PRELIMINARY ENGINEERING REPORT

for

WATER SYSTEM EVALUATION

VILLAGE OF AVOCA
STEUBEN COUNTY, NEW YORK

October 2026

HUNT 1562-003

143 COURT STREET
BINGHAMTON, NY 13901
TELE: 607.798.8081

4 COMMERCIAL STREET
SUITE 300
ROCHESTER, NY 14614
TELE: 585.327.7950

100 HUNT CENTER
HORSEHEADS, NY 14845
TELE: 607.358.1000

1 ELIZABETH STREET
SUITE 12
TOWANDA, PA 18848
TELE: 570.265.4868

251 NEW KARNER ROAD
ALBANY, NY 12205
TELE: 607-798-8081

HUNT-EAS.COM

Preliminary Engineering Report

For

WATER SYSTEM EVALUATION
VILLAGE OF AVOCA
STEUBEN COUNTY, NEW YORK

HUNT 1562-003

October 2026

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 1
II. PROJECT BACKGROUND AND HISTORY 2
A. Background and Purpose 2
B. Site Information and Location 2
C. Geologic Conditions 2
D. Surface Water Features 3
E. Environmental Resources 3
1. Agricultural Districts 3
2. Wetlands 3
3. Endangered Species 3
4. Archeological Sensitivity 4
5. Critical Environmental Area 4
F. Environmental Justice Areas 4
G. Floodplain Considerations 4
H. Ownership and Service Area 4
1. Background 4
2. Population Trends and Growth 4
3. Historical and Projected Water Use Data 6
III. EXISTING FACILITIES 9
A. Location and Layout 9
B. General Description and History 9
C. Present Condition 10
D. Permit Conditions 11
IV. NEED FOR THE PROJECT 12
A. Health, Sanitation and Security 12
B. Aging Infrastructure 12
C. Reasonable Growth 13
D. Water, Energy, Waste Considerations 13
E. Suitability for Continued Use 13

F. Storm and Flood Resiliency 13
G. Compliance with Regulations and Accepted Standards 13
H. Capacity Development 13
V. ALTERNATIVE ANALYSIS 13
A. No Action 14
B. Alternative 1 (Repeat for all alternatives or equipment improvements) 14
1. Proposed Preliminary Design 14
2. Impact on Existing Facility 14
3. Land Requirements 14
4. Environmental Impacts and Mitigation Measures 14
5. Construction and Site Considerations 14
6. Permit Requirements 14
7. Water and Energy Efficiency Measures 15
8. Storm and Flood Resiliency 15
9. Constructability and Schedule 15
10. Cost Estimate 15
11. Non-Monetary Factors 15
VI. SUMMARY AND COMPARISON OF ALTERNATIVES 20
A. Summary Table of Feasible Alternatives 20
VII. RECOMMENDED ALTERNATIVE 21
A. Basis of Selection 21
B. Cost Estimate 21
C. Project Schedule 22
D. Next Steps 22
VIII. Smart Growth 22
IX. Maps and Figures 22
X. Engineering Report Certification 23

TABLES

Table 1: Population Data for the Village of Avoca 5
Table 2: Monthly Water Production in 2024 6
Table 3:
Table 4. Village of Avoca EDUs by Type of Use 8
Table 5. Water System Improvement Design Values (Projected 2040 Values) 9

FIGURES

No table of figures entries found.

APPENDICES

Appendix A – Project Location Mapping
Appendix B – Environmental Resources
Appendix C – Existing Facilities

Appendix D – Permits
Appendix E – Conceptual Improvement Plans
Appendix F – Capacity Development Evaluation Form
Appendix G – Financial Information
Appendix H – Cost Estimates & Flow Projections
Appendix I – Smart Growth Assessment
Appendix J – Maps and Figures
Appendix K – Engineering Report Certification

I. EXECUTIVE SUMMARY

The Village of Avoca has obtained the services of Hunt Engineers, Architects, Land Surveyors & Landscape Architects (HUNT) to provide recommendations and assist with the identification of prioritization of water system improvements to strategically improve the delivery, quality and reliability of potable water to its customers. The purpose of this report is to describe the existing system and proposed improvements.

The project is situated within the Village of Avoca, which is located in the Town of Avoca, in central Steuben County. The water system is predominantly within the Village limits but also serves a small permissive service area in the Town of Avoca northwest of the village along NYS Route 415. The Village of Avoca water district serves approximately 1,000 people through 427 service connections. As described in this report, the system consists of two groundwater supply wells, a water treatment building, a water storage tank, and approximately 8 miles of water distribution piping as shown on in Appendix A. The groundwater supply wells and water treatment building are located in Hees Memorial Park, and the water storage tank is in the northern portion of the Village on Wagner Hill Road.

During review of the system, it was noted that the operational aspects of the system are diligently managed; however, this study identified numerous shortcomings within the Village's existing water system and facilities. Several issues include significantly reduced capacity of Well #1, the outdated water treatment building, insufficient mixing within the storage tank, and low water pressure at the northwest extent of the system. These problems are largely due to aged equipment and outdated facilities.

A careful consideration of all alternatives has led to the proposed recommended alternatives noted herein. The recommended alternative is a combination of Alternatives 1, 2, 3, and 4. This combination addresses concerns and deficiencies within the system and existing facilities. The estimated cost of this improvement project is $3,672,000. Without any funding, assuming an approximate going interest rate of 4% for 30 years, is approximately $476 per equivalent dwelling unit (EDU) for debt service per year, plus approximately $504 per EDU for O&M costs, for a total of approximately $980 per year. Should the community be awarded an Environmental Facilities Corporation (EFC) Water Infrastructure Improvement Act (WIIA) grant for 70% of the project cost at approximately 4% interest rate, for 30 years the debt service per EDU reduces to approximately $143 per EDU (~$647 total with O&M). Or if 0% interest rate is achieved, the annual debt service per EDU would be about $82 (~$587 total with O&M).

As noted above with the drastic decrease in cost to the customers that are located within a NYSDEC Potential Environmental Justice Area (PEJA), if funding cannot be secured, the required improvements to the system will need to be re-evaluated and an emergency plan should be prepared for use when a failure occurs.

II. PROJECT BACKGROUND AND HISTORY

A. Background and Purpose

The Village of Avoca is located within the Town of Avoca, in central Steuben County. The Village owns and operates the municipal water supply system identified as Public Water Supply ID# 5001205. The system provides service to the Village of Avoca and a small number of parcels located in the Town of Avoca. The system serves approximately 1,000 people through 381 service connections to single family and multifamily residences. There are also 46 commercial and institutional connections. The largest consumer of water is the Avoca Central School District.

This Water System Evaluation investigates alternatives for improving the Village of Avoca drinking water sources and facilities. The Village's water system currently depends on groundwater wells drawing from the aquifer within the Village boundaries to provide potable water to its users. The source water is known to contain turbidity, iron and manganese, impacting the water supply infrastructure and making the older water supply sources vulnerable to failure. This study investigates: 1) source water quality, 2) water production and consumption data, 3) water rate structure, 4) condition of the existing water system, 5) an analysis of developing a new water supply source, and 6) the recommended improvement alternative with associated costs.

This report is funded through a NYS OCR Community Planning Grant. The report has been prepared in accordance with the NYS EFC Engineering Report Outline for NYS Assisted Drinking Water Projects and the United States Department of Agriculture Rural Utilities Service's Bulletin 1780-2.

B. Site Information and Location

The Village of Avoca is located within the Town of Avoca in central Steuben County. The Village is generally bounded by Interstate 390 to the north and east and the Cohocton River to the west and south. The water is produced from two groundwater wells and treated for distribution at Hees Memorial Park on River Street. A water storage tank is located in the northern portion of the Village on Wagner Hill Road.

The project is mainly focused within the established water districts as shown in the Project Location Map and the Water System Map found in Appendix A.

C. Geologic Conditions

The predominant soil types within the Village of Avoca water district limits include Wayland soils complex (Wn), Bath soils (BBE), Middlebury silt loam (Mp) and Alton gravelly fine sandy loam (AlA). Soil mapping is included in Appendix B.

According to the United States Department of Agriculture Natural Resource Conservations Service's Web Soil Survey. The depth to groundwater varies from 0" to 78-inches".

D. Surface Water Features

According to the NYSDEC Waterbody Inventory, there are several streams adjacent to the project area. The Cohocton River (Segment ID 0502-003) runs from north to south along the western portion of the Village and the Salmon Creek (Segment ID 0502-0036) runs from north to south along the eastern portion of the site. The Cohocton River is an impaired waterbody per the 2022 202(d) list for pH levels. PWL fact sheets can be found in Appendix B. The proposed project is not anticipated to impact the existing waterbodies.

E. Environmental Resources

1. Aquifer

The project boundary does lie above an unconfined primary aquifer, the Lower Cohocton River. Refer to Appendix B for the Aquifer Mapping.

2. Agricultural Districts

Review of the County Agricultural District Mapping shows that there is an agricultural district within the Village of Avoca water system boundary. Parcels located in the northwest and southeast portion of the Village are within Steuben County Ag District No. 3. Refer to Appendix B for the Agricultural District Map.

3. Wetlands

Review of the NYSDEC Environmental Resource Mapper did not identify any wetlands under NYS DEC jurisdiction on or immediately adjacent to the project sites. There is a wetland under NYSDEC jurisdiction located southeast of the Village and another located to the north of the Village.

Review of the National Wetland Mapping Database documented ACOE wetlands located in the northern portion of the Village as shown on the NWI Wetland Mapping provided in Appendix B.

4. Endangered Species

A search of the NYSDEC Environmental Resource Mapper identified the presence of threatened or endangered species. The species identified are potential mussels located within the banks of the Cohocton River. There is no potential impact as there will be no disturbance of the Cohocton River associated with this project.

The NYSDEC listing of Endangered Species in the project area is shown in Appendix B.

The US Fish and Wildlife Service has identified the Northern Long-Eared Bat as Threatened or Endangered species of concern within the project area. They also identified the Bald Eagle, Black-capped Chickadee, Bobolink, Chimney Swift and Wood Thrush migratory birds as birds of concern. The Fish & Wildlife listing of endangered species and birds are provided in Appendix B.

5. **Archeological Sensitivity**
   The project site is located within an archaeologically sensitive area established by the Office of Parks, Recreation & Historic Preservation (OPRHP). Refer to Appendix B for Archaeologically Sensitive Areas Map. A no impact letter from OPRHP is required prior to any proposed future improvements.

6. **Critical Environmental Area**
   The project location is not near any Critical Environmental Areas per the NYS DEC Info Locator. Refer to Appendix B for Critical Environmental Area map.

F. Environmental Justice Areas

The NYS DEC has identified a Potential Environmental Justice Area (PEJA) within the existing Village water district boundary. As established in DEC Commissioner Policy 29 on Environmental Justice and Permitting, PEJA areas are identified as areas with higher-than-average populations of minority groups or higher than average household incomes below the federal poverty level. The northern portion of the Village of Avoca lies within Census Block Group 361019610001 which consists of 24.33% of the population below poverty level.

The improvement of the water system will protect water quality, improve safety, and serve all residents in the Village of Avoca Water District, including PEJA identified above.

Refer to Appendix B for Environmental Justice area mapping.

G. Floodplain Considerations

A small portion of the Village of Avoca is within the 100-year flood boundary as defined on FEMA FIRM Panel 360765-0001-B. The majority of the Village is protected by levees along the Cohocton Rover and the Salmon Creek.

Refer to Appendix B for FEMA/FIRM mapping.

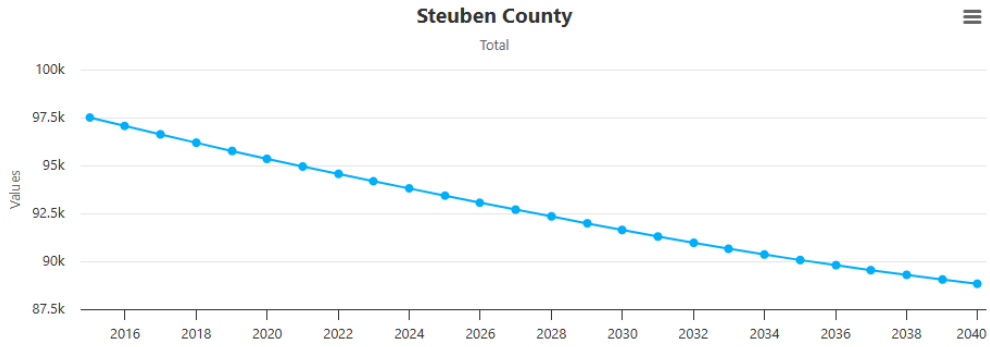
H. Ownership and Service Area

1. **Background**
   The Village of Avoca water district includes Village of Avoca and a small, permissive service area in the Town of Avoca located along NYS Route 415 north of the village limits. Refer to Appendix A for a map of the water system and service areas. The water system is owned and operated by the Village of Avoca. The water operator is Anthony Comstock with certification NY0037435 level C-Plant or Distribution System, and level D-Distribution System.

2. **Population Trends and Growth**
   Per US Census data, the population in the Village of Avoca has been steady since 2000. However, the Cornell Program on Applied Demographics anticipates that the population of Steuben County will decrease over the next 15 years as shown on the

graph below. The primary reason seems to be the decline of small rural businesses in small communities such as the Village of Avoca.

Figure 1: Cornell Program of Applied Demographics Projection



The population totals for the Village of Avoca from 2000-2024 were taken from the US Census Bureau and the projection corresponds to the declining total projected in Steuben County.

Table 1: Population Data for the Village of Avoca

Year	Population
2000	1,008
2010	946
2015	1,033
2020	1,006
2024	1,023
2030	1,002 (projected)
2035	985 (projected)
2040	971 (projected)

The Village of Avoca Median Household Income (MHI) is $66,389 (2024 ACS 5-year Estimates), which is below the New York State MHI of $85,820. Reviewing the HUD Low-Moderate Income Summary Data for CDBG, the Village of Avoca project area is at 51.3% LMI.

3. **Outside Users**

The Village of Avoca supplies drinking water to a small, permissive service area in the Town of Avoca. These outside users are located along NYS Route 415 north of the village limits and include 3 residential properties, 1 commercial property and a church.

4. **Agricultural & Industrial Land Use Activities**

There are numerous farm operations within and adjacent to the Village. There are no significant industrial users within the Village.

5. Nearest Public Water System

The Village of Avoca water system is publicly owned. The nearest publicly owned water system is the Village of Bath water system which is approximately 6 miles southwest of the Village of Avoca.

6. Historical and Projected Water Use Data

a. Water Production

The Village of Avoca supplied the New York State Department of Environmental Conservation (NYSDEC) Water Withdrawal Report for 2025. The total monthly water production for that year is summarized in Table 2. The average daily production in 2025 was 39,918 gallons, and the maximum daily demand was 89,000 gallons.

Table 2: Monthly Water Production in 2025

Month	Monthly Production (gallons)	Month	Monthly Production (gallons)
January	1,315,000	July	1,322,000
February	1,230,000	August	1,378,000
March	1,222,000	September	1,272,000
April	1,121,000	October	1,124,000
May	1,121,000	November	1,058,000
June	1,273,000	December	1,134,000
Total Annual Production			14,570,000
Average Daily Production			39,918
Maximum Daily Production			89,000

b. Water Demand

The Village supplied quarterly billing/consumption records for the same time frame as the production records for proper correlation between billed (metered) consumption and the production. The average daily demand for consumed water was 38,781 gallons in 2025. Assuming a typical daily peaking factor of 1.8, the peak day demand is taken to be 69,806 gallons. Assuming a typical hourly peaking factor of 2.7, the peak hourly demand is taken to be (38,781 gallons per day * 2.7 / 24 hours per day) = 4,363 gallons (or 73 gpm).

Table 3: Quarterly Water Consumption in 2025

Quarter	Total Demand (gallons)	Average Daily Demand (gallons)
2025 Q1	3,926,923	43,632
2025 Q2	3,087,726	34,308
2025 Q3	3,686,809	40,965
2025 Q4	3,453,431	38,371
Annual Values	Total Demand	14,154,889
	Average Daily Demand	38,780

c. Fire Flows

NFPA and ISO recommend fire flows for a hydrant in a residential area to be between 750 and 1,000 gpm; and in a commercial district between 1,000 and 1,500 gmp to meet the demands of a pump truck fighting a structure fire. ISO performed a hydrant flow test in 2016 where 9 hydrants were tested within the system and found that flows ranged from 650-2,180 gpm. Overall, one (1) of the hydrants tested did not meet the requirements. This hydrant is located on Mackey Road near the furthest extent of the system. The ISO flow test data is included in Appendix C.

d. Equivalent Dwelling Units

The Equivalent Dwelling Unit (EDU) is a metric that relates all water system usage to a multiple of that of the typical single-family residence. The Ten State Standards recommend designs account for 100 gallons of water usage per capita per day. According to the 2020 Census, the average household size in Avoca was 2.17. Therefore, the typical single-family household would require 217 gallons per day. The actual single-family consumption in the Village of Avoca was calculated as the difference of the total billed minus the sum of the commercial and industrial demands. The resulting value is 12,092,456 gallons per year for single and multi-family residential usage. Per the billing records, there are 381 single and multi-family households in the Village of Avoca. The resulting analysis yields 87.0 gallons of water per day per EDU. From analysis of the aforementioned billing records, there are 381 single family residential users (EDUs) and 65 EDUs for the commercial and institutional users resulting in a total of 446 EDU's in the Village of Avoca.

Table 4: Village of Avoca EDUs by Type of Use

Type	Connections	Average Daily Consumption (gallons)	EDUs*	Projected EDUs (2040)
Single Family Residences	381	33,130	381	381
Commercial/Industrial	43	2,683	31	31
Avoca Central Schools	3	2,968	34	34
Other	0	0	0	0
Total	*427*	*38,781*	446	*446*

* Using 87 gallons per residence per day.

e. Unaccounted for Water

Unaccounted for water is water lost via breaks and leaks, or via maintenance activities such as hydrant flushing. Unaccounted for water may also occur due to inaccurate meter readings.

According to the New York State Department of Environmental Conversation (NYSDEC) 1989 Water Conservation Manual, utilities should strive for 10 to 15 percent of unaccounted water within a water system. While calculation of unaccounted for water contains numerous variables, estimates can be calculated using the following equation:

Percentage Unaccounted Water = (Withdrawal – Consumption)/Withdrawal x 100

Percentage Unaccounted Water = (14,570,000–14,154,889)/14,570,000 x 100 = 2.8%

The Village of Avoca water system has 2.8% unaccounted for water, which is well below the 10 to 15 percent recommended by the NYSDEC.

f. Existing Water Rate

The current rate for water consumption is comprised of the following rate structure. The rate structure is based on billing cycles of quarterly billing.

All users are charged a base rate of $10.00 per quarter plus $7.00 per 1,000 gallons consumed. The fee structure was last updated in June 2025.

The average single-family residence uses 87 gpd, 7,830-gallons per quarter. Therefore, the average single-family residential user would have an annual water bill as calculated as follows:

Annual Residential Water Cost = 4 x [$10 + $7 (7,830/1,000)] = $259.24

Percent of MHI = A year's worth of water bills (at average consumption)/ MHI
Percent MHI = $259.24/$66,389 = 0.39%

g. Projected Values

Based on the estimates given above, the design values for the proposed water improvements can be projected to 2040 as summarized in Table . Although the population projections are decreasing, the projected values listed below remain stable with current production.

Table 5: Water System Improvement Design Values (Projected 2040 Values)

Gallons[1]	Item
40,000	Average Daily Demand
14,600,000	Total Annual Demand
72,000	Peak Daily Demand
4,500	Peak Hourly Demand

1. Based on 2025 values and scaled with expected population growth rate

h. Community Involvement (Support/Opposition)

The Village of Avoca will hold a public hearing in November 2026 to discuss the proposed project, including completion of the environmental reviews and the adoption of a bond resolution. The residents will have an opportunity to discuss the project, ask questions and provide comments that they may have. The study will be open to a public comment period following the public hearing. Meeting minutes will be available for download from the Village of Avoca website.

III. EXISTING FACILITIES

A. Location and Layout

The Village of Avoca water system consists of two wells (Well #1 and Well #2), a water treatment building, a water storage tank and approximately 8 miles of watermains. A Location Map and Layout of the existing water system can be found in Appendix A. Photographs of the existing facilities can be found in Appendix C.

B. General Description and History

The majority of the current Village of Avoca water system was installed in approximately 2000. Other work to replace the existing main on NYS Route 415 to the north was completed in 2007. Original piping that remains is along NYS Route 415 from River Street to South Main Street. The Village produces water from two groundwater wells located at Hees Memorial Park on River Street. The water treatment plant is also located at Hees Memorial Park. Well #2 is the primary source of production and Well #1 serves as a backup. A Hydrogeologic Investigation was conducted in August 2026 to investigate the

current pumping capacity of the wells (Appendix C). Well #1 was found to have a yield rate of 70 gpm. Pumping rates above 70 gpm showed increased turbidity and cavitation. Well #2 was found to have a yield rate of at least 180 gpm without excessive drawdown, aquifer impacts or signs of turbidity.

The water is disinfected with chlorine and treated with polyphosphate to reduce the levels of iron and manganese prior to distribution. A controlled, low level of fluoride is also added to the water for consumer dental health. Contact time (CT) is achieved prior to the first customer through a 24-inch diameter, 450 linear foot watermain installed from the treatment building to the intersection of River Street and Route 415.

The water is then distributed through the system and into the storage tank. The tank is 36-foot diameter, 56 foot tall, 425,000-gallon Aquastore tank located on Wagner Hill Road. The tank was constructed in 2002.

C. Present Condition

1. Groundwater Wells

Well #1 and Well #2 were installed in 2000 and are both gravel packed wells, wherein gravel is placed in the annular space between the well screen and the casing to improve water quality and yield. Well #1 and Well #2 were not installed using typical construction methods for gravel packed wells. As a result, there is no access to the gravel pack to monitor the gravel pack height or add additional gravel pack material. During typical well development and redevelopment, 10% or greater of the gravel pack volume may pass through the screen slot openings. Gravel pack loss or subsidence allows intrusion of fines into the well. Due to the improper construction of Well #1 and #2, it is not possible to assess the condition of the gravel packs or to address issues with the gravel pack.

An attempt to rehabilitate Well #1 was conducted in 2008, but the installation of a liner did not produce the desired results.

Well #1 suffers from multiple issues and is not a reliable source of water. Pumping capacity at Well #1 has significantly degraded since its installation. Cavitation and air bubbles are formed when Well #1 is pumped above 70 gpm. Well #1 also produces very fine sand and clay particles when pumped at 75 gpm. It is suspected that the gravel pack at Well #1 is compromised.

Well redevelopment options for Well #2 are limited due to the improper construction of Well #2. Redevelopment activities may disturb or reduce the gravel pack in Well #2, thus causing turbidity issues.

2. **Water Treatment Plant**
   A natural gas emergency generator is located adjacent to the water treatment plant. Poor drainage and grading leads to water ponding around and under the generator. The base of the generator is visibly rusted.

   The water treatment building does not have adequate ventilation. Pipes within the building are corroded due to the high humidity and chlorine exposure. The water treatment building needs repairs to the roof, generator pad, and piping components. Additionally, the roof leaks during heavy rain events.

   The Village of Avoca water department does not have sufficient space for spare parts and document storage. The existing office space is combined with the overall Village Public Works department. A dedicated space for document and spare parts is necessary to maintain efficient operation.

3. **Water Storage**
   The water system has one (1) water storage tank. The 425,000-gallon Aquastore tank on Wagner Hill Rd was installed in 2002. The gravel access road to the tank is extremely steep and limits access to the tank site in winter months. Additionally, the perimeter security fencing around the tank is in need of repair.

4. **Water Distribution System**
   The Village of Avoca replaced the majority of the distribution system within the Village in the early 2000s. This included replacement of service lines with copper from the new main to the curb stop. The section of watermain along NYS Route 415 from River Street to the northwest was replaced in 2007. Despite the relatively recent replacements, many copper water lines have experienced severe deterioration. The remaining original 6" cast iron watermain along NYS Route 415 was installed in the mid-1900s. This section of main is undersized and has reached the end of its useful life. This section of watermain also lacks sufficient hydrant spacing.

   Several curb and valve boxes throughout the system have corroded and are not usable.

   The furthest extent of the system to the northwest receives low water pressure.

D. Permit Conditions

The primary focus of improvements in the existing water system to improve the health and safety of the water supply is replacing Well #1. Based on hydrologic testing, the water quality is compromised when pumping at rates above 70gpm. Flow characteristics throughout the Village for both residences and their fire hydrants show the need to make improvements.

IV. NEED FOR THE PROJECT

A. Health, Sanitation and Security

The need for the project predominantly revolves around Well #1 being an inadequate and unreliable source of drinking water for the Village. The quality of the water taken from Well #1 becomes compromised when pumping rates reach 70gpm. For the Village to rely on only one well to produce drinking water for its residents is not acceptable. If an unplanned failure of Well #2 were to occur, the quality of water would be in jeopardy. It is reported that an attempt was made previously to rehabilitate Well #1 by installing a liner, but the liner was removed as the desired results were not achieved.

The existing water treatment building is in need of repairs. The roof is leaking and the generator pad has settled causing a ponding issue which has resulted in the base of the generator becoming rusted. Additionally, the piping inside the building is rusting due to the humidity and chlorine exposure in the room and should be replaced. The high humidity inside the building is a result of poor ventilation, which should be upgraded as well.

The low water pressure in the northwest section of the system, as identified in the ISO flow testing results, presents a fire safety risk for the residents in this area. The installation of a booster pump to this section of the system is required.

The water tank site should be easily accessible by the water department staff at all times of the year. If an issue occurred at the tank site and the necessary equipment to make the repairs was not able to access the area, the system would be in jeopardy.

B. Aging Infrastructure

As described in Section A above, if Well #1was required to be used as the primary source of drinking water for the Village, the quality of water would be severely compromised. The well should be replaced with a new well.

In the event of heavy storms and power outages, the generator pad would flood and potentially cause the generator to fail.

Roof leaks and poor ventilation within the treatment building have deteriorated piping components which are in need of replacement.

The existing 6” cast iron watermain along Route 415 dates back to the original system which was installed in the mid-1900’s and should be replaced. Replacing this section of watermain with an 8” PVC pipe will improve the flow characteristics of the system and prevent future failures. Additionally, the existing hydrants on this section of watermain are not spaced appropriately.

C. Reasonable Growth

Based on US Census Bureau and Steuben County planning, the potential for future growth in the Village is minimal.

D. Water, Energy, Waste Considerations

The Village of Avoca water system is a static pressure system with no pump stations to distribute water to its users. The installation of a water booster pump station would require a new electrical service, but the additional cost would be minimal.

E. Suitability for Continued Use

Although the Village water system will continue to function as it currently is, it is a matter of time that components fail, and the reliability of the water system is compromised.

F. Storm and Flood Resiliency

The majority of the system located in the Village of Avoca is protected by a levee system. Regardless, storm or flood resiliency during design will be conducted. *All new structures will be designed to current guidelines on flood protection.*

G. Compliance with Regulations and Accepted Standards

There are no current Consent Orders from the NYS DOH regarding the Village of Avoca water system. The proposed improvements will be designed in conformance with the most current design standards and reviewed by the NYS DOH.

H. Capacity Development

The Village of Avoca Water District must maintain adequate technical, managerial, and financial capacity to improve and secure safe and reliable drinking water service to users that complies with the Safe Drinking Water Act and NYSDOH drinking water standards. The proposed project will improve the technical capacity by replacing aging infrastructure, improving system reliability, enhancing water accounting, and providing source redundancy. Managerial capacity will be improved through modernization of infrastructure that reduces operational complexity and emergency response limitations. Financial capacity will be evaluated as part of project funding and rate planning to ensure the District can continue to meet operating expenses, maintenance requirements, and debt obligations associated with system improvements. As required for projects funded with DWSRF assistance, a Capacity Development Program Evaluation Form will be included.

V. ALTERNATIVE ANALYSIS

This report focuses on no action versus replacing the system components identified as being deficient. Alternatives have been included for the lower priority items that need to be upgraded but are at lower risk to failure

A. No Action

Taking no action may save on capital debt service costs to the Village but will undoubtedly increase the risk to contaminate the public drinking water. Emergency repairs for component failure are typically more expensive than planned and properly designed upgrades as proposed in the alternatives below.

B. Alternative 1 – Well Replacement and Treatment Building Improvements

Alternative 1 includes the replacement of Well #1 with a new groundwater well and improvements to the water treatment building including a new generator and pad, new roof and new ventilation system.

1. Proposed Preliminary Design

This project will be designed to meet Ten State Standards and the NYS Department of Health Regulations. The proposed design is included in Appendix E. This alternative will ensure that the drinking water supply maintains reliability and quality standards.

2. Impact on Existing Facility

This project will improve the reliability of the water source used by the Village. There are no changes in the overall operation of the system and there are no new processes proposed, only replacement of existing components.

3. Land Requirements

A new well is proposed to be installed on land currently owned by the Village of Avoca. Therefore, no new land purchases or easements are required.

4. Environmental Impacts and Mitigation Measures

There are no anticipated impacts on water quality and supply, noise levels or air quality except for normal, short duration construction activities. There are no new structures proposed, therefore no impacts to wetlands, floodplains or other sensitive areas.

Although Environmental Justice Areas are served by the existing system, the proposed project does not impact those properties.

5. Construction and Site Considerations

This project will use standard construction practices including utility trenching and well drilling. The proposed location of the new well has the same general characteristics of Well #2. Other items include typical building construction methods.

6. Permit Requirements

This project will not occur within the NYSDOT ROW, or disturb greater than 1-acre of land, therefore permits from the NYSDOT and NYSDEC will not be required. A well permit from the NYS DOH will be required for the installation of the new well.

7. **Water and Energy Efficiency Measures**
   The contractor will be encouraged in the bid documents to use the most efficient equipment and implementation possible. A new, more efficient well pump will be installed to replace the existing pump.

8. **Storm and Flood Resiliency**
   No new structures are proposed in this project; therefore, no impact is anticipated on flood resiliency or stormwater management.

9. **Constructability and Schedule**
   With all work occurring on Village owned property and mainly consisting of replacement of existing components, constructability of this project is very routine. Attention to design details will be used to ensure ease of construction which results in better quality and durability.

10. **Cost Estimate**
    The total cost to complete this alternative is estimated to be $997,000. An itemized cost estimate is located in Appendix H.

11. **Non-Monetary Factors**
    Having a reliable second well, improved SCADA, improved well house, and emergency generator, will allow for increased ease of operations by the Village staff.

C. **Alternative 2 – Tank Site**
Alternative 2 includes the installation of an in-tank mixer to promote mixing throughout the year, especially during the winter months so the tank will not freeze, and promotes circulation to limit aging within the large capacity tank compared to the low daily demand, will repair the security fencing that has been damaged during the years, and will provide safe and adequate access to the tank site, especially during the winter months.

1. **Proposed Preliminary Design**
   The proposed design is included in Appendix E. This alternative will ensure that the existing water tank is protected by an adequate security fence and that access to the tank site can be maintained through the winter months.

2. **Impact on Existing Facility**
   This project will improve the security and access to the existing tank site. There are no changes in the overall operation of the system and there are no new processes proposed.

3. **Land Requirements**
   The existing tank site is owned by the Village and will not require any land to be acquired by the Village either through purchase or easement.

4. **Environmental Impacts and Mitigation Measures**
   There are no impacts on water quality and supply, noise levels or air quality except for normal, short duration construction activities.

   Although Environmental Justice Areas are served by the existing system, the proposed project does not impact those properties.

5. **Construction and Site Considerations**
   This project will use standard construction practices including grading, road construction and fence installation. The current access to the site is steep and proper erosion control and slope stabilization measures will be implemented.

6. **Permit Requirements**
   This project will not occur within the NYSDOT ROW, or disturb greater than 1-acre of land, therefore permits from the NYSDOT and NYSDEC will not be required.

7. **Water and Energy Efficiency Measures**
   The contractor will be encouraged in the bid documents to use the most efficient equipment and implementation possible. There are no new components that require water or energy.

8. **Storm and Flood Resiliency**
   Flood resiliency is not an issue at this site since it is at a much higher elevation than the floodplain in the Village. Stormwater management will be considered in the design.

9. **Constructability and Schedule**
   All work will occur on Village owned property. The steepness of the site will be considered in the design and measures to mitigate the potential for erosion and stormwater impacts will be implemented.

10. **Cost Estimate**
    The total cost to complete this alternative is estimated to be $420,000. An itemized cost estimate is located in Appendix H.

11. **Non-Monetary Factors**
    Non-monetary factor of this alternative is the improvements to the tank access road providing safer passage for the Village staff. The current road is extremely steep and is very difficult to traverse during winter conditions. The mixer within the tank will promote water turnover and help reduce aging within the tank and the water system.

D. **Alternative 3 – Office & Storage Space**
   Alternative 3 includes a building addition to the existing Village garage to facilitate an adequate office and storage area.

1. **Proposed Preliminary Design**
   This project will be designed to meet the NYS Building Code. The proposed design is included in Appendix E. This alternative will provide for adequate space for an office which will include document storage areas. Additionally, space will be allocated for the storage of replacement parts necessary to maintain the existing water system.

2. **Impact on Existing Facility**
   This project will result in additional space for the entire Village of Avoca Public Works Department by freeing up the small areas currently utilized by the water department.

3. **Land Requirements**
   The existing building is currently owned by the Village of Avoca and will not require any additional land.

4. **Environmental Impacts and Mitigation Measures**
   There are no anticipated impacts on water quality and supply, noise levels or air quality except for normal, short duration construction activities.

   Although Environmental Justice Areas are served by the existing system, the proposed project does not impact those properties.

5. **Construction and Site Considerations**
   This project will use standard building construction practices. The existing structure will be .

6. **Permit Requirements**
   This project will not occur within the NYSDOT ROW, or disturb greater than 1-acre of land, therefore permits from the NYSDOT and NYSDEC will not be required. Although the project will be located on Village owned property, a building permit will likely be required from the Village of Avoca Building Department.

7. **Water and Energy Efficiency Measures**
   The contractor will be encouraged in the bid documents to use the most efficient equipment and implementation possible. The new addition will include energy-efficient insulation measures as required by the NYS Building Code.

8. **Storm and Flood Resiliency**
   The new addition has a minimal footprint; therefore, no impact is anticipated on flood resiliency or stormwater management.

9. **Constructability and Schedule**
   With all work occurring on Village owned property and consisting of building construction, constructability of this project is very routine. The existing structure will be reviewed and taken into account in the new design and layout.

10. **Cost Estimate**
    The total cost to complete this alternative is estimated to be $653,000. An itemized cost estimate is located in Appendix H.

11. **Non-Monetary Factors**
    Non-monetary factor for this alternative is the additional space for storage of spare parts and documents. Currently the space utilized is inadequate in size and functionality.

E. **Alternative 4 – Distribution System**
Alternative 4 includes the replacement of the 6" cast iron watermain along NYS Route 415, the installation of a water booster pump station to provide adequate water pressure to the northwest area of the service area, and adding a master meter and vault going to the north of the system near the Village/Town line. Additionally, multiple water services, curb stops and valve boxes have corroded and are in need of replacement.

1. **Proposed Preliminary Design**
   This project will be designed to meet Ten State Standards and the NYS Department of Health Regulations. The proposed design is included in Appendix E. This alternative will ensure that the water pressure at the furthest extents of the system, specifically in the northwest area will meet ISO requirements. The proposed replacement of components such as service lines, curb boxes and valves will ensure service is maintained to each user.

2. **Impact on Existing Facility**
   This project will improve the reliability of the water distribution in the Village water system. There are no changes in the overall operation of the system. New maintenance and inspection schedules will be implemented after construction for the booster pumps.

3. **Land Requirements**
   The new booster pump station will require a small amount of land to be acquired by the Village either through purchase or easement. Replacement of the existing 6" watermain and other various components will occur within the right-of-way and not require additional land to be acquired.

4. **Environmental Impacts and Mitigation Measures**
   There are no impacts on water quality and supply, noise levels or air quality except for normal, short duration construction activities. The new booster pump station has a

minimal footprint and will have no impact to wetlands, floodplains or other sensitive areas.

Although Environmental Justice Areas are served by the existing system, the proposed project does not impact those properties.

5. **Construction and Site Considerations**
   This project will use standard construction practices. A booster pump station is typical of small communities where service locations are spread out over a large area. Other items included in this alternative are replacement of existing components and require typical construction methods.

6. **Permit Requirements**
   This project will occur within the NYSDOT ROW and will likely disturb greater than 1-acre of land, therefore permits from the NYSDOT and NYSDEC will be required.

7. **Water and Energy Efficiency Measures**
   The contractor will be encouraged in the bid documents to use the most efficient equipment and implementation possible. The new booster pump station will include high efficiency pumps and HVAC systems. These systems will have a minimal impact on energy usage by the Village.

8. **Storm and Flood Resiliency**
   The new booster pump station has a minimal footprint; therefore, no impact is anticipated on flood resiliency or stormwater management.

9. **Constructability and Schedule**
   With all work occurring in readily accessible areas near the right-of-way and mainly consisting of replacement of existing components, constructability of this project is very routine. The new booster pump station is a typical component of small community water systems. Attention to design details will be used to ensure ease of construction which results in better quality and durability.

10. **Cost Estimate**
    The total cost to complete this alternative is estimated to be $1,602,000. An itemized cost estimate is located in Appendix H.

11. **Non-Monetary Factors**
    This alternative will provide increased fire flow to users at the furthest extent of the system, and will improve system meter reading.

VI. SUMMARY AND COMPARISON OF ALTERNATIVES

A. Summary Table of Feasible Alternatives

Key components to the Village of Avoca Water District drinking water system were evaluated based on current Ten States Standards and NYSDOH requirements. This evaluation determined that multiple key components within the water system related to source redundancy, mixing, and the distribution system, as well as system reliability for the Village staff such as safe passage to the water storage tank were noted as requiring improvements in order to sustain a safe and reliable drinking water system to the Village Water District users. The alternatives evaluated were developed to inform the Village of its options moving forward and to determine which alternative would be the most economically feasible for the community.

The table below is a summary of the various alternatives reviewed with their respective replacement or upgrade elements identified for potential improvements. Detailed cost estimates are included in Appendix G.

Table 7: Selected Project Summary

Parameter	Improvement Costs (Preferred Project)
Est. Project Cost including soft costs:	
Alt 1 (Well replacement)	$ 997,000
Alt 2 (Tank Site)	$ 420,000
Alt 3 (Office & Storage Space)	$ 653,000
Alt 4 (Distribution)	$ 1,602,000
TOTAL ESTIMATED PROJECT COST:	$ **3,672,000**
Annual Debt Service (30-yr 4%)	$ 212,352
Annual O&M*	$ 225,000
Number of EDUs	446
Annual Project Cost/EDU	$ 476
O&M Cost /EDU	$ 504
Total Annual Cost/EDU	$ 980
Potential CDBG ($2M w/co-funding)	$ 2,000,000
Project cost subtotal w/CDBG	$ 1,672,000
Potential WIIA (70% of net eligible Project costs, up to a maximum of $5M)	$ 1,170,400
Project cost subtotal w/CDBG & WIIA	$ 501,600
Annual Project Cost/EDU w/WIIA & CDBG (@4%)	$ 65
Total Annual Cost/EDU w/O&M	$ 569
Annual Debt Service (30-yr 0%)	$ 122,400
Annual O&M	$ 225,000

Number of EDUs	446
Annual Project Cost/EDU	$ 274
O&M Cost /EDU	$ 504
Total Annual Cost/EDU	$ 778
Annual Project Cost/EDU w/WIIA & CDBG	$ 37
Total Annual Cost/EDU w/O&M	$ 541

VII. RECOMMENDED ALTERNATIVE

A. Basis of Selection

This project seeks to include all work included in Alternates 1-4 due to the potential impact on water quality, to improve access to vital infrastructure and to improve the overall functionality of the water department.

B. Cost Estimate

Below is an analysis that comes up with an approximate figure for the financial impact of the project per EDU. Debt service is greatly dependent upon the rate of return and average interest rate utilized. Common municipal funding consists of return periods of approximately 30 years with varying interest rates. However, a 4% interest rate is a conservative estimate of a reasonable interest rate that could be obtained with such financing. The analysis below develops a generic example project cost per EDU based on a 30-year, 4% interest rate scenario.

The project debt service for the water system improvements is given by:

Annual Payment = Present Worth / [((1 + interest rate) $^{\#\ of\ years}$ - 1) / (interest rate * (1 + interest rate) $^{\#\ of\ years}$)]

Annual Payment = $ 212,352

Total EDUs = 446

$$\text{Annual Debt Service per EDU} = \frac{\text{Annual Payment}}{\text{Total EDUs}}$$

Annual Debt Service per EDU = $ 476 per year

The debt service on a quarterly water bill would be as follows:

Debt Service per Billing Cycle = $ 53,088

Debt Service per Billing Cycle per EDU = $ 119

A reserve for short-lived assets should also be put into place to ensure longevity of the system. Critical short-lived assets are included. With just watermains, fittings, valves, and hydrants all materials should last at least 50 years. However, a part can fail in any of these. Therefore, a modest reserve should be established to help build up reserves for ultimate replacement and unexpected repairs.

C. Project Schedule

The anticipated project schedule is as follows:

RFQ for Engineering Study Services	Completed
Water System Study	Feb-Nov 2026
SEQR / NEPA	Dec 2026 – Feb 2027
Bond Resolution	April 2027
Intended Use Plan Submittal	May 2027
WIIA Funding Solicitation and EFC DWSRF	Anticipated Sept 2027
Funding Award Announcements	Anticipated Dec 2027
RFQ for Design/CA Engineering Services	Sept – Dec 2027
Design (dependent on EFC financing)	Jan – April 2028
Regulatory Approval	May – Sept 2028
CDBG Funding Application	July 2028
Bidding	Dec 2028 – Feb 2029
Construction	April 2029 – July 2030

D. Next Steps

Once funding is awarded, the Village will authorize their engineering firm to begin the design and engineering report on design. During the preliminary design phase, the Village will hold a Public Informational Meeting to present the design ideas, schedule and impact on their property and estimated costs to purchase water.

Once the project is awarded for construction, another Public Informational Meeting will be held with the Contractor and Engineer to introduce the personnel on the project and review the overall work schedule with the residents and businesses.

VIII. Smart Growth

The proposed project will comply with the New York State Smart Growth Public Infrastructure Policy Act to the extent practicable. A completed Smart Growth form can be found in Appendix I of this report.

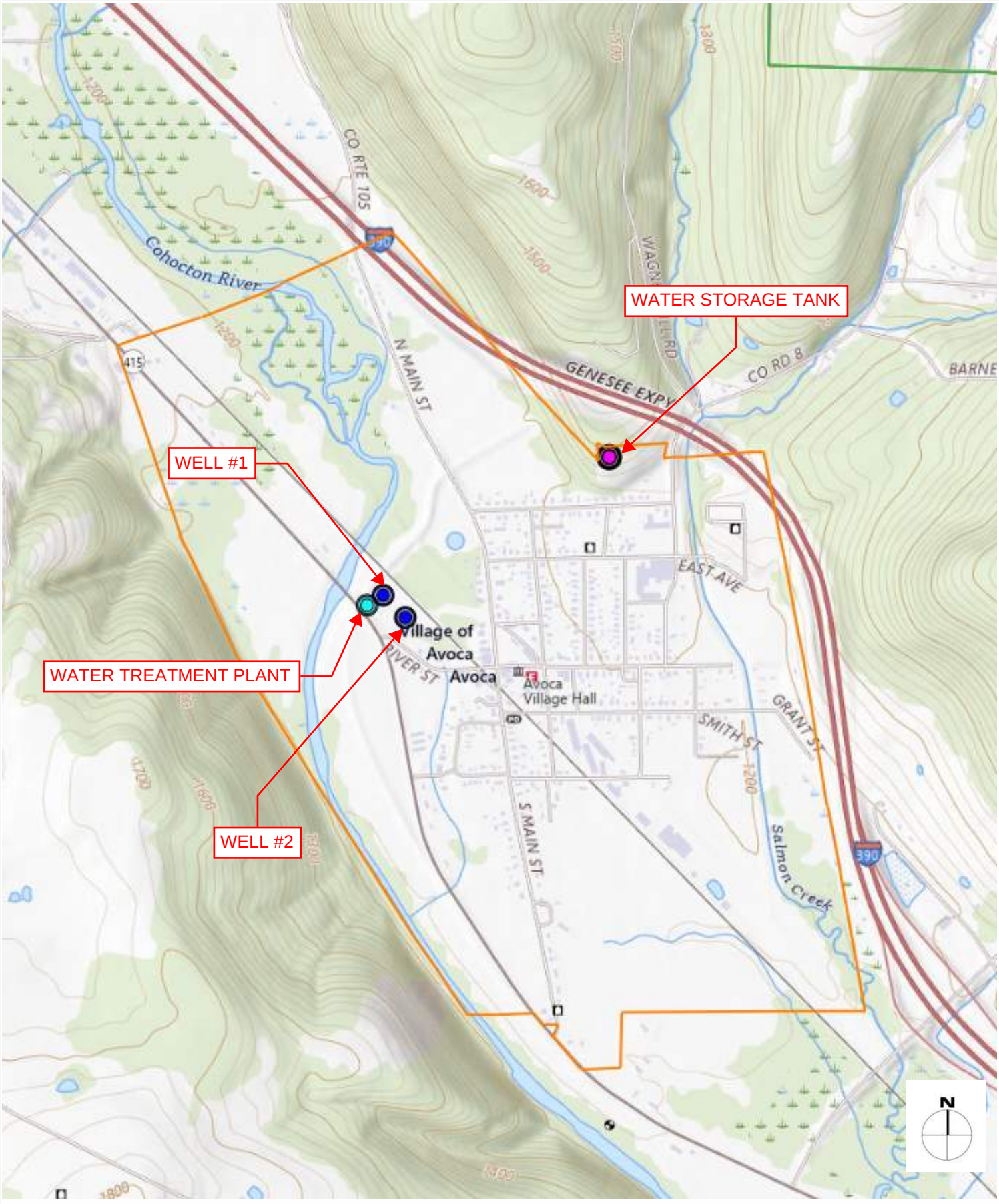
IX. Maps and Figures

Maps and Figures as referenced throughout this report can be found in their appropriately indicated Appendices.

X. Engineering Report Certification

Engineering Report Certification can be found in Appendix K.

APPENDIX A
LOCATION MAP



LOCATION MAP

WATER SYSTEM EVALUATION

VILLAGE OF AVOCA

STEUBEN COUNTY, NEW YORK

Copyright: 2026

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
4 Commercial Street, Suite 300, Rochester, NY 14614
P: 585-327-7950 F: 585-327-7949
Offices: Horseheads | Rochester | Towanda

DATE : September 2026

PROJECT NO: 1562-003

APPENDIX B
ENVIRONMENTAL RESOURCES

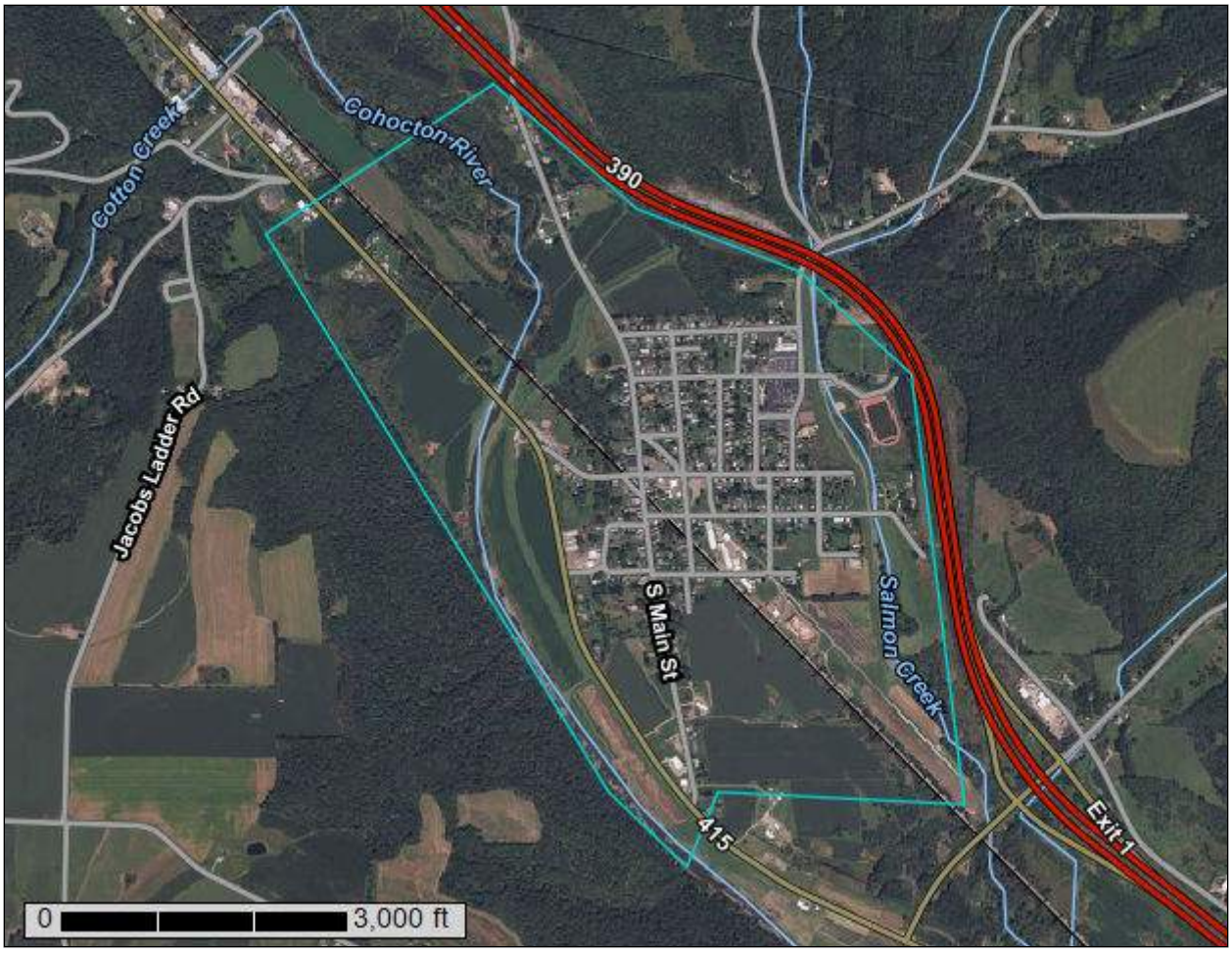
United States Department of Agriculture

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 Steuben County, New York



September 8, 2026

Preface

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

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

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

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

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

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

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

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

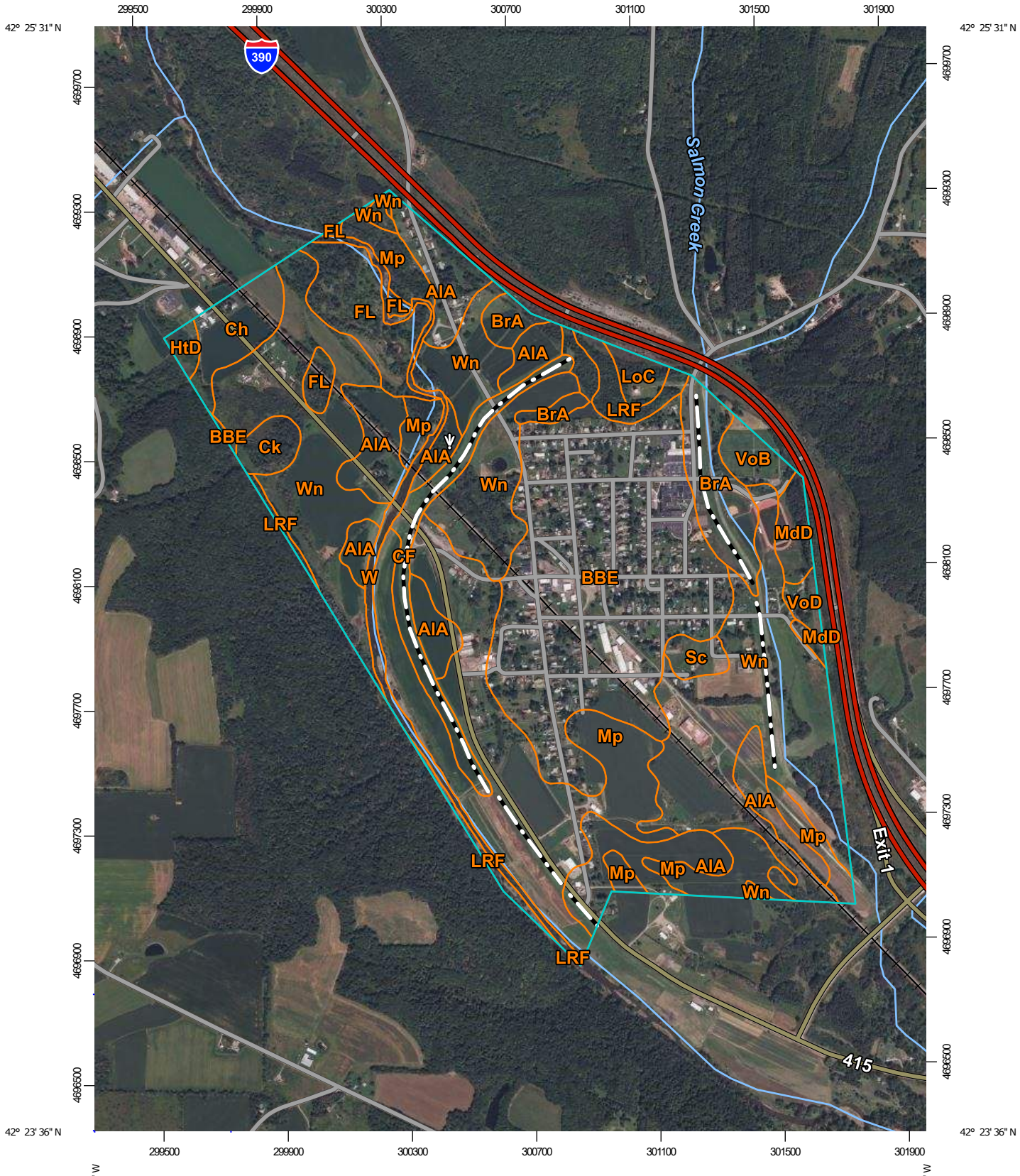
Contents

Preface..... 2
Soil Map..... 5
Soil Map.....6
Legend.....7
Map Unit Legend..... 8
Map Unit Descriptions..... 8
Steuben County, New York..... 11
AlA—Alton gravelly fine sandy loam, 0 to 3 percent slopes..... 11
BBE—Bath soils, steep..... 12
BrA—Braceville gravelly silt loam, 0 to 3 percent slopes..... 14
CF—Cut and fill land..... 15
Ch—Chenango channery silt loam, fan.....16
Ck—Chippewa channery silt loam, 0 to 3 percent slopes..... 18
FL—Fluvaquents and Ochrepts..... 19
HrD—Howard-Madrid complex, 20 to 30 percent slopes.....21
HtD—Howard and Alton gravelly soils, 20 to 30 percent slopes.....23
LoC—Lordstown channery silt loam, 12 to 20 percent slopes..... 25
LRF—Lordstown-Arnot complex, very steep, very rocky..... 27
MdD—Mardin channery silt loam, 15 to 25 percent slopes.....29
Mp—Middlebury silt loam.....30
Sc—Scio silt loam..... 32
VoB—Volusia channery silt loam, 3 to 8 percent slopes..... 33
VoD—Volusia channery silt loam, 15 to 25 percent slopes.....35
W—Water.....36
Wn—Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded.....36

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 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: Steuben County, New York
Survey Area Data: Version 22, Aug 27, 2025

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

Date(s) aerial images were photographed: Aug 3, 2021—Nov 7, 2021

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
AlA	Alton gravelly fine sandy loam, 0 to 3 percent slopes	78.8	10.5%
BBE	Bath soils, steep	159.6	21.2%
BrA	Braceville gravelly silt loam, 0 to 3 percent slopes	30.7	4.1%
CF	Cut and fill land	21.3	2.8%
Ch	Chenango channery silt loam, fan	16.1	2.1%
Ck	Chippewa channery silt loam, 0 to 3 percent slopes	7.2	1.0%
FL	Fluvaquents and Ochrepts	30.7	4.1%
HrD	Howard-Madrid complex, 20 to 30 percent slopes	1.6	0.2%
HtD	Howard and Alton gravelly soils, 20 to 30 percent slopes	3.1	0.4%
LoC	Lordstown channery silt loam, 12 to 20 percent slopes	5.7	0.8%
LRF	Lordstown-Arnot complex, very steep, very rocky	12.9	1.7%
MdD	Mardin channery silt loam, 15 to 25 percent slopes	7.8	1.0%
Mp	Middlebury silt loam	136.2	18.1%
Sc	Scio silt loam	5.5	0.7%
VoB	Volusia channery silt loam, 3 to 8 percent slopes	8.1	1.1%
VoD	Volusia channery silt loam, 15 to 25 percent slopes	3.8	0.5%
W	Water	16.0	2.1%
Wn	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	207.0	27.5%
Totals for Area of Interest		**752.1**	**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.

Steuben County, New York

AlA—Alton gravelly fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9wr3
Elevation: 250 to 650 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Alton

Setting

Landform: Terraces, Outwash plains, Proglacial deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from acidic rocks, with some limestone below 40 inches

Typical profile

H1 - 0 to 6 inches: gravelly fine sandy loam
H2 - 6 to 36 inches: very gravelly sandy loam
H3 - 36 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

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

Minor Components

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

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

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

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

BBE—Bath soils, steep

Map Unit Setting
National map unit symbol: 2v31g
Landscape: Uplands
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

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

Description of Bath

Setting
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile
A - 0 to 4 inches: channery silt loam
Bw1 - 4 to 15 inches: channery silt loam
Bw2 - 15 to 25 inches: channery loam
E - 25 to 29 inches: channery loam

Bx - 29 to 52 inches: very channery silt loam
C - 52 to 72 inches: very channery silt loam

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 26 to 38 inches to fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Minor Components

Cadosia, very stony

Percent of map unit: 10 percent
Landscape: Uplands
Landform: Glaciated ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lordstown, very stony

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

Mardin

Percent of map unit: 5 percent
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

BrA—Braceville gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9wrc
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Braceville

Setting

Landform: Terraces, Outwash plains, Proglacial deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits of stratified sand, silt, and gravel derived mainly from noncalcareous sandstone and shale

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 24 inches: gravelly loam
H3 - 24 to 36 inches: gravelly silt loam
H4 - 36 to 60 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 15 to 30 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 14 to 24 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F140XY020NY - Dense Outwash
Hydric soil rating: No

Minor Components

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

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

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

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

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

CF—Cut and fill land

Map Unit Setting
National map unit symbol: 9wrk
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: Not prime farmland

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

Description of Cut And Fill Land

Typical profile
H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 60 inches: channery silt loam

Properties and qualities
Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Alden

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

Collamer

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

Lackawanna

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

Scio

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

Fremont

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

Ch—Chenango channery silt loam, fan

Map Unit Setting

National map unit symbol: 9wrl
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chenango

Setting

Landform: Terraces, Valley trains

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

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 34 inches: very channery silt loam
H3 - 34 to 60 inches: very channery sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

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

Minor Components

Tioga

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

Alton

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

Braceville

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

Howard

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

Red hook

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

Ck—Chippewa channery silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2vcj6
Landscape: Uplands
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Chippewa

Setting

Landscape: Uplands
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy till dominated by siltstone, sandstone, and shale fragments

Typical profile

Ap - 0 to 7 inches: channery silt loam
Eg - 7 to 15 inches: channery silt loam
Bxg - 15 to 45 inches: channery silt loam
C - 45 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 8 to 20 inches to fragipan
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

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

Hydrologic Soil Group: D
Ecological site: F140XY016NY - Mineral Wetlands
Hydric soil rating: Yes

Minor Components

Chippewa, very poorly drained
Percent of map unit: 10 percent
Landscape: Uplands
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

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

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

Alden
Percent of map unit: 5 percent
Landscape: Uplands
Landform: Depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

FL—Fluvaquents and Ochrepts

Map Unit Setting
National map unit symbol: 9wrs
Elevation: 300 to 2,460 feet

Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 40 percent
Ochrepts and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting

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

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 60 inches: silt 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 high (0.06 to 5.95 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

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

Description of Ochrepts

Typical profile

H1 - 0 to 11 inches: gravelly sandy loam
H2 - 11 to 72 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 18 to 72 inches

Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

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

Minor Components

Alden

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

Tioga

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

Middlebury

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

Unnamed soils

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

Wayland

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

HrD—Howard-Madrid complex, 20 to 30 percent slopes

Map Unit Setting

National map unit symbol: 9ws7
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Howard and similar soils: 41 percent
Madrid and similar soils: 39 percent
Minor components: 20 percent

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

Description of Howard

Setting

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

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 24 inches: very gravelly loam
H3 - 24 to 45 inches: very gravelly loam
H4 - 45 to 72 inches: very gravelly sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

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

Description of Madrid

Setting

Landform: Till plains, Hills, Drumlinoid ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone and limestone

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 22 inches: fine sandy loam
H3 - 22 to 50 inches: gravelly fine sandy loam
H4 - 50 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Alton

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

Dunkirk

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

Lordstown

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

Mardin

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

HtD—Howard and Alton gravelly soils, 20 to 30 percent slopes

Map Unit Setting

National map unit symbol: 9ws8
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Howard

Setting

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

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 24 inches: very gravelly loam
H3 - 24 to 45 inches: very gravelly loam
H4 - 45 to 72 inches: very gravelly sand

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

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

Description of Alton

Setting

Landform: Terraces, Outwash plains, Proglacial deltas
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from acidic rocks, with some limestone below 40 inches

Typical profile

H1 - 0 to 6 inches: gravelly fine sandy loam
H2 - 6 to 36 inches: very gravelly sandy loam
H3 - 36 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

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

Minor Components

Dunkirk

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

Bath

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

Canaseraga

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

Lordstown

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

LoC—Lordstown channery silt loam, 12 to 20 percent slopes

Map Unit Setting

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

Map Unit Composition

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

Description of Lordstown

Setting

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

Typical profile

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

Properties and qualities

Slope: 12 to 20 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Arnot

Percent of map unit: 5 percent
Landscape: Glaciated uplands
Landform: Hills, Mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

LRF—Lordstown-Arnot complex, very steep, very rocky

Map Unit Setting

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

Map Unit Composition

Lordstown, very stony, and similar soils: 50 percent
Arnot, very stony, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Very Stony

Setting

Landscape: Glaciated uplands
Landform: Hills, Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic silt loam
Bw1 - 5 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 15 to 60 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Arnot, Very Stony

Setting

Landscape: Glaciated uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

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

Properties and qualities

Slope: 15 to 60 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

Minor Components

Cadosia, extremely stony

Percent of map unit: 10 percent
Landscape: Uplands
Landform: Glaciated ridges
Landform position (two-dimensional): Backslope, footslope

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

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

MdD—Mardin channery silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 2srh8
Landscape: Uplands
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

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

Description of Mardin

Setting
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile
Ap - 0 to 8 inches: channery silt loam
BE - 8 to 12 inches: channery silt loam
Bw1 - 12 to 16 inches: channery silt loam
Bw2 - 16 to 20 inches: channery silt loam
Bx1 - 20 to 36 inches: channery silt loam
Bx2 - 36 to 57 inches: channery silt loam
C - 57 to 72 inches: channery silt loam

Properties and qualities
Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Volusia

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

Bath

Percent of map unit: 5 percent
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landscape: Glaciated uplands
Landform: Hills, Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mp—Middlebury silt loam

Map Unit Setting

National map unit symbol: 9wsy
Elevation: 160 to 1,970 feet

Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Middlebury

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy alluvium predominantly from areas of shale and sandstone with some lime-bearing material

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 22 inches: silt loam
H3 - 22 to 41 inches: silt loam
H4 - 41 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F140XY014NY - Low Floodplain
Hydric soil rating: No

Minor Components

Tioga

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

Fluvaquents

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

Wayland

Percent of map unit: 5 percent

Landform: Flood plains
Hydric soil rating: Yes

Unnamed soils

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

Sc—Scio silt loam

Map Unit Setting

National map unit symbol: 9wtc
Elevation: 100 to 1,000 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Scio

Setting

Landform: Proglacial lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Glaciolacustrine deposits, eolian deposits, or old alluvium, comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 35 inches: silt loam
H3 - 35 to 42 inches: very fine sandy loam
H4 - 42 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

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

Minor Components

Collamer

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

Unadilla

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

Wallington

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

Middlebury

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

VoB—Volusia channery silt loam, 3 to 8 percent slopes

Map Unit Setting

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

Map Unit Composition

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

Description of Volusia

Setting

Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw - 9 to 15 inches: channery silt loam
Eg - 15 to 17 inches: channery silt loam
Bx1 - 17 to 29 inches: channery loam
Bx2 - 29 to 54 inches: channery loam
C - 54 to 72 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

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

Minor Components

Chippewa

Percent of map unit: 5 percent
Landscape: Uplands
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

Mardin

Percent of map unit: 5 percent
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

VoD—Volusia channery silt loam, 15 to 25 percent slopes

Map Unit Setting

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

Map Unit Composition

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

Description of Volusia

Setting

Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw - 9 to 15 inches: channery silt loam
Eg - 15 to 17 inches: channery silt loam
Bx1 - 17 to 29 inches: channery loam
Bx2 - 29 to 54 inches: channery loam
C - 54 to 72 inches: channery silt loam

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Mardin
Percent of map unit: 7 percent
Landscape: Uplands
Landform: Mountains, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Chippewa
Percent of map unit: 3 percent
Landscape: Uplands
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

W—Water

Map Unit Setting
National map unit symbol: 9wtm
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 155 days
Farmland classification: Not prime farmland

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

Wn—Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded

Map Unit Setting
National map unit symbol: 2srgt
Landscape: Valleys
Elevation: 160 to 1,970 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting

Landscape: Valleys
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt 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 high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F101XY003NY - Low Floodplain Depression
Hydric soil rating: Yes

Description of Wayland, Very Poorly Drained

Setting

Landscape: Valleys
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 9 inches: mucky silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt 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 low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F101XY003NY - Low Floodplain Depression
Hydric soil rating: Yes

Minor Components

Holderton

Percent of map unit: 10 percent
Landscape: Valleys
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED BY ENGINEERING ENTERPRISES, INC., NORMAN, OKLAHOMA, FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY UNDER CONTRACT NO. 68-01-6389

WATER RESOURCE INVESTIGATIONS
REPORT 85-4095 (SHEET 6 OF 7)

WELL YIELD

By

Timothy S. Pagano and David B. Terry

EXPLANATION

POTENTIAL WELL YIELD FROM PROPERLY CONSTRUCTED WELL IN SURFACE AQUIFER

in gallons per minute

1	50 - 500
2	50 - 1000
3	500 - 2500
4	1000 - 10000

BOUNDARY OF WELL YIELD UNITS

AQUIFER BOUNDARY—dashed where full extent of aquifer is not shown

AREA OF INSUFFICIENT DATA

AREA UNDERLAIN BY BURIED AQUIFER WITH POTENTIALLY GREATER PRODUCTIVITY THAN SURFACE AQUIFER

14-40 COMMUNITY WATER SYSTEM WELL OR INDUSTRIAL WELL - numbers are seconds of latitude and longitude, after Randall (1972).

spring 45-41

NOTE

Potential well yield map is based upon hydrologic data from Hollyday (1969) and MacNish and Randall (1982), and well data from Randall (1972). The potential yeild ranges listed above are the yields obtainable from more than 50% of wells tapping similar aquifers throughout the Susquehanna River basin. The highest yielding wells require special construction, usually a Ranny type collector.

In some areas the surface aquifer is underlain by more productive buried aquifers. These aquifers are separated from the surface aquifer by relatively impermeable silt and clay layers (see geologic sections, sheet 2), and are indicated on the map.

REFERENCES

Hollyday, E.F., 1969, An appraisal of the groundwater resources of the Susquehanna River basin in New York State, U.S. Geological Survey Open-File Report, 52 p.

MacNish, R.D., and Randall, A.D., 1982, Stratified-drift aquifers in the Susquehanna River basin, New York, New York State Dept. of Environmental Conservation Bulletin 75, 68pp., 17 figures, 1 pl.

Randall, A.D., 1972, Records of wells and test borings in the Susquehanna River basin, New York State, N.Y. State Dept. of Environmental Conservation Bulletin, 69, 92p.

DRAINAGE AREA

AQUIFER AREA

WATER TANK

WELL LOCATION

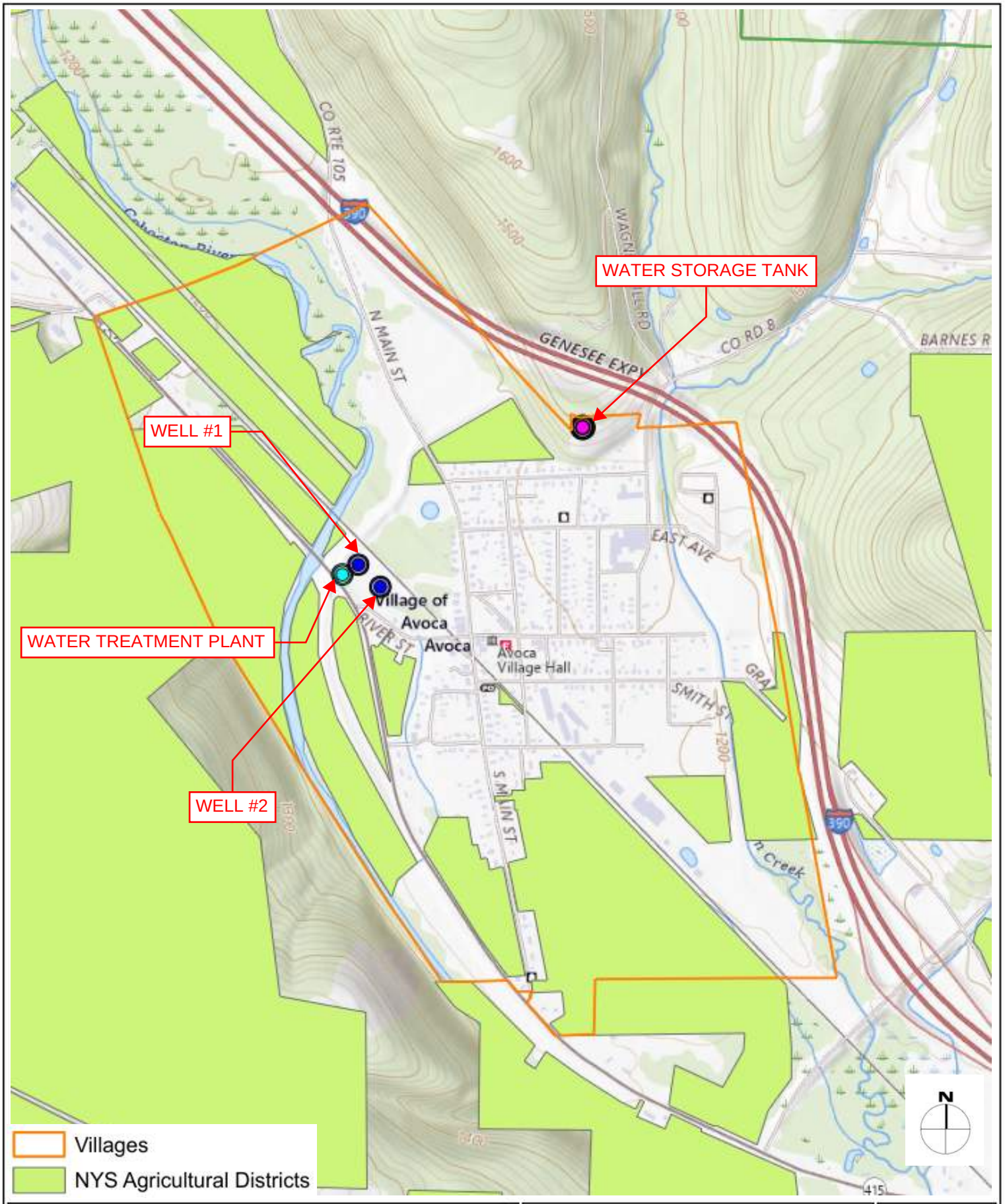
SCALE 1:24 000

JOINS U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 82-85, CORNING AREA, STEUBEN COUNTY, NEW YORK.

BASE FROM NEW YORK STATE DEPARTMENT OF TRANSPORTATION PLANIMETRIC MAPS. AVOCA, N.Y. 1977. SAVONA, N.Y. 1977. RHEIMS, N.Y. 1977. BATH, N.Y. 1977, TOWLESVILLE, N.Y. 1977. 1:24,000

GEOHYDROLOGY OF THE VALLEY-FILL AQUIFER IN THE BATH AREA, LOWER COHOCTON RIVER, STEUBEN COUNTY, NEW YORK

1984



AGRICULTURAL DISTRICT MAP

WATER SYSTEM EVALUATION

VILLAGE OF AVOCA

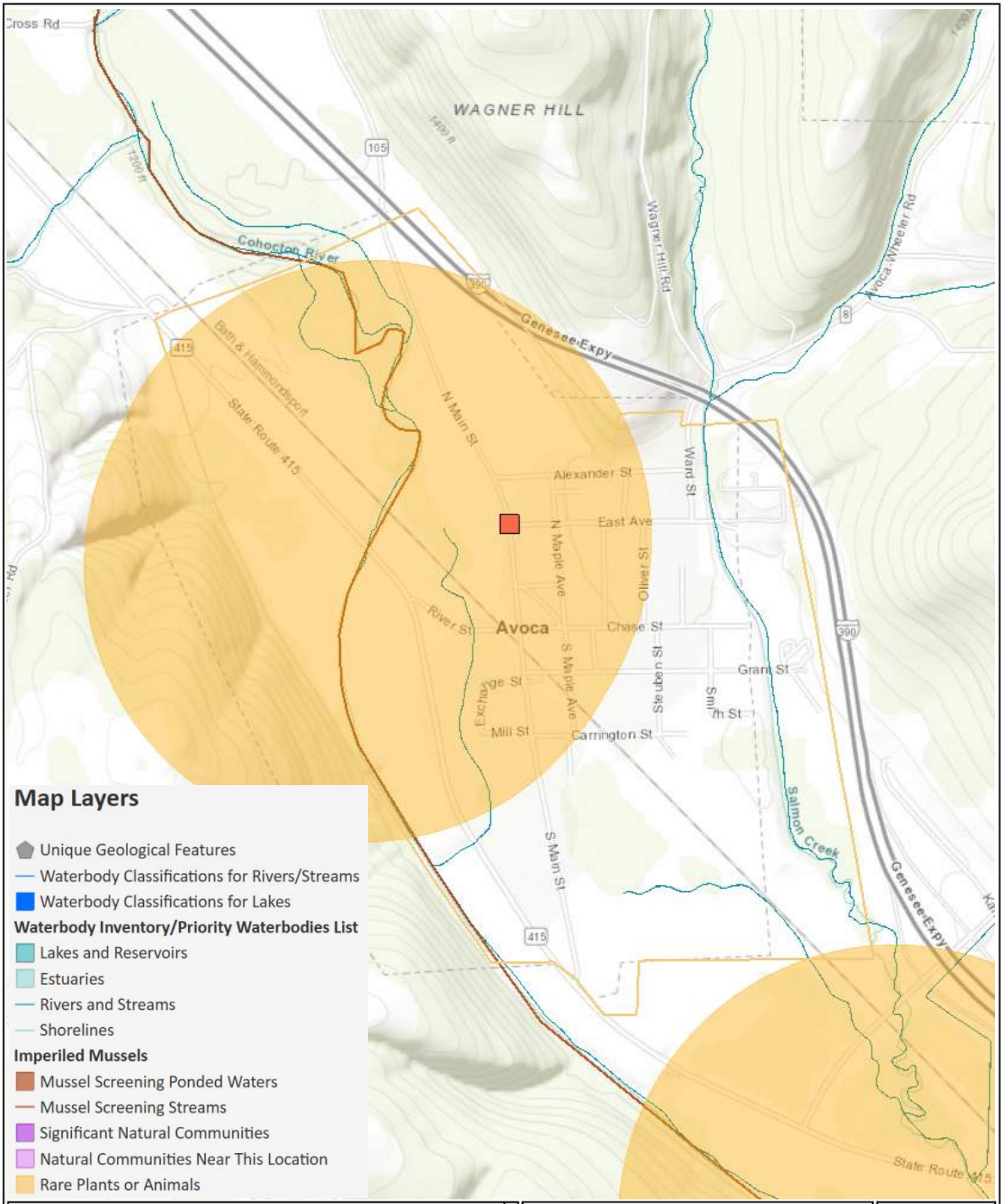
STEUBEN COUNTY, NEW YORK

Copyright: 2026

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
4 Commercial Street, Suite 300, Rochester, NY 14614
P: 585-327-7950 F: 585-327-7949
Offices: Horseheads | Rochester | Towanda

DATE : September 2026

PROJECT NO: 1562-003



Map Layers

- Unique Geological Features
- Waterbody Classifications for Rivers/Streams
- Waterbody Classifications for Lakes

Waterbody Inventory/Priority Waterbodies List

- Lakes and Reservoirs
- Estuaries
- Rivers and Streams
- Shorelines

Imperiled Mussels

- Mussel Screening Ponded Waters
- Mussel Screening Streams
- Significant Natural Communities
- Natural Communities Near This Location
- Rare Plants or Animals

PROJECT LOCATION

WATER SYSTEM EVALUATION

VILLAGE OF AVOCA

STEUBEN COUNTY, NEW YORK

Copyright: 2026

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
4 Commercial Street, Suite 300, Rochester, NY 14614
P: 585-327-7950 F: 585-327-7949
Offices: Horseheads | Rochester | Towanda

DATE : September 2026

PROJECT NO: 1562-003

COHOCTON RIVER, MIDDLE, AND MINOR TRIBS
(SEGMENT ID 0502-0003)

Waterbody Segment Assessment Factsheet

Factsheet Update: March 24, 2025
Integrated Reporting Cycle: 2022
NYSDEC CALM: 2021

IMPAIRED SEGMENT

Introduction

This fact sheet contains the most recent water quality assessment information for this waterbody segment. The assessment is based on water quality data that meet the quality assurance requirements of NYSDEC's Division of Water (DOW). An outline of the process used to assess the quality of New York State waters is described in the NYSDEC's Consolidated Assessment and Listing Methodology (CALM). (https://extapps.dec.ny.gov/docs/water_pdf/calm.pdf)

WATERBODY INFORMATION

- **Water Index Number:** Pa 3-58 (portion 3)
- **Segment Classification:** C
- **Waterbody Type:** River/Stream
- **Size:** 68 Miles
- **Drainage Basin:** Chemung River
- **Hydrologic Unit Code:** 0205010501
- **County:** Steuben
- **Segment Description:** Stream and selected tribs, from kanona to cohocton

Assessment of Best Use

Background

New York State waterbodies are classified to reflect their best use(s), and the assessment of a waterbody is based on the ability of waters to support those uses. This section lists whether this waterbody segment supports its best use(s).

Best Use	Use Assessment	Use Assessment Confirmation	Pollutant(s) Cause(s)	303(d) Year	Integrated Reporting Category
 Fishing	Impaired	Confirmed	pH	2022	IR5
 Secondary Contact Recreation	Unassessed	—	No Data	N/A	IR3

Best Use	Use Assessment	Use Assessment Confirmation	Pollutant(s) Cause(s)	303(d) Year	Integrated Reporting Category
Primary Contact Recreation	N/A for Waterbody Class	—	—	—	—
Source of Water Supply	N/A for Waterbody Class	—	—	—	—
Shellfishing	N/A for Waterbody Class	—	—	—	—

Water Quality Monitoring Data and Information

Background

Water quality monitoring data used for assessments may come from a variety of sources, including but not limited to NYSDEC's surface water monitoring and regulatory programs, and monitoring network partnerships on rivers, streams, lakes, reservoirs, estuaries, and coastal waters.

For access to current and historical DOW data collected by our stream and lake monitoring programs, please use the Division of Water Monitoring Data Portal (https://experience.arcgis.com/experience/301748017d7d40649bc5082fc1c5365e).

Data Source	Pollutant(s)
Division of Water's Stream Monitoring and Assessment Programs	pH

For more information, or to sign-up for email updates from NYSDEC, visit our website: https://dec.ny.gov/environmental-protection/water (https://dec.ny.gov/environmental-protection/water)

NEW YORK STATE | Department of Environmental Conservation

SALMON CREEK AND TRIBS
(SEGMENT ID 0502-0036)

Waterbody Segment Assessment Factsheet

Factsheet Update: March 24, 2025
Integrated Reporting Cycle: 2022
NYSDEC CALM: 2021

NEEDS VERIFICATION

Introduction

This fact sheet contains the most recent water quality assessment information for this waterbody segment. The assessment is based on water quality data that meet the quality assurance requirements of NYSDEC's Division of Water (DOW). An outline of the process used to assess the quality of New York State waters is described in the NYSDEC's Consolidated Assessment and Listing Methodology (CALM). (https://extapps.dec.ny.gov/docs/water_pdf/calm.pdf)

WATERBODY INFORMATION

- **Water Index Number:** Pa 3-58-32
- **Segment Classification:** C
- **Waterbody Type:** River/Stream
- **Size:** 20.6 Miles
- **Drainage Basin:** Chemung River
- **Hydrologic Unit Code:** 0205010501
- **County:** Steuben
- **Segment Description:** Entire stream and tribs

Assessment of Best Use

Background

New York State waterbodies are classified to reflect their best use(s), and the assessment of a waterbody is based on the ability of waters to support those uses. This section lists whether this waterbody segment supports its best use(s).

Best Use	Use Assessment	Use Assessment Confirmation	Pollutant(s) Cause(s)	303(d) Year	Integrated Reporting Category
 Fishing	Impaired	Unconfirmed	pH	N/A	IR3
 Secondary Contact Recreation	Unassessed	—	No Data	N/A	IR3

Best Use	Use Assessment	Use Assessment Confirmation	Pollutant(s) Cause(s)	303(d) Year	Integrated Reporting Category
Primary Contact Recreation	N/A for Waterbody Class	—	—	—	—
Source of Water Supply	N/A for Waterbody Class	—	—	—	—
Shellfishing	N/A for Waterbody Class	—	—	—	—

Water Quality Monitoring Data and Information

Background

Water quality monitoring data used for assessments may come from a variety of sources, including but not limited to NYSDEC's surface water monitoring and regulatory programs, and monitoring network partnerships on rivers, streams, lakes, reservoirs, estuaries, and coastal waters.

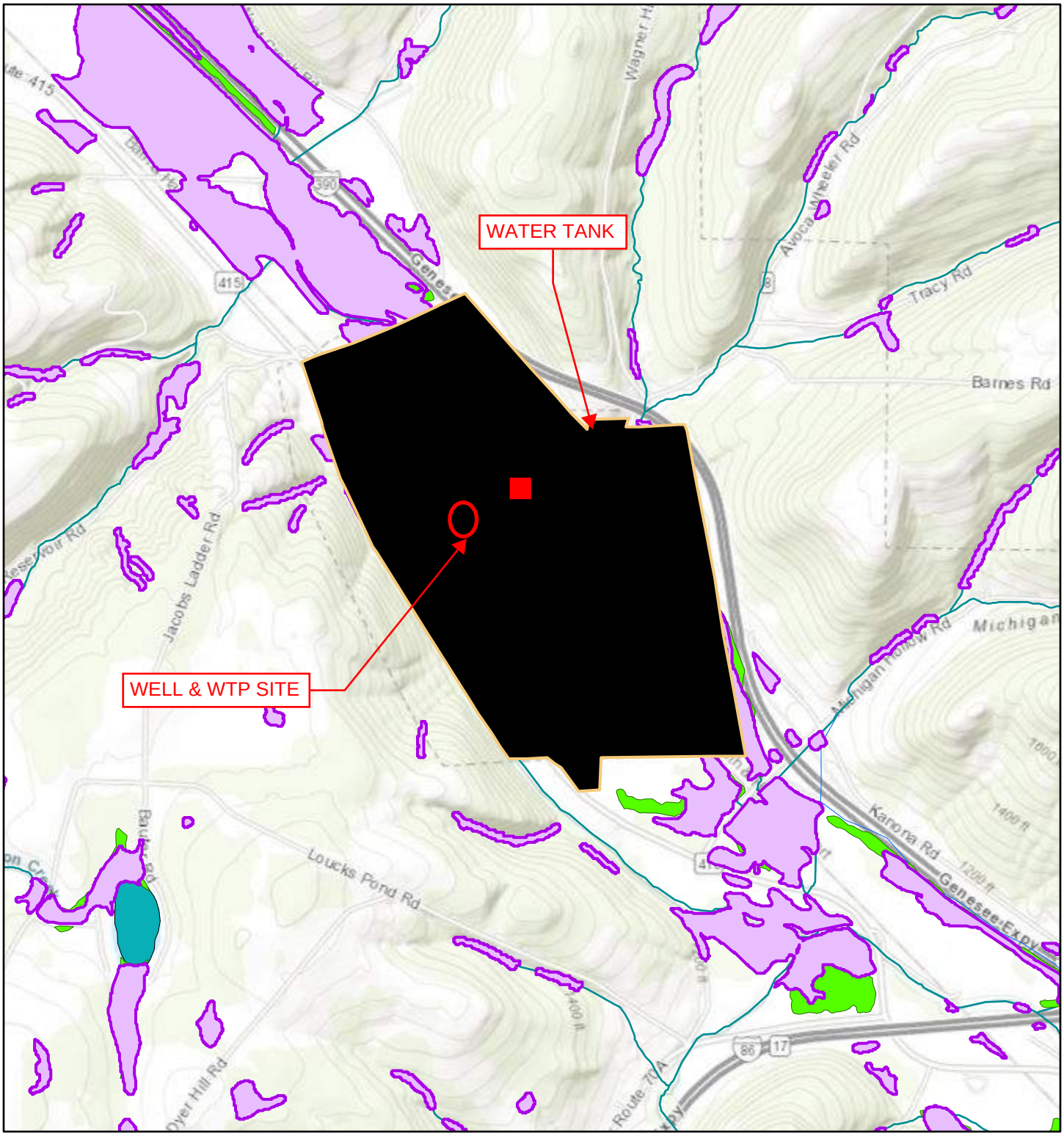
For access to current and historical DOW data collected by our stream and lake monitoring programs, please use the Division of Water Monitoring Data Portal (https://experience.arcgis.com/experience/301748017d7d40649bc5082fc1c5365e).

Data Source	Pollutant(s)
Division of Water's Stream Monitoring and Assessment Programs	pH

For more information, or to sign-up for email updates from NYSDEC, visit our website: https://dec.ny.gov/environmental-protection/water (https://dec.ny.gov/environmental-protection/water)

NEW YORK STATE | Department of Environmental Conservation

1<6'(& ,QIRUPDWLRQDO)UHVKZDWHU



6HSWHPEHU

Map Layers

- Waterbody Classifications for Rivers/Streams

Waterbody Inventory/Priority Waterbodies List

- Lakes and Reservoirs
- Estuaries
- Rivers and Streams
- Shorelines
- Previously Mapped Freshwater Wetlands
- Informational Freshwater Wetland Mapping
- Villages

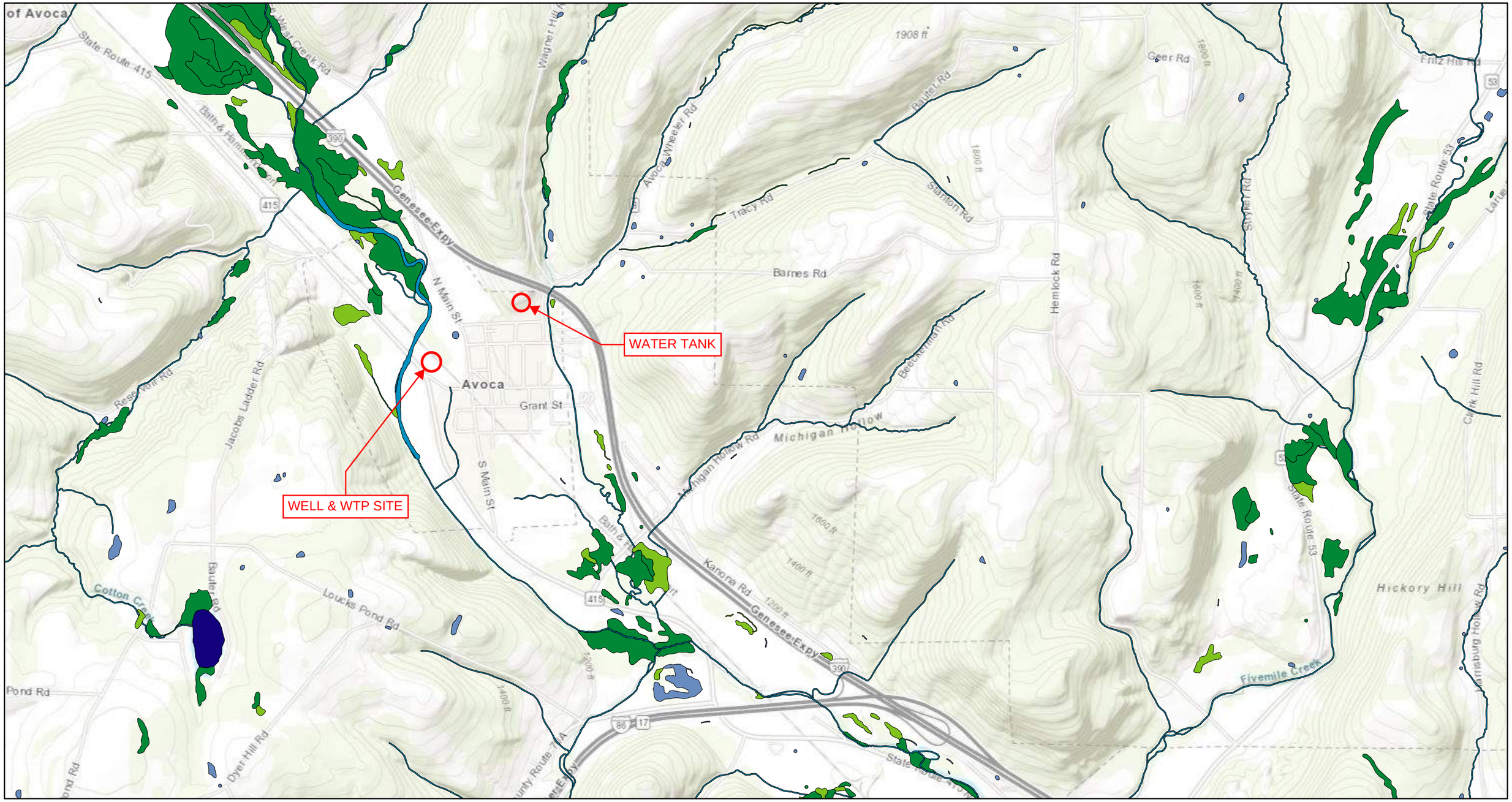
PL

NP

3URYLQFH RI 2QWDULR (VUL &DQDGD (VUL +(5(*
86*6 0(7, 1$6$ (3$ 86'$

1<6 'HSDUWPHQW RI (QYLURQPHQWDO
1RW D OHJDO GRFXPH

1:, :HWODQGV



6HSWHPEHU

PL

NP

3URYLQFH RI 2QWDULR (VUL &DQDGD (VUL +
3 86*6 0(7, 1$6$ (3$ 86'$

1<6 'HSDUWPHQW RI (QYLURQPHQ
1RW D OHJDO GRF

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Steuben County, New York



Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699
fw5es_nyfo@fws.gov

3817 Luker Road
Cortland, NY 13045-9385

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-Eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Clams

NAME	STATUS
Green floater Lasmigona subviridis Wherever found There is **proposed** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/7541	Proposed Threatened

Insects

NAME	STATUS
Monarch butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

NOT FOR CONSULTATION

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Green floater Lasmigona subviridis https://ecos.fws.gov/ecp/species/7541#crithab	Proposed

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1].
Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

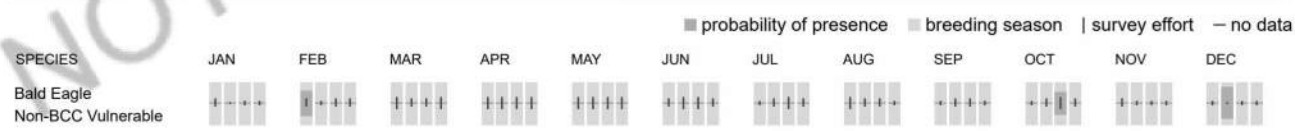
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



NOT FOR CONSULTATION

Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report
On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC

PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NOT FOR CONSULTATION

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Black-capped Chickadee Poecile atricapillus practicus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 10 to Jul 31
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

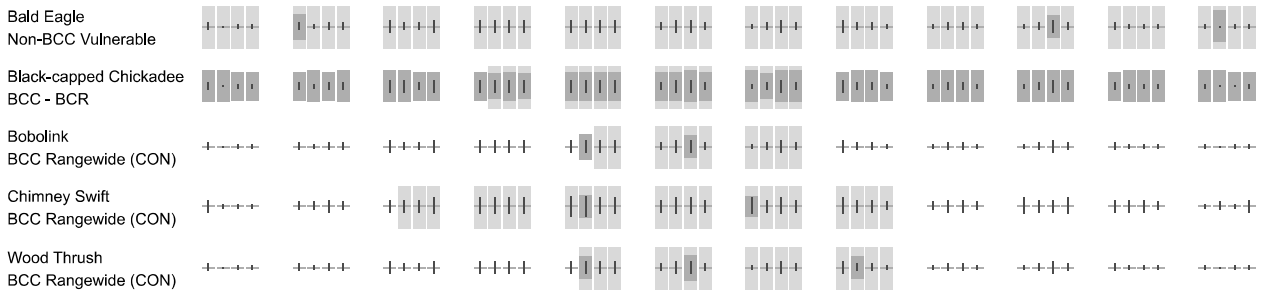
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort — no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

NOT FOR CONSULTATION



Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ "Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

NOT FOR CONSULTATION

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

NOT FOR CONSULTATION

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1/SS1E
- PEM1E
- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND
- PFO1C
- PSS1E
- PFO1/SS1E
- PFO1E
- PSS1C

FRESHWATER POND
- PUBHx

RIVERINE
- R2UBH
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

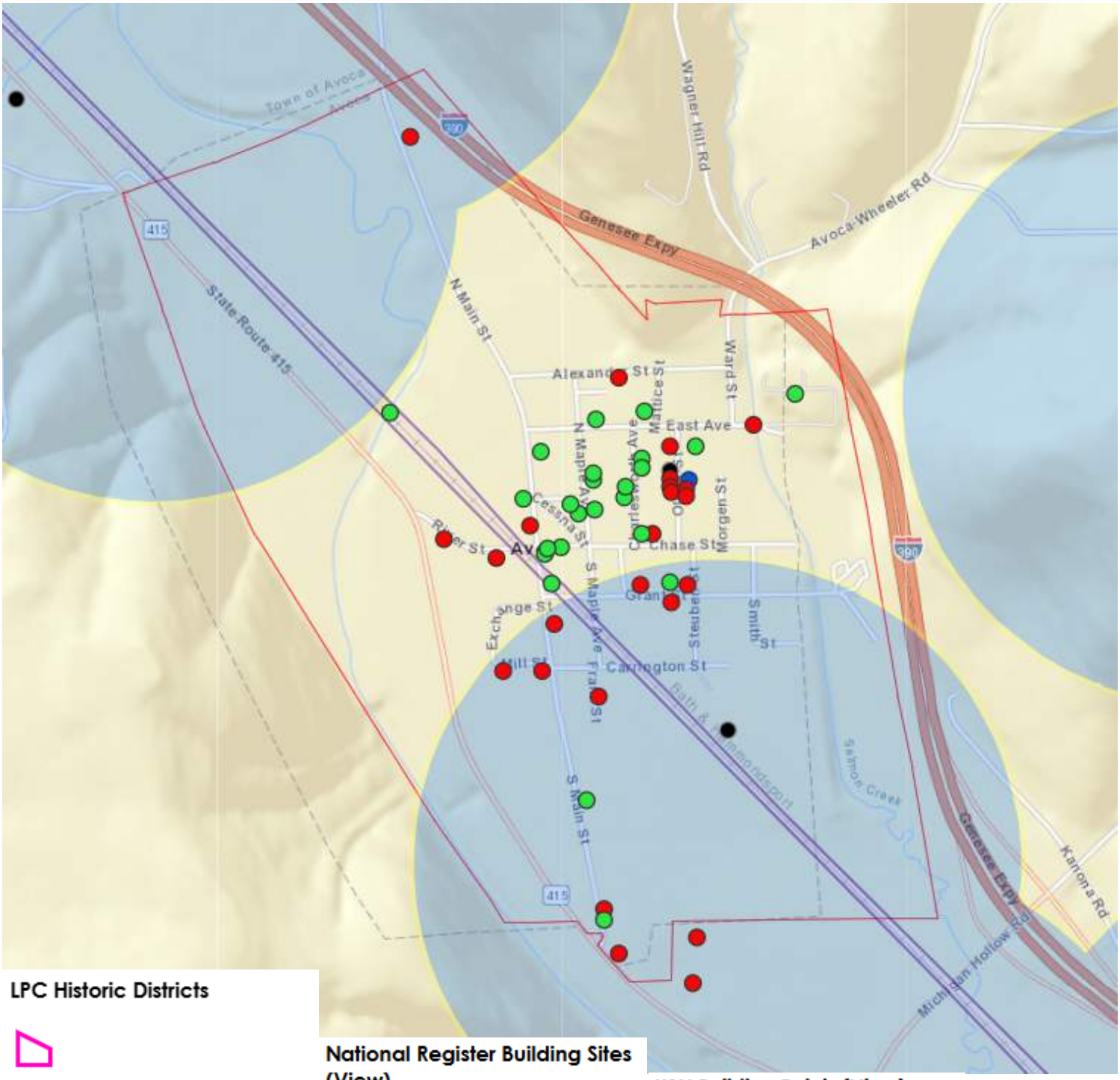
Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



LPC Historic Districts

Archaeological Buffer Areas

Minor Civil Divisions

National Register Building Sites (View)

USN Building Districts (View)

- Eligible
- others

USN Building Points (View)

- Eligible
- Listed
- Not Eligible
- Not Eligible - Demolished
- Undetermined

N

PROJECT LOCATION

WATER SYSTEM EVALUATION

VILLAGE OF AVOCA

STEUBEN COUNTY, NEW YORK

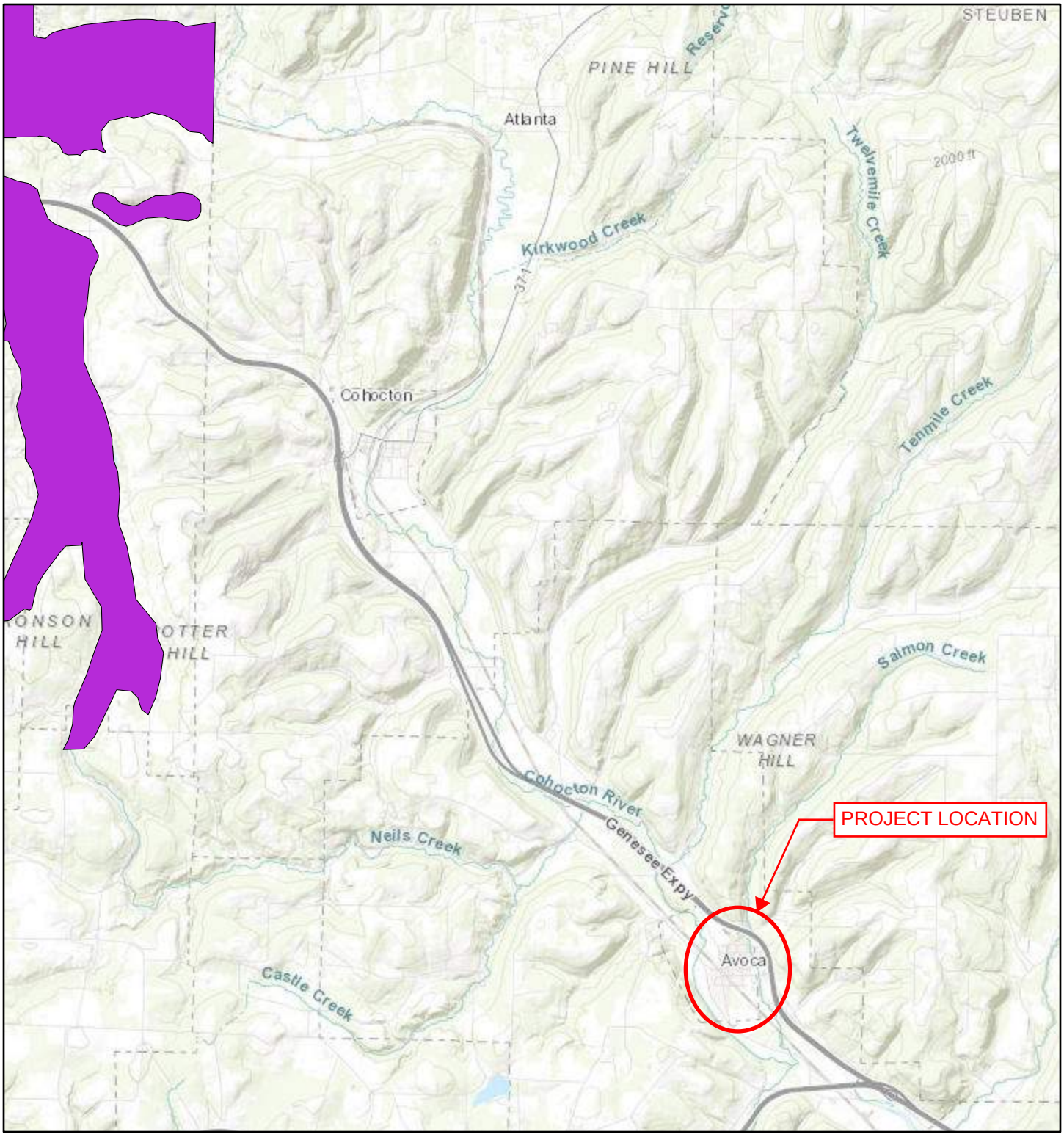
Copyright: 2026

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
4 Commercial Street, Suite 300, Rochester, NY 14614
P: 585-327-7950 F: 585-327-7949
Offices: Horseheads | Rochester | Towanda

DATE : September 2026

PROJECT NO: 1562-003

&ULWLFDO (QYLURQPHQWDO $U



6HSWHPEHU

Environmentally Sensitive Areas

- Critical Environmental Areas
- Regulatory Tidal Wetlands Areas
- Coastal Erosion Hazard Areas

PL

NP

3URYLQFH RI 2QWDULR (VUL &DQDGD (VUL +(5(*DU
86'$ 136

1<6 'HSDUWPHQW RI (QYLURQPHQWDO
1RW D OHJDO GRFXPH

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 / ZONE A5
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513
Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)
Elevation Reference Mark — RM7 ×
Zone D Boundary
River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain 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; or areas protected by levees from the base flood. (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); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (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.

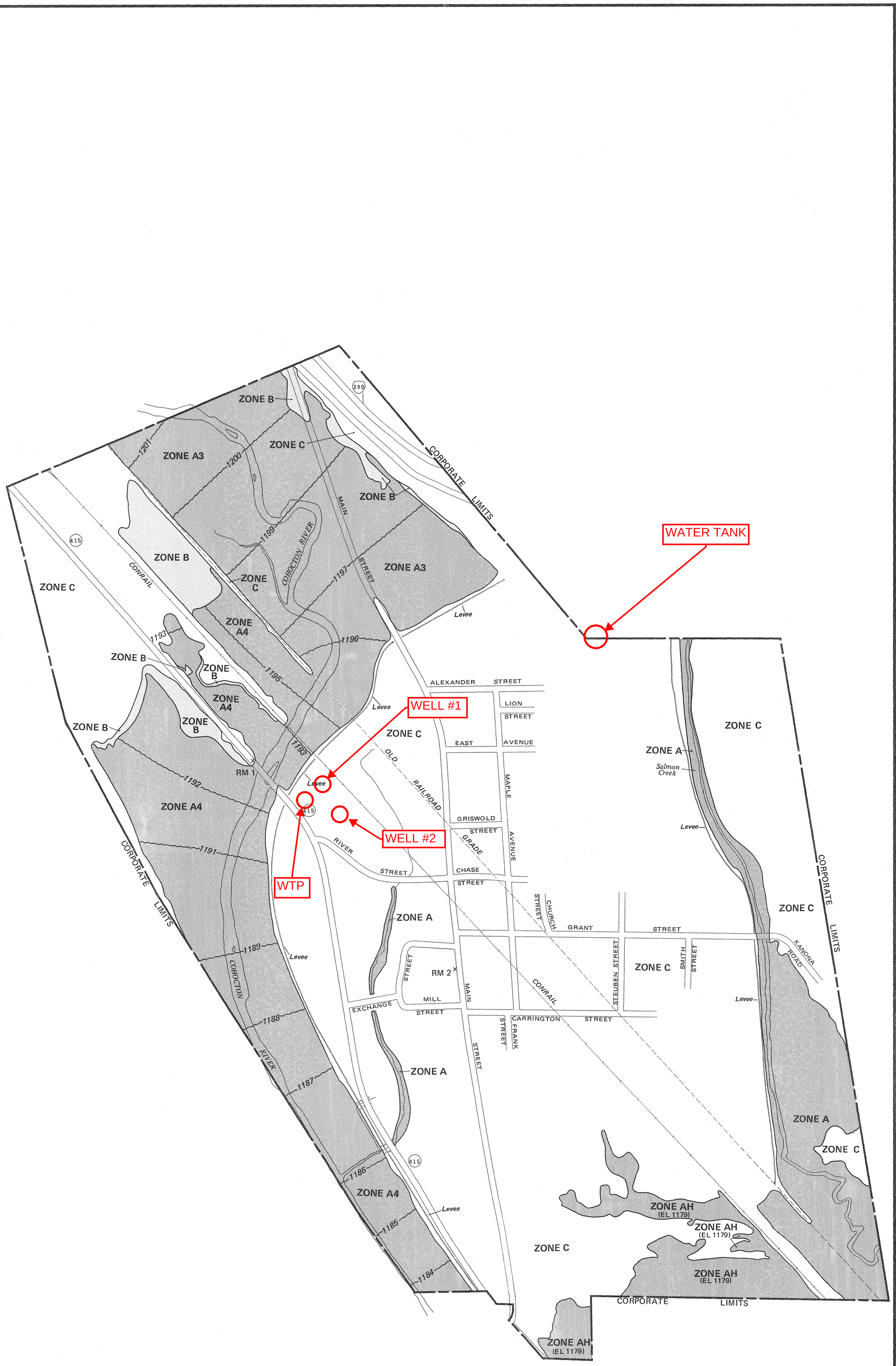
INITIAL IDENTIFICATION:
APRIL 12, 1974
FLOOD HAZARD BOUNDARY MAP REVISIONS:
MARCH 5, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
MAY 16, 1983
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 where elevations or depths have been established.

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
500 0 500 FEET



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 1	1204.31	Lead plug at north end of bridge M-20, along State Route 415, at milepost 1401.
RM 2	1191.64	USGS BM standard tablet stamped 1191 on the west side of South Main Street, approximately 300 feet north of Mill Street, near the southwest corner of Methodist-Episcopal Church front.

[1] National Geodetic Vertical Datum of 1929

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

VILLAGE OF
AVOCA,
NEW YORK
STEUBEN COUNTY

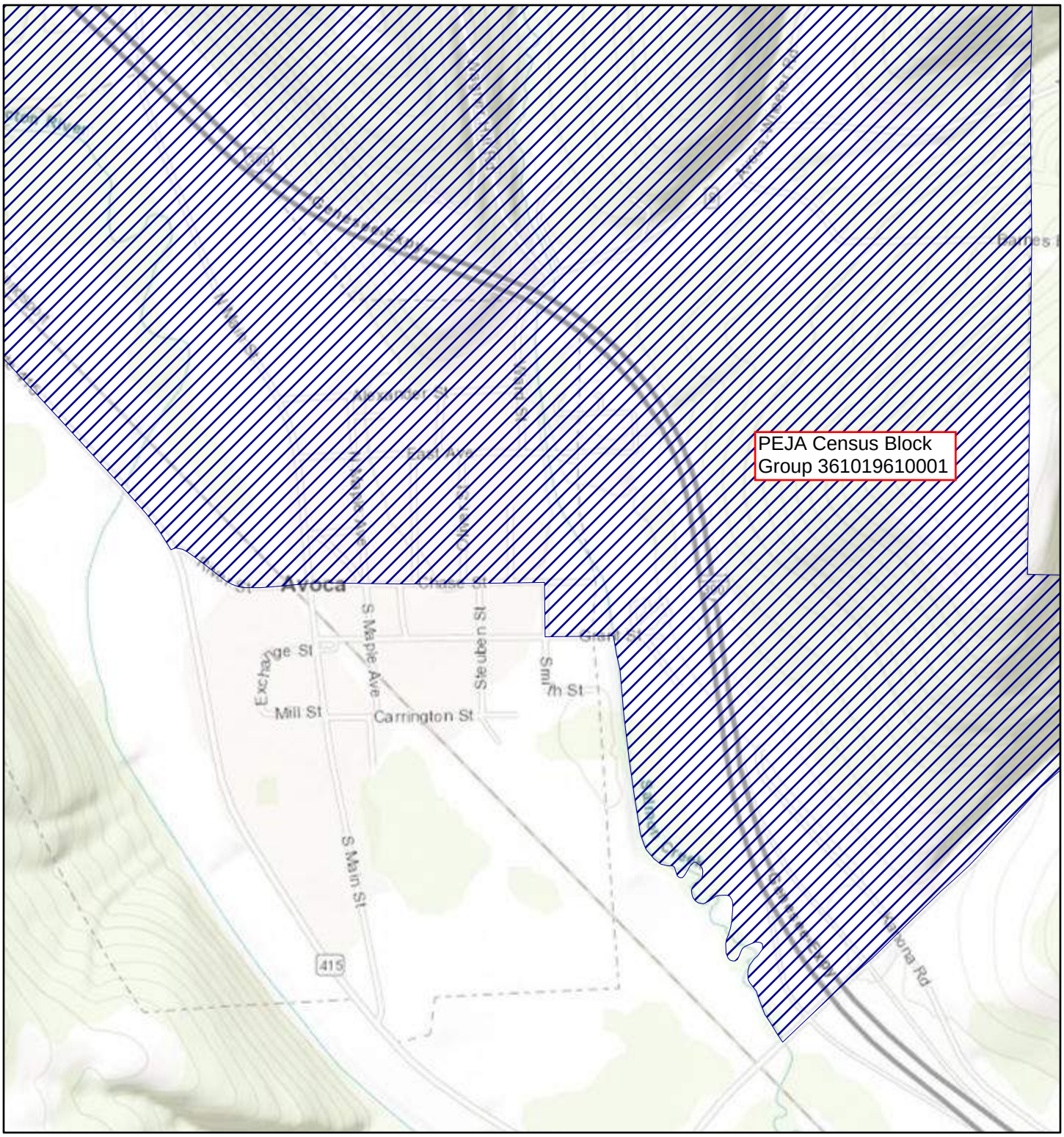
ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
360765 0001 B

EFFECTIVE DATE:
MAY 16, 1983

Federal Emergency Management Agency

3RWHQWLDO (QYLURQPHQWDO -X



6HSWHPEHU

Public Involvement

- Potential Environmental Justice Areas
- Disadvantaged Communities (DAC)
- OEJ Grants
- Climate Smart Communities
- Climate Smart Communities Grants
- Zero-emission Vehicle Rebates
- Zero-emission Vehicle Infrastructure Grants

PL

NP

3URYLQFH RI 2QWDULR (VUL &DQDGD (VUL +(5(*
86*6 0(7, 1$6$ (3$ 86'$

1<6 'HSDUWPHQW RI (QYLURQPHQWDO
1RW D OHJDO GRFXPH

APPENDIX C
EXISTING FACILITIES

Village of Avoca, New York - Water System



APPENDIX D
CONCEPTUAL IMPROVEMENTS

Legend

Junction
Type
- Active
- Domain
- Inactive
- <All other values>

Tank
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe Display
Diameter (in)
- less than 3.00
- 4.00
- 6.00
- 8.00
- 10.00
- 12.00
- greater than 12.00

Install New Groundwater Well and Connect to Existing Treatment Building

Improvements to Water Treatment Building

Province of Ontario, Esri Canada, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA

0 0.07 0.15 0.3 0.45 0.6 Miles

DRAWN BY:	SBT
CHECKED BY:	BTW
DATE:	10/07/2026
PHASE:	FINAL

COPYRIGHT 2023

#	DATE	DESCRIPTION OF REVISION

IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO MAKE UNAUTHORIZED ALTERATIONS OR ADDITIONS TO PLANS BEARING A LICENSED ENGINEER'S, ARCHITECT'S OR SURVEYOR'S SEAL.

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
HORSEHEADS, NY 607 - 358 - 1000 ROCHESTER, NY 585 - 327 - 7950
TOWANDA, PA 570 - 265 - 4868 BINGHAMTON, NY 607 - 798 - 8081
ALBANY, NY 607 - 798 - 8081 WWW.HUNT-EAS.COM
NY CERTIFICATE NO. 001622 PA CERTIFICATE NO. TSC2203131464-1

ALT 1

WATER SYSTEM EVALUATION
VILLAGE OF AVOCA
STEUBEN COUNTY, NEW YORK

PROJECT No. 1562-003

Legend

Junction

Type
- Active
- Domain
- Inactive
- <All other values>

Tank

Type
- Active
- Domain
- Inactive
- <All other values>

Pipe

Type
- Active
- Domain
- Inactive
- <All other values>

Pipe Display

Diameter (in)
- less than 3.00
- 4.00
- 6.00
- 8.00
- 10.00
- 12.00
- greater than 12.00

Install Tank Mixer, New Security Fencing & Re-Grade Access Road

Province of Ontario, Esri Canada, Esri, HERE, GarCanada, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

N 0 0.07 0.15 0.3 0.45 0.6 Miles

DRAWN BY:	SBT
CHECKED BY:	BTW
DATE:	10/07/2026
PHASE:	FINAL

COPYRIGHT 2023

#	DATE	DESCRIPTION OF REVISION

"IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO MAKE UNAUTHORIZED ALTERATIONS OR ADDITIONS TO PLANS BEARING A LICENSED ENGINEER'S, ARCHITECT'S OR SURVEYOR'S SEAL."

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
HORSEHEADS, NY 607 - 358 - 1000 ROCHESTER, NY 585 - 327 - 7950
TOWANDA, PA 570 - 265 - 4868 BINGHAMTON, NY 607 - 798 - 8081
ALBANY, NY 607 - 798 - 8081 WWW.HUNT-EAS.COM
NY CERTIFICATE NO. 001622 PA CERTIFICATE NO. TSC22031314641

ALT 2

WATER SYSTEM EVALUATION
VILLAGE OF AVOCA
STEUBEN COUNTY, NEW YORK

PROJECT No. 1562-003

Legend

Junction
Type
- Active
- Domain
- Inactive
- <All other values>

Tank
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe Display
Diameter (in)
- less than 3.00
- 4.00
- 6.00
- 8.00
- 10.00
- 12.00
- greater than 12.00

Install 15' x 60' Building Addition for Office and Storage Space

Province of Ontario, Esri Canada, Esri, HERE, GarCanada, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

0 0.07 0.15 0.3 0.45 0.6 Miles

DRAWN BY:	SBT
CHECKED BY:	BTW
DATE:	10/07/2026
PHASE:	FINAL

COPYRIGHT 2023

#	DATE	DESCRIPTION OF REVISION

"IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO MAKE UNAUTHORIZED ALTERATIONS OR ADDITIONS TO PLANS BEARING A LICENSED ENGINEER'S, ARCHITECT'S OR SURVEYOR'S SEAL."

HUNT ENGINEERS | ARCHITECTS | SURVEYORS
HORSEHEADS, NY 607 - 358 - 1000 ROCHESTER, NY 585 - 327 - 7950
TOWANDA, PA 570 - 265 - 4868 BINGHAMTON, NY 607 - 798 - 8081
ALBANY, NY 607 - 798 - 8081 WWW.HUNT-EAS.COM
NY CERTIFICATE NO. 001622 PA CERTIFICATE NO. TSC22031314641

ALT 3

WATER SYSTEM EVALUATION
VILLAGE OF AVOCA
STEUBEN COUNTY, NEW YORK

PROJECT No. 1562-003

Legend

Junction
Type
- Active
- Domain
- Inactive
- <All other values>

Tank
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe Display
Diameter (in)
- less than 3.00
- 4.00
- 6.00
- 8.00
- 10.00
- 12.00
- greater than 12.00

Install Water Booster Pump & Master Meter

Replace Existing 6" Cast Iron Pipe with 8" DIP Watermain and Hydrants

Province of Ontario, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

N 0 0.07 0.15 0.3 0.45 0.6 Miles

DRAWN BY:	SBT
CHECKED BY:	BTW
DATE:	10/07/2026
PHASE:	FINAL

COPYRIGHT 2023

#	DATE	DESCRIPTION OF REVISION

"IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO MAKE UNAUTHORIZED ALTERATIONS OR ADDITIONS TO PLANS BEARING A LICENSED ENGINEER'S, ARCHITECT'S OR SURVEYOR'S SEAL."

HUNT ENGINEERS | ARCHITECTS | SURVEYORS

HORSEHEADS, NY 607 - 358 - 1000 ROCHESTER, NY 585 - 327 - 7950
TOWANDA, PA 570 - 265 - 4868 BINGHAMTON, NY 607 - 798 - 8081
ALBANY, NY 607 - 798 - 8081 WWW.HUNT-EAS.COM
NY CERTIFICATE NO. 001622 PA CERTIFICATE NO. TSC2203131464-1

ALT 4

WATER SYSTEM EVALUATION
VILLAGE OF AVOCA
STEUBEN COUNTY, NEW YORK

PROJECT No. 1562-003

APPENDIX E
COST ESTIMATES

Opinion of Probable Cost

Avoca ALTERNATE 1
Locate and develop new well and improvements to existing treatment building

Stage of Design: Study
Avoca Water District

HUNT Project Number: 1562.003
Calculated By: DPY
Checked By:
Date October 2026

Item No.	Item	Quantity	Unit	COSTS $/Unit	COSTS Total	Subtotals
	Construction					***$ 549,200.00***
1	Erosion and Sediment Control	1	LS	$ 2,000.00	$ 2,000.00	
2	Locate, Drill, Test, and Connect New Well	1	LS	$ 275,000.00	$ 275,000.00	
3	New Well Pump	1	EA	$ 25,000.00	$ 25,000.00	
4	New Well Meter	1	EA	$ 10,000.00	$ 10,000.00	
5	2-inch HDPE in trench (for new well)	700	LF	$ 100.00	$ 70,000.00	
6	Scrape and Repaint Piping and Appurtenances in Wellhouse	1	LS	$ 5,000.00	$ 5,000.00	
7	Restoration, lawns	1000	SY	$ 7.00	$ 7,000.00	
8	Gate Valves, 2 inch	2	EA	$ 2,000.00	$ 4,000.00	
9	Connect to existing piping	1	EA	$ 10,000.00	$ 10,000.00	
10	Ventilation System in Treatment Building	1	EA	$ 30,000.00	$ 30,000.00	
11	New Roof on Treatment Building	1	EA	$ 15,000.00	$ 15,000.00	
12	New Generator Pad	1	EA	$ 1,200.00	$ 1,200.00	
13	Standby Generator with Auto Transfer Switch	1	LS	$ 95,000.00	$ 95,000.00	
14	Mobilization/Demobilization	3.0%			$ 16,476.00	***$ 16,476.00***
15	General Conditions	5.0%			$ 27,460.00	***$ 27,460.00***
	CONSTRUCTION SUBTOTAL					**$ 594,000**
	Contingency	35%				**$208,000**
	PROJECT SUBTOTAL					**$802,000**
	Administrative	3%				**$25,000**
	Legal	3%				**$25,000**
	Engineering/Construction Observation	18%				**$145,000**
	TOTAL ESTIMATED COST					**$997,000**

Opinion of Probable Cost

Avoca ALTERNATE 2
Tank Site Improvements

Stage of Design: Study
Avoca Water District

HUNT Project Number: 1562.003
Calculated By: DPY
Checked By:
Date October 2026

Item No.	Item	Quantity	Unit	COSTS $/Unit	COSTS Total	Subtotals
	Construction					***$ 229,900.00***
1	Clearing and Grubbing	0.5	AC	$ 50,000.00	$ 25,000.00	
2	Erosion and Sediment Control	1	EA	$ 2,500.00	$ 2,500.00	
3	Grading - Cut/Fill	500	CY	$ 70.00	$ 35,000.00	
4	Gravel Access Road	10000	SF	$ 5.00	$ 50,000.00	
5	Remove and Replace Guide Rail	200	LF	$ 40.00	$ 8,000.00	
6	Security Fencing	360	LF	$ 40.00	$ 14,400.00	
7	Install Tank Mixer, including temp tank	1	LS	$ 95,000.00	$ 95,000.00	
8	Mobilization/Demobilization	3.0%			$ 6,897.00	***$ 6,897.00***
9	General Conditions	5.0%			$ 11,495.00	***$ 11,495.00***
	CONSTRUCTION SUBTOTAL					**$ 249,000**
	Contingency	35%				**$88,000**
	PROJECT SUBTOTAL					**$337,000**
	Administrative	3%				**$11,000**
	Legal	3%				**$11,000**
	Engineering/Construction Observation	18%				**$61,000**
	TOTAL ESTIMATED COST					**$420,000**

Opinion of Probable Cost

Avoca ALTERNATE 3
New Office Space & Storage

Stage of Design: Study
Avoca Water District

HUNT Project Number: 1562.003
Calculated By: DPY
Checked By:
Date October 2026

Item No.	Item	Quantity	Unit	COSTS $/Unit	COSTS Total	Subtotals
	Construction					***$ 360,000.00***
1	New Addition for Office Space & Storage 15' x 60' (all-inclusive	900	SF	$ 400.00	$ 360,000.00	
2	Mobilization/Demobilization	3.0%			$ 10,800.00	***$ 10,800.00***
3	General Conditions	5.0%			$ 18,000.00	***$ 18,000.00***
	CONSTRUCTION SUBTOTAL					**$ 389,000**
	Contingency	35%				**$137,000**
	PROJECT SUBTOTAL					**$526,000**
	Administrative	3%				**$16,000**
	Legal	3%				**$16,000**
	Engineering/Construction Observation	18%				**$95,000**
	TOTAL ESTIMATED COST					**$653,000**

Opinion of Probable Cost

Avoca ALTERNATE 4
Replace existing 6" cast iron watermain and instrall fire booster pump station

Stage of Design: Study
Avoca Water District

HUNT Project Number: 1562.003
Calculated By: DPY
Checked By:
Date October 2026

Item No.	Item	Quantity	Unit	COSTS $/Unit	COSTS Total	Subtotals
	Construction					***$ 852,750.00***
1	Erosion and Sediment Control	1	LS	$ 5,000.00	$ 5,000.00	
2	Removal 6" cast iron watermain	500	LF	$ 50.00	$ 25,000.00	
3	Removal existing hydrant	4	EA	$ 1,500.00	$ 6,000.00	
4	8-inch DIP in trench	3800	LF	$ 135.00	$ 513,000.00	
5	Roadway Restoration (Off State Highway)	50	SY	$ 110.00	$ 5,500.00	
6	Roadside Restoration, lawns	1500	SY	$ 7.00	$ 10,500.00	
7	Gate Valves, 6 inch	7	EA	$ 2,250.00	$ 15,750.00	
8	Gate Valves, 8 inch	13	EA	$ 2,500.00	$ 32,500.00	
9	Hydrant Units	7	EA	$ 9,500.00	$ 66,500.00	
10	Connect to existing 8"	3	EA	$ 5,000.00	$ 15,000.00	
11	Reconnect House Services	4	EA	$ 2,000.00	$ 8,000.00	
12	Stream Crossing	1	EA	$ 10,000.00	$ 10,000.00	
13	Fire Booster Pump Station	1	LS	$ 80,000.00	$ 80,000.00	
14	Install Master Meter & Vault	1	LS	$ 40,000.00	$ 40,000.00	
15	Land Acquisition	1	LS	$ 20,000.00	$ 20,000.00	
16	Maintenance and Protection of Traffic	4.0%			$ 34,110.00	***$ 34,110.00***
17	Mobilization/Demobilization	3.0%			$ 25,583.00	***$ 25,583.00***
18	General Conditions	5.0%			$ 42,638.00	***$ 42,638.00***
	CONSTRUCTION SUBTOTAL					**$ 956,000**
	Contingency	35%				**$335,000**
	PROJECT SUBTOTAL					**$1,291,000**
	Administrative	3%				**$39,000**
	Legal	3%				**$39,000**
	Engineering/Construction Observation	18%				**$233,000**
	TOTAL ESTIMATED COST					**$1,602,000**

APPENDIX F
SMART GROWTH ASSESSMENT FORM

STATE SMART GROWTH PUBLIC INFRASTRUCTURE POLICY ACT
Smart Growth Impact Evaluation Form

This Smart Growth Impact Evaluation Form will assist the New York State Homes and Community Renewal (HCR) Smart Growth Advisory Committee and Staff to determine whether a proposed financing, acquisition or construction of a project by certain HCR agencies (collectively, the "Covered Agencies") complies with the NY State Smart Growth Public Infrastructure Policy Act (the "Act").

Covered Agencies are the New York State Housing Financing Agency, State of New York Mortgage Agency, Housing Trust Fund Corporation, New York State Affordable Housing Corporation, State of New York Municipal Bond Bank Agency, and Tobacco Settlement Financing Corporation.

PART A
Project Information

Project Name	Water System Evaluation and Improvements		
CDBG Project Number	TBD		
Project Address	Village of Avoca, Steuben County, NY		
Municipal Applicant	Village of Avoca		
Address	3 Chase Street		
	Avoca	NY	14809

1. List all the programs of the Covered Agencies subject to compliance with the Act which are expected to participate in the financing, acquisition, construction, or rehabilitation of the Project (do not list outside agency funding):

Program(s) of Covered Agencies	Funding Amount
Housing Trust Fund Corporation, CDBG	$38,400

2. Description of the proposed scope of work of rehabilitation and/or new construction of Project:

The proposed project consists of the following: construction of a new well; building and generator improvements at the Water Treatment Plant (WTP); security and access improvements at the water tank site; construction of a building addition at the Village garage to serve the water department; and water distribution system improvements and replacements.

Description of any public infrastructure proposed in the scope of work of rehabilitation and/or new construction of Project:

The project will drill and develop a new groundwater well at Hees Memorial Park to replace Well #1. WTP improvements includes generator and generator pad replacement, roof replacement, and installation of a ventilation system. Security and access will be improved at the tank site. The project includes a building addition to the existing Village garage to provide adequate office and storage space for the water department. Water distribution improvements includes the replacement of the watermain along NYS Route 415, installation of a water booster pump station to serve the northwest service area, and replacement of corroded water service lines, curb stops, and valve boxes.

3. Have any other entities issued a written statement or completed a smart growth review of the Project in connection with the Act?

	Entity
☐ Yes	
☑ No	

(Attach copy of written statement or results of smart growth review)

4. Is the Project subject to review as a public infrastructure project?

☐ Project DOES NOT involve the acquisition, new construction of, or expansion or reconstruction by a Covered Agency of infrastructure such as roads, sewers or sidewalks that are open and accessible to the public. A public infrastructure project does not include financing, acquisition, construction, or rehabilitation of infrastructure owned and used solely by the private owners or tenants of a project.

(For example, the construction or rehabilitation of a project-owned sewage treatment facility used by the private owners or tenants of *project would not be a public infrastructure project).*

OR

5. Is the Project subject to review as a public infrastructure project?

☑ Project DOES involve the acquisition, new construction of, or expansion or reconstruction by a Covered Agency of infrastructure such as roads, sewers or sidewalks that are open and accessible to the public and such infrastructure is not owned and used solely by the project.
IF CHECKED, GO ON TO PART B BELOW

PART B
Public Infrastructure Project Criteria Review

(*Briefly describe whether the proposed public infrastructure project satisfies the following criteria or why a criterion is not relevant or practicable.)*

The following Guidance and Regulations must be referenced as relevant, especially in response to criterion 11:

- 6 NYCRR Part 490, Projected Sea-level Rise https://www.dec.ny.gov/energy/102559.html
- Community Risk and Resiliency Act (CRRA), Guidance for Consideration of Flood Risk in Smart Growth Public Infrastructure Assessment https://www.dec.ny.gov/docs/administration_pdf/crrasmartgrowth.pdf
- NYS Flood Risk Management Guidance for Implementation of the CRRA https://www.dec.ny.gov/docs/administration_pdf/crrasmartgrowth.pdf
- NYS Flood Risk Management Guidance for Implementation of the CRRA - Estimating Guideline Elevations https://www.dec.ny.gov/docs/administration_pdf/crraestelevguidelines.pdf
- Using Natural Measures to Reduce Risk of Flooding and Erosion https://www.dec.ny.gov/docs/administration_pdf/crranaturalmeasuresgndc.pdf

STATE SMART GROWTH PUBLIC INFRASTRUCTURE POLICY ACT
Smart Growth Impact Evaluation Form

Does the public infrastructure project satisfy the following criteria?

1. To advance projects for the use, maintenance, or improvement of existing infrastructure:

☑	Yes	Explain briefly:
The project will improve the existing Village of Avoca water infrastructure by replacing Well #1, improving the WTP (generator replacement, roof replacement, ventilation system), improving the existing water tank, and replacing deteriorated water distribution system components (water mains, water service lines, curb stops, valve boxes).		
☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

2. To advance projects located in "Municipal Centers"

2a. an area of concentrated and mixed land use that serves as a center for various activities including, but not limited to:

(1) Downtown areas or Central business districts (such as the commercial and often geographic heart of a city, "downtown", "city center"); or

(2) Main streets (such as the primary retail street of a village, town, or small city. It is usually a focal point for shops and retailers in the central business district, and is most often used in reference to retailing and socializing); or

(3) Brownfield Opportunity Areas (http://nyswaterfronts.com/BOA_projects.asp); or

(4) Downtown areas of Local Waterfront Revitalization Plan areas (http://nyswaterfronts.com/maps_regions.asp); or
(5) Locations of transit-oriented development (such as projects serving areas that have access to mass or public transit for residents); or
(6) Environmental Justice areas (http://www.dec.ny.gov/public/899.html); or
(7) Hardship areas;

✔	Yes	Explain briefly:
The project seeks to improve the lifetime and reliability of a water system that serves the Village of Avoca. The project is located around the Village of Avoca main street(s) and community center. The Village of Avoca is also partially located within a Potential Environmental Justice Area (PEJA).		
	Criteria is Not Relevant	Explain briefly:
	No	Explain briefly:
	Compliance with the Criteria is considered impracticable	Explain briefly:

2b. An area adjacent to a Municipal Center defined in 2a. above which have clearly defined borders, are designated for concentrated development in the future in a municipal or regional comprehensive plan, and exhibit strong land use, transportation, infrastructure and economic connections to a municipal center; and areas designated in a municipal or comprehensive plan, and appropriately zoned in a municipal zoning ordinance, as a future municipal center.

✔	Yes	Explain briefly:

The project will serve the entirety of the Village of Avoca water system, which encompasses the Village of Avoca municipal center and adjacent areas.		
☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

3. To advance projects in developed areas or areas designated for concentrated infill development in a municipally approved comprehensive land use plan, local waterfront revitalization plan and/or brownfield opportunity area plan:

☐	Yes	Explain briefly:
☐	Criteria is Not Relevant	Explain briefly:

✔	No	Explain briefly:
The Village of Avoca is not designated for concentrated development in the future. The project will serve the General Business and Industrial districts as designated in the Village of Avoca Land Use and Development Law and zoning ordinance		
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

4. To protect, preserve and enhance the State's resources, including agricultural land, forests, surface and groundwater, air quality, recreation and open space, scenic areas, and significant historic and archeological resources:

✔	Yes	Explain briefly:
The project will improve the municipal water system. The new groundwater well will replace an existing deficient well. Water demands and withdrawals are not expected to increase. Water main replacements will reduce water loss and will protect State resources.		
☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:

☐	Compliance with the Criteria is considered impracticable	Explain briefly:

5. To 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	Explain briefly:
Reliable and equitable water supply promotes development and revitalization, particularly in the local business districts. Individuals of all income and age groups within the service area will benefit, including individuals within both the Village of Avoca and PEJA Census Tract 361019610001.		
☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

6. To provide mobility through transportation choices including improved public transportation and reduced automobile dependency:

☐	Yes	Explain briefly:
☑	Criteria is Not Relevant	Explain briefly:
The project consists of water system improvements and will not impact transportation systems.		
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

7. To coordinate between state and local government and intermunicipal and regional planning:

☑	Yes	Explain briefly:

The project includes coordination between state and local government to ensure regulatory compliance and best practices.

☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

8. To participate in community-based planning and collaboration:

☑	Yes	Explain briefly:

Community meetings will be conducted to develop the project.

☐	Criteria is Not Relevant	Explain briefly:

☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

9. To ensure predictability in building and land use codes:

✔	Yes	Explain briefly:
The Village of Avoca building and land use codes requires that all building/facilities with drinking water within the Village must be connected to the Village's public water system. The project will ensure compliance with Village of Avoca building and land use codes by providing safe and reliable drinking water.		
☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly:

10. To promote sustainability by strengthening existing and creating new communities which reduce greenhouse gas emissions and do not compromise the needs of future generations. The local public is involved in developing and implementing a community plan and ensuring the governance structure is adequate to sustain its implementation *[describe how project complies with local planning efforts to reduce greenhouse gas emissions, comprehensive planning, through zoning, and/or participation in FEMA Hazard Mitigation Planning or NYS Climate Smart Community Program]***:**

☐	Yes	Explain briefly:
☐	Criteria is Not Relevant	Explain briefly:
☐	No	Explain briefly:
✔	Compliance with the Criteria is considered impracticable	Explain briefly:
The Village of Avoca does not have a comprehensive community plan. The project will result in a minor increase in energy use due to the new pump station. Energy efficient equipment and design will be utilized wherever possible to mitigate the impact on energy and climate.		

11. To mitigate future physical climate risk due to sea level rise, and/or storm surges and/or flooding, based on available data predicting the likelihood of future extreme weather events, including hazard risk analysis data, if applicable *[If site is in or in close proximity to any flood risk must analyze regulations and guidance noted at the beginning of this document. For projects which may be located in the extended flood extent per the NYS Flood Risk Management Guidance for Implementation of the CRRA an analysis must be provided of whether the project design meets the Guidance and if not, explain why.]***:**

☐	Yes	Explain briefly:
☑	Criteria is Not Relevant	Explain briefly:
Current and proposed critical water infrastructure are not located within a FEMA floodplain. The project will improve localized ponding around the existing WTP and prevent flooding of the generator.		
☐	No	Explain briefly:
☐	Compliance with the Criteria is considered impracticable	Explain briefly: