year	= $ 345.00/Year
$15.00/Quarter x 4 Quarters/Year	= $ 60.00/Year
Total Estimated Cost of Water	= $ 405.00/Year

3. Debt repayments

Payment of the debt service will be made on an EDU basis by the residents of the water district. Appendix J contains the cost estimate, with break down by EDU as well.

4. Short Lived Assets and Debt Service Reserves

This project does not involve short lived assets which will require separate debt service reserves.

5. Estimated Costs for the Average Residential User

The estimated first year costs for the average residential user would be as follows:

1.	Installation of Water Service (100 lf x $12.00/lf)	= $ 1,200.00
2.	Internal Plumbing Changes	= $ 150.00
3.	Meter from Town	= $ 350.00
3.	Repayment of Long-Term Bonding	= $ 1,161.90
4.	Water Storage Tank Painting Fee	= $ 60.00
5.	Purchase of Water (60,000 gal./yr)	= $ 345.00
	Total First Year Costs for the Average Residential User	**= $ 3,266.90**

The estimated annual costs for the average residential user after the first year would be as follows:

1.	Repayment of Long-Term Bonding	= $ 1,161.90
2.	Water Storage Tank Painting Fee	= $ 60.00
3.	Purchase of Water (60,000 gal./yr)	= $ 345.00
	Total Second Year and beyond Costs for the Average Residential User	**= $ 1,566.90**

The property owner is responsible for paying the fee associated with purchase of the water meter. In addition, the property owner is responsible for installation of their own individual water service and connection to the new water service.

As part of this project, water services will be provided from the water main to the right-of-way in front of each building. A curb stop and box will be located at the right-of-way to shut off the water service if necessary.

Upon the completion of the proposed Project, should the budget permit, the Town should consider installing automatic flushing units, purchasing basic operation and maintenance tools, equipment and spare parts including, but not limited to: spare hydrants, spare valves, spare fittings, spare service materials.

Consideration should also be given to meter reading improvements, utility locating devices, and computer hardware/software upgrades in order to maximize the efficiency of the operation and maintenance of the proposed Project. Also, if the project budget allows, residential water meters, readers and other miscellaneous metering equipment should be provided to each residence. The Town should also seek reimbursement for water purchased during construction and reimbursement for necessary repairs to the roadways damaged by construction, if project funds are available.

G. System Operation and Maintenance

Dead end water mains and rural water mains require periodic flushing and chlorine residual testing, which are typical of a rural water districts because of low population density and low water usage. Currently, the Town of Barre manually flushes their dead end and rural water mains to maintain chlorine residual throughout the water system. The proposed water district will create an interconnection between the water mains on Oak Orchard Road and East Barre Road and will create a dead-end water main on Transit Road. There is a potential in the future for an interconnection with the Town of Clarendon Water System in the vicinity of Transit Road and Brown Schoolhouse Road. This potential interconnection would not only provide an emergency connection but would also reduce the need for flushing.

IV. RECOMMENDED AND SELECTED ALTERNATIVES

A. BASIS OF SELECTION

1. Water Supply

The Town of Barre receives its water from the Village of Albion Water Treatment Plant located on Wilson Road in the Town of Carlton. The source of water for the Village of Albion Water Treatment Plant is Lake Ontario.

The estimated water usage for the Project is 4,932 gallons per day (3.43 gpm), assuming an average usage of 60,000 gallons per year per house. The future usage could reach 5,425 gallons per day (3.77 gpm) assuming a 10% growth over the next 20 years.

The Village of Albion Water Treatment Plant has excess capacity to meet the needs of Project.

The Town of Barre also has an inter-municipal agreement with the Town of Clarendon to obtain water from their system on an emergency basis. The Town of Clarendon receives their water supply from Monroe County Water Authority (MCWA) which also has an ample supply of water.

2. Treatment

The Village of Albion owns and operates the Water Treatment Facility, which will treat the water supplied to the Project. The Village of Albion Water Treatment Facility is a 2.4 MGD Rapid Sand Filter Treatment Plant. The Water Treatment Facility currently produces approximately 1.8 MGD of potable water and has excess capacity.

3. Storage

The Project Area will be directly supplied by the Town of Barre 150,000-gallon Water Storage Tank that is located on NYS Route 98 in Barre Center, behind the

Barre Fire Hall.

The Village of Albion owns a 1.0-million-gallon Water Storage Tank located in the Town of Gaines near 5 Corners and a 3.0-million-gallon Water Storage Tank located in the Town of Barre near the intersection of NYS Route's 98 and 31A.

In addition, the Town of Clarendon owns and operates a 150,000-gallon Water Storage Tank, which can provide water to the Town of Barre Water System in the event of an emergency.

4. Pumping Stations

No additional pumping is needed to serve the proposed project.

5. Distribution Layout

The proposed areas of service include:

- Angevine Road

  The proposed improvements along Angevine Road consist of installing approximately 14,500 linear feet of 8" water main, valves, hydrants, services and appurtenances between Oak Orchard Road and East Barre Road

  The proposed water main is anticipated to be located on the east side of Angevine Road, generally within the Highway right-of-way.

- McNamar Road

  The proposed improvements along McNamar Road consist of installing approximately 5,250 linear feet of 8" water main, valves, hydrants, services and appurtenances between Angevine Road and Transit Road.

  The proposed water main is anticipated to be located on the north side of McNamar Road, generally within the Highway right-of-way.

- Transit Road

  The proposed improvements along Transit Road consist of installing approximately 3,600 linear feet of 8" water main, valves, hydrants, services and appurtenances between McNamar Road and Mansfield Road.

  The proposed water main is anticipated to be located on the west side of Transit Road, generally within the Highway right-of-way.

- Master Meter Pit

  The proposed master meter pit will be located near the intersection of Transit Road and Brick Schoolhouse Road. This meter pit will serve as an emergency supply of water between the Towns of Barre and Clarendon. This interconnection is dependent upon an inter-municipal agreement and approval by the water purveyors.

6. Hydraulic Calculations

A computer model was used to estimate the hydraulic conditions in the proposed Water District. The detailed Hydraulic Calculations are included in Appendix H. Table 1 Proposed Hydraulic Conditions summarizes the estimated static and residual pressures and fire flow conditions throughout the proposed water district.

Table 1 – Proposed Hydraulic Conditions

Location	**Junction**	**Pres.(psi)**	**(GPM)**	**Pres. (psi)**
Angevine Road @ McNamar Road	J-73	69	1,161	32
McNamar Road @ Brick Schoolhouse Road	J-76	56	737	20
Transit Road @ Mansfield Road	J-77	61	677	20

7. Easements

The water main will generally be located within the highway right-of-way. On rare occasions, the water main, fire hydrants or appurtenances may need to be installed on private easements. In those cases, the Town Engineer will prepare a permanent easement map and work with the Town Attorney who will prepare the easement and description for execution by the property owner. In addition, temporary easements may be necessary for installation of the improvements.

B. COST ESTIMATE

The summary of estimated for the proposed project are as follows:

a.	Construction	$	1,868,000
b.	Contingency (15%)	$	280,000
c.	Engineering	$	230,000
d.	Legal and Administrative	$	330,000
	Total Project Costs	**$**	**2,708,000**
	Less Anticipated WIIA Grant	$	(1,624,800)
	Net Local Share	**$**	**1,083,200**
Total Number of EDUs in Proposed WD			37.0
Annual debt service with Grant (Based upon $500,000 @ 2.125% for 38 years, $524,000 @ 2.25% for 38 years, and $59,200 @ 0.0% for 38 years)		$	41,527.69
Annual debt service (for 38 years) per parcel with Grant		**$**	**1,122.37**

Refer to Appendix I at the end of this report for a detailed Cost Estimate of the Proposed Project.

Based upon our previous experience with similar type water projects, within this community and other surrounding communities, we feel that the contingency provided is sufficient for this Project. There are no construction concerns associated with this Project.

We have included mobilization/demobilization, lawn restoration, fittings, bonds, insurance,

creek crossings and miscellaneous items in the cost estimate. These items are spread out in the respective line items. We have also provided an adequate contingency amount to cover anticipated cost increases as this project progresses through the funding and approval process.

C. PROJECT SCHEDULE

The anticipated Project Schedule will be determined once the financing package has been received by the Town of Barre. The general steps to be taken include:

- Submit the Application to NYSEFC for their consideration
- Receive Funding from NYSEFC
- Finalize Map, Plan and Report based upon NYSEFC LOC
- TB Accepts Map, Plan and Report
- TB holds Legal Public Hearing
- Submission to the NYS Comptroller if necessary
- Approval by NYS Comptroller
- Design Phase of Improvements
- Submission to agencies for approvals & permits
- Bidding Phase
- Construction Phase and Final Restoration
- Completion and Project Closeout

D. NEXT STEPS

This project will provide potable water to residents of the Proposed Water District, who are in dire need of the water for daily usage.

The Town of Barre should apply for grants and low interest loans to provide a badly needed, reliable water service and fire protection to the project area.

E. ENGINEERING REPORT CERTIFICATION

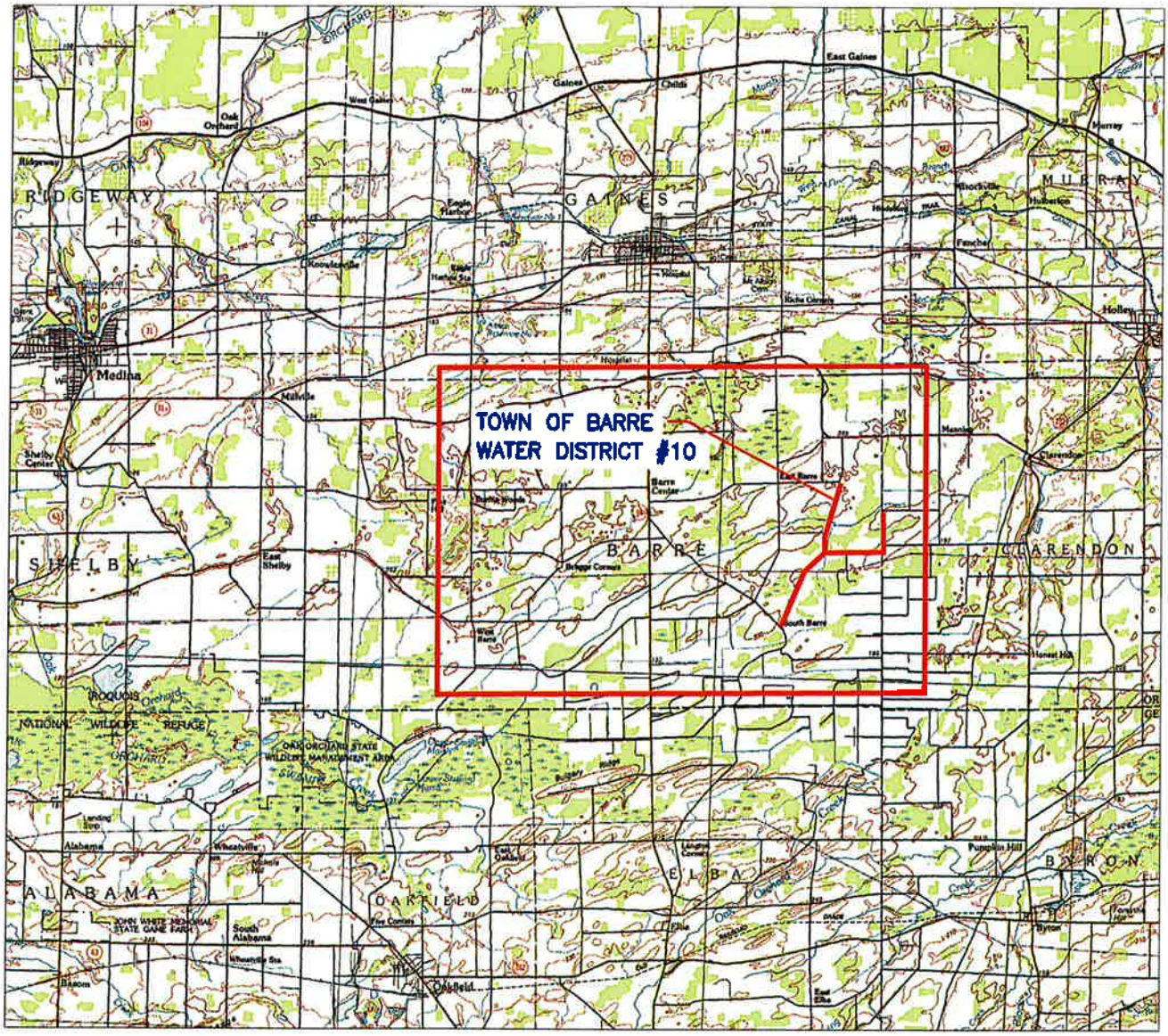
Refer to Appendix J for the stamped and signed Engineering Report Certification.

F. SMART GROWTH ASSESSMENT FORM

Refer to Appendix K for the stamped and signed Smart Growth Assessment Form.

FIGURES

NORTH



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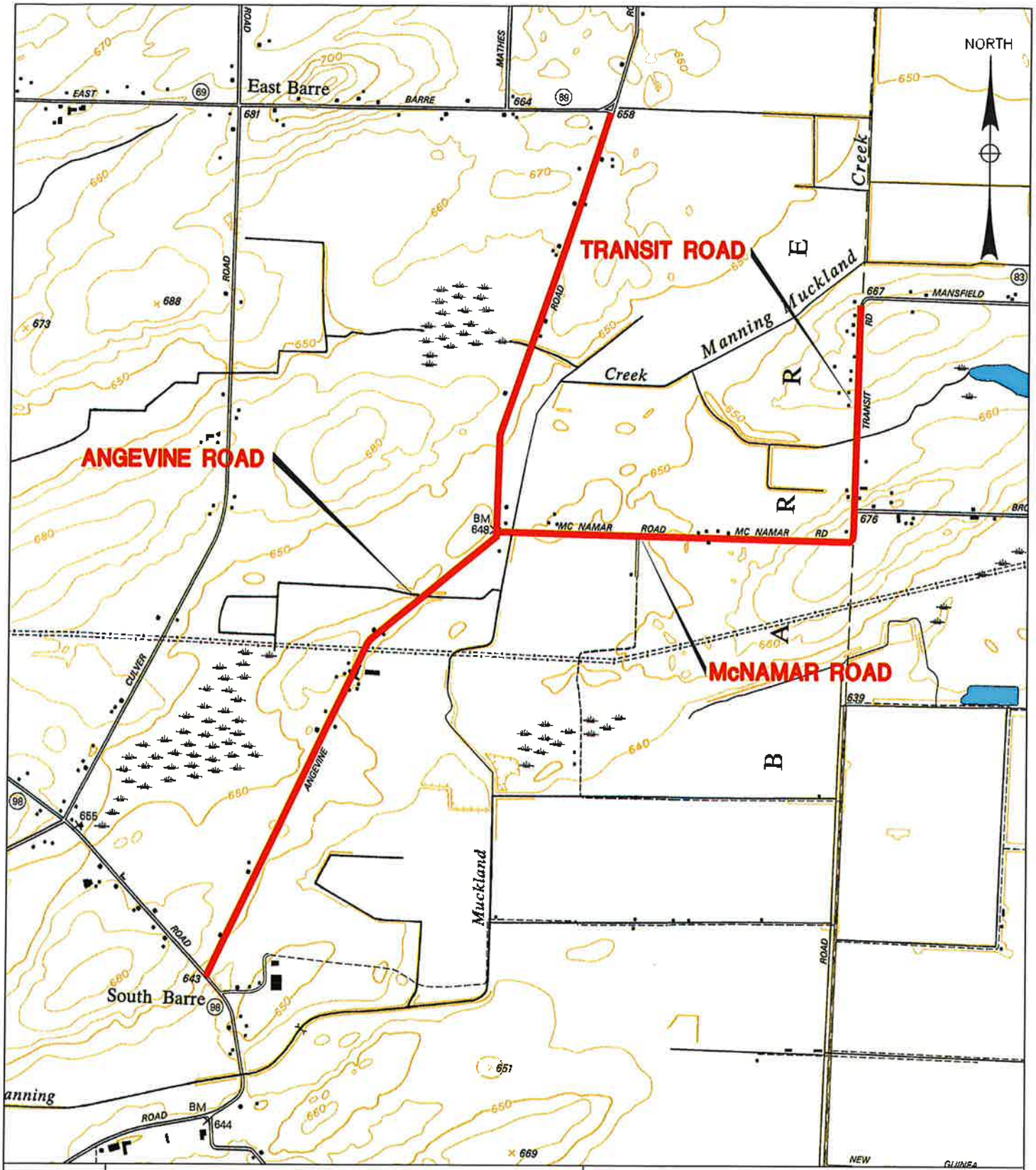
DRAFTED BY: JBL	
CHECKED BY: SDM	
DATE: 5/18/18	
PROJ. NO.: 18-1291	

CHATFIELD ENGINEERS, P.C.
2800 Dewey Avenue
Rochester, New York 14616
(585) 227-6040 • Fax 227-4233

PROJECT:
TOWN OF BARRE
WATER DISTRICT NO. 10

TITLE:
FIGURE 1
GENERAL LOCATION MAP



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DRAFTED BY:	EJM
CHECKED BY:	SDM
DATE:	6/11/18
PROJ. NO.:	18-1291

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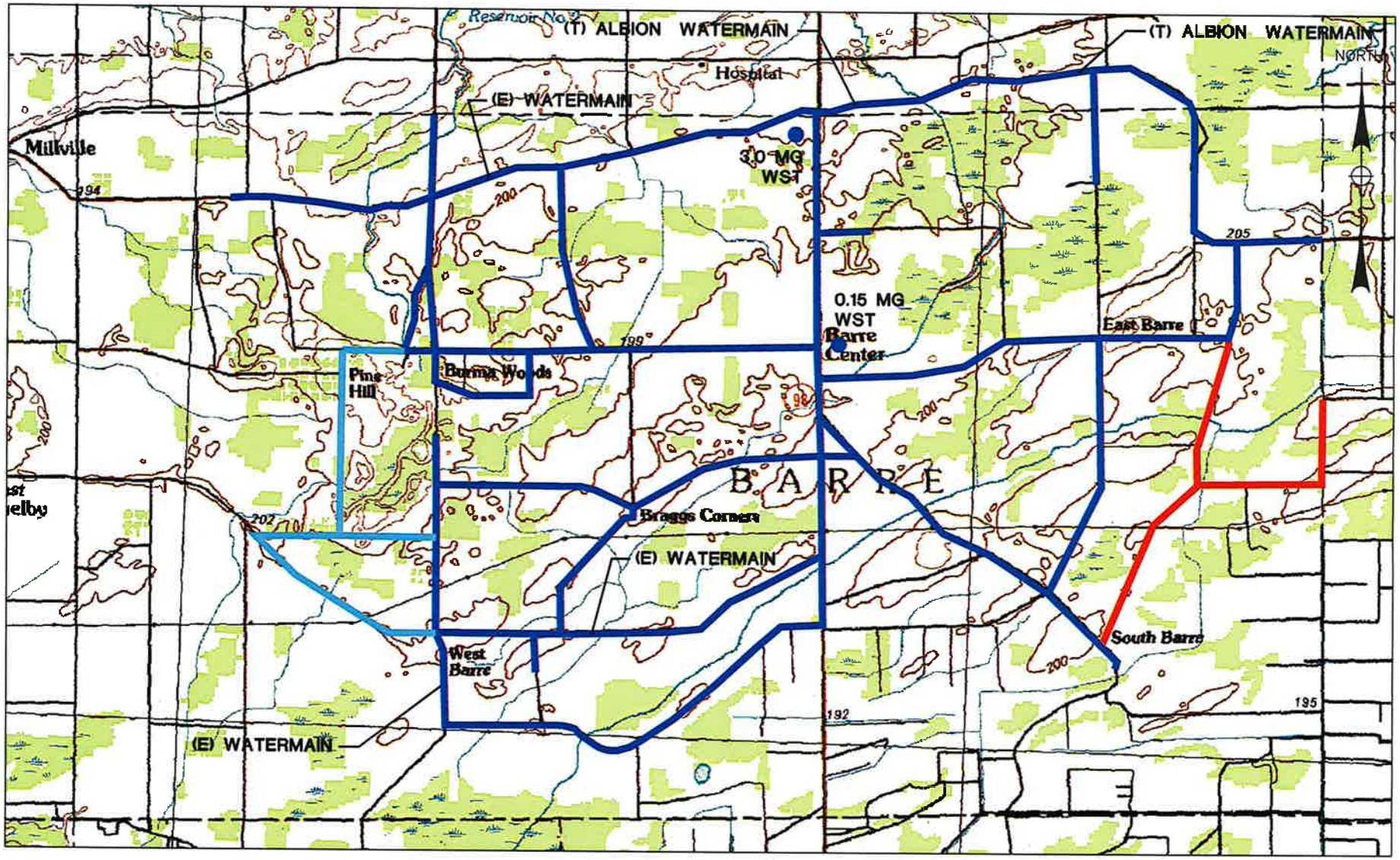
2800 Dewey Avenue
Rochester, New York 14616
(585) 227-6040 • Fax 227-4233

PROJECT:
TOWN OF BARRE
WATER DISTRICT NO. 10

TITLE:
FIGURE 2
PROJECT LOCATION MAP



LEGEND

- EXISTING WATER MAIN
- WATER MAIN IN CONSTRUCTION
- PROPOSED WATER MAIN

SCALE: 1-6000	DATE: 6/11/18
DRAFTED BY: EJM	PROJ. NO.: 18-1291
CHECKED BY: SDM	

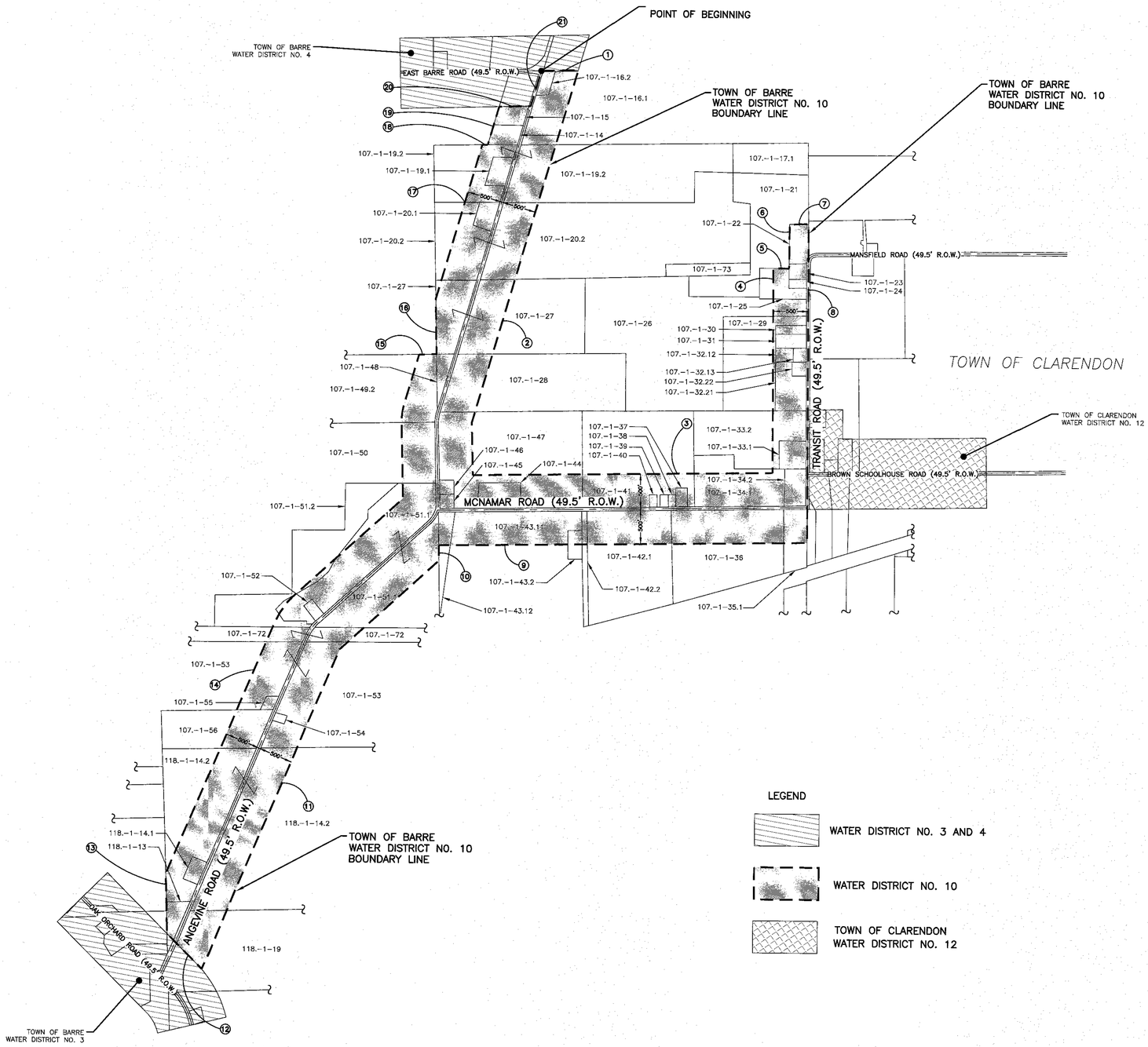
CHATFIELD ENGINEERS, P.C.
2800 Dewey Avenue
Rochester, New York 14616
(585) 227-6040 • Fax 227-4233

PROJECT:
TOWN OF BARRE
WATER DISTRICT NO. 10

TITLE:
FIGURE 3
EXISTING FACILITIES

APPENDIX A

BOUNDARY MAP AND DESCRIPTION



LEGEND

- WATER DISTRICT NO. 3 AND 4
- WATER DISTRICT NO. 10
- TOWN OF CLARENDON WATER DISTRICT NO. 12

BOUNDARY DESCRIPTION
FOR THE
TOWN OF BARRE
WATER DISTRICT No. 10
ORLEANS COUNTY, NEW YORK
JUNE 1, 2018

The Town of Barre Water District No. 10 shall have an exterior boundary described as follows:

Beginning at a point, said point being the intersection of the centerline of East Barre Road (49.5' ROW) with the centerline of Angevine Road (49.5' ROW); thence

1. Easterly, 500 feet more or less, along a southerly boundary line of The Town of Barre Water District No. 4, also being the northerly property line for Tax Account No. 107.-1-16.2 & 107.-1-16.1 to a point, said point being 500 feet easterly of the centerline of Angevine Road; thence

2. Southerly, 5,985 feet more or less, along a line parallel to and 500 feet easterly of the centerline of Angevine Road to a point, said point being 500 feet northerly of the centerline of Mcnamar Road (49.5' ROW); thence

3. Easterly, 4,270 feet more or less, along a line parallel to and 500 feet northerly of the centerline of Mcnamar Road to a point, said point being 500 feet westerly of the centerline of Transit Road (49.5' ROW); thence

4. Northerly, 2,914 feet more or less, along a line parallel to and 500 feet westerly of the centerline of Transit Road to a point, said point being located on northerly property line of Tax Account No. 107.-1-25; thence

5. Easterly, 225 feet more or less, along northerly property line of Tax Account No. 107.-1-25 a point, said point being a northeasterly property corner of Tax Account No. 107.-1-25; thence

6. Northerly, 629 feet more or less, along a westerly property line of Tax Account No. 107.-1-23 & 107.-1-22 to a point, said point being the northwesterly property corner of Tax Account No. 107.-1-22; thence

7. Easterly, 271 feet more or less, along the northerly property line of Tax Account No. 107.-1-22 to a point, said point being the northeasterly property corner of Tax Account 107.-1-22; thence

8. Southerly, 4,540 feet more or less, along the centerline of Transit Road to a point, said point being located 500' southerly of the centerline of Mcnamar Road along the easterly property line of Tax Account No. 107.-1-35.1; thence

9. Westerly, 5,242 feet more or less, along a line parallel to and 500 feet southerly of the centerline of Mcnamar Road to a point, said point being located on the westerly property line of Tax Account No. 107.-1-43.12; thence

10. Southerly, 219 feet more or less, along the westerly property line of Tax account No. 107.-1-43.12 to a point; thence

11. Southwesterly, 6,845 feet more or less, along a line parallel to and loocted 500 feet southeasterly of the centerline of Angevine Road to a point, said point being a northerly boundary of the Town of Barre Water District No. 3; thence

12. Northwesterly, 704 feet more or less, along a line parallel to and located 500 feet northeasterly of the centerline of Oak Orchard Road (49.5' ROW) to a point, said point being located on the westerly property line of Tax Account No. 118.-1-13; thence

13. Northerly, 856 feet more or less, along the westerly property line of Tax Account No. 118.-1-14.2 to a point, said point being 500 feet northwesterly of the centerline of Angevine Road; thence

14. Northeasterly, 8,423 feet more or less, along a line parallel to and located 500 feet northwesterly of the centerline of Angevine Road to a point, said point being located on the northerly property line of Tax Account No. 107.-1-49.2; thence

15. Easterly, 248 feet more or less, along the northerly property line of Tax Account No. 107.-1-49.2 to a point, said point being the southwesterly property corner of Tax Account No. 107.-1-27; thence

16. Northerly, 789 feet more or less, along the westerly property line of Tax Account No. 107.-1-27 to a point, said point being 500 feet northwesterly of the centerline of Angevine Road; thence

17. Northeasterly, 2,294 feet more or less, along a line parallel to and 500 feet northwesterly of the centerline of Angevine Road to a point, said point being located on the northerly property line of Tax Account No. 107.-1-19.2; thence

18. Easterly, 78 feet more or less, along the northerly property line of Tax Account No. 107.-1-19.2 to a point, said point being a southwesterly property corner of Tax Account No. 107.-1-14; thence

19. Northeasterly, 569 feet more or less, along the westerly property corner of Tax Account No. 107.-1-14 to a point, said point being a southerly boundary of the Town of Barre Water District No. 4; thence

20. Easterly, 449 feet more or less, along the southerly boundary of the Town of Barre Water District No. 4 to a point, said point being the centerline of Angevine Road; thence

21. Northeasterly, 525 feet more or less, along the centerline Angevine Road to a point, said point being the point of beginning.

End of Boundary Description

NORTH

NO.	REVISIONS	BY	DATE

PROJECT MANAGER

FIRM PRINCIPAL

PROJECT ENGINEER: SDM
DRAFTED BY: JBL
CHECKED BY: PRC
SCALE: 1" = 800'
DATE: JUNE 2018

CHATFIELD ENGINEERS, P.C.
2800 Dewey Avenue
Rochester, New York 14616
(585) 227-6040 • Fax 227-4283

PROJECT: TOWN OF BARRE WATER DISTRICT NO. 10

TITLE: WATER DISTRICT BOUNDARY MAP

PROJECT No. 18-1291

DRAWING No. 1 OF 1

filename: J:\Active\(T)Barre\18-1291 (W.D. #10)\CAD\Boundary Map.dwg

APPENDIX B

USDA-NRCS SOIL SURVEY

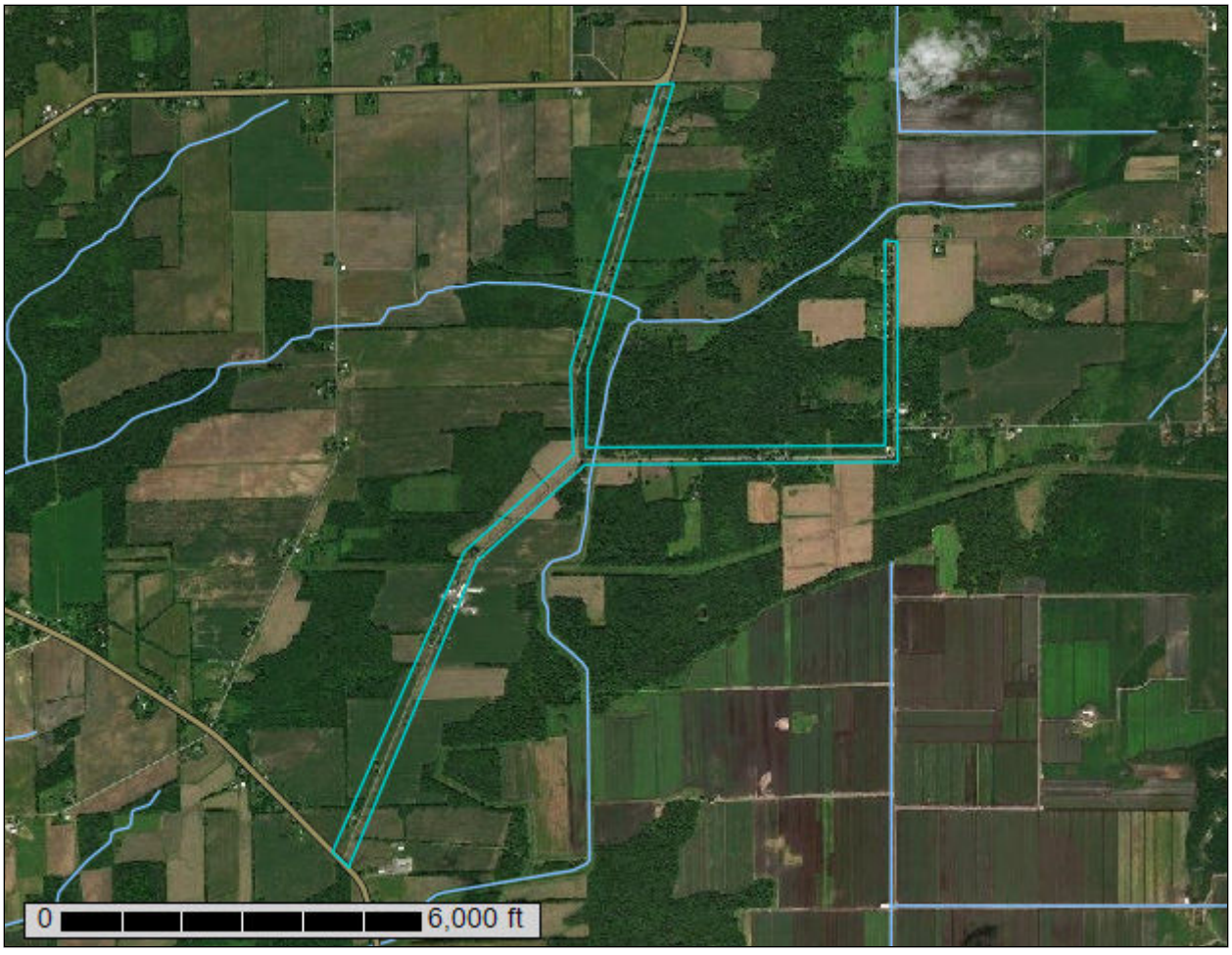
United States Department of Agriculture

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 Orleans County, New York



March 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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Contents

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: 1:23,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 300 600 1200 1800

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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: Orleans County, New York
Survey Area Data: Version 20, Sep 6, 2023

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AnA	Appleton silt loam, 0 to 3 percent slopes	43.5	30.9%
AnB	Appleton silt loam, 3 to 8 percent slopes	1.2	0.9%
Ba	Barre silt loam	5.8	4.1%
Ca	Canandaigua soils	7.6	5.4%
ChA	Churchville silt loam, 0 to 2 percent slopes	8.4	6.0%
HbA	Hilton loam, 0 to 3 percent slopes	2.4	1.7%
HbB	Hilton loam, 3 to 8 percent slopes	61.3	43.6%
HnB	Hilton-Cazenovia complex, 0 to 8 percent slopes, stony	4.4	3.1%
Ly	Lyons soils, 0 to 3 percent slopes	1.5	1.1%
OdA	Odessa silt loam, 0 to 3 percent slopes	0.4	0.3%
OnC	Ontario loam, 8 to 15 percent slopes	0.5	0.4%
OoB	Ontario loam, 3 to 8 percent slopes, stony	3.6	2.6%
Totals for Area of Interest		**140.8**	**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.

Orleans County, New York

AnA—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

AnB—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

Ba—Barre silt loam

Map Unit Setting

National map unit symbol: 9vxw
Elevation: 280 to 670 feet
Mean annual precipitation: 30 to 35 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Barre

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey and silty glaciolacustrine deposits over loamy till

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 25 inches: silty clay
H3 - 25 to 60 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 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 moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 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): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY010NY - Wet Lake Plain Depression
Hydric soil rating: Yes

Minor Components

Churchville

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

Madalin

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Ovid

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

Appleton

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

Fonda

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Lakemont

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Ca—Canandaigua soils

Map Unit Setting

National map unit symbol: 9vy2

Elevation: 100 to 1,000 feet
Mean annual precipitation: 30 to 35 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Canandaigua

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 30 inches: silt loam
H3 - 30 to 60 inches: stratified silt loam to very fine sandy loam

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 (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: High (about 12.0 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

Lakemont

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

Lamson

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Lyons

Percent of map unit: 4 percent

Landform: Depressions
Hydric soil rating: Yes

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

Sun
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Madalin
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

ChA—Churchville silt loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 9vyc
Elevation: 250 to 670 feet
Mean annual precipitation: 30 to 35 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

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

Description of Churchville

Setting
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits over loamy till

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 29 inches: silty clay
H3 - 29 to 60 inches: gravelly loam

Properties and qualities
Slope: 0 to 2 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 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Barre

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

Madalin

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Cayuga

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

Schoharie

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

Cazenovia

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

Lakemont

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

HbA—Hilton loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2wrdq
Elevation: 660 to 980 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

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

Description of Hilton

Setting

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

Typical profile

Ap - 0 to 9 inches: loam
E - 9 to 17 inches: loam
Bt/E - 17 to 24 inches: gravelly loam
Bt - 24 to 36 inches: gravelly loam
C1 - 36 to 54 inches: gravelly loam
C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 5 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 high (0.00 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 7.5 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

Appleton

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

Ontario

Percent of map unit: 5 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

Bombay

Percent of map unit: 3 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HbB—Hilton loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w3ld
Elevation: 260 to 1,310 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

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

Description of Hilton

Setting

Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex, concave

Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: loam
E - 9 to 17 inches: loam
Bt/E - 17 to 24 inches: gravelly loam
Bt - 24 to 36 inches: gravelly loam
C1 - 36 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: Moderately well drained
Runoff class: Low
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: 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 7.5 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

Appleton

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

Ontario

Percent of map unit: 5 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

Bombay

Percent of map unit: 3 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave

Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HnB—Hilton-Cazenovia complex, 0 to 8 percent slopes, stony

Map Unit Setting

National map unit symbol: 2w3l3
Elevation: 590 to 720 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

Hilton and similar soils: 55 percent
Cazenovia and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hilton

Setting

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

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 17 inches: loam
Bt/E - 17 to 24 inches: gravelly loam
Bt - 24 to 36 inches: gravelly loam
C1 - 36 to 54 inches: gravelly loam
C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.1 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 high (0.00 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 7.7 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

Description of Cazenovia

Setting

Landform: Till plains, reworked lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till that contains limestone with an admixture of reddish lake-laid clays or reddish clay shale

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 27 inches: clay loam
H3 - 27 to 62 inches: gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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 36 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
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Appleton

Percent of map unit: 3 percent

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

Ontario

Percent of map unit: 3 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

Bombay

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ly—Lyons soils, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2spjy
Elevation: 250 to 1,900 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

Lyons and similar soils: 75 percent
Lyons, frequently ponded, and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyons

Setting

Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Calcareous loamy lodgment till derived from limestone and shale

Typical profile

Ap - 0 to 10 inches: silt loam
Bg1 - 10 to 19 inches: silt loam
Bg2 - 19 to 25 inches: silty clay loam
BCg - 25 to 34 inches: gravelly silt loam
C - 34 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
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: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F101XY014NY - Wet Till Depression
Hydric soil rating: Yes

Description of Lyons, Frequently Ponded

Setting

Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Calcareous loamy lodgment till derived from limestone and shale

Typical profile

Ap - 0 to 10 inches: mucky silt loam
Bg1 - 10 to 19 inches: silt loam
Bg2 - 19 to 25 inches: silty clay loam
BCg - 25 to 34 inches: gravelly silt loam
C - 34 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained
Runoff class: Negligible
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: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F101XY014NY - Wet Till Depression
Hydric soil rating: Yes

Minor Components

Canandaigua

Percent of map unit: 3 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

Appleton

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

Kendaia

Percent of map unit: 2 percent
Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Ilion

Percent of map unit: 1 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

Palms, undrained

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

OdA—Odessa silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2wrd8
Elevation: 260 to 1,540 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: 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): 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

Lakemont

Percent of map unit: 5 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

Schoharie

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

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

OnC—Ontario loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w3px
Elevation: 250 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: Farmland of statewide importance

Map Unit Composition

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

Description of Ontario

Setting

Landform: Till plains, ridges, drumlins
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: loam
E - 8 to 14 inches: loam
Bt/E - 14 to 21 inches: loam
Bt - 21 to 39 inches: gravelly loam
C1 - 39 to 48 inches: gravelly loam
C2 - 48 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 7.8 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

Honeoye
Percent of map unit: 5 percent
Landform: Till plains, ridges, drumlins
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

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

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

OoB—Ontario loam, 3 to 8 percent slopes, stony

Map Unit Setting
National map unit symbol: 2w3pv
Elevation: 570 to 1,000 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

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

Description of Ontario, Stony

Setting

Landform: Till plains, ridges, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): 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: loam
E - 8 to 14 inches: loam
Bt/E - 14 to 21 inches: loam
Bt - 21 to 39 inches: gravelly loam
C1 - 39 to 48 inches: gravelly loam
C2 - 48 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
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 7.8 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

Honeoye

Percent of map unit: 5 percent
Landform: Till plains, ridges, 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

Hilton

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

Cazenovia

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

Soil Information for All Uses

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.

Available Water Storage

Available water storage (AWS) is the total volume of water (in centimeters) that should be available to plants when the soil, inclusive of rock fragments, is at field capacity. It is commonly estimated as the amount of water held between field capacity and the wilting point, with corrections for salinity, rock fragments, and rooting depth. AWS is reported as a single value (in centimeters) of water for the specified depth of the soil. AWS is calculated as the available water capacity times the thickness of each soil horizon to a specified depth.

For each soil layer, available water capacity, used in the computation of AWS, is 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 the derivation of AWS, only the representative value for available water capacity is used.

The available water storage for each map unit component is computed as described above and then aggregated to a single value for the map unit by the process described below.

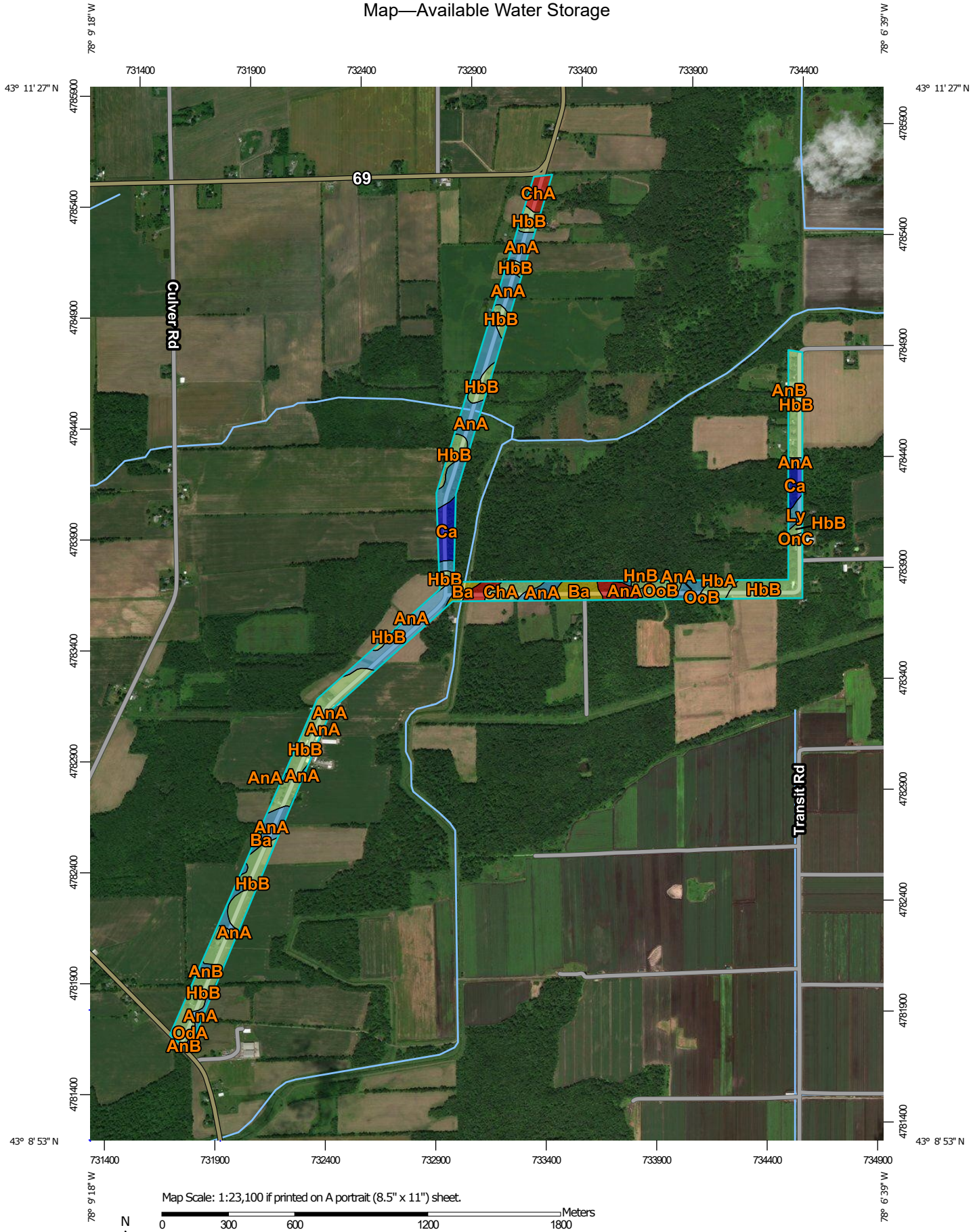
A map unit typically consists of one or more "components." A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being

aggregated (e.g., available water storage), the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the process is to derive a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for the map units can be generated. Aggregation is needed because map units rather than components are delineated on the soil maps.

The composition of each component in a map unit is recorded as a percentage. A composition of 60 indicates that the component typically makes up approximately 60 percent of the map unit.

For the available water storage, when a weighted average of all component values is computed, percent composition is the weighting factor.

Map—Available Water Storage



MAP LEGEND

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

Soils

Soil Rating Polygons
- <= 21.38
- > 21.38 and <= 22.72
- > 22.72 and <= 25.36
- > 25.36 and <= 28.10
- > 28.10 and <= 30.63
- Not rated or not available

Soil Rating Lines
- <= 21.38
- > 21.38 and <= 22.72
- > 22.72 and <= 25.36
- > 25.36 and <= 28.10
- > 28.10 and <= 30.63
- Not rated or not available

Soil Rating Points
- <= 21.38
- > 21.38 and <= 22.72
- > 22.72 and <= 25.36
- > 25.36 and <= 28.10
- > 28.10 and <= 30.63
- 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: Orleans County, New York
Survey Area Data: Version 20, Sep 6, 2023

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

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.

Table—Available Water Storage

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AnA	Appleton silt loam, 0 to 3 percent slopes	27.24	43.5	30.9%
AnB	Appleton silt loam, 3 to 8 percent slopes	26.89	1.2	0.9%
Ba	Barre silt loam	22.72	5.8	4.1%
Ca	Canandaigua soils	30.40	7.6	5.4%
ChA	Churchville silt loam, 0 to 2 percent slopes	21.38	8.4	6.0%
HbA	Hilton loam, 0 to 3 percent slopes	24.84	2.4	1.7%
HbB	Hilton loam, 3 to 8 percent slopes	24.84	61.3	43.6%
HnB	Hilton-Cazenovia complex, 0 to 8 percent slopes, stony	24.40	4.4	3.1%
Ly	Lyons soils, 0 to 3 percent slopes	28.10	1.5	1.1%
OdA	Odessa silt loam, 0 to 3 percent slopes	30.63	0.4	0.3%
OnC	Ontario loam, 8 to 15 percent slopes	25.36	0.5	0.4%
OoB	Ontario loam, 3 to 8 percent slopes, stony	25.36	3.6	2.6%
Totals for Area of Interest			**140.8**	**100.0%**

Rating Options—Available Water Storage

Units of Measure: centimeters

Aggregation Method: Weighted Average

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Sum)

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

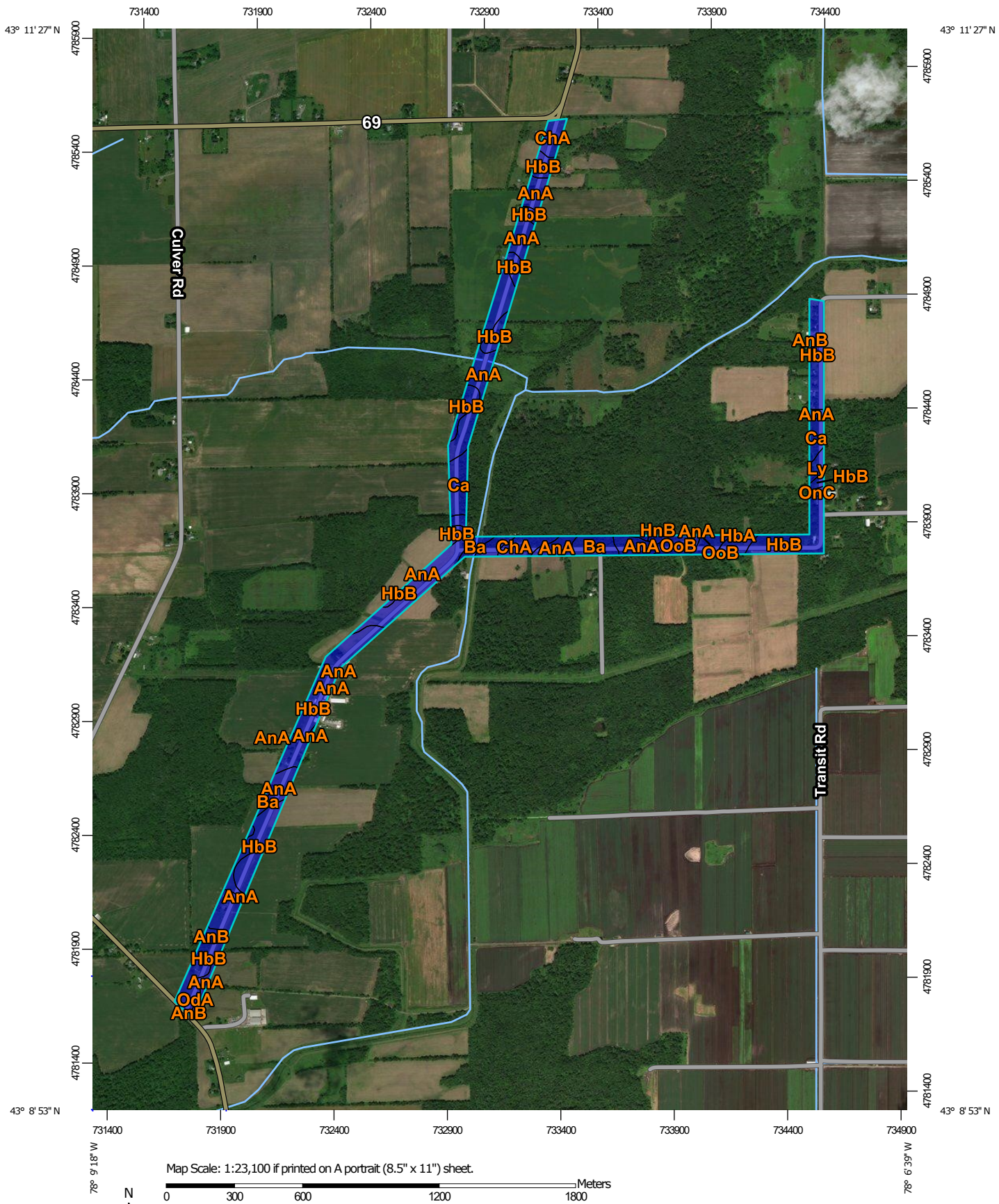
include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

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.


78° 9' 18" W
78° 6' 39" W
43° 11' 27" N
43° 8' 53" N
731400
731900
732400
732900
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733900
734400
734900
4785900
4785400
4784900
4784400
4783900
4783400
4782900
4782400
4781900
4781400
69
Culver Rd
Transit Rd
ChA
HbB
AnA
HbB
AnA
HbB
HbB
AnA
HbB
Ca
HbB
Ba ChA AnA Ba
HnB AnA
AnA OoB
HbA
OoB
HbB
AnB
HbB
AnA
Ca
Ly
HbB
OnC
AnA
HbB
AnA
AnA
HbB
AnA AnA
AnA
Ba
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AnA
AnB
HbB
AnA
OdA
AnB
Map Scale: 1:23,100 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 300 600 1200 1800
Feet
0 1000 2000 4000 6000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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)

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Survey Area Data: Version 20, Sep 6, 2023

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Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

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Table—Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AnA	Appleton silt loam, 0 to 3 percent slopes	>200	43.5	30.9%
AnB	Appleton silt loam, 3 to 8 percent slopes	>200	1.2	0.9%
Ba	Barre silt loam	>200	5.8	4.1%
Ca	Canandaigua soils	>200	7.6	5.4%
ChA	Churchville silt loam, 0 to 2 percent slopes	>200	8.4	6.0%
HbA	Hilton loam, 0 to 3 percent slopes	>200	2.4	1.7%
HbB	Hilton loam, 3 to 8 percent slopes	>200	61.3	43.6%
HnB	Hilton-Cazenovia complex, 0 to 8 percent slopes, stony	>200	4.4	3.1%
Ly	Lyons soils, 0 to 3 percent slopes	>200	1.5	1.1%
OdA	Odessa silt loam, 0 to 3 percent slopes	>200	0.4	0.3%
OnC	Ontario loam, 8 to 15 percent slopes	>200	0.5	0.4%
OoB	Ontario loam, 3 to 8 percent slopes, stony	>200	3.6	2.6%
Totals for Area of Interest			**140.8**	**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

Depth to Bedrock

The term bedrock in soil survey refers to a continuous root and water restrictive layer of rock that occurs within the soil profile.

There are many types of restrictions that can occur within the soil profile but this theme only includes the three restrictions that use the term bedrock. These are:

1) Lithic Bedrock

2) Paralithic Bedrock

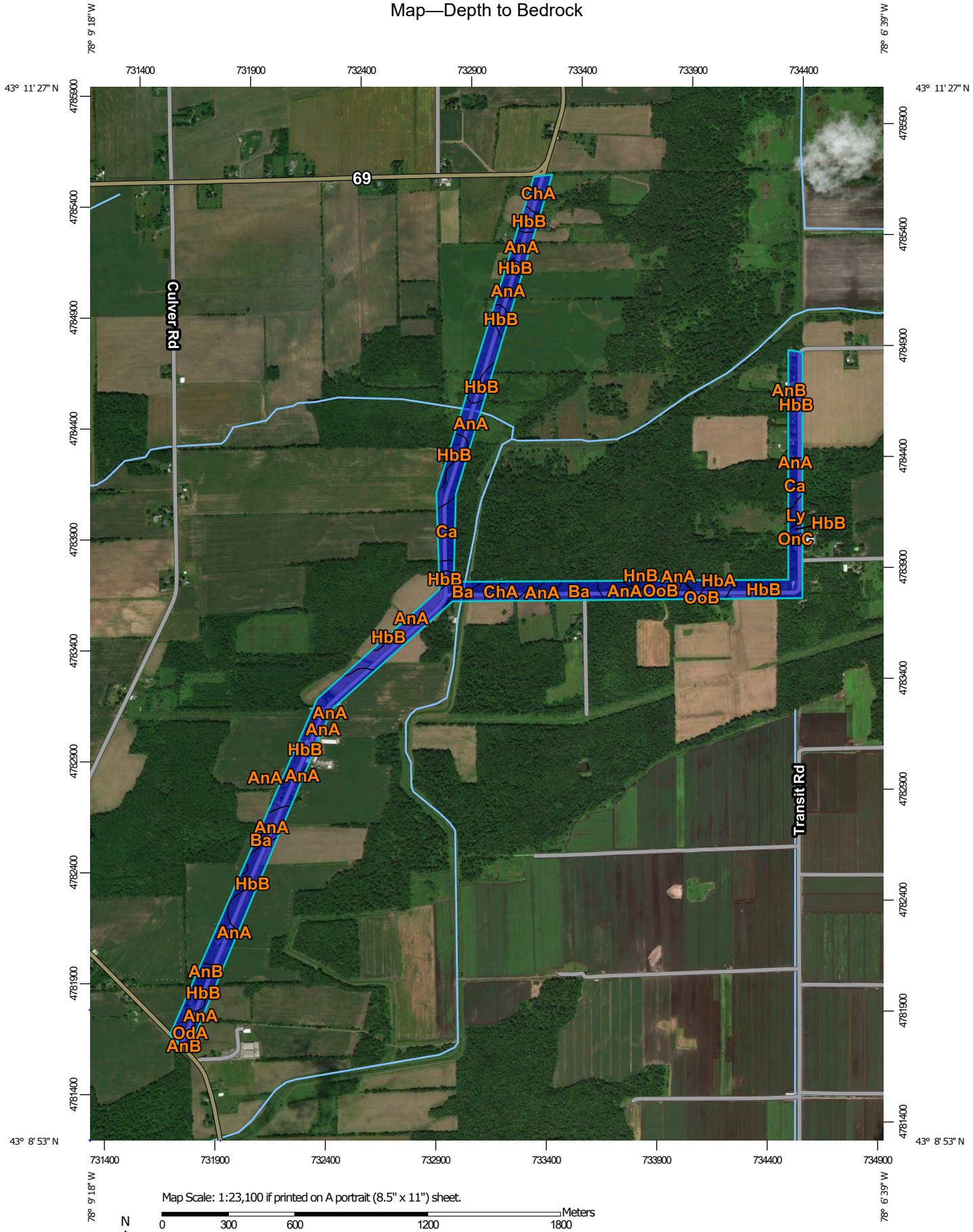
3) Densic Bedrock

Lithic bedrock and paralithic bedrock are comprised of igneous, metamorphic, and sedimentary rocks, which are coherent and consolidated into rock through pressure, heat, cementation, or fusion. Lithic bedrock represents the hardest type of bedrock, with a hardness of strongly coherent to indurated. Paralithic bedrock has a hardness of extremely weakly coherent to moderately coherent. It can occur as a thin layer of weathered bedrock above harder lithic bedrock. Paralithic bedrock can also be much thicker, extending well below the soil profile.

Densic bedrock represents a unique kind of bedrock recognized within the soil survey. It is non-coherent and consolidated, dense root restrictive material, formed by pressure, heat, and dewatering of earth materials or sediments. Densic bedrock differs from densic materials, which formed under the compaction of glaciers, mudflows, and or human-caused compaction.

If more than one type of bedrock is described for an individual soil type, the depth to the shallowest one is given. If no bedrock is described in a map unit, it is represented by the "greater than 200" depth class.

Depth to bedrock 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.


78° 9' 18" W
78° 6' 39" W
43° 11' 27" N
43° 8' 53" N
731400
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734400
734900
4785900
4785400
4784900
4784400
4783900
4783400
4782900
4782400
4781900
4781400
69
Culver Rd
Transit Rd
ChA
HbB
AnA
HbB
AnA
HbB
HbB
AnA
HbB
Ca
HbB
Ba ChA AnA Ba AnA OoB
HnB AnA
HbA
OoB
HbB
AnB
HbB
AnA
Ca
Ly
HbB
OnC
AnA
HbB
AnA
AnA
HbB
AnA AnA
AnA
Ba
HbB
AnA
AnB
HbB
AnA
OdA
AnB
Map Scale: 1:23,100 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 300 600 1200 1800
Feet
0 1000 2000 4000 6000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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)

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Table—Depth to Bedrock

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AnA	Appleton silt loam, 0 to 3 percent slopes	>200	43.5	30.9%
AnB	Appleton silt loam, 3 to 8 percent slopes	>200	1.2	0.9%
Ba	Barre silt loam	>200	5.8	4.1%
Ca	Canandaigua soils	>200	7.6	5.4%
ChA	Churchville silt loam, 0 to 2 percent slopes	>200	8.4	6.0%
HbA	Hilton loam, 0 to 3 percent slopes	>200	2.4	1.7%
HbB	Hilton loam, 3 to 8 percent slopes	>200	61.3	43.6%
HnB	Hilton-Cazenovia complex, 0 to 8 percent slopes, stony	>200	4.4	3.1%
Ly	Lyons soils, 0 to 3 percent slopes	>200	1.5	1.1%
OdA	Odessa silt loam, 0 to 3 percent slopes	>200	0.4	0.3%
OnC	Ontario loam, 8 to 15 percent slopes	>200	0.5	0.4%
OoB	Ontario loam, 3 to 8 percent slopes, stony	>200	3.6	2.6%
Totals for Area of Interest			**140.8**	**100.0%**

Rating Options—Depth to Bedrock

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group

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)

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Soil Survey Area: Orleans County, New York
Survey Area Data: Version 20, Sep 6, 2023

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Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnA	Appleton silt loam, 0 to 3 percent slopes	B/D	43.5	30.9%
AnB	Appleton silt loam, 3 to 8 percent slopes	B/D	1.2	0.9%
Ba	Barre silt loam	C/D	5.8	4.1%
Ca	Canandaigua soils	C/D	7.6	5.4%
ChA	Churchville silt loam, 0 to 2 percent slopes	C/D	8.4	6.0%
HbA	Hilton loam, 0 to 3 percent slopes	B/D	2.4	1.7%
HbB	Hilton loam, 3 to 8 percent slopes	B/D	61.3	43.6%
HnB	Hilton-Cazenovia complex, 0 to 8 percent slopes, stony	B/D	4.4	3.1%
Ly	Lyons soils, 0 to 3 percent slopes	C/D	1.5	1.1%
OdA	Odessa silt loam, 0 to 3 percent slopes	D	0.4	0.3%
OnC	Ontario loam, 8 to 15 percent slopes	B	0.5	0.4%
OoB	Ontario loam, 3 to 8 percent slopes, stony	B	3.6	2.6%
Totals for Area of Interest			**140.8**	**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.

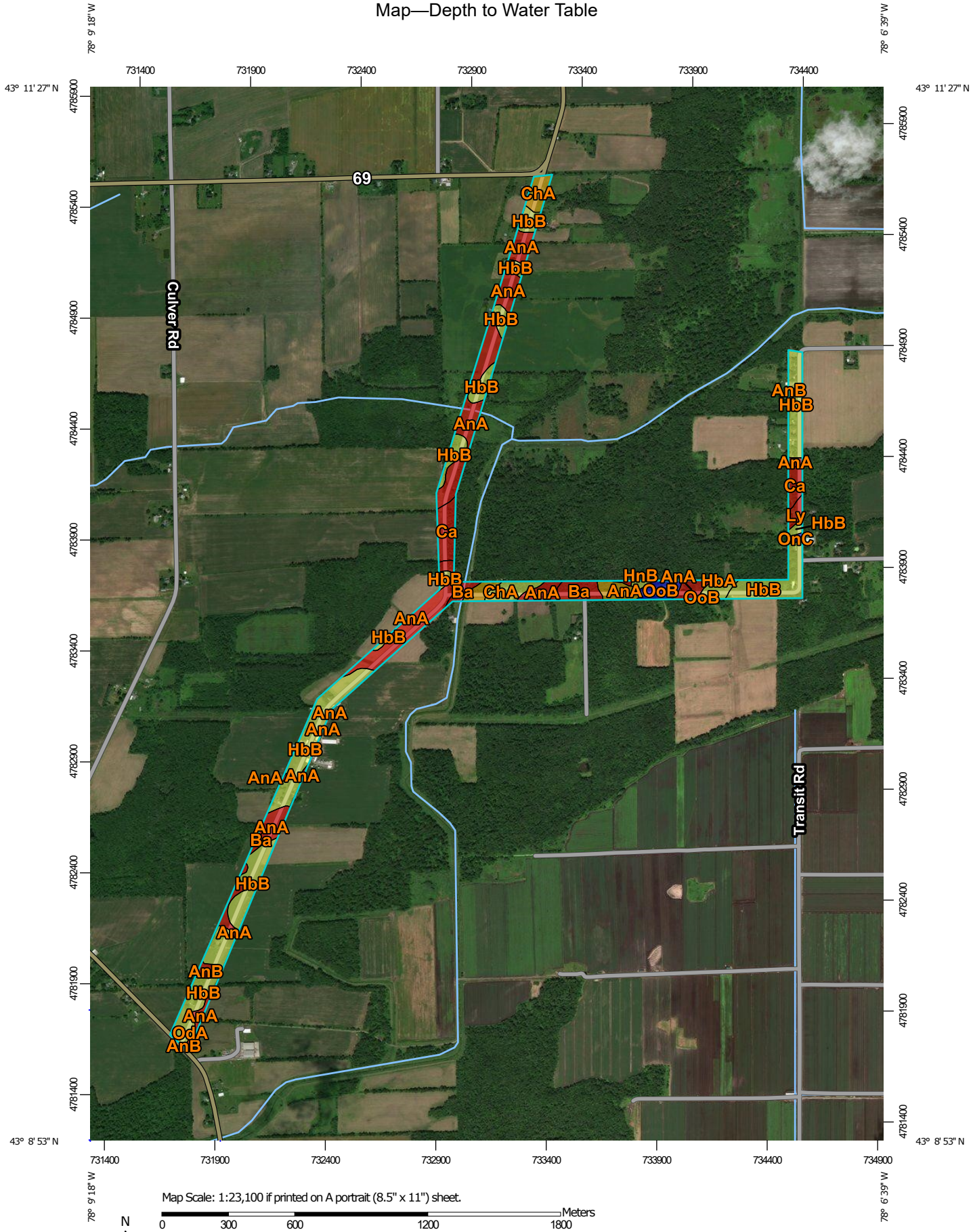
Depth to Water Table

"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—Depth to Water Table



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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Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
AnA	Appleton silt loam, 0 to 3 percent slopes	20	43.5	30.9%
AnB	Appleton silt loam, 3 to 8 percent slopes	20	1.2	0.9%
Ba	Barre silt loam	20	5.8	4.1%
Ca	Canandaigua soils	0	7.6	5.4%
ChA	Churchville silt loam, 0 to 2 percent slopes	38	8.4	6.0%
HbA	Hilton loam, 0 to 3 percent slopes	54	2.4	1.7%
HbB	Hilton loam, 3 to 8 percent slopes	54	61.3	43.6%
HnB	Hilton-Cazenovia complex, 0 to 8 percent slopes, stony	54	4.4	3.1%
Ly	Lyons soils, 0 to 3 percent slopes	0	1.5	1.1%
OdA	Odessa silt loam, 0 to 3 percent slopes	20	0.4	0.3%
OnC	Ontario loam, 8 to 15 percent slopes	>200	0.5	0.4%
OoB	Ontario loam, 3 to 8 percent slopes, stony	>200	3.6	2.6%
Totals for Area of Interest			**140.8**	**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

References

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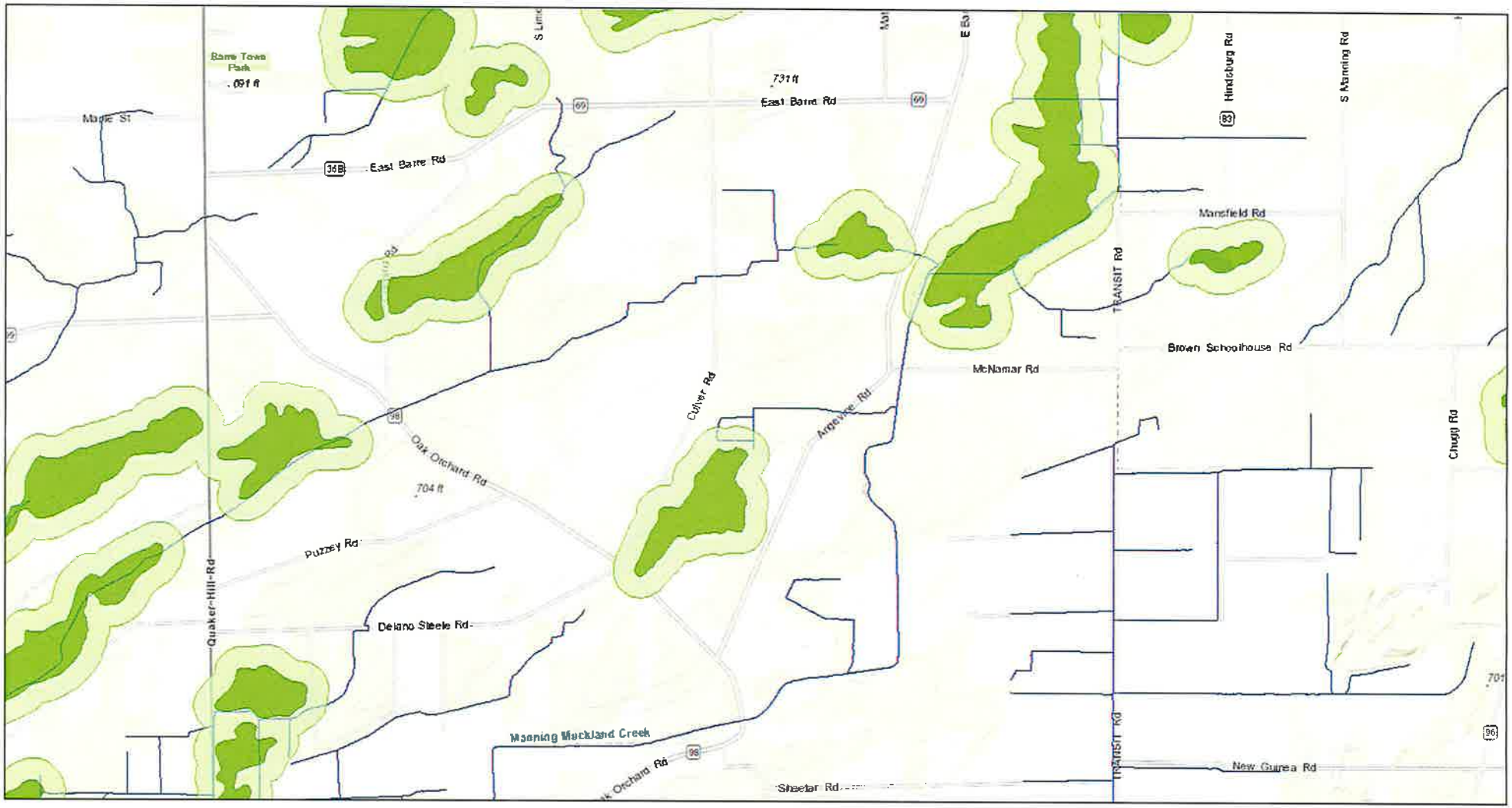
APPENDIX C

WETLAND MAPS

Barre Water District No. 10 - NYSDEC Wetland Map



June 12, 2018

1:36,112

0 0.45 0.9 1.8 mi

0 0.5 1 2 km

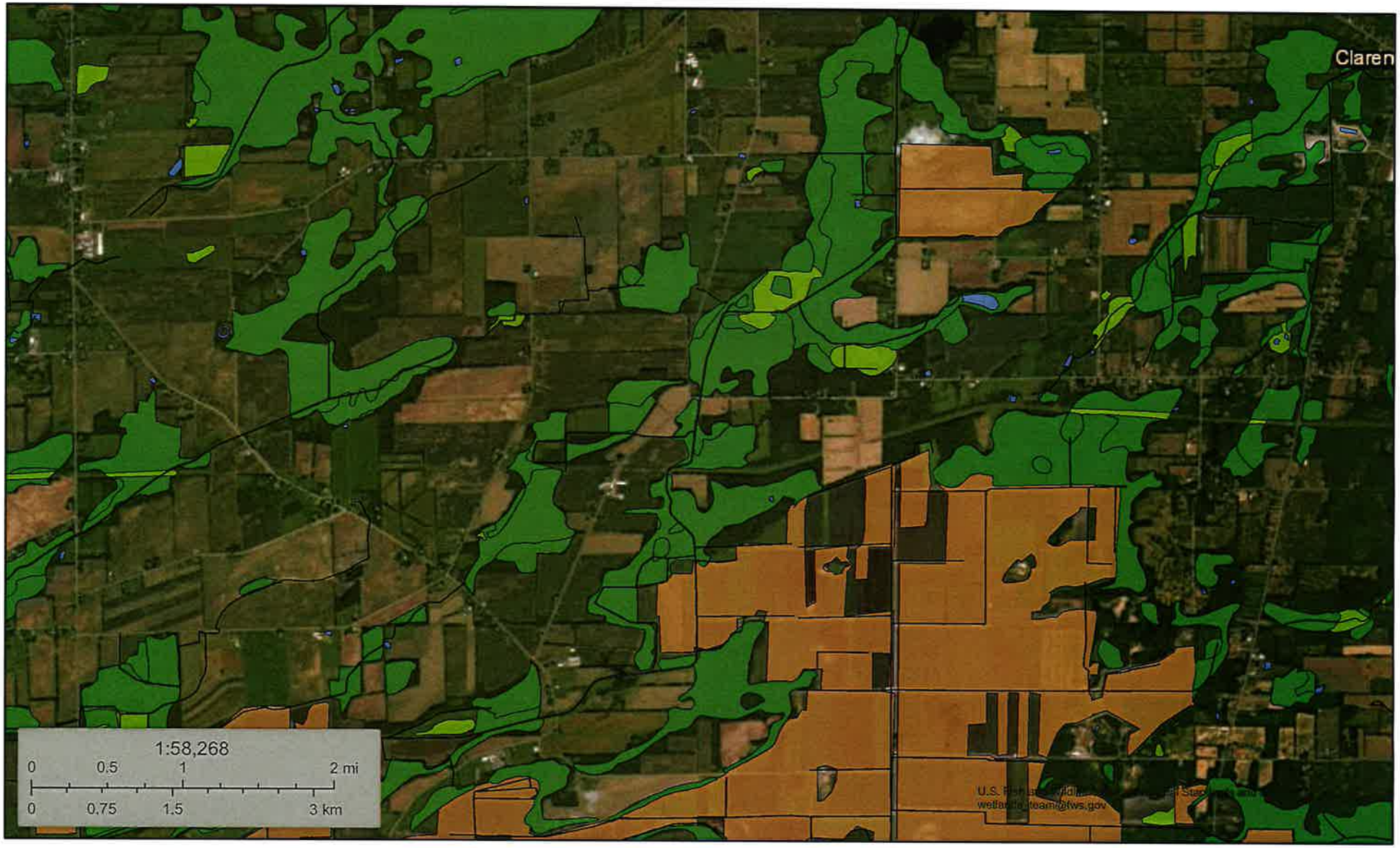
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

U.S. Fish and Wildlife Service

National Wetlands Inventory

Barre Water District No. 10



June 12, 2018

Wetlands

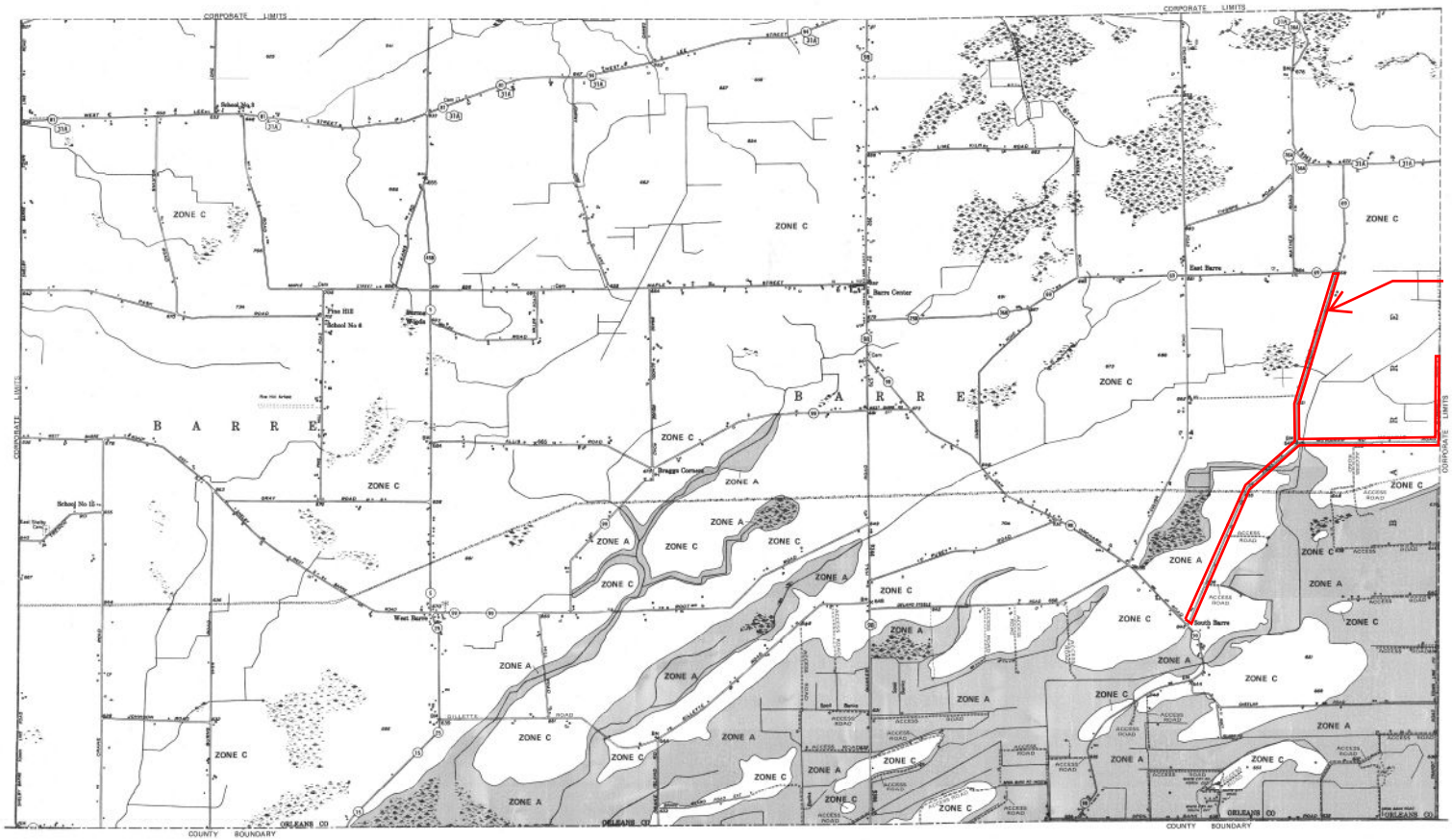
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

APPENDIX D

FEMA FIRMS



PROJECT LOCATION

KEY TO MAP

100-Year Flood Boundary

ZONE A

ZONE B

100-Year Flood Boundary

River Mile M1.5

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood. (Heavy shading)
B	Areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action).

NOTES TO USER

Certain areas not in the special flood hazard area (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

INITIAL IDENTIFICATION:
OCTOBER 29, 1976
FLOOD HAZARD BOUNDARY MAP REVISIONS:
DECEMBER 5, 1978

FLOOD INSURANCE RATE MAP EFFECTIVE:
OCTOBER 15, 1981
FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
BARRE,
NEW YORK
ORLEANS COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
361253 0001 B

EFFECTIVE DATE:
OCTOBER 15, 1981

federal emergency management agency
federal insurance administration

APPENDIX E

LIST OF PARCELS IN WATER DISTRICT

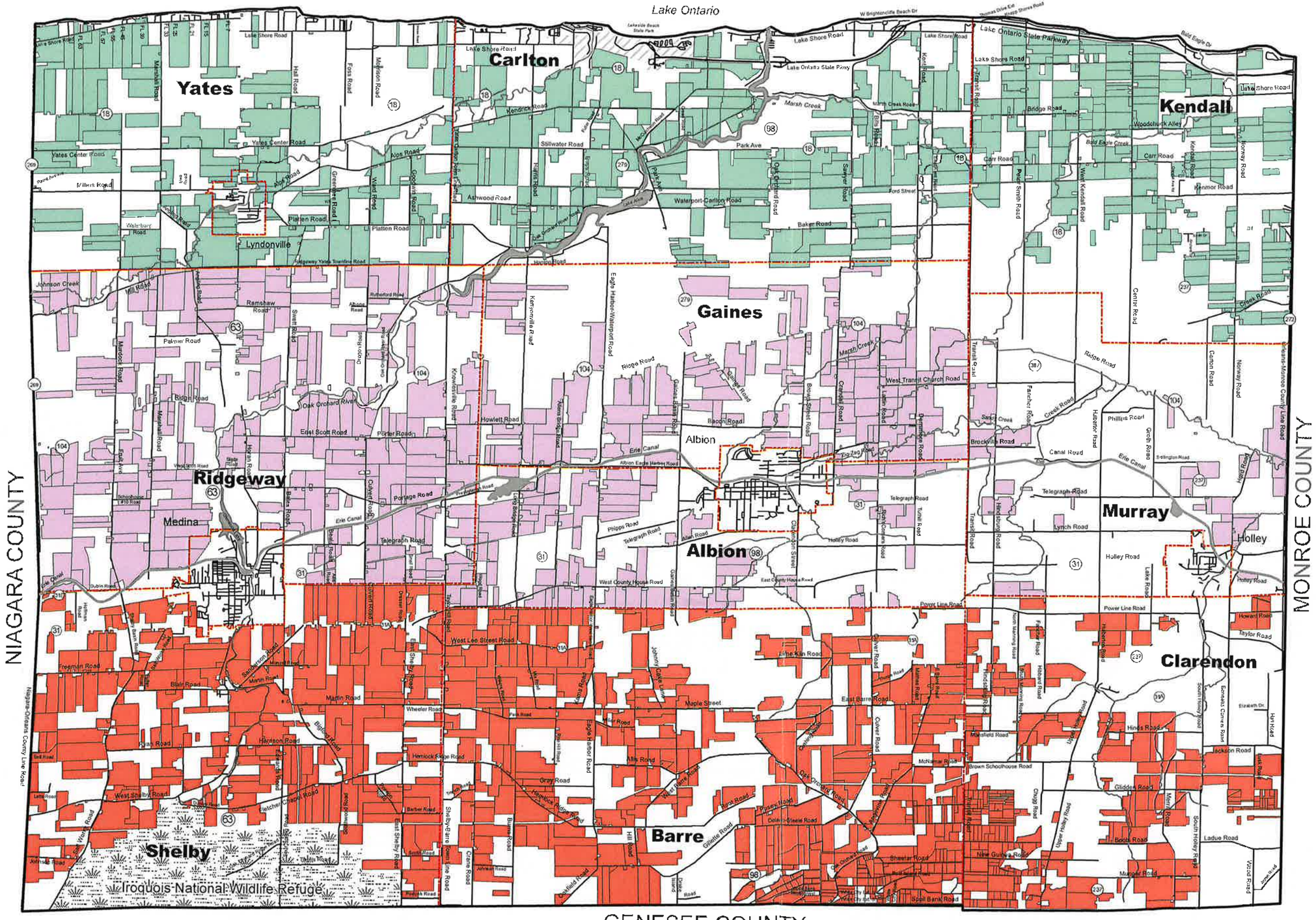
Tax Map #	Name	Location	Mailing 1	City State Zip	Property Class	Unit	AV
118.-1-19	Triple G. Farms, Inc.	Angevine Rd	5407 Oak Orchard Rd	Elba, NY 14058	130	0.00	437,500
118-1-13	Jeffrey / Sharon Hillabush	5334 Angevine Rd	5334 Angevine Rd	Albion, NY 14411	210	1.00	65,900
118-1-14.2	Angevine Farms	Angevine Rd	5140 Angevine Rd	Albion, NY 14411	105	0.00	365,600
118-1-14.1	Brandon S. Gurnsey	5290 Angevine Rd	5290 Angevine Rd	Albion, NY 14411	210	1.00	70,500
107-1-56	Michael J. Dillion	5188 Angevine Rd	5188 Angevine Rd	Albion, NY 14411	240	1.00	98,300
107-1-55	James / Jean Peglow	5170 Angevine Rd	5170 Angevine Rd	Albion, NY 14411	210	1.00	93,000
107-1-54	Jon / Melissa Peglow	5185 Angevine Rd	5185 Angevine Rd	Albion, NY 14411	210	1.00	84,000
107-1-53	Jon / Melissa / Jean / James Peglow	5140 Angevine Rd	5185 Angevine Rd	Albion, NY 14411	112	1.00	349,400
107-1-72	National Grid	Angevine Rd	300 Erie Blvd W	Syracuse, NY 13202	380	0.00	53,500
107-1-51.2	Florence S. Surdi	Angevine Rd	13919 Allen Road	Albion, NY 14411	322	0.50	24,300
107-1-51.1	Jon / James Peglow	Angevine Rd	5185 Angevine Rd	Albion, NY 14411	105	0.00	165,400
107-1-52	James E. Robinson	5114 Angevine Rd	7610 Bank St Rd	Elba, NY 14058	210	1.00	33,900
107-1-43.12	Sheila M. Allport	15250 Mcnamar Rd	15250 Mcnamar Rd	Holley, NY 14470	210	1.00	190,000
107-1-45	Paul / Catherine Jakaub	5005 Angevine Rd	5005 Angevine Rd	Albion, NY 14411	210	1.00	81,800
107-1-46	Janet Engle (Life Use) / Deborah Mar	4997 Angevine Rd	250 North Main St	Albion, NY 14411	210	1.00	78,800
107-1-47	Stacy / Jerome Scharlav	Mcnamar Rd	8 Bartz Dr	Alexander, NY 14005	323	0.50	40,900
107-1-50	Panek Family LLC	Angevine Rd	13420 West Countyhouse Rd	Albion, NY 14411	105	0.00	388,500
107-1-49.2	Alvin Smith	Angevine Rd	12524 Barber Rd	Medina NY 14103	105	0.00	239,100
107-1-48	Terry / Sanora Jurs	4892 Angevine Rd	4892 Angevine Rd	Albion, NY 14411	210	1.00	77,000
107-1-28	Mark Waite	Angevine Rd	7911 Lewiston Rd	Batavia, NY 14021	323	0.50	33,400
107-1-44	Germain / Kristine Welles	15263 Mcnamar Rd	15263 Mcnamar Rd	Holley, NY 14470	210	1.00	90,400
107-1-43.11	Jeffery / Stacey Braley	Mcnamar Rd	3379 Kenyonville Rd	Albion, NY 14411	105	0.00	116,400
107-1-43.2	John / Jean Swabb (Life Use) / Jule N	15300 Mcnamar Rd	15300 Mcnamar Rd	Holley, NY 14470	210	1.00	86,100
107-1-42.1	Nicholas / Paul Calarco	Mcnamar Rd	PO Box 85	Oakfield, NY 14125	323	0.50	30,200
107-1-36	Jon / Melissa / Jean / James Peglow	Mcnamar Rd	5185 Angevine Rd	Albion, NY 14411	105	0.00	170,400
107-1-35.1	Donald / Elizabeth Ann Sparks	Mcnamar Rd	4991 Transit Rd	Holley, NY 14470	310	0.50	10,000
107-1-34.2	Sunrise Bees, Inc.	15523 Mcnamar Rd	PO Box 220 7599 Oak Orchard	Elba, NY 14058	312	0.50	7,900
107-1-34.1	Sunrise Bees, Inc.	Mcnamar Rd	PO Box 220 7599 Oak Orchard	Elba, NY 14058	323	0.50	13,100
107-1-41	David M. Press	Mcnamar Rd	4600 Hibbard Rd	Holley, NY 14470	322	0.50	32,300
107-1-37	Roger Kingdollar Jr.	15425 Mcnamar Rd	15425 Mcnamar Rd	Holley, NY 14470	210	1.00	47,500
107-1-27	Raymond E. Cook Jr.	4833 Angevine Rd	4833 Angevine Rd	Albion, NY 14411	240	1.00	100,000
107-1-20.2	Michael / Andrew Vanlieshout	Angevine Rd	4759 Oak Orchard Rd	Albion, NY 14411	105	0.00	193,500
107-1-20.1	Richard Decarlo / Sabrina Pearce	4778 Angevine Rd	4778 Angevine Rd	Albion, NY 14411	210	1.00	130,300
107-1-19.2	Michael / Andrew Vanlieshout	Angevine Rd	4759 Oak Orchard Rd	Albion, NY 14411	105	0.00	152,100
107-1-19.1	Ashley S. Neri	4742 Angevine Rd	4742 Angevine Rd	Albion, NY 14411	210	1.00	134,000
107-1-14	Randall Powley	4722 Angevine Rd	4722 Angevine Rd	Holley, NY 14470	210	1.00	103,200
107-1-16.1	Steven / Patricia Thiel	4705 Angevine Rd	4705 Angevine Rd	Albion, NY 14411	240	1.00	127,000
107-1-16.2	Alvis / Bonny Clay	4701 Angevine Rd	4701 Angevine Rd	Albion, NY 14411	210	0.00	82,000
107-1-15	Lynoa / James Bullivant	Angevine Rd	4712 Angevine Rd	Holley, NY 14470	311	0.00	12,000
107-1-38	Peter / Kirk Mathes	15423 Mcnamar Rd	15130 East Barre Rd	Albion, NY 14411	270	1.00	38,000
107-1-39	William / Arlene Hicks	15417 Mcnamar Rd	15417 Mcnamar Rd	Holley, NY 14470	210	1.00	40,400
107-1-40	John / Roger Kingdollar	15325 Mcnamar Rd	15325 Mcnamar Rd	Holley, NY 14470	270	1.00	40,700

Tax Map #	Name	Location	Mailing 1	City State Zip	Property Class	Unit	AV
107-1-33.1	Jennifer T. Citriniti	4958 Transit Rd	4958 Transit Rd	Holley, NY 14470	210	1.00	103,000
107-1-33.2	David M. Press	Transit Rd	4600 Hibbard Rd	Holley, NY 14470	322	0.50	17,300
107-1-32.21	Allen L. Neal	Transit Rd	120 Woodside Ct.	Holley, NY 14470	311	0.50	6,000
107-1-32.22	David Engle	4890 Transit Rd	6101 Tower Hill Rd	Byron, NY 14422	210	1.00	20,000
107-1-32.13	RHE Investments, LLC.	4880 Transit Rd	4870 Transit Rd	Holley, NY 14470	270	1.00	15,000
107-1-32.12	Leon / Pamela Baxter	4886 Transit Rd	4886 Transit Rd	Holley, NY 14470	210	1.00	71,000
107-1-31	Jack Nelson Estate & Richard Edman	4870 Transit Rd	4870 Transit Rd	Holley, NY 14470	210	1.00	19,100
107-1-30	Micah / Brenda Eldridge	4860 Transit Rd	4641 Hall Rd	Holley, NY 14470	210	0.50	6,000
107-1-29	Roger W. Jaczynsky	Transit Rd	PO Box 246	Byron, NY 14422	312	0.50	18,700
107-1-26	Jason Kozlowski	Transit Rd	95 Selye Terrace	Rochester, NY 14613	323	0.50	55,700
107-1-25	Rosemary P. Jaczynski	4836 Transit Rd	4836 Transit Rd	Holley, NY 14470	210	1.00	84,500
107-1-24	Geoffrey / Joan Whittier	4830 Transit Rd	12900 Roosevelt Hwy	Waterport, NY 14571	210	1.00	52,900
107-1-23	David J. Engle	4822 Transit Rd	6101 Tower Hill Rd	Byron, NY 14422	210	1.00	25,000
107-1-22	Jeffrey T. Coniglio	4810 Transit Rd	59 Rochester St	Bergen, NY 14416	311	0.50	4,700
Total Assesed Value							**5,227,200**
Total Number of Parcels in the District						**57**	
Total Number of Residences to be Served						**30.00**	
Total Chargeable Units (EDU's)						**37.00**	

APPENDIX F

ORLEANS COUNTY AGRICULTURAL DISTRICT MAPS

Orleans County Agricultural Districts through 2014



Prepared 9-8-15
by Orleans County
Department of
Planning and Development

APPENDIX G

CAPACITY DEVELOPMENT PROGRAM FORM

CAPACITY DEVELOPMENT PROGRAM

TECHNICAL, MANAGERIAL, AND FINANCIAL EVALUATION CRITERIA
FOR: COMMUNITY PUBLIC WATER SYSTEMS

SYSTEM NAME: Town of Barre Water District No. 10

COUNTY: Orleans **PWSID #:** _____

COMPLETED BY: _____ **DATE:** _____

Technical Capacity

A. System Infrastructure

1. Does the system have as-built plans, drawings, or maps of its facilities including source, treatment, storage, and distribution?

   ☐ Yes ☐ No ☐ Not Applicable

   If the system lacks certain plans, please specify:

   _____

   _____

2. Does the system have exact location measurements of all main valves and service shut-offs?

   ☐ Yes ☐ No ☐ Not Applicable

3. Can the system's pumping, storage and distribution facilities meet current normal and peak demands and required distribution pressures?

   ☐ Yes ☐ No ☐ Not Applicable

4. Does the system have a water conservation plan?

   ☐ Yes ☐ No ☐ Not Applicable

5. Are all customers on the water system metered?

   ☐ Yes ☐ No ☐ Not Applicable

6. Is the system equipped with "master" meters that measure the amount of water the system produces or purchases for each source of water?

   ☐ Yes ☐ No ☐ Not Applicable

B. Source Water Evaluation

1. Does the system have a copy of its Source Water Assessment?

☐ Yes ☐ No ☐ Not Applicable

2. Has a yield analysis been done for the system's source?

☐ Yes ☐ No ☐ Not Applicable

3. Does the system have a description of the existing source-pumping capacity and the system's raw and finished water storage capacity?

☐ Yes ☐ No ☐ Not Applicable

4. For groundwater systems, does your system have a wellhead protection program in place?

☐ Yes ☐ No ☐ Not Applicable

C. Technical Knowledge

1. Has an evaluation of the water system facilities been conducted with respect to its ability to reliably meet current and proposed State and Federal drinking water regulations?

☐ Yes ☐ No ☐ Not Applicable

If system can't meet regulations, please specify:

_____

_____

2. Does the system have monthly water production records or treatment records that show daily and monthly water production for each source used by the system?

☐ Yes ☐ No ☐ Not Applicable

3. Has an evaluation been conducted to document the condition and remaining service life of existing facilities?

☐ Yes ☐ No ☐ Not Applicable

4. Has the system been cited within the past two years for failing to sample and report test results?

☐ Yes ☐ No ☐ Not Applicable

5. Has the system been cited within the past two years for operating deficiencies as a result of a sanitary survey or other inspection conducted by the DOH?

☐ Yes ☐ No ☐ Not Applicable

6. If you answered *"Yes"* to Questions 4 or 5, has corrective action been taken to correct all deficiencies?

☐ Yes ☐ No ☐ Not Applicable

D. Certified Operators

1. Does the water system have a certified water operator(s) and designated an operator in responsible charge?

☐ Yes ☐ No

2. If the water system does not have a state-certified water treatment operator, or lacks the necessary number of operators to safely and reliably operate the system, does the system have a plan to acquire the services of a (additional) state-certified operator?

☐ Yes ☐ No ☐ Not Applicable

Managerial Capacity

A. Staffing and Organization

1. What type of training/continuing education did system personnel attend within the last two years (please specify)?

_____

_____

_____

2. Who is responsible for policy and operational decisions for the water system *(name and title)*?

_____

3. Who is responsible for ensuring compliance with state regulatory requirements *(name and title)*?

_____

4. Who is responsible for approving expenditures *(name and title)*?

_____

5. *For systems that contract for system operation or management*: Does the system have a valid (signed) contract that summarizes the duties and responsibilities the contractor must provide to the system?

☐ Yes ☐ No ☐ Not Applicable

B. Ownership

1. *If the system is under temporary ownership*, has a future owner been found for the water system?

   ☐ Yes ☐ No ☐ Not Applicable

   If "*Yes*", who will the future owner be?

   _____

2. *For systems that use, but do not own, land or facilities that are essential to water system operation:* Is there a valid long-term contract (i.e., lease) between the water system and the owner of the land or facilities essential to the operation of the system?

   ☐ Yes ☐ No ☐ Not Applicable

3. *For systems with a single proprietor:* Does the system have a contingency plan for continuing system operation in the event the owner becomes incapable of carrying out his/her responsibilities?

   ☐ Yes ☐ No ☐ Not Applicable

C. Consolidation/Restructuring

1. Has the system examined the feasibility of:
   a) Incorporating with an existing water system in the immediate proximity?

   ☐ Yes ☐ No ☐ Not Applicable

   b) Selling ownership to an existing water system?

   ☐ Yes ☐ No ☐ Not Applicable

   c) Contracting for the management or operation of the system with an existing system or satellite management/operations agency?

   ☐ Yes ☐ No ☐ Not Applicable

D. Emergency/Disaster Response Plans

1. Has the system developed an Emergency Response Plan?

   ☐ Yes ☐ No ☐ Not Applicable

2. Does the Emergency Response Plan:

   a) Designate responsible personnel in the event of an emergency?

   ☐ Yes ☐ No ☐ Not Applicable

b) Provide for emergency phone and radio capabilities?

☐ Yes ☐ No ☐ Not Applicable

c) Describe public and health department notification procedures?

☐ Yes ☐ No ☐ Not Applicable

3. Does the system have any emergency contract agreements under which it operates (e.g., emergency water interconnections and alternative sources)?

☐ Yes ☐ No ☐ Not Applicable

E. Water System Policies

1. Does the system have a *written* System Operations Manual or Policy?

☐ Yes ☐ No ☐ Not Applicable

F. Record Keeping

1. Does the system keep water utility records including: financial, regulatory, facility, operations and maintenance, data quality, Annual Water Quality Reports, and correspondence with the NYS Department of Health and/or local Health Departments (and where appropriate, the NYSPSC)?

☐ Yes ☐ No ☐ Not Applicable

Financial Capacity

A. Budget Projection – Revenues and Expenses

1. Does the system have a water budget?

☐ Yes ☐ No ☐ Not Applicable

2. Are the system's annual water revenues sufficient to cover the annual water expenses as well as anticipated capital improvements?

☐ Yes ☐ No ☐ Not Applicable

3. Are the system's water rates, when combined with other revenue sources, sufficient to cover all listed expenditures for the water system?

☐ Yes ☐ No ☐ Not Applicable

4. Does the system retain budget information for at least two years?

☐ Yes ☐ No ☐ Not Applicable

B. Reserves

1. Does the system have a reserve account (or funds within a reserve account) dedicated to:

   a) Financing the emergency replacement of critical facilities in the event of their failure?

   ☐ Yes ☐ No ☐ Not Applicable

   b) The maintenance of cash flow in the event of an unexpected funding shortfall?

   ☐ Yes ☐ No ☐ Not Applicable

2. If the system has a reserve account, how does it determine the amount to put into the account?

   ____ Fixed Amount_____Percentage of Revenues_____Percentage of Expenses

   ____Other (please specify) _____

3. If the system has a reserve account, what type(s) of reserve account(s) does it have?

   _____Operation and Maintenance_____Capital Projects_____Debt Service

   _____Other (please specify)_____

C. Capital Improvement Plan

1. How do you finance operation and maintenance costs (Check all that apply)?

   _____Rates collected from ratepayers _____Rental fees
   _____Other business revenue _____Personal capital
   _____Surcharges _____Reserve account
   _____Other (Please specify) _____

2. How did you finance your LAST major repair or improvement?

   _____Commercial bank loan ____Bonds
   _____ DWSRF ____Other State or federal loan/grant program
   _____Surcharge ____Personal Capital
   _____Reserve Account ____Revenue from other business
   _____Other (Please specify) _____

3. What options do you have for financing your NEXT major repair or improvement?

_____Commercial bank loan ____Bonds
_____DWSRF ____Other State or federal loan/grant program
_____Surcharge ____Personal Capital
_____Reserve Account ____Revenue from other business
_____Other (Please specify) _____

D. Water System Rates

1. Does the water system management review user fee, user charge, or rate system at least once every two years?

☐ Yes ☐ No ☐ Not Applicable

2. What is the frequency of billing (e.g., 12, 6, or 4 times per/year)?_____times/year

3. Where applicable, what are the system's water rates?
_____

4. What are rates based on?

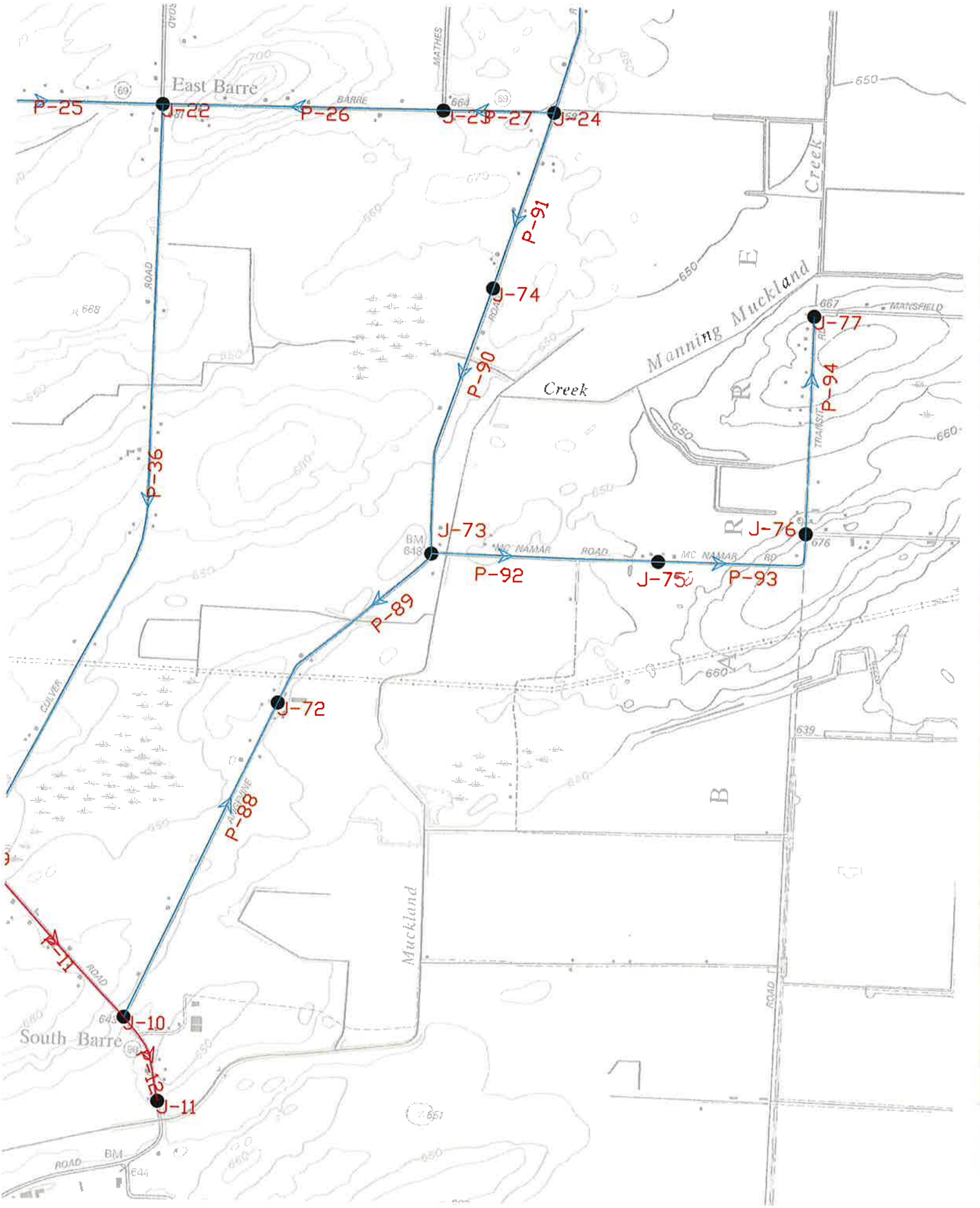
_____Capital Improvement Plan and Annual Budget
_____Annual Budget Only
_____Cash on Hand
_____Last year's expenses
_____Not sure
_____Other (Please specify_____)

5. What was the date of the last rate increase? -
_____

END OF DOCUMENT

APPENDIX H

HYDRAULIC MODEL INFORMATION



East Barre
South Barre
P-25
J-22
P-26
J-23
P-27
J-24
P-91
J-74
P-90
P-36
J-73
P-92
J-75
P-93
J-76
P-94
J-77
P-89
J-72
P-88
P-11
J-10
P-12
J-11
Manning Muckland
Creek
Mucklan
MC NAMAR
ROAD
BARRE
MATHES
MANSFIELD
COLVER
TRANSIT
650
660
670
700

Fire Flow Node FlexTable: Fire Flow Report

Label	Pressure (psi)	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Residual Lower Limit) (psi)	Hydraulic Grade (ft)	Zone
J-77	60.6	500.00	676.80	20.0	J-76	20.0	807.04	<None>
J-76	56.7	500.00	737.23	20.0	J-77	20.0	807.05	<None>
J-75	63.6	500.00	859.84	26.9	J-76	20.0	807.05	<None>
J-74	63.7	500.00	1,345.77	20.5	J-76	20.0	807.12	<None>
J-73	68.8	500.00	1,161.14	32.1	J-76	20.0	807.07	<None>
J-72	63.2	500.00	1,290.06	20.4	J-76	20.0	807.07	<None>
J-71	62.3	500.00	1,300.35	20.0	J-68	20.0	807.03	<None>
J-70	64.5	500.00	1,512.68	22.5	J-68	20.0	807.03	<None>
J-69	56.7	500.00	1,345.78	22.6	J-68	20.0	807.03	<None>
J-68	41.2	500.00	982.23	20.0	J-67	20.0	807.11	<None>
J-67	43.8	500.00	1,032.96	21.3	J-68	20.0	807.13	<None>
J-66	63.7	500.00	1,247.71	20.0	J-61	20.0	807.27	<None>
J-65	49.4	500.00	1,246.55	20.0	J-68	20.0	807.21	<None>
J-64	65.9	500.00	1,291.37	35.9	J-68	20.0	807.22	<None>
J-63	60.2	500.00	1,211.51	34.5	J-68	20.0	807.19	<None>
J-62	63.3	500.00	1,270.21	35.2	J-68	20.0	807.20	<None>
J-61	52.5	500.00	1,328.56	20.0	J-68	20.0	807.27	<None>
J-60	76.7	500.00	1,184.36	20.0	J-34	20.0	807.28	Zone
J-57	67.2	500.00	787.73	20.0	J-34	20.0	807.27	Zone
J-56	(N/A)	500.00	(N/A)	(N/A)	(N/A)	20.0	(N/A)	<None>
J-55	(N/A)	500.00	(N/A)	(N/A)	(N/A)	20.0	(N/A)	<None>
J-54	72.7	500.00	1,327.49	24.7	J-53	20.0	807.02	<None>
J-53	63.2	500.00	1,137.90	20.0	J-68	20.0	807.02	<None>
J-52	70.5	500.00	1,206.18	20.0	J-51	20.0	807.02	<None>
J-51	63.6	500.00	1,126.72	20.0	J-68	20.0	807.02	<None>
J-50	68.8	500.00	1,413.23	20.0	J-51	20.0	807.03	<None>
J-49	68.4	500.00	1,730.53	20.0	J-51	20.0	807.04	<None>
J-48	61.4	500.00	1,320.53	20.0	J-68	20.0	807.03	<None>
J-47	65.8	500.00	1,464.57	20.0	J-37	20.0	807.02	Zone
J-46	61.5	500.00	840.76	20.1	J-29	20.0	808.18	Zone
J-45	67.9	500.00	1,414.56	28.7	J-44	20.0	807.02	Zone
J-44	59.3	500.00	1,290.59	20.0	J-37	20.0	807.02	Zone
J-43	72.7	500.00	1,290.59	23.5	J-44	20.0	807.02	Zone
J-42	65.8	500.00	1,506.83	20.0	J-37	20.0	807.03	Zone
J-41	63.2	500.00	1,504.83	21.5	J-44	20.0	807.03	Zone
J-40	64.0	500.00	1,527.84	20.6	J-38	20.0	807.02	Zone
J-39	59.3	500.00	1,061.45	20.0	J-37	20.0	807.03	Zone
J-38	59.3	500.00	1,510.96	20.0	J-37	20.0	807.02	Zone
J-37	53.2	500.00	1,207.52	20.0	J-39	20.0	807.03	Zone
J-36	58.0	500.00	1,471.48	20.0	J-13	20.0	807.03	Zone
J-35	(N/A)	500.00	(N/A)	(N/A)	(N/A)	20.0	(N/A)	Zone
J-34	66.7	500.00	806.56	20.0	J-57	20.0	807.27	Zone
J-33	69.8	500.00	850.29	23.0	J-34	20.0	807.27	Zone
J-32	63.6	500.00	1,082.06	20.0	J-22	20.0	807.07	Zone
J-31	65.8	500.00	790.26	20.0	J-22	20.0	807.14	Zone
J-30	63.9	500.00	1,466.74	20.0	J-29	20.0	808.65	Zone

Fire Flow Node FlexTable: Fire Flow Report

Label	Pressure (psi)	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Residual Lower Limit) (psi)	Hydraulic Grade (ft)	Zone
J-29	58.5	500.00	1,155.37	20.0	J-28	20.0	808.18	Zone
J-28	58.5	500.00	1,145.89	20.0	J-29	20.0	808.14	Zone
J-27	58.8	500.00	1,114.09	20.0	J-28	20.0	807.86	Zone
J-26	63.8	500.00	748.00	20.0	J-25	20.0	807.39	Zone
J-25	58.6	500.00	1,193.48	20.0	J-26	20.0	807.39	Zone
J-24	64.5	500.00	1,523.56	20.0	J-25	20.0	807.17	Zone
J-23	61.9	500.00	1,434.83	20.0	J-22	20.0	807.16	Zone
J-22	54.6	500.00	1,422.41	20.0	J-23	20.0	807.14	Zone
J-21	61.5	500.00	1,511.02	20.0	J-22	20.0	807.14	Zone
J-20	60.6	500.00	1,552.38	20.0	J-31	20.0	807.15	Zone
J-19	75.4	500.00	1,573.75	28.7	J-34	20.0	807.28	Zone
J-18	67.1	500.00	1,788.35	20.0	J-17	20.0	807.98	Zone
J-17	69.5	500.00	1,916.55	20.0	J-34	20.0	807.54	Zone
J-16	65.9	500.00	1,883.68	20.0	J-15	20.0	807.32	Zone
J-15	66.3	500.00	1,875.57	20.0	J-16	20.0	807.32	Zone
J-14	49.9	500.00	5,000.00	49.8	J-4	20.0	807.22	Zone
J-13	57.1	500.00	1,424.31	20.0	J-36	20.0	807.04	Zone
J-12	54.5	500.00	2,053.60	20.0	J-37	20.0	807.07	Zone
J-11	68.0	500.00	1,484.33	20.0	J-10	20.0	807.07	Zone
J-10	71.0	500.00	1,626.50	23.0	J-11	20.0	807.07	Zone
J-9	65.8	500.00	1,725.81	22.2	J-32	20.0	807.07	Zone
J-8	65.4	500.00	1,838.38	20.0	J-32	20.0	807.07	Zone
J-7	58.0	500.00	2,157.30	20.0	J-12	20.0	807.08	Zone
J-6	63.2	500.00	2,359.64	26.1	J-12	20.0	807.10	Zone
J-5	55.5	500.00	3,164.78	20.0	J-12	20.0	807.17	Zone
J-4	49.9	500.00	5,000.00	41.4	J-3	20.0	807.25	Zone
J-3	49.9	500.00	5,000.00	34.1	J-4	20.0	807.32	Zone
J-2	64.6	500.00	3,903.02	20.0	J-1	20.0	808.23	Zone
J-1	64.5	500.00	3,346.04	20.0	J-30	20.0	809.19	Zone

FlexTable: Pipe Table

ID	Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Headloss (ft)
282	P-94	3,045.00	J-76	J-77	8.0	PVC	150.0	5.00	0.00
280	P-93	2,480.00	J-75	J-76	8.0	PVC	150.0	10.00	0.01
278	P-92	3,186.00	J-73	J-75	8.0	PVC	150.0	15.00	0.02
276	P-91	2,609.00	J-74	J-24	8.0	PVC	150.0	-28.33	0.05
275	P-90	3,848.00	J-73	J-74	8.0	PVC	150.0	-23.33	0.05
273	P-89	3,040.00	J-72	J-73	8.0	PVC	150.0	-3.33	0.00
271	P-88	4,887.00	J-10	J-72	8.0	PVC	150.0	1.67	0.00
269	P-87	8,406.00	J-71	J-40	8.0	PVC	150.0	3.43	0.00
268	P-86	3,484.00	J-69	J-71	8.0	PVC	150.0	8.43	0.01
266	P-85	4,051.00	J-69	J-70	8.0	PVC	150.0	8.20	0.01
265	P-84	2,157.00	J-70	J-37	8.0	PVC	150.0	-1.32	0.00
264	P-83	4,007.00	J-38	J-70	8.0	PVC	150.0	-4.52	0.00
262	P-82	6,775.00	J-68	J-69	8.0	PVC	150.0	21.62	0.08
260	P-81	992.00	J-67	J-68	8.0	PVC	150.0	26.62	0.02
258	P-80	2,614.00	J-63	J-67	8.0	PVC	150.0	31.62	0.06
251	P-78	1,600.00	J-61	J-66	8.0	PVC	150.0	5.00	0.00
249	P-77	1,181.00	J-65	J-62	8.0	PVC	150.0	14.68	0.01
248	P-76	5,836.00	J-61	J-65	8.0	PVC	150.0	19.68	0.06
246	P-75	3,784.00	J-62	J-64	8.0	PVC	150.0	-10.91	0.01
245	P-74	2,682.00	J-64	J-19	8.0	PVC	150.0	-31.95	0.06
244	P-73	3,917.00	J-63	J-64	8.0	PVC	150.0	-16.04	0.03
242	P-72	1,301.00	J-62	J-63	8.0	PVC	150.0	20.58	0.01
238	P-70	2,675.00	J-16	J-61	8.0	PVC	150.0	29.68	0.06
233	P-69	3,434.00	J-60	J-19	8.0	PVC	150.0	-4.00	0.00
228	P-67	610.00	J-34	J-57	8.0	PVC	150.0	1.35	0.00
225	P-66	4,992.00	J-55	J-56	8.0	PVC	150.0	(N/A)	(N/A)
223	P-65	1,627.00	J-35	J-55	8.0	PVC	150.0	(N/A)	(N/A)
221	P-64	4,161.00	J-12	J-49	8.0	PVC	150.0	18.31	0.04
220	P-63	2,559.00	J-54	J-47	8.0	PVC	150.0	-5.60	0.00
219	P-62	3,977.00	J-53	J-54	8.0	PVC	150.0	-2.60	0.00
217	P-61	4,393.00	J-52	J-53	8.0	PVC	150.0	0.40	0.00
215	P-60	2,946.00	J-51	J-52	8.0	PVC	150.0	3.40	0.00
213	P-59	6,611.00	J-50	J-51	8.0	PVC	150.0	6.40	0.01
211	P-58	2,868.00	J-49	J-50	8.0	PVC	150.0	9.40	0.01
209	P-57	7,898.00	J-48	J-49	8.0	PVC	150.0	-5.91	0.01
207	P-56	3,912.00	J-41	J-48	8.0	PVC	150.0	-2.91	0.00
204	P-55	1,421.00	J-47	J-38	8.0	PVC	150.0	-6.95	0.00
202	P-54	4,494.00	J-29	J-46	8.0	PVC	150.0	1.35	0.00
200	P-53	605.00	J-44	J-45	8.0	PVC	150.0	-2.70	0.00
199	P-52	1,161.00	J-45	J-41	8.0	PVC	150.0	-5.75	0.00
198	P-51	3,972.00	J-38	J-45	8.0	PVC	150.0	-1.70	0.00
196	P-50	1,017.00	J-43	J-44	8.0	PVC	150.0	-1.35	0.00
193	P-49	4,673.00	J-42	J-36	8.0	PVC	150.0	-5.55	0.00
192	P-48	1,918.00	J-41	J-42	8.0	PVC	150.0	-4.20	0.00
188	P-46	497.00	J-40	J-38	8.0	PVC	150.0	2.08	0.00
186	P-45	1,888.00	J-37	J-39	8.0	PVC	150.0	1.35	0.00
182	P-43	8,349.00	J-36	J-37	8.0	PVC	150.0	4.02	0.00
180	P-42	1,742.00	J-13	J-36	8.0	PVC	150.0	10.92	0.01
178	P-41	487.00	J-34	J-35	8.0	PVC	150.0	(N/A)	(N/A)

FlexTable: Pipe Table

ID	Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Headloss (ft)
177	P-40	1,031.00	J-33	J-34	8.0	PVC	150.0	4.35	0.00
176	P-39	6,828.00	J-19	J-33	8.0	PVC	150.0	7.35	0.01
175	P-38	1.00	T-2	J-14	12.0	PVC	150.0	-153.11	0.00
174	P-37	3,056.00	J-9	J-32	8.0	PVC	140.0	3.00	0.00
173	P-36	11,068.00	J-9	J-22	8.0	PVC	125.0	-12.75	0.07
172	P-35	2,100.00	J-20	J-31	6.0	PVC	150.0	3.00	0.00
171	P-34	6,017.00	J-30	J-1	8.0	PVC	150.0	-65.65	0.54
170	P-33	5,660.00	J-29	J-30	8.0	PVC	150.0	-62.65	0.47
169	P-32	535.00	J-28	J-29	8.0	PVC	150.0	-58.30	0.04
168	P-31	4,216.00	J-27	J-28	8.0	PVC	150.0	-55.30	0.28
167	P-30	7,052.00	J-25	J-27	8.0	PVC	140.0	-52.30	0.48
166	P-29	3,568.00	J-25	J-26	8.0	PVC	100.0	3.00	0.00
165	P-28	3,989.00	J-24	J-25	8.0	PVC	140.0	-46.30	0.21
164	P-27	1,559.00	J-23	J-24	8.0	PVC	130.0	-14.98	0.01
163	P-26	3,947.00	J-22	J-23	8.0	PVC	130.0	-11.98	0.02
162	P-25	3,977.00	J-21	J-22	8.0	PVC	140.0	3.77	0.00
161	P-24	2,100.00	J-20	J-21	8.0	PVC	150.0	6.77	0.00
160	P-23	5,951.00	J-5	J-20	8.0	PVC	150.0	12.77	0.03
159	P-22	5,575.00	J-17	J-19	8.0	PVC	150.0	46.30	0.26
158	P-21	7,989.00	J-18	J-1	8.0	PVC	150.0	-87.00	1.22
157	P-20	3,027.00	J-17	J-18	8.0	PVC	150.0	-84.00	0.43
156	P-19	7,971.00	J-16	J-17	8.0	PVC	150.0	-34.70	0.22
155	P-18	1,463.00	J-15	J-16	8.0	PVC	150.0	-2.03	0.00
154	P-17	7,909.00	J-3	J-15	8.0	PVC	150.0	0.97	0.00
153	P-16	550.00	J-14	J-4	12.0	PVC	150.0	-156.11	0.03
152	P-15	6,571.00	J-12	J-13	8.0	PVC	150.0	13.92	0.03
151	P-14	1,534.00	J-12	J-7	8.0	PVC	150.0	-11.34	0.01
150	P-13	1,844.00	J-6	J-12	8.0	PVC	150.0	24.89	0.03
149	P-12	1,302.00	J-10	J-11	10.0	PVC	130.0	3.00	0.00
148	P-11	3,097.00	J-9	J-10	10.0	PVC	130.0	7.67	0.00
147	P-10	3,058.00	J-8	J-9	10.0	PVC	130.0	0.93	0.00
146	P-9	6,879.00	J-7	J-8	10.0	PVC	130.0	3.93	0.00
145	P-8	2,388.00	J-6	J-7	8.0	PVC	150.0	19.27	0.02
144	P-7	1,461.00	J-5	J-6	8.0	PVC	150.0	48.15	0.07
143	P-6	952.00	J-4	J-5	8.0	PVC	150.0	63.92	0.08
142	P-5	378.00	J-3	J-4	12.0	PVC	120.0	223.03	0.07
141	P-4	4,790.00	J-2	J-3	12.0	PVC	120.0	227.00	0.90
140	P-3	4,996.00	J-1	J-2	12.0	PVC	120.0	230.00	0.97
139	P-2	420.00	PMP-1	J-1	12.0	PVC	120.0	385.66	0.21
138	P-1	1.00	T-1	PMP-1	12.0	PVC	120.0	385.66	0.00

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Zone
J-77	667.00	5.00	807.04	60.6	676.80	20.0	<None>
J-76	676.00	5.00	807.05	56.7	737.23	20.0	<None>
J-75	660.00	5.00	807.05	63.6	859.84	26.9	<None>
J-74	660.00	5.00	807.12	63.7	1,345.77	20.5	<None>
J-73	648.00	5.00	807.07	68.8	1,161.14	32.1	<None>
J-72	661.00	5.00	807.07	63.2	1,290.06	20.4	<None>
J-71	663.00	5.00	807.03	62.3	1,300.35	20.0	<None>
J-70	658.00	5.00	807.03	64.5	1,512.68	22.5	<None>
J-69	676.00	5.00	807.03	56.7	1,345.78	22.6	<None>
J-68	712.00	5.00	807.11	41.2	982.23	20.0	<None>
J-67	706.00	5.00	807.13	43.8	1,032.96	21.3	<None>
J-66	660.00	5.00	807.27	63.7	1,247.71	20.0	<None>
J-65	693.00	5.00	807.21	49.4	1,246.55	20.0	<None>
J-64	655.00	5.00	807.22	65.9	1,291.37	35.9	<None>
J-63	668.00	5.00	807.19	60.2	1,211.51	34.5	<None>
J-62	661.00	5.00	807.20	63.3	1,270.21	35.2	<None>
J-61	686.00	5.00	807.27	52.5	1,328.56	20.0	<None>
J-60	630.00	4.00	807.28	76.7	1,184.36	20.0	Zone
J-57	652.00	1.35	807.27	67.2	787.73	20.0	Zone
J-56	635.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	<None>
J-55	658.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	<None>
J-54	639.00	3.00	807.02	72.7	1,327.49	24.7	<None>
J-53	661.00	3.00	807.02	63.2	1,137.90	20.0	<None>
J-52	644.00	3.00	807.02	70.5	1,206.18	20.0	<None>
J-51	660.00	3.00	807.02	63.6	1,126.72	20.0	<None>
J-50	648.00	3.00	807.03	68.8	1,413.23	20.0	<None>
J-49	649.00	3.00	807.04	68.4	1,730.53	20.0	<None>
J-48	665.00	3.00	807.03	61.4	1,320.53	20.0	<None>
J-47	655.00	1.35	807.02	65.8	1,464.57	20.0	Zone
J-46	666.00	1.35	808.18	61.5	840.76	20.1	Zone
J-45	650.00	1.35	807.02	67.9	1,414.56	28.7	Zone
J-44	670.00	1.35	807.02	59.3	1,290.59	20.0	Zone
J-43	639.00	1.35	807.02	72.7	1,290.59	23.5	Zone
J-42	655.00	1.35	807.03	65.8	1,506.83	20.0	Zone
J-41	661.00	1.35	807.03	63.2	1,504.83	21.5	Zone
J-40	659.00	1.35	807.02	64.0	1,527.84	20.6	Zone
J-39	670.00	1.35	807.03	59.3	1,061.45	20.0	Zone
J-38	670.00	1.35	807.02	59.3	1,510.96	20.0	Zone
J-37	684.00	1.35	807.03	53.2	1,207.52	20.0	Zone
J-36	673.00	1.35	807.03	58.0	1,471.48	20.0	Zone
J-35	653.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	Zone
J-34	653.00	3.00	807.27	66.7	806.56	20.0	Zone
J-33	646.00	3.00	807.27	69.8	850.29	23.0	Zone
J-32	660.00	3.00	807.07	63.6	1,082.06	20.0	Zone
J-31	655.00	3.00	807.14	65.8	790.26	20.0	Zone
J-30	661.00	3.00	808.65	63.9	1,466.74	20.0	Zone
J-29	673.00	3.00	808.18	58.5	1,155.37	20.0	Zone

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Zone
J-28	673.00	3.00	808.14	58.5	1,145.89	20.0	Zone
J-27	672.00	3.00	807.86	58.8	1,114.09	20.0	Zone
J-26	660.00	3.00	807.39	63.8	748.00	20.0	Zone
J-25	672.00	3.00	807.39	58.6	1,193.48	20.0	Zone
J-24	658.00	3.00	807.17	64.5	1,523.56	20.0	Zone
J-23	664.00	3.00	807.16	61.9	1,434.83	20.0	Zone
J-22	681.00	3.00	807.14	54.6	1,422.41	20.0	Zone
J-21	665.00	3.00	807.14	61.5	1,511.02	20.0	Zone
J-20	667.00	3.00	807.15	60.6	1,552.38	20.0	Zone
J-19	633.00	3.00	807.28	75.4	1,573.75	28.7	Zone
J-18	653.00	3.00	807.98	67.1	1,788.35	20.0	Zone
J-17	647.00	3.00	807.54	69.5	1,916.55	20.0	Zone
J-16	655.00	3.00	807.32	65.9	1,883.68	20.0	Zone
J-15	654.00	3.00	807.32	66.3	1,875.57	20.0	Zone
J-14	692.00	3.00	807.22	49.9	5,000.00	49.8	Zone
J-13	675.00	3.00	807.04	57.1	1,424.31	20.0	Zone
J-12	681.00	4.00	807.07	54.5	2,053.60	20.0	Zone
J-11	650.00	3.00	807.07	68.0	1,484.33	20.0	Zone
J-10	643.00	3.00	807.07	71.0	1,626.50	23.0	Zone
J-9	655.00	3.00	807.07	65.8	1,725.81	22.2	Zone
J-8	656.00	3.00	807.07	65.4	1,838.38	20.0	Zone
J-7	673.00	4.00	807.08	58.0	2,157.30	20.0	Zone
J-6	661.00	4.00	807.10	63.2	2,359.64	26.1	Zone
J-5	679.00	3.00	807.17	55.5	3,164.78	20.0	Zone
J-4	692.00	3.00	807.25	49.9	5,000.00	41.4	Zone
J-3	692.00	3.00	807.32	49.9	5,000.00	34.1	Zone
J-2	659.00	3.00	808.23	64.6	3,903.02	20.0	Zone
J-1	660.00	3.00	809.19	64.5	3,346.04	20.0	Zone

FlexTable: Tank Table

ID	Label	Zone	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Volume (Inactive) (gal)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
135	T-1	Zone	660.00	660.00	695.00	700.00	0.00	110.00	385.66	695.00
136	T-2	Zone	790.00	800.00	807.22	810.22	0.00	15.00	-153.11	807.22

FlexTable: Pump Table

ID	Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
137	PMP-1	660.00	31A Pump	On	695.00	809.40	385.66	114.40

APPENDIX I

ENGINEER'S OPINION OF PROBABLE COST (OPC)

CONSTRUCTION

General Construction Administrative

Mobilization	$ 35,000.00	1	LS	$ 35,000.00	
Maintenance and Protection of Traffic	$ 7,500.00	1	LS	$ 7,500.00	
Subproject Construction Subtotal					$ 42,500.00

Proposed Project Improvements

Item Description	*Unit Price*	*Quantity*	*Units*	*Cost*	
Select Fill	$ 29.00	100	CY	$ 2,900.00	
8" DR-18 PVC Pipe Watermain	$ 47.00	23500	LF	$ 1,104,500.00	
Pipe Bedding	$ 2.00	23500	LF	$ 47,000.00	
8" Gate Valve and Boxes	$ 4,125.00	16	EA	$ 66,000.00	
Hydrant Unit	$ 11,000.00	39	EA	$ 429,000.00	
6" Hydrant Extension	$ 590.00	1	EA	$ 590.00	
12" Hydrant Extension	$ 885.00	1	EA	$ 885.00	
18" Hydrant Extension	$ 1,180.00	1	EA	$ 1,180.00	
1" Tap, Saddle and Corporation Stop	$ 1,180.00	32	EA	$ 37,760.00	
1" Curb Stop and Box	$ 885.00	32	EA	$ 28,320.00	
1" PE Short Side Water Service	$ 18.00	300	LF	$ 5,400.00	
1" PE Long Side Water Service	$ 24.00	600	LF	$ 14,400.00	
Connect New Watermain to Existing	$ 8,900.00	3	EA	$ 26,700.00	
Automatic Flushing Unit	$ 8,900.00	1	EA	$ 8,900.00	
12" SICPP	$ 24.00	100	LF	$ 2,400.00	
12" Galvanized End Sections for SICPP	$ 177.00	10	EA	$ 1,770.00	
Directional Drill 8" DR-11 HDPE (MT102 + 15 to MT103+86)	$ 27,245.00	1	LS	$ 27,245.00	
Asphalt Pavement Replacement (Roads)	$ 18.00	350	LF	$ 6,300.00	
Asphalt Pavement Replacement (Driveways)	$ 14.00	125	LF	$ 1,750.00	
Stone/Gravel Driveway Repair	$ 12.00	800	LF	$ 9,600.00	
Rock Removal	$ 29.00	100	CY	$ 2,900.00	
Subproject Construction Subtotal					$ 1,825,500.00

GC/Total Subproject Construction Costs = **$ 1,868,000.00**

Outside Costs

Construction contingency (15%)	$ 280,000.00
Engineering/Legal/Admin/Inspections/Misc (30%)	$ 560,000.00
Total	**$ 840,000.00**

PROJECT TOTAL **$ 2,708,000.00**

FINANCING

Original Loan Amount (LOC Issued 8/5/2019) =	$500,000
Additional Loan Amount (LOC issued 6/22/2023) =	$524,000
Yearly Debt Service on Original Loan Amount of $500,000 (2.125% for 38 Years) =	$19,309.77
Yearly Debt Service on Additional Loan Amount of $524,000 (2.25% for 38 Years) =	$20,660.02
Total Annual Debt Service Available from USDA RD=	**$39,969.80**
Total Project Cost =	$2,708,000.00
60% WIIA Grant =	$1,624,800.00
Total Project Cost (with 60% WIIA Grant) =	**$1,083,200.00**
Original Loan Amount Needed (LOC Issued 8/5/2019) =	$500,000
Additional Loan Amount Needed (LOC issued 6/22/2023) =	$524,000
Local Loan Amount Needed =	$59,200
Yearly Debt Service on Original Loan Amount of $500,000 (2.125% for 38 Years) =	$19,309.77
Yearly Debt Service on Additional Loan Amount of $524,000 (2.25% for 38 Years) =	$20,660.02
Yearly Debt Service on Local Loan Amount of $59,200 (0.0% for 38 Years) =	$1,557.89
Total Annual Debt Service Needed =	**$41,527.69**
Total Number of EDU's in Water District No. 10 =	37
Yearly Debt Service/Parcel with Grant =	**$1,122.37**
Plus annual cost of water (Based upon 60,000 gpy/house) =	$345.00
Plus Water Storage Tank Painting Reserve =	$60.00
Total Estimated Cost per year =	**$1,527.37**

APPENDIX J

ENGINEERING REPORT CERTIFICATION

Engineering Report Certification

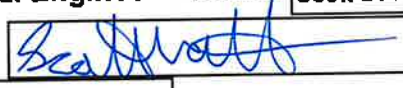
To Be Provided by the Professional Engineer Preparing the Report

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: Water District No. 10

Date of Report: 04/10/2024

Professional Engineer's Name: Scott D. Mattison, P.E.

Signature: 

Date: 04/10/2024

APPENDIX K

SMART GROWTH ASSESSMENT FORM

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: Town of Barre Project No.: 0203.18003

Project Name: Water District No. 10

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 purpose of this project is to provide a safe and reliable potable water supply and fire protection for residents of the proposed Town of Barre Water District No. 10. The proposed improvements consist of the installation of approximately 23,350 linear feet (LF) of 8" water main, valves, hydrants, and appurtenances along various roads in the Town of Barre.

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 proposed project seeks to connect to the existing water distribution system, and construct a new water district.

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 spans a rural area, which seeks to serve residential and agricultural demands, within an Agricultural District.

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:

The proposed project spans a rural area, within an Agricultural District.

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 aims to connect parcels that were previously utilizing groundwater wells as a water source. By connecting these parcels to the water distribution system, the groundwater will no longer be withdrawn from the area, which will help protect, preserve and enhance the State's resources.

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:

The proposed project spans a rural area, within an Agricultural District.

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:

As part of the project planning process, a complete environmental review has taken place including the State Environmental Quality Review (SEQR) Act and the National Environmental Policy Act (NEPA).

8. Does the project involve community-based planning and collaboration?

   ☑Yes ☐No

   Explain your response and reference any applicable plans:

   A formal petition has been prepared and filed with the Town. The Town of Barre will be scheduling a Public Information Meeting and Legal Public Hearing for creation of the Water District.

9. Does the project support predictability in building and land use codes?

   ☑Yes ☐No ☐N/A

   Explain your response:

   The project will support the existing Agricultural District.

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 project aims to expand the water distribution system for the Town of Barre; this will not directly promote sustainability.

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 project is mostly outside of FEMA FIRMs 100-year and 500-year floodplains. This project should not be impacted by future physical climate risk.

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: Town of Barre	Phone Number:
Name and Title of Signatory:	
Signature:	Date: