Preliminary Engineering Report

Water System Evaluation

Prepared for

Village of Portville

1 South Main Street, P.O Box 436
Portville, New York

September 2020

Barton&Loguidice

Water System Evaluation
Village of Portville, Cattaraugus County

Preliminary Engineering Report

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Prepared For:

Village of Portville
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EXECUTIVE SUMMARY

The Village of Portville owns and operates a water system that consists of three (3) well houses, two (2) water storage tanks, and 8.1 miles of water distribution main. Several components in the Village's water system do not meet current health standards, or are in need of significant rehabilitation or replacement due to age related deficiencies. Major deficiencies of the water system generally include:

1. inadequate chlorine contact time (4-log inactivation of viruses) at each of two (2) active wells;
2. inadequate source capacity with North water well out of service;
3. various water treatment and storage violations as cited by the local DOH per 10 NYCRR Part 5;
4. the lack of modern system controls and monitoring;
5. the need for significant distribution system improvements to replace aging and undersized mains; and
6. system components (assets) that have reached the end of their useful service lives.

As a result of the condition of the water system and a January 9, 2020 inspection performed by the Cattaraugus County Department of Health (CCDOH), the Village water system has been issued several serious violations.

As the first step toward planning for an upgrade, the Village applied for and received a Community Planning Grant through the NYS Office of Homes and Community Renewal under the 2019 Consolidated Funding Application for completing this comprehensive evaluation of its drinking water system. This Preliminary Engineering Report (PER) assesses existing treatment and distribution system conditions, and evaluates alternatives for asset renewal and rehabilitation. This report recommends that the Village proceed with the design and construction of a Drinking Water System capital improvement plan (CIP) to address its deficiencies within the next few years, contingent on securing adequate funding.

The estimated probable project cost for the recommended CIP is $5,251,000. It is envisioned that the NYSEFC's DWSRF program would serve as the core funding program for the Village's CIP, supplemented by grant funding provided by NYSEFC or the Water Infrastructure Improvement Act (WIIA) grant program. A Preliminary Plan of Finance was developed herein. After implementing the proposed project, water rates are estimated to be between $465 and $836 per EDU per year dependent on the final scope and financing package secured for the project. Once implemented, the recommended CIP will provide the Village with safe and reliable drinking water for the foreseeable future.

ABBREVIATIONS

ADD	Average daily demand
BMP	Best Management Practice
C	Celsius
CCI	Construction Cost Index (ENR)
cfs	Cubic feet per second
CT	concentration x time
DBP	Disinfection byproducts
DEC	New York State Department of Environmental Conservation
DO	Dissolved oxygen
DOC	Dissolved organic carbon
DOH	New York State Department of Health
DOT	New York State Department of Transportation
DWSRF	Drinking Water State Revolving Fund
ECL	Environmental Conservation Law
EDU	Equivalent Dwelling Unit
EFC	New York State Environmental Facilities Corporation
ENR	Engineering News-Record
EPA	United States Environmental Protection Agency
F	Fahrenheit
fps	Feet per second
gpd	Gallons per day
GML	General Municipal Law
gpm	Gallons per minute
HAA	Haloacetic acid
HAB	Harmful algal bloom
HGL	Hydraulic Grade Line
hp	Horsepower
HPGN	High Precision Geodetic Network (1998)
IUP	Intended Use Plan
ISO	Insurance Services Office
LF	linear feet
MCL	Maximum contaminant level
MC-LR	Microcystin-LR
MHI	Median Household Income
MGD	Million gallons per day

ABBREVIATIONS (cont'd)

NAD83	North American Datum (1983)
NAVD88	North American Vertical Datum (1988)
NPSHa	Net positive suction head available
NPSHr	Net positive suction head required
NYSOPRHP	New York State Office of Parks, Recreation, and Historic Preservation
OMB	Office of Management and Budget
PAC	Powdered activated carbon
PACl	Polyaluminum chloride
PHD	Peak hourly demand
PER	Preliminary Engineering Report
ppm	parts per million
psig	Pounds per square inch (gauge)
Q	Volumetric flow rate (gpm, MGD)
SEQR	State Environmental Quality Review
SPDES	State Pollutant Discharge Elimination System
SUVA	Specific ultraviolet absorbance
SWPPP	Storm Water Pollution Prevention Plan
TDH	Total dynamic head
THM	Trihalomethane
TOC	Total organic carbon
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

1.1. Authorization

The Village of Portville retained the services of Barton & Loguidice, D.P.C. (B&L) to prepare an engineering report to evaluate the condition of its drinking water infrastructure. This report evaluates improvement alternatives and develops a recommended capital improvement plan (CIP) for upgrading existing infrastructure. The study is being funded by a NYSHCR CDBG Community Planning Grant.

1.2. Project Background

The Village owns and operates distribution and treatment infrastructure located in Portville. The age of the Village water system is unknown, but is believed to be originally constructed in the early 1900s. Several critical assets within the water system are either not in compliance with current State health and sanitary codes, or are approaching the end of their useful service lives. This study and PER includes an asset condition assessment of the Village's drinking water infrastructure. It outlines a recommended capital improvement plan based on evaluation of capital, operation and maintenance, and life-cycle costs, and presents a preliminary plan of finance for financing the CIP.

1.3. Scope of Work

The scope of services for the PER is as follows:

- Review of current water system data
- Develop GIS mapping of the existing system
- Develop a hydraulic model of the existing system
- Assess condition of existing infrastructure
- Evaluate alternative source, pumping, storage and distribution improvements to achieve code compliance
- Prepare estimates of probable project capital, annual operation and maintenance, short-lived asset, and life-cycle costs for each alternative considered
- Evaluate potential and probable plans of finance and estimate annual user costs
- Development of an agency-compliant Preliminary Engineering Report

2.0 PROJECT BACKGROUND AND HISTORY

2.1. Site Information

2.1.1. Location

The Village of Portville is located in the southeast quadrant of Cattaraugus County, New York. Neighboring communities are the Towns of Portville and Olean to the northwest, and Mckean County in Pennsylvania to the South. The Allegheny River is located on the western border of the Village. A project location map and map of the Village water system is include as Figure 1.

2.1.2. Geologic Conditions

Geologic conditions, including a topographic map, are included in Appendix A. A USDA Web Soil Survey of the project area was completed to determine soil conditions and depth to the water table. Soil conditions within the Village are generally characterized by Olean silt loam with 0 to 3 percent slope (18.8%), Pawling silt loam (12.9%), Olean silt loam with 3 to 8 percent slope (12.9%), Unadilla silt loam (11.4%), and Swormville silt loam (9.6%). Complete results of the Web Soil Survey are included in Appendix A.

2.1.3. Environmental Resources

Preliminary screening through the New York State Department of Environmental Conservation Environmental Resource Mapper has identified that portions of Portville are located within the vicinity of state regulated freshwater wetlands and rare plant or animal habitats. A copy of the Environmental Resource Map is included in Appendix A.

2.1.4. Floodplain Considerations

The Village of Portville is located where Dodge Creek meets the Allegheny River outside of a large levee. Most of the Village is located outside the 100 year flood plain, but within the 500 year flood plain. FEMA mapping does not indicated the 500 year flood plain elevation level. FEMA Flood Plain Mapping is available as Appendix A.

2.2. Ownership and Service Area

2.2.1. Ownership

The existing water system is owned and operated by the Village of Portville.

2.2.2. Outside Users

Currently there are approximately 12outside water users located in the Town of Portville to which the Village distributes water.

2.2.3. Population Trends and Projected Growth

Census and American Community Survey data indicates that the Village of Portville population has fluctuated between 1,007 people and 1,115 people between 1990 and 2017. Currently the Village of Portville is estimated to have a population of about 1,050

people. For planning purposes, a 10% population growth rate is projected over the next 25 years, which equates to a population of 1,155 people in year 2045. This modest population growth will not result in any major upsizing of water infrastructure.

Table 2-1: Population Data Taken from U.S. Census

1990 Population	2000 Population	2010 Population	2014 Population	2017 Population	25-Year Projected Growth
1,040	1,024	1,014	1,135	1,007	10.0%

2.2.4. Equivalent Dwelling Units (EDUs) and Water Usage

An equivalent dwelling unit, or EDU, is the unit of measure by which a user is charged for water service, wherein a "typical" single-family household is equivalent to 1 EDU. Based on the current Village EDU assessment structure, the Village of Portville has approximately 465 EDUs.

2.2.5. Nearby Public Water Systems

The closest public water system is located approximately 2.5 miles northwest of the Village at the intersection of NYS Route 417 and County Route 27 in the Town of Portville. This water main was extended east from the City of Olean along the Route 417 corridor to serve Town water districts within the Towns of Olean and Portville.

2.2.6. Community Engagement

Community engagement will be a project priority. The Village will host public information meetings to share information and solicit public comment from the affected community.

2.3. Financial Status

The Village of Portville had a 2010 Census median household income (MHI) of $39,663, a 2017 American Community Survey MHI of $50,179, a 2017 families below poverty rate of 7.5%, and a 36.68% low-to-moderate income percentage.

2.3.1. Source of Income

The Village generates income from quarterly water bills issued to all water users. The current rate schedule and number of users is defined below:

Village Residents and Outside Users

- Estimated Number of Equivalent Dwelling Units (EDUs): 465
- Base fee for first 4,000 gal. of usage: $22.00 per quarter
- Usage over 4,000 per quarter: $4.50 per thousand gallons
- Base fee for Outside users: $35.00 per quarter
- Usage over 4,000/qtr. (Outside): $8.72 per thousand gallons

- Average Water Use per quarter: 15,000 gallons
- Est. Quarterly Water Cost per EDU: $71.50 per quarter
- Estimated Annual Water Cost per EDU: $286 per year (avg.)

The current water budget for operation and maintenance costs is $114,970 per year. The Village water system does not have any outstanding debt.

2.3.2. Other Capital Improvement Needs

Currently, there is not an existing capital improvement project underway within the Village of Portville; however, the Portville sewer system has been evaluated and is in need of significant upgrades within the collection system and at the treatment plant.

2.3.3. Status of Existing Debt

The Village water system does not have any outstanding debt.

2.3.4. Required Reserve Accounts

The Village of Portville does not currently fund a water reserve account. All monies collected on a yearly basis are typically expended. Unanticipated water expenses would result in a budget deficit due to a lack of reserve savings.

3.0 EXISTING CONDITIONS

A map of existing water facilities including pipe sizes and material is included as Figure 1. The Cattaraugus County Department of Health (CCDOH) Sanitary Survey and Public Water Inspection referred to in Section 3 of this report is included in Appendix B. Site visit photos showing existing infrastructure are included as Appendix C.

3.1. Water Usage

Current water usage is based on the Water System Operation Reports provided by the Village of Portville. Usage data is summarized below and detailed in Appendix D. The below estimates were developed from historical water usage provided for the 2-year period 2018 through 2019.

Average Daily Water Production:	131,759 GPD
Average Daily Metered Water Use:	74,358 gallons
Max. Month Demand (Jan. 2018):	167,194 GPD
99% Max Day Demand:	231,710 GPD
Est. Max. Day Peak Hour Demand:	322 GPM
Estimated Unaccounted Water:	44% based on data available*

*Antiquated water meters that read low may artificially increase estimated unaccounted water; the Village has started to replace its meters.

3.2. Overview of Existing System

The existing Village water system generally consists of three (3) groundwater production wells, three (3) groundwater treatment buildings, two (2) water storage tanks, and 8.1 miles of water distribution piping. Water is pumped from groundwater production wells through a treatment building and into the water distribution system/storage tanks. The water storage tanks are used to pressurize the water system and provide enough water storage to satisfy peak daily demands and fire flow situations. A hydraulic model of the existing water system is included in Appendix E.

3.3. Groundwater Source and Treatment

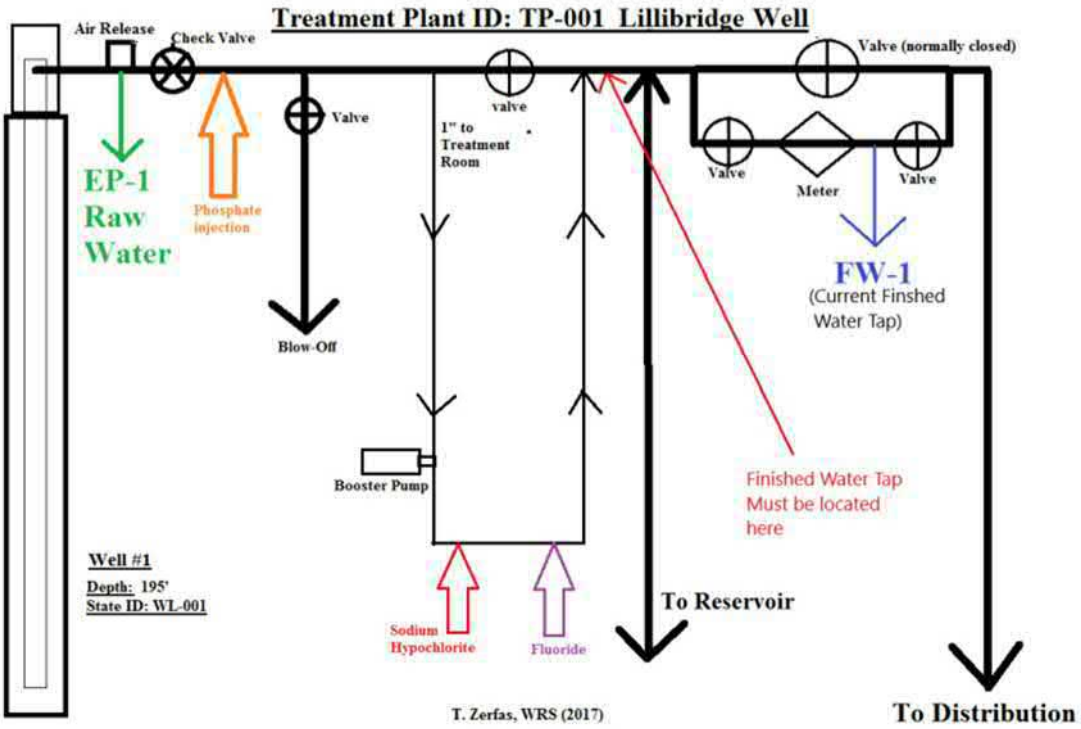
The Village has the ability to utilize three (3) developed groundwater wells as water sources; however, only two (2) of the three (3) wells are currently in service. The two (2) currently utilized groundwater wells include the North Well (located on Lillibridge Road) and the South Well (located behind Portville Central School) which collectively produce ~450 GPM of water. The third well, currently out of service, is the Wellington Drive Well which has not been used in approximately 28 years.

3.3.1. North Well

The north well is also referred to as Well No. 1, or the Lillibridge Well. It is located on the east side of Lillibridge Road near the Village line. According to the Cattaraugus County Department of Health (CCDOH), this well is a 12-inch diameter rock well that is 195 feet deep and produced 300 GPM during its initial pump testing which occurred in 1954. The fenced-in well site contains three (3) buildings: Well House No. 1 (which

contains the well); a treatment building (which houses all treatment pumps, chemicals, and equipment); and a meter/emergency well building. The emergency well has reportedly not been operated since the late 1970s.

Water from the North well is treated with three (3) chemicals. It is first injected with a poly-orthophosphate for corrosion control, then liquid sodium hypochlorite for disinfection, and finally with fluoride utilizing an up-flow saturator for dental health purposes. Originally, this well utilized a gas chlorination process, which operated by mixing chlorine gas with a side stream of water, and then combining the heavily chlorinated side stream with the untreated water. When the treatment system was retrofitted for liquid chemical injections, the side stream chemical injection process remained in service and is still in service today. A schematic of the Well No. 1 treatment process, prepared by the CCDOH, is shown below.



Once water from the North well passes through the treatment building, piping arrangements direct the water to the Northern water storage reservoir or to the distribution system. Notable deficiencies discovered during a review of the North Well Site include the following:

- Lack of Adequate Chlorine Contact Time - After chlorination, current piping arrangements allow water to be sent directly to the distribution system. Based on the flow rate and pipe sizing/length, the first customer may be served with water

well before the minimum required chlorine contact time is experienced. This is a serious health concern. Preliminary chlorine contact time calculations based on information provided by the Village are included as Appendix F.

- No water softener for Up-flow Fluoride Saturator – The water softener required in the fluoride addition process has been completely removed. This is causing fluoride to combine with water hardness and precipitate out prior to chemical injection. As a result, chemical feed piping often clogs and the water is not properly dosed with fluoride. The CCDOH has noted this as a violation of 10 NYCRR Part 5-1.71(b) in their 2020 inspection report.
- Insufficient Top of Well Casing Elevation – The well casing at the North Well must extend a minimum of 18-inches above grade (12-inches above the building floor and the floor must be 6-inches above grade). The well was constructed prior to this regulation, but the CCDOH has noted this as a violation of 10 NYCRR Part 5-D.3(b) in their 2020 inspection report and states it must be corrected under the next capital improvement project. The floor of the well building and the top of the well casing are located at the base of several steps and several feet below adjacent grade level.
- Lack of Secondary Chemical Containment – Although the Village has recently added secondary containment under most of the chemical containers at the treatment building, there are currently chemical drums stored inside the building without secondary containment. The CCDOH has noted this as a violation of 10 NYCRR Part 5-A.5.1.10(j) in their 2020 inspection report.
- Improperly located Finished Water Tap – The finished water tap located at the North treatment building is located after water could be sent to the distribution system (as shown on the sketch above). The location of this tap is incorrect and should be moved upstream of the distribution main connection. The CCDOH has noted this as a violation of 10 NYCRR Part 5-A.2.10 in their 2020 inspection report.
- Security Fencing in Disrepair – Portions of the North well site's security fencing are broken and in need of repair. The CCDOH has noted this as a violation of 10 NYCRR Part 5-A.2.19 in their 2020 inspection report.
- Various Additional Minor Deficiencies – Various components of the building systems at the North Well site are approaching the end of their useful lives or are in need of repair. Items in need of upgrades generally include roofs, windows, siding, interior piping, and building accessibility.

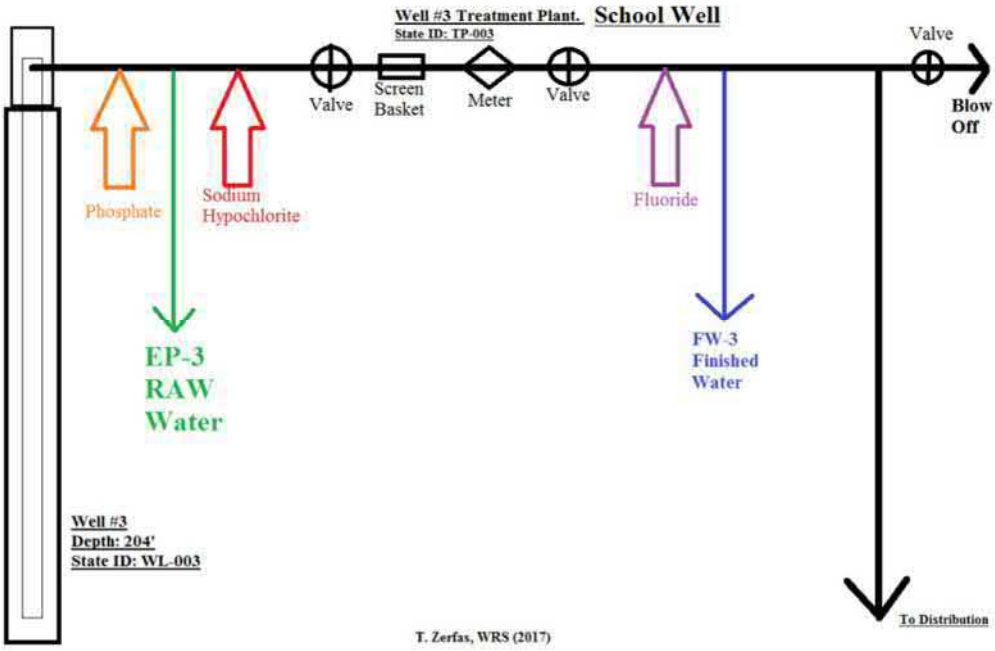
North Well: Treatment Building

North Well: Well Building Interior

3.3.2. South Well (School Well)

The South Well can sometimes also be referred to as Well No. 3, or the School Well. It is located on the east side of the Portville Junior High School (on school property) and was developed in 1996. According to the Cattaraugus County Department of Health (CCDOH), this well is 10-inch diameter rock well that is 200 feet deep and produced 150 GPM during its initial pump testing. The Well Building containing chemical drums, feed pumps, electrical panels, and a water meter is split into a chemical and a control room. The well is located outside in close vicinity to the building and utilizes a submersible well pump and a pitless adapter. The building is enclosed in fencing; however, the well casing and pitless unit are not.

Water from the South Well, like the North Well, is treated with three (3) chemicals. It is first injected with a poly-orthophosphate for corrosion control, next liquid sodium hypochlorite for disinfection, and then finally with fluoride utilizing an up-flow saturator for dental health purposes. A schematic of the Well No. 3 treatment process prepared by the CCDOH is shown below.



Once water from the South Well passes through the treatment building, water is sent to the southern water storage reservoir or to the distribution system. Notable deficiencies discovered during a review of the South Well Site include the following:

- Unknown Chlorine Contact Time – The buried pipe configuration following chlorination is unknown. Based on the flow rate and the assumed pipe sizing/length, it appears that the school may potentially be served with water before the minimum required chlorine contact time is achieved. This may not be the case as accurate mapping was not available at the time of this study; however, the lack of CT time is a serious health concern and must be confirmed.
- Inadequate Capacity to Service Water System – It would be difficult for the water system to only utilize the South Well to service water demands if the North Well was out of service for an extended period of time. During the majority of the year, the South Well could service demands operating 14+ hours per day, but in the event of a water main break or a fire during peak usage, the Village would be at risk of depleting its well yield and running out of water. Ideally, the Village water system sources should be capable of supplying 215 GPM with the largest well out of service. This rate is based on servicing the 99% peak day in 18 hours of pumping and the average day in less than 12 hours of pumping. The south well alone does not meet this criteria.
- Inoperable Up-flow Fluoride Saturator Water Softener – The water softener required in the fluoride addition process does not work properly. This is causing fluoride to combine with water hardness and precipitate out prior to chemical

injection. As a result, chemical feed piping often clogs and the water is not properly dosed with fluoride. The CCDOH has noted this as a violation of 10 NYCRR Part 5-1.71(b) in their 2020 inspection report.

- Lack of Secondary Chemical Containment – Although the Village has recently added secondary containment under most of the chemical containers at the treatment building, there are currently chemical drums stored inside the building without secondary containment. The CCDOH has noted this as a violation of 10 NYCRR Part 5-A.5.1.10(j) in their 2020 inspection report.
- Lack of Security Fencing Around Well – There is currently no security fencing around the well head itself, only the treatment building. Per 10 States Standards, the well should be protected by Security Fencing.
- Various Additional Minor Deficiencies – Various components of the building systems at the South Well may be upgraded should a capital improvement projected be implemented. The interior mechanical piping and bolts were noted to be showing corrosion and may require replacement or painting; the heating and ventilation system should also be upgraded to meet current minimum air changes per hour.

South Well: Treatment Building

South Well: Unprotected Well Head

3.3.3. Wellington Drive Well

The Wellington Drive Well has not been used in nearly 30 years due to water quality issues. The capacity of the well was not available at the time of this study, but has been reported to be in excess of 200 GPM. The Well was placed into service in the late 1970s and was found to have corrosive water which corroded the system's cast iron piping, leading to discolored water and drawing significant public complaints. As a result, the Village stopped using the well under normal circumstances and then in 2001 the Village officially abandoned the well. However, in 2014 plans were submitted to the Health Department and work began to reinstate the well by bringing it up to current standards, but construction was never completed. Today, the well remains offline and inoperable.

Well No. 3: Exterior

Well No. 3: Incomplete Interior Piping

3.4. Water Storage Tanks

The Village currently utilize two (2) water storage tanks. These include the North (Lillibridge) Reservoir and the South (School) Reservoir.

3.4.1. North Reservoir

North Reservoir Exterior

The North or Lillibridge reservoir is located northeast of and above the North Well site. The reservoir has a capacity of 240,000 gallons and consists of a rectangular concrete tank covered by a wood framed/shingled roof structure. The Village recently replaced the reservoir's roof, but failed to use proper roof sheathing materials. The roof is currently experiencing mold issues and will soon rot if not properly insulated. Notable deficiencies identified during an inspection of the North Reservoir include the following:

- Unprotected Openings into Reservoir Structure – The reservoir contains unprotected openings to the structure's interior, which puts it at risk of animal infestation and water contamination. The CCDOH has noted this as a violation of 10 NYCRR Part 5-1.32,5-1.71(b), and 5-A-7.03 in their 2020 inspection report.
- Unsecured Reservoir – The door to enter the reservoir was noted to be inadequately secured and does not contain a proper high quality stainless steel lock. Additionally, the remotely located reservoir does not have any fencing or security cameras. The CCDOH has noted this as a violation of 10 NYCRR Part 5-A-7.04 in their 2020 inspection report.
- Improper Roof Sheathing – The Village reconstructed the reservoir roof with Oriental Strain Board (OSB) sheathing. OSB is not meant to be used in moist environments and is starting to mold up and degrade at the reservoir. It is critical that the Village insulate the OSB roof in the immediate future or they risk having to replace the entire roof structure again in the near future.

- Lack of Water Level Transducer– The tank level transducer that controls the well pumps is no longer operational. The Village operates the well pumps in hand mode which is causing accidental tank overflows.
- Leaking Top Section of Structure – The top of the water storage structure is constructed out of CMU blocks and does not hold water without leaking. Numeorus blocks have cracked and are not sturturally sound.


North Reservoir Damaged CMU Block

3.4.2. South Reservoir

The South, or School Reservoir is located just uphill and generally east of the South Well. The reservoir has a capacity of 160,000 gallons and consists of a rectangular concrete tank covered by a wood framed/shingled roof structure. Notable deficiencies identified during an inspection of the North Reservoir include the following:

- Unprotected Openings into Reservoir Structure – The reservoir contains unprotected openings to the structure's interior, which puts it at risk of animal infestation and water contamination. The CCDOH has noted this as a violation of 10 NYCRR Part 5-1.32,5-1.71(b), and 5-A-7.03 in their 2020 inspection report.
- Insecure Reservoir Site –The remotely located reservoir does not have any fencing or security cameras. The CCDOH has noted this as a violation of 10 NYCRR Part 5-A-7.04 in their 2020 inspection report.
- Poor Roof Structure Condition – The roof structure over the South Reservoir is in very poor condition and is in need of replacement.
- Unsafe Water Reservoir Access – The operator is unable to enter the water storage structure safely. The door to the structure opens directly over the reservoir with no safety provisions, further contributing to the risk of water contamination.


South Reservoir Exterior


South Reservoir Roof Deterioration

3.5. System Pressures

The water level within the water storage tanks dictate the hydraulic gradient and supply pressures in the Village of Portville water system. Elevations in the water system range from 1,420 feet to 1,520 feet. The water storage operating levels are believed to range between 1,617 feet to 1,621 feet, resulting in system static pressures that generally range between 42 PSI to 85 PSI. Hydraulic modeling for existing system pressures during maximum daily and fire flow demand periods are included in Appendix E.

3.6. Water Distribution and Transmission

The Village of Portville water system (shown in Figure 1) contains approximately 750 feet of 10 - inch pipe; 18,200 feet of 8-inch pipe; 21,400 feet of 6-inch pipe; and 2,400 feet of 4-inch pipe. Information on the age and condition of most of the water main is unknown, as operators can only judge the Village main condition by frequency of leaks and other water main issues. The estimated unaccounted for water loss rate for the Village water system is 44%; however, this may be inflated due to antiquated water meters that may be reading low. Based on discussions with the operator, the below listed sections of water main require frequent maintenance/repairs and are suggested for replacement:

- 240 LF of 4-inch water main along Finch Street from Court Street to approximately 20 Finch Street;
- 890 LF of 6-inch water main that crosses Dodge Creek from Lillibridge Road to Brooklyn Street;
- 1,650 LF of 6-inch water main along North Main Street from Maple Street to the Village boundary line;
- 1,100 LF of 6-inch water main along Mersereau Place from South Main Street to approximately 50 Pine Street;
- 915 LF of 8-inch water main along Pine Street from South Main Street to approximately 34 Pine Street; and,
- 890 LF of 8-inch water main along Brooklyn Street from South Main Street to approximately 33 Brooklyn Street.

In addition to the above sections, it is believed that additional sections of main may be severely deteriorated based on the age of the system and the volume of unaccounted water, and therefore warrant replacement.

3.7. Residential Water Meters

The Village of Portville currently bills water users based on individual water use measured by a water meter. The majority of the existing water meters are well over 20 years old and have exceeded their useful service lives. They do not have remote read features, which makes the manual reading of meters very time consuming for Village operators. In recent years, the Village has begun replacing the existing meters with Mueller water meters. To date, the Village has replaced about 100 of the 465 water meters. The water meters are capable of drive-by reading, but the Village has not purchased a drive-by reading system or associated software.

3.8. Water System Control and Monitoring

The only control infrastructure currently in the Village of Portville water system is a water level transducer located in the South Reservoir which controls the operation of the South Well. The Village does not have any SCADA or alarm systems to alert operators of potential problems (i.e., low/high reservoir level, well pump failure, power failure, etc.). The lack of system monitoring has resulted in overflowing water storage tanks, as well as almost completely draining the storage tanks without realizing there was an issue.

3.9. Emergency Power

Upon discovering a power failure at its wells, the Village of Portville utilizes a portable generator to power the well sites during outages. Each well site is equipped with a generator plug and a manual transfer switch. Operators report the emergency power equipment and generator to be in good condition.

3.10. Capacity Development Overview

A completed NYS DWSRF Capacity Development Form is included as Appendix G. NYSDOH is required to ensure that all systems receiving DWSRF assistance have adequate technical, managerial, and financial capabilities to provide safe drinking water. Systems that lack adequate capacity must correct the technical, managerial, and financial deficiencies during a capital improvement project. The Village is committed to correcting any technical, managerial, and financial deficiencies. The CCDOH has issued the following operation related violations to the Village:

- Failing to Enforce a Cross Connection Control Program – The Village has not submitted backflow prevention device test reports to the health department since 2017. The CCDOH has noted this as a violation of 10 NYCRR Part 5-1.31 in their 2020 inspection report.
- Failing to Complete Regular System Flushing and Valve Exercising – The Village does not have a plan to and does not regularly flush water mains and exercise mainline water valves. The CCDOH has noted this as a violation of 10 NYCRR Part 5-1.71(b) in their 2020 inspection report.

4.0 NEED FOR PROJECT

The of Village of Portville water system is in need of significant upgrades to address several deficiencies on critical infrastructure assets as noted above and by the CCDOH letter contained in Appendix B. The need to correct the deficiencies described in Section 3.0 is detailed below.

4.1. Health, Sanitation, and Safety

Several asset systems and current operational practices within the Village of Portville water system pose health, sanitary, and safety risk to the water system users and have resulted in CCDOH violations. The lack of chlorine contact time at the North Well may be considered a major health hazard and could result in user's drinking water that has not been fully treated (disinfected). Additionally, many of the critical water system sites lack basic security measures including proper fencing and alarms. This puts the water system at risk for tampering. Lastly, the storage reservoirs have openings where birds and animals can enter causing sanitation issues following chlorination at the wellhead stations.

4.2. Aging Infrastructure

Many assets within the Village of Portville water system have exceeded their useful design service life. It is not reasonable to expect the equipment to last another 10 years without a significant investment in asset replacement. If antiquated infrastructure is not replaced in the next few years, it would be expected that the Village's water system operation and maintenance budget will continue to increase each year in proportion to system repairs.

4.3. Water, Energy, and/or Waste Considerations

Portville's water system, like many older water systems, experiences frequent water main breaks and has a significant amount of unaccounted for water on a yearly basis. The well pumps are not equipped with PLC-based controls linked to the reservoir levels, nor are they equipped with premium efficiency motors.

4.4. Suitability for Continued Use

The current treatment and distribution infrastructure is not suitable to continue long-term operation without upgrades. The CCDOH has issued several violations that the Village must address in the near future. The lack of chlorine contact time, lack of system security, and the lack of any system monitoring or alarms poses safety concerns to all water system customers.

4.5. Compliance with Local, State, and Federal Requirements

Several components of the current water system are not in compliance with the "Recommended Standard for Water Works" (10 States) and NYSCRR Part 5. This has resulted in the Village being cited with several violations by the Cattaraugus County Health Department.

5.0 ALTERNATIVES ANALYSIS

The following alternatives were analyzed as part of this engineering study:

- No Action Alternative
- Alternative No. 1: Upgrade Existing Village of Portville Water Infrastructure
- Alternative No. 2: Consolidate Water System with Nearby Towns of Portville and Olean, and City of Olean

5.1. No Action

This alternative provides a baseline comparison for all other alternatives and consists of the "do-nothing" alternative. This alternative provides the lowest initial cost; however, taking no action in proactively maintaining the Village's existing infrastructure would result in continued degradation of the existing Village's facilities and will degrade the quality of service provided to the rate-payers while increasing their annual user costs. Taking no action will not correct non-compliance infrastructure, result in unmeasurable reactionary spending as process and equipment asset failures occur, be unsustainable, and will result in several future additional DOH violations. Selecting to take no action alternative is not a viable option.

5.2. Alternative No. 1: Upgrade Existing Village of Portville Infrastructure

This alternative consists of upgrading the Village of Portville water system to be in full compliance with current standards and address violations cited by the CCDOH. The following improvements would extend the life of the water system by approximately 20+ years. An improvement summary map is included in Figure 2. A hydraulic model of the proposed improvements is included in Appendix E.

5.2.1. Groundwater Source and Treatment Improvements

5.2.1.1 <u>North Well</u>

The following improvements are recommended/required at the North Well site:

- Install Chlorine Contact Piping at North Well Site – An adequate length of chlorine contact piping should be installed at the north well site. Based on the small size of the North Well Site, this can be accomplished by looping approximately 190 feet of 24" C905 PVC piping on site prior to the connection to the distribution system. The Village could also rearrange piping at the North Well site to direct all chlorinated well water to the North Reservoir prior to entering the distribution system as an alternative to installing the large 24-inch piping. However, this alternative may require future improvements to obtain the required CT Time if the Northern Reservoir were to be taken offline. The CCDOH has issued a violation that mandates the Village to make this improvement.
- Replace Well with a Submersible Pitless and Extend Well Casing Above Grade – The CCDOH has mandated that the well casing be extended to at least 18-inches above grade (12-inches above the building floor and the

floor must be 6-inches above outside adjacent grade) during the next capital project. This will require removing the existing well building. Considering the age of the existing well pump and the cost of constructing a new building, it is recommended that the existing well casing be extended above-grade and that a new submersible well pump with a pitless adapter be installed on the well casing extension. Similar to the South Well, a building will no longer be required around the well casing following retrofit with a pitless unit.

- Construct New or Reconstruct Existing Treatment Building – Considering the age/condition of the existing treatment building, the current side stream chemical injection process, the need to extend the well casing, and the need to reconfigure site piping for chlorine contact time, it is recommended that the North Well Treatment building be demolished and replaced with a new treatment building. The new building would be equipped with a control room and a chemical feed room built to current design standards and inclusive of secondary chemical spill containment for the three chemicals. The building would contain a new water meter, new interior piping, and properly located water sample taps. Various site improvements would be made, including replacing damaged portions of the barbed wire fencing. All unnecessary infrastructure, including the old treatment building which contains an old well, would be properly decommissioned and removed. The emergency well would be capped or decommissioned. This improvement will address several CCDOH issued violations at this well site. A concept level floor plan of the proposed building is included in Appendix H.
- Replace Up-flow Saturator Fluoridation System with HydroFluorosilicic Acid Chemical Feed System – The existing up-flow saturator requires substantial operator attention and labor, in addition to working water softeners to dose correct concentrations of fluoride. It is therefore recommended that the existing upflow saturator systems be removed from service and replaced with a new liquid HydroFluorosilicic Acid dosing system using a chemical feed pump and water. The placement of the fluoride injection point could remain the same, but the chemical dosing rate would change to approximately 0.1 GPH. Based on the average day use of the North Well (~82,000 GPD), approximately 0.45 GPD of hydrofluorosilicic acid will be required. This will be completed in advance of a major capital improvement project as mandated by the CCDOH violation. The CCDOH has been provided with a Memorandum and supporting calculations (included as Appendix I) that further details the design basis for this retrofit recommendation.

5.2.1.2 South Well (School Well)

The following improvements are recommended/required at the South Well site:

- Verify Actual Chlorine Contact Time and Increase if required – The current actual chlorine contact time at the South Well site is unknown. Based on assumptions made regarding buried pipe alignments and length prior to first user, a 3.79 log removal was calculated, which is less than the 4 log removal requirement. Considering the age of the well (1996), it is likely that the well and pipes were constructed to current design standards and will not require additional CT piping; however, due to the importance of this regulation, the Village should verify actual piping arrangements and confirm chlorine contact time.
- Add Secondary Chemical Containment to Remaining Containers – A few chemical drums were noted as being stored inside the treatment building without secondary containment. It is recommended that the Village provide secondary containment for all chemical containers. The CCDOH has issued a violation that mandates the Village complete this improvement.
- Add Security Fencing around Well – Currently, only the well building is enclosed with security fencing. Current standards require that the well itself be enclosed with security fencing. It is recommended that the Village install fencing around the South Well.
- Complete Various Building Improvements – Should the Village move forward with a capital improvement project, various minor improvements should be completed, including building HVAC system upgrades and painting/replacing corroded interior mechanical piping and hardware.
- Replace Up-flow Saturator Fluoridation System with HydroFluorosilicic Acid Chemical Feed System – Similar to the North Well, it is recommended that the existing upflow saturator system be removed from service and replaced with a new liquid HydroFluorosilicic Acid dosing system using a chemical feed pump. Placement of the fluoride injection point could remain the same, but the chemical dosing rate would change to approximately 0.05 GPH. Based on the average day use of the north well (~55,000 GPD), approximately 0.30 GPD of hydrofluorosilicic acid will be required. This will be completed in advance of a major capital improvement project as mandated by the CCDOH violation. Details of the South Well fluoridation system replacement are also summarized in the Memorandum in Appendix I.

5.2.1.3 Wellington Drive Well

Based on the current maximum daily demand of ~232,000 gpd, the Village of Portville source water systems should be capable of producing a minimum of 215 GPM with the largest well out of service. Since, the South Well is only rated

for 150 GPM, the Portville water system cannot meet this requirement should the North Well be taken out of service. It is therefore recommended that the Village place the Wellington Well back in service as a third back up well.

Based on a site visit to the wellhead station, where the Village DPW had started working on reinstating this well nearly two (2) years ago, it appears the following improvements are required at Wellington Well Site:

- Complete assembly of well discharge pipes, valves and fittings within the building;
- Complete various electrical work including wiring of the new well pump;
- Add a PLC-based control system capable of automatically operating the well pump, including telemetry communications with the North and South Wells and two (2) reservoirs;
- Add chemical spill containment for sodium hypochlorite, poly-orthophosphate, fluoride, and caustic soda chemicals;
- Replace existing antiquated water meter;
- Various architectural and HVAC building upgrades, including replacing the existing cedar shake roofing; and
- Although, the Village spent significant time on replacing/installing the current piping arrangement on the second floor of the building, consideration should be given to modifying the interior piping to allow for the chemical addition to be moved to the first floor of the building. This would be much more operator friendly and would eliminate the second floor deliveries of chemicals. This would also provide separation between sodium hypochlorite and electrical equipment.

5.2.2. Water Storage Reservoir Improvements

5.2.2.1 North Reservoir

The following improvements are recommended/required at the North Reservoir Site.

- Complete North Reservoir Roof Upgrade – As stated in the CCDOH inspection report, based on the OSB sheathing used for the roof of the North reservoir, it is critical that the Village insulate the structure with a closed cell spray foam insulation in the immediate future. The OSB is currently holding in moisture, starting to mold/degrade, and will soon have to be replaced again if this is not addressed. The life of the roof structure has already been reduced as a result of its current state. Additionally, the Village must cover any ventilation openings into the structure with appropriately sized mesh to prevent debris/animals from easily entering the

reservoir, and repair all cracks/holes within above-grade portions of the stone and masonry block walls. The CCDOH has issued a violation that mandates the Village make these improvements.

- Add Site Security Measures – It is also recommended that the Village add site security to the remote North Storage reservoir site. Currently, the site does not have any security fencing, cameras, or a high strength cut resistant door lock to help prevent intrusion into the site and reservoir itself. Security improvements are being mandated by the CCDOH under the Village's next capital improvement project.

5.2.2.2 Replacement of South Water Storage Reservoir

Considering the age, size, and roof condition of the South Storage Reservoir, in addition to the current issues at the North Storage Reservoir, it is recommended that the South Reservoir be decommissioned and removed from service, and replaced with a pre-stressed concrete water storage tank. The new tank would be located within the approximate footprint of the existing reservoir, and be sized to service the Village by itself (without the North Reservoir online). Based on water use calculations, a 400,000 gallon, 58' diameter, and 20' tall tank is recommended. A manufacturer provided cost estimate for construction of the new water tank is included in Appendix J.

5.2.3. Water Distribution and Transmission Improvements

It is recommended that the below listed sections of water main be replaced in-kind and sized appropriately as these sections experience a significant number of breaks and have reached the end of their useful service lives. Each new section of main would be equipped with new isolation valves and hydrants, spaced in accordance with current design standards. Existing water services would be transferred to the new mains with goose necks and couplings at the edge of the right of way, along with new curb stop and box assemblies. In total, this recommendation (shown in Figure 2) will include approximately:

- 1,400 LF of new 6-inch PVC water main;
- 4,300 LF of new 8-inch PVC water main; and
- 4,300 LF of additional new 8-inch PVC pipe (Not shown on Figure 2, location TBD)

5.2.4. Residential Water Meters Improvements

It is recommended that the Village replace the remaining 365 residential water meters and install a meter system equipped with cellular or drive-by reading capabilities. Once implemented, this improvement will increase operator efficiency, increase water meter accuracy, and substantially improve on the ability to identify "private side" water leaks. Until new water meters are installed, the Village will not be able to accurately quantify its estimated 44% unaccounted water.

5.2.5. Water System Control and Monitoring

It is recommended that the Village install a telemetry or Supervisory Control and Data Acquisition (SCADA) system that is capable of remotely monitoring and controlling all critical components of the water system. The telemetry system would include a Main Control Panel (MCP) located at the DPW garage. Operators would be able to monitor and control water storage tank levels, well pump operation and treatment flow rates, chemical metering pumps, and a variety of alarms (low water tank level, low well level, intrusion alerts, power outages, etc.) remotely from the DPW garage. This system would require each critical water site (storage tank sites, water treatment sites, etc.) to have a Remote Terminal Unit (RTU) that transmits critical telemetry data to the MCP. New local Programmable Logic Controllers (PLC) with Human Machine Interfaces (HMI) would also be installed at all treatment and pumping facilities.

5.2.6. Emergency Power

The Village's emergency power system is not currently in need of any upgrades.

5.2.7. Operational, Financial, and Managerial Improvements

The Village is committed to correcting any technical, managerial, and financial deficiencies identified by the CCDOH, including:

- Enforcement of the cross connection control program;
- Schedule/perform regular system flushing and valve operation; and
- Begin to save for the replacement of short-lived assets as much as required, or as deemed affordable to Village residents by the Village Board.

5.3. Alternative No. 2: Consolidate Water System with the City of Olean

This alternative would consist of connecting to and purchasing water from the City of Olean water system via a ~2.5-mile water main extension through the Town of Portville along the NYS Route 417 corridor. Since Olean is located at a similar but lower elevation than Portville, a water pump station will be required to convey Olean water to Portville. Figure 3 displays the approximate pipe alignment and profile for the Olean interconnection piping. Although the Village of Portville would no longer need to produce water, several improvements described in Alternative No. 1 would still be required, summarized below.

5.3.1. Groundwater Source and Treatment Improvements

The majority of the groundwater source and treatment improvements described in Alternative No. 1 would no longer be required. It is anticipated that provisions would be provided to keep the Village's North Well as an emergency water source.

5.3.2. Water Storage Reservoir Improvements

The water storage improvements described under Alternative No. 1 would be required.

5.3.3. Water Distribution and Transmission Improvements

The water distribution and transmission main improvements described under Alternative No. 1 would be required.

5.3.4. Residential Water Meter Improvements

The water metering improvements described under Alternative No. 1 would be required.

5.3.5. Water System Control and Monitoring

Similar system control, monitoring, and telemetry improvements as descried under Alternative No. 1 would be required. Instead of having the remote capability to monitor and control the three (3) water (well) treatment sites, the Village would move its telemetry system to the new booster pump station to achieve remote monitoring and control of the pump station and two reservoirs.

5.3.6. Emergency Power

The new water booster pumping station that would convey water from Olean to Portville would be outfitted with a manual transfer switch and generator plug to allow Portville to utilize their existing generator to operate the station during power outages.

5.3.7. Operational, Financial, and Managerial Improvements

The Village would correct the technical, managerial, and financial deficiencies as described under Alternative No. 1 in Section 5.2.7.

5.3.8. City of Olean Water Charges

It assumed that the City of Olean water billing would be based on the Portville residential water meters, and the City's rates would be as published for an outside user. Currently, the water rates are as follows:

Minimum Charge:	$21.56
First 2,600 gallons:	$0.01347
Next 10,000 gallons:	$0.01119
Next 15,000 gallons:	$0.00998
Thereafter:	$0.00893

Based on the published water rates and the average water usage of a Portville user (~15,000 gal./quarter), the average user would be billed ~$171 per quarter (~$684 per year) for water usage. This is substantially higher than what residents currently pay.

6.0 SUMMARY AND COMPARISON OF ALTERATIVES

6.1. Feasible Alternatives Summary

Two (2) feasible alternatives were described in Section 5 that would upgrade and extend the life of the Portville drinking water infrastructure system. Alternative No. 1 describes what improvements would be necessary to renovate the existing water system in-kind, while Alternative No. 2 describes what improvements would be necessary for purchasing drinking water from the City of Olean via main extension northwest through the Town of Portville. Alternative No. 2 would also require improvements to the Village's reservoirs, distribution/ transmission mains, metering and control systems as recommended under Alternative No. 1.

6.2. Non-Monetary Factors

The following table summarizes non-monetary factors of each feasible alternative:

Table 6-1: None-Monetary Factors

Factor	Alt. No. 1: Upgrade Existing	Alt. No. 2: Water Supplied by Olean
Impact on Existing Facility	- Minor operational impacts due to construction including short periods of water shutdowns	- Minor operational impacts due to construction including short periods of water shutdowns - Water treatment facilities no longer required - New main water pump station to operate and maintain
Water Treatment Capacity	- Capacity of existing system would be increased with Wellington Drive Well Site being returned to service	- Olean has adequate capacity to service Portville
Land Requirements	- No new land required (if existing easements are in place)	- New Land required for main water booster pump station - Easements along Olean Transmission main
Water & Energy Efficiency Measures	- Should reduce unaccounted for water - Design will utilize premium efficiency equipment	- Should reduce unaccounted for water - Design will utilize premium efficiency equipment
Storm & Flood Resiliency	- Flooding has not been an issue, but all upgrades will be designed to be protected from flooding	- New infrastructure will be designed to be protected from flooding

Environmental Impacts & Mitigation	- No major environmental impacts anticipated - Impacts will be mitigated to the furthest extent feasible - No anticipated Wetland Impacts	- No major environmental impacts anticipated - Impacts will be mitigated to the furthest extent feasible - No anticipated Wetland Impacts
Schedule & Constructability	- Improvements can be constructed with minimal impacts to existing water system - Short water shutdowns will be required	- Improvements can be constructed with minimal impacts to existing water system - Short water shutdowns will be required
Compliance with Standards	- Will be designed to comply with applicable standards and address current violations	- Will be designed to comply with applicable standards and address current violations
Local Government Efficiency	- Portville remains in control of water system - Portville DPW staff stretched thin - Affords opportunity to extend public water into surrounding Town of Portville areas	- Will work with nearby City of Olean - Local governments working together to reduce labor costs - Provides opportunity for formation of new Town of Portville Water District to share capital and O&M costs for new main extension and pump station
Community Objections	- Public hearings will be held discussing project to allow for community input	- Public hearings will be held discussing project to allow for community input

6.3. Alternative Capital Costs

The estimated probable capital costs for Alternative No. 1 and Alternative No. 2 are detailed in Appendix K and summarized in Table 6-2.

Table 6-2: Estimate of Probable Capital Cost

Line Item	Alt. No. 1: Upgrade Existing	Alt. No. 2: Water Supplied by Olean
Est. Probable Construction Cost	$3,282,000	$4,259,000
Contractor General Conditions (5%)	$164,000	$213,000
Construction Contingency (15%)	$492,000	$639,000
Subtotal (2020 dollars)	$3,938,000	$5,111,000
Subtotal (2024 dollars) (8% total)	$4,201,000	$5,452,000
Est. Engineering, Legal, Admin. (25%)	$1,050,000	$1,363,000
Total Estimated Probable Project Cost (2024 $'s)	$5,251,000	$6,815,000

6.4. Alternative Operation and Maintenance Cost Increases

The existing Village of Portville Operation and Maintenance budget is currently approximately $115,000. Based on the size and current condition of the water system, this appears to be insufficient. The Village should review existing water budgets to make sure all operation and maintenance expenses, and short-lived asset expenses are accounted for. The following bullet points describe anticipated changes to annual O&M costs compared to existing conditions:

- Alternative No. 1 – Upgrade Existing Water System – The annual O&M cost for this alternative should not increase from existing conditions as this alternative largely upgrades existing infrastructure and will utilize premium efficiency motors, PLC-based controls and telemetry, as well as drive-by meter reading and an automated billing system.
- Alternative No. 2– Purchase water from Olean – The O&M cost of this alternative may slightly decrease from existing conditions, but will largely remain the same. Instead of operating 2-3 water well sites, the Village of Portville would assume operation of one "main" water booster pumping station. The only savings the Village may experience is on chemical costs as pumping costs will largely remain the same. The cost of purchasing water from Olean is estimated to increase costs to the average Village household by ~$400 per year over current Village rates.

6.5. Alternative Short Lived Asset Replacement Costs

Short-lived assets (SLA) are items that are likely to fail and need replacement within the typical 20 to 30-year design life of a capital improvement project. These items are typically smaller assets or ancillary system assets that are more prone to heavy wear due to frequent operation. In a typical water system, items such as pumps, generators, water meters, control systems, etc. are all considered to be short-lived assets.

It is recommended that municipality's budget for SLA replacement using their water billing collections to create a capital reserve fund. The capital reserve may be increased annually and should be adequate to replace assets when they are run to failure, or begin to consistently incur

annual maintenance costs that exceed a reasonable simple payback period of 3- to 5-years. A table of short-lived assets and the anticipated reserve account needed for replacement of these items for each Alternative is included as Appendix L. The estimated annual short-lived asset reserve account needed to offset the replacement of the short-lived assets for each alternative are summarized below:

- Alternative No. 1 (Upgrade Existing): $15,000 per year
- Alternative No. 2 (Water Supplied by Olean): $12,000 per year

6.6. Life Cycle Cost Comparison

Life cycle costs inclusive of the project capital costs, the estimated annual O&M costs, and the short-lived asset costs discussed above have been extrapolated to cover an estimated 30-year operational life of the water system, summarized in Table 6-3 for each alternative considered:

Table 6-3: Summary of Alternative Capital and Net Present Value Costs

Net Present Value (NPV) Analysis	Alternative 1 - Upgrade Existing	Alternative 2 - Water Supplied by Olean
Initial Capital Project Cost	$5,251,000	$6,815,000
Additional Yearly O&M Cost and Water Purchase Cost	$0	$190,000
Yearly Short-Lived Asset Cost	$15,000	$12,000
Total NPV (2% Discount Rate)	5,587,000	11,339,000
Delta	-	5,752,000

7.0 RECOMMENDED AND SELECTED ALTERNATIVES

7.1. Basis of Selection

The two (2) alternatives were each evaluated on their ability to provide efficient and reliable drinking water in accordance with recognized design standards and regulations for a 20- to 30-year planning period. Additional long-term project goals and considerations include removing the existing antiquated infrastructure from service, simplifying daily operations, and increasing system performance/reliability. Collectively, these goals seek to ensure safe and reliable drinking water service is consistently provided to the Village water system customers. A summary of the pros and cons of the alternatives evaluated, including non-monetary factors, is provided in Table 7-1.

Table 7-1: Comparison of Alternatives Table

Alternatives	Pros	Cons
Alternative No. 1 – Renovate Existing Water System	· Addresses System Violations and extends life of water system · Lowest Capital Cost · Operations remain nearly identical to current system · Village controls water rates · Provides ability to extend water to Town of Portville Water District along the NYS Route 417 corridor	· Portville DPW is understaffed based on current state of disrepair of the water and sewer systems
Alternative No. 2 – Water Supplied by the City of Olean	· Addresses System Violations and extends life of water system · Possible small O&M cost savings · Local Government Efficiency, possible cost sharing with Town of Portville · Water System more resilient with Olean connection and existing wells as back-ups	· Higher capital cost due to 2.5 miles of new piping · Purchase cost of water for Olean far exceeds O&M cost savings · Capital Cost – Many improvements under Alt. No. 1 still need to be completed

Based on discussion with the Village, monetary, and non-monetary factors it is recommended that the Village of Portville proceed with Alternative No. 1. Although, Alternative No. 2 has some advantages, the capital cost of improvements and the yearly water purchase cost of Alternative No. 2 far exceed the non-monetary benefits.

8.0 PLAN OF FINANCE

8.1. Grant Funding and Project Financing Opportunities

Currently, there are several opportunities for a municipal water project to receive grant or low interest loan funding. Some opportunities this project may qualify for are as follows:

- NYSEFC Drinking Water State Revolving Fund (DWSRF) Program: The NYSEFC DWSRF program provides grant and loan funding for qualifying municipal water projects. Grants and loans are awarded based on the community's financial status indicated by municipality's 2017 median household income (MHI) combined with the public health need for the specific project determined by a scoring system published in the DWSRF Intended Use Plan (IUP). In review of the Portville's 2017 MHI of $50,179, the Village financially qualifies for Hardship financing which means the project could be awarded a 60% grant (up to $3,000,000) and a 30-year loan at a 0% interest rate as long the project scores high enough on the IUP (i.e., above the hardship funding subsidy line). Based on the project specific data, this project was preliminary scored by B&L at 125 points (refer to Appendix M), which is above the draft 2021 IUP hardship funding line. It is therefore believed that the project will receive at a minimum a hardship loan (0%, 30 year) through the DWSRF program. The project may also receive grant funding through this program, but the availability of grant money is typically limited to the top scoring projects.

- New York Water Infrastructure Improvement Act Grants (WIIA): The WIIA program distributes grants through NYSEFC for clean and drinking projects. Eligible drinking water rehabilitation or replacement projects could receive up to $3,000,000 of grant or 60% of the total project cost. Priority will be given to water projects that demonstrate a public health need and hardship communities. If the project does not receive a 60% grant directly from the NYSEFC DWSRF program, this project would likely receive a WIIA grant up to 60% of the net total project cost (i.e., total project cost less any other grants that are secured).

- Office of Homes and Community Renewal (HCR) Community Development Block Grant (CDBG) Public Infrastructure (PI) Grant: HCR's CDBG PI grant program provides up to $1,000,000 or $1,250,000 (with eligible co-funding) in grants for drinking water, clean water, and storm water projects. Grants are applied through the NYS Consolidated Funding Application (CFA) process and are awarded based on the public health need of the project and the financial need of the community. A critical requirement of this program is that the 51% or more of the project beneficiaries must be low-to-moderate income individuals. The Village would have to verify income eligibility via an income survey. Assuming that the Village does co-fund the project through NYSEFC or USDA, and the Village meets the income requirement, the Village could receive up to $1,250,000 in grant funding through this program.

- USDA Rural Development (RD) Water and Environmental Program (WEP) Grants: The USDA WEP program provides grant funding and low interest loans to eligible drinking water, clean water, and storm water projects. The proposed project meets the eligibility criteria for the USDA RD WEP program and based on the 2010 MHI should qualify for a 38 year loan with a poverty category interest rate (currently 1.125%). The project may also qualify for grant funding through this program, noting that grant funds are limited each fiscal year. Grants would be awarded based on the projected average annual cost of water service for a typical single-family home and similar system utility rates. Grants are only used to reduce the annual user cost of water to an affordable rate which is generally about 1.5% of the 2010 MHI. Based on the Village's 2010 MHI of $39,663, grant funding may be awarded to reduce the annual user cost of water to about $595 per year.

8.2. Plausible Funding Scenarios

Based on the funding opportunities described in Section 8.1, annual user cost impacts of the proposed water project was reviewed under four (4) plausible funding scenarios. The Village should consult with a fiscal advisor regarding these and other potential funding options prior to moving forward with the project. The following four (4) funding scenarios were evaluated:

- Scenario No. 1: EFC 0% Hardship and 60% Grant – Under this scenario the Village would receive a 30 year 0% interest rate hardship loan through the NYSEFC DWSRF program. The Village would also receive a 60% DWSRF or WIIA grant.
- Scenario No. 2: EFC Subsidized 2.20% Financing and 60% WIIA Grant – Under this scenario the Village would receive a 30 year 2.2% subsidized interest rate loan through the NYSEFC DWSRF program if the project score does not fall above the hardship subsidy line. The Village would also receive a 60% WIIA grant.
- Scenario No. 3: EFC Subsidized 2.20% Financing – Under this scenario the Village would receive a 30 year 2.2% subsidized interest rate loan through the NYSEFC DWSRF program with no grant.
- Scenario No. 4: USDA RD Loan and WIIA Grant – Under this scenario the Village would receive a 38 year 1.125% poverty rate interest loan through the USDA Rural Development program. The Village would also receive grants totaling 60% of the project cost, either through USDA RD, WIIA, or a combination of the two grants.

8.3. Annual User Costs

The impact of this $5.25 million project on the Village's current annual water user cost (~$286/EDU) will be largely dependent on the project's final scope, actual financing, and the amount of grant received by the Village of Portville. Table 8-1 (detailed in Appendix N) estimates annual user costs for the recommended capital improvement project under the four different funding scenarios described above.

Table 8-1: Summary of Impacts on Annual User Cost

Financing	Total Grant	Total Loan	Estimated Debt Service Increase due to Project	Estimated Short Lived Asset Reserve Charge	Estimated Future Water Cost
Scenario No. 1: EFC 0% Hardship and 60% Grant	$3,150,600	$2,100,400	$151	$32	$469
Scenario No. 2: EFC 2.2% Subsidized and 60% Grant	$3,150,600	$2,100,400	$207	$32	$526
Scenario No. 3: EFC 2.2% Subsidized	$0	$5,251,000	$518	$32	$836
Scenario No. 4: USDA 1.125% Poverty Rate and 60% Grant	$3,150,000	$2,100,400	$147	$32	$465

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9.0 ENVIRONMENTAL REVIEW

Ground disturbance resulting from the project could potentially impact environmental resources. Most impacts would likely be temporary and largely confined to Village owned property or maintained/ developed road right-of-ways. Further details regarding potential environmental impacts related to the proposed improvements are described below.

9.1. Wetlands and Surface Waters

The NYSDEC Environmental Resource Mapper and U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) were reviewed to determine the presence of mapped wetlands within the project area. Based on available information, portions of the project area could be located in the vicinity of wetlands of Allegheny River. Field wetland delineations would be conducted during project design in order to locate and characterize all wetlands and streams within proposed disturbance areas. If wetlands exist and impacts cannot be avoided, permits from the NYSDEC and USACE would be necessary. It is anticipated that any wetland impacts would likely only be temporary in nature.

9.2. Threatened and Endangered Species

A review of the USFWS Information for Planning and Conservation (IPaC) system indicated that the project area is within the range of one federally listed species that may occur within the Village, including the Northern Long-eared Bat (*Myotis septentrionalis*) (threatened). The northern long-eared bat is also listed as threatened in New York State. Impacts to Northern long-eared bats can generally be avoided by conducting tree clearing during the bats' hibernation period (October 1st through March 31st). USFWS IPaC also listed various clams as endangered, including Clubshell (Pleurobema clava), Northern Riffleshell (Epioblasma torulosa rangiana), and Rayed Bean (Villosa fabalis).

A review of the NYS Environmental Resource Mapper and New York Nature Explorer databases was completed to determine if any additional species are located in the Village. The River Redhorse, Silver Shiner, Black Redhorse (listed as special concern by NYS), Ohio Lamprey, Streamline Chub (listed special concern), Variegate Darter, Tonguetied Minnow, and Bigmouth Shiner were all listed as rare animals in the vicinity of the Village.

9.3. Cultural and Historic Resources

An initial review of the NYS Historic Preservation Office (SHPO) Cultural Resource Information System (CRIS) indicated that portions of the Village of Portville are within archaeologically sensitive areas. These areas include National Register Building Sites at the Portville Free Library and 29 Maple Street. Multiple houses are eligible for listing along North Main Street and Brooklyn Street. The project will be formally submitted to SHPO for review during the design phase. SHPO may still request that a Phase 1 Archaeological Survey be completed in order to

further assess possible impacts to archaeological resources. Consultation with SHPO will continue throughout the project design phase to avoid and mitigate potential cultural resource impacts.

9.4. Environmental Permit Summary

Exact permitting needs would be further explored during the project's final design stage. The following permits may be required dependent on final environmental impacts:

- USACE Section 404 Clean Water Act Permit - temporary and/or permanent disturbances involving disturbance to wetlands or surface waters that qualify as Waters of the United States; construction within/adjacent to a flood control levee.
- NYSDEC Section 401 Water Quality Certification - temporary and/or permanent disturbances to wetlands or surface waters that qualify as Waters of the United States.

9.5. Smart Growth

The recommended CIP is consistent with Smart Growth principles and practices as it proposes to improve the design service life, reliability and integrity of existing infrastructure serving a municipal center. A completed NYSEFC Smart Growth form is included in Appendix O.

10.0 RECOMMENDATIONS FOR PROJECT IMPLEMENTATIONS

It is recommended that this report be presented to the Village of Portville residents, the NYS Department of Health, and potential funding agencies outlined herein. Additional steps and timeframe for project implementation generally include the following:

1.) Submit this Preliminary Engineering Report and completed IUP pre-application for inclusion in the NYSEFC Final DWSRF Intended Use Plan (September 2020).
2.) Project scored and listed in the 2020 Final DWSRF Intended Use Plan (October 2020).
3.) Complete an environmental review to satisfy SEQR/SERP requirements (November 2020).
4.) Complete bond resolution (Early 2021).
5.) Submit DWSRF application (Mid 2021).
6.) Submit WIIA Grant application (TBD).
7.) Secure Funding commitments (2021/2022)
8.) Prepare design plans and specifications (TBD based on financing).
9.) Secure regulatory and funding agency approvals (TBD based on financing).
10.) Receive bids and award construction contracts (TBD based on financing).
11.) Construction of proposed facilities and infrastructure (TBD based on financing).

See Appendix R for EFC Engineering Report Certification Form.

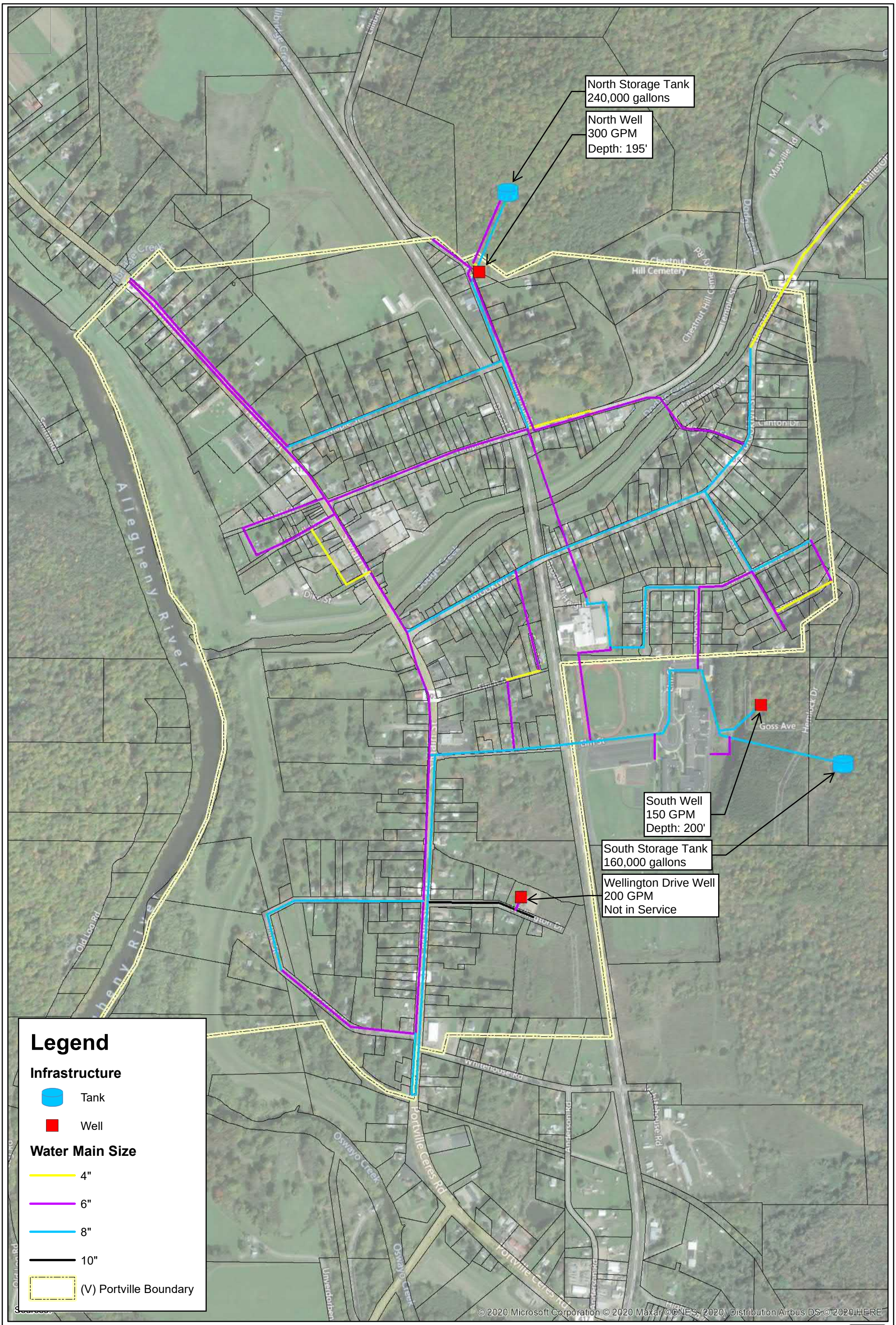
REFERENCES

Department of Health. (n.d.). *State Sanitary Code, 10 NYCRR Part 5, Subpart 5-1.*

Great Lakes - Upper Missisippi River Board of State and Provincial Public Health and Environmental Managers. (2018). *Recommended Standards for Water Works.* Albany: Health Education Services.

Figures

Figure 1
Project Location Map and Existing System



Barton & Loguidice

N W E S

1 inch = 600 feet

Village of Portville

Existing Water System

Cattaraugus County New York

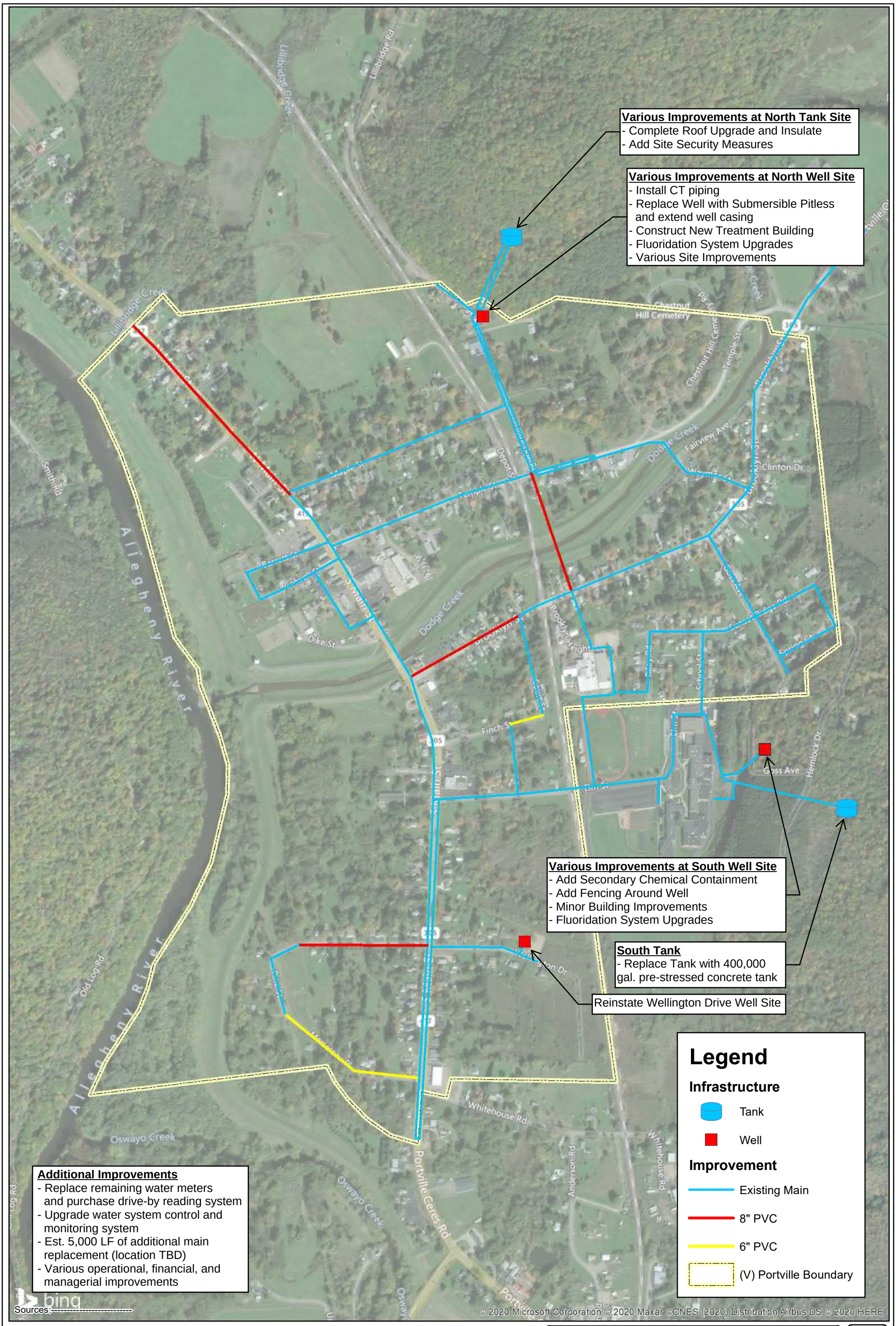
9/15/2020

Figure 1

Project No. 2302.002

Path: K:\Projects\2300\2302.002\Figure 1 - Existing.mxd

Figure 2
Alternative No. 1 Improvement Map



Barton & Loguidice

1 inch = 600 feet

Village of Portville

Alternative No. 1 Improvements

Cattaraugus County 9/15/2020 New York

Figure 2

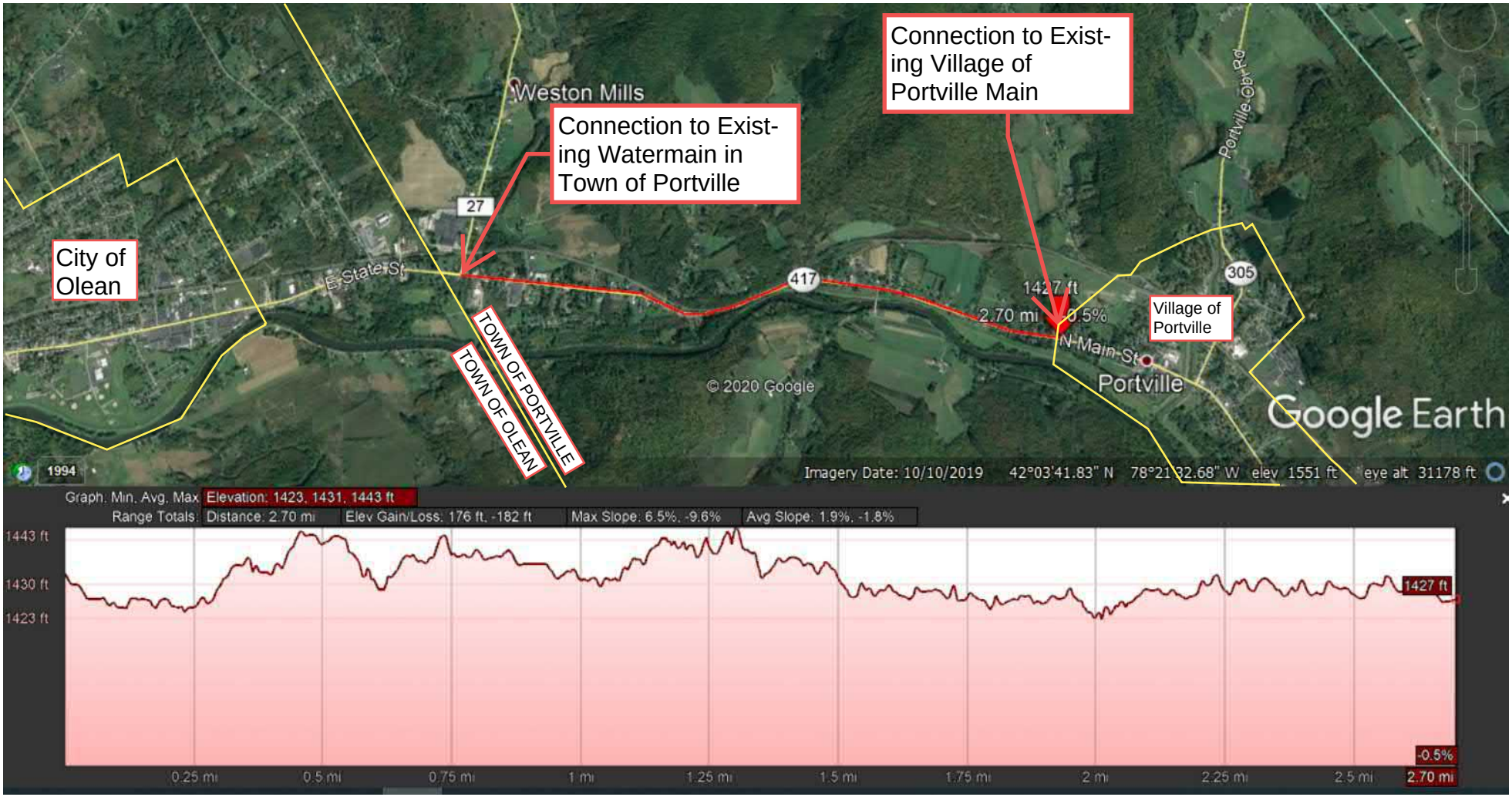
Project No. 2302.002

Path: K:\Projects\2302\2302.002\Figure 2 - Alt No. 1 Improvements Map.mxd

Figure 3

Alternative No. 2 Water Supplied by City of Olean Map

Figure 3 - Alternative No. 2 - Water Supplied by (C) Olean

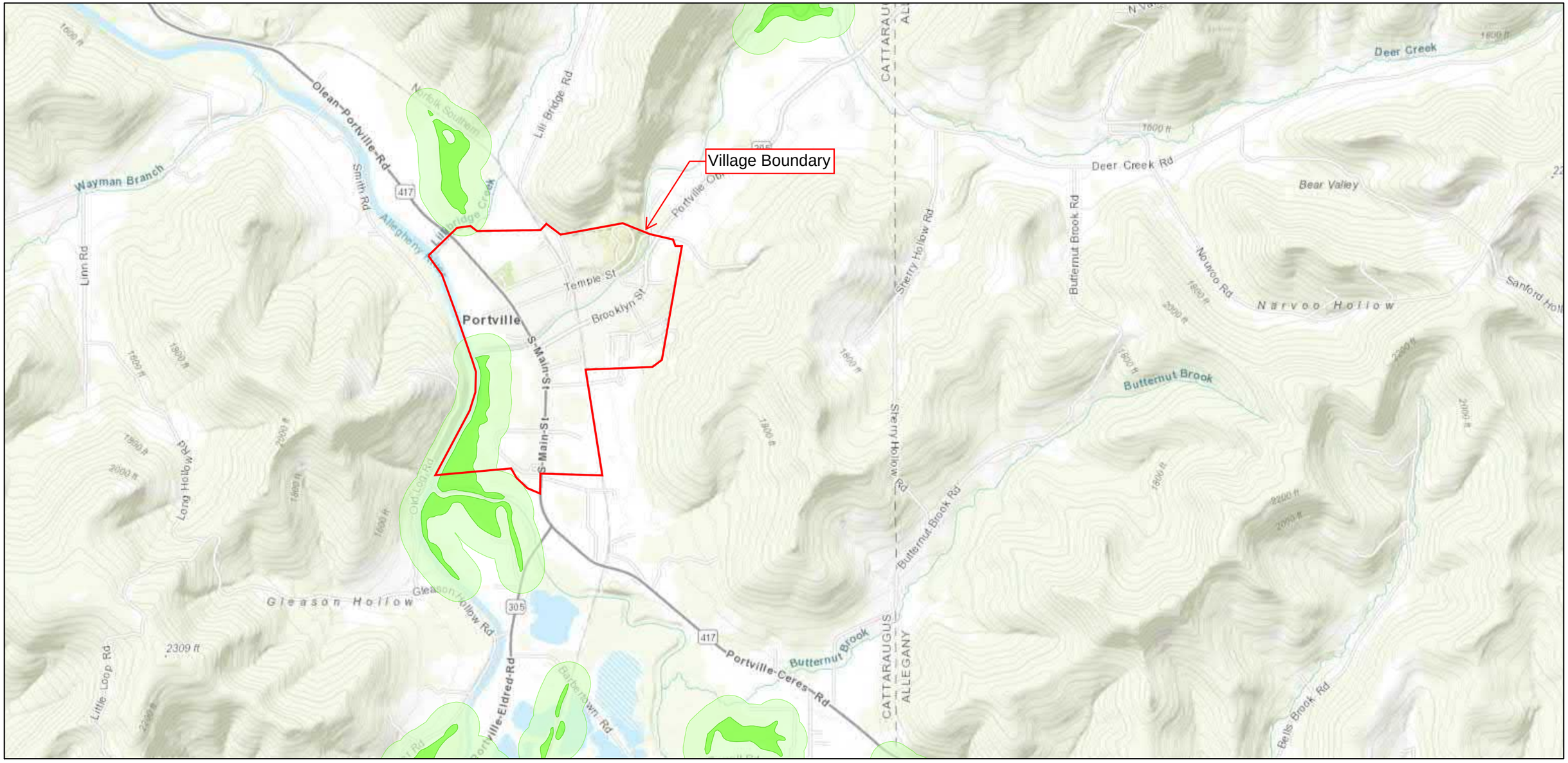


~ One water pump station and approx. 2.5 miles of new water transmission main from connection to Town main (Olean supply) at NYS Rte. 417 and County Rte. 27
~ Existing Wells would be kept as an emergency water source
~ Distribution system, water storage, control/monitoring, and metering improvements would still be required.

Appendices

Appendix A
Environmental Mapping

Village of Portville Environmental Resource Mapper



- ☑ ★ Unique Geological Features
- ☑ Waterbody Classifications for Rivers/Streams
- ☑ Waterbody Classifications for Lakes
- ☑ State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone
- ☑ Significant Natural Communities
- Natural Communities Near This Location
- ☑ Rare Plants or Animals

1:36,112

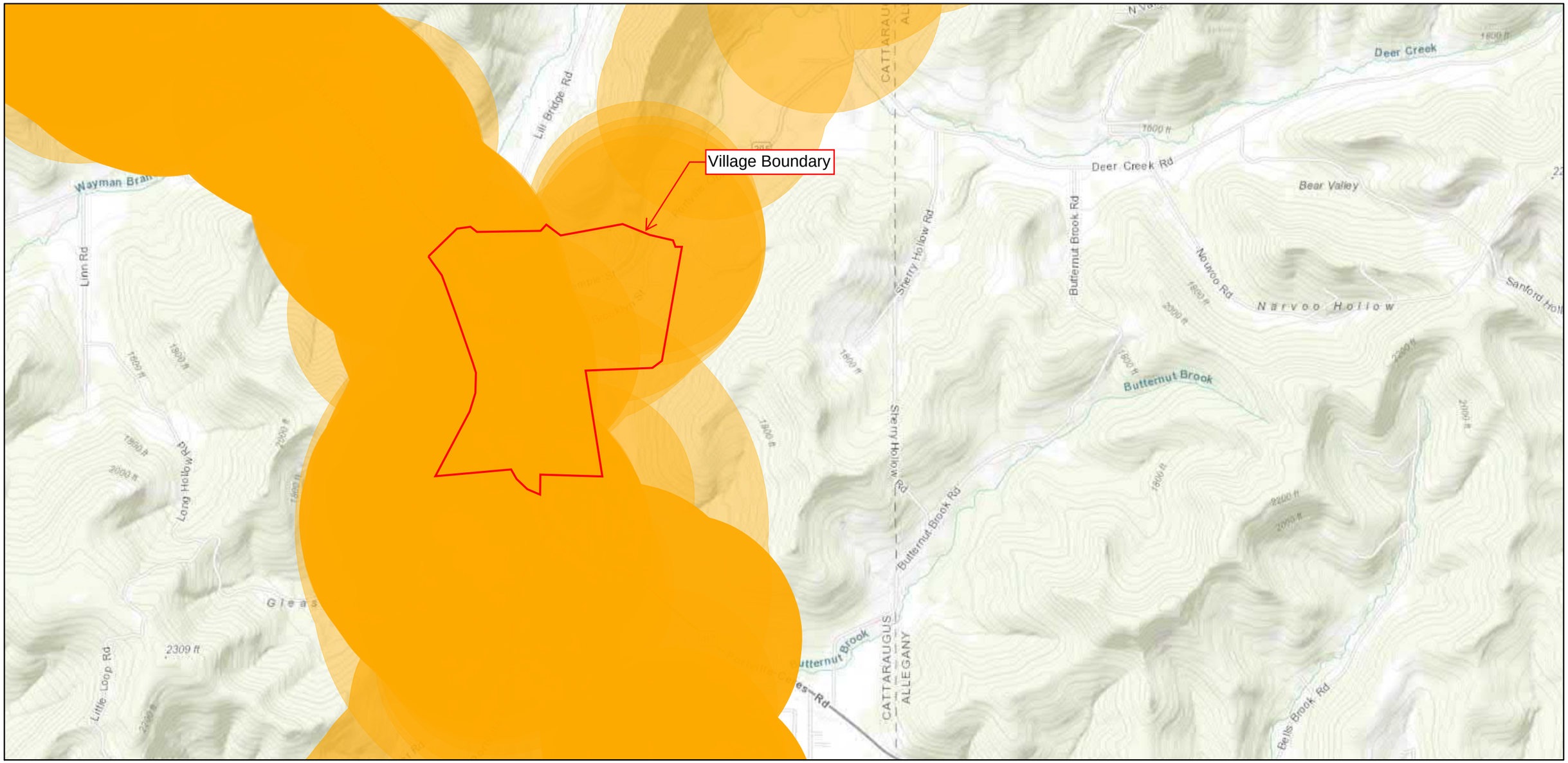
0 0.33 0.65 1.3 mi

0 0.5 1 2 km

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

NYS Department of Environmental Conservation
Not a legal document

Village of Portville Environmental Resource Mapper



- ☑ ★ Unique Geological Features
- ☑ Waterbody Classifications for Rivers/Streams
- ☑ Waterbody Classifications for Lakes
- ☑ State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone
- ☑ Significant Natural Communities
- Natural Communities Near This Location
- ☑ Rare Plants or Animals

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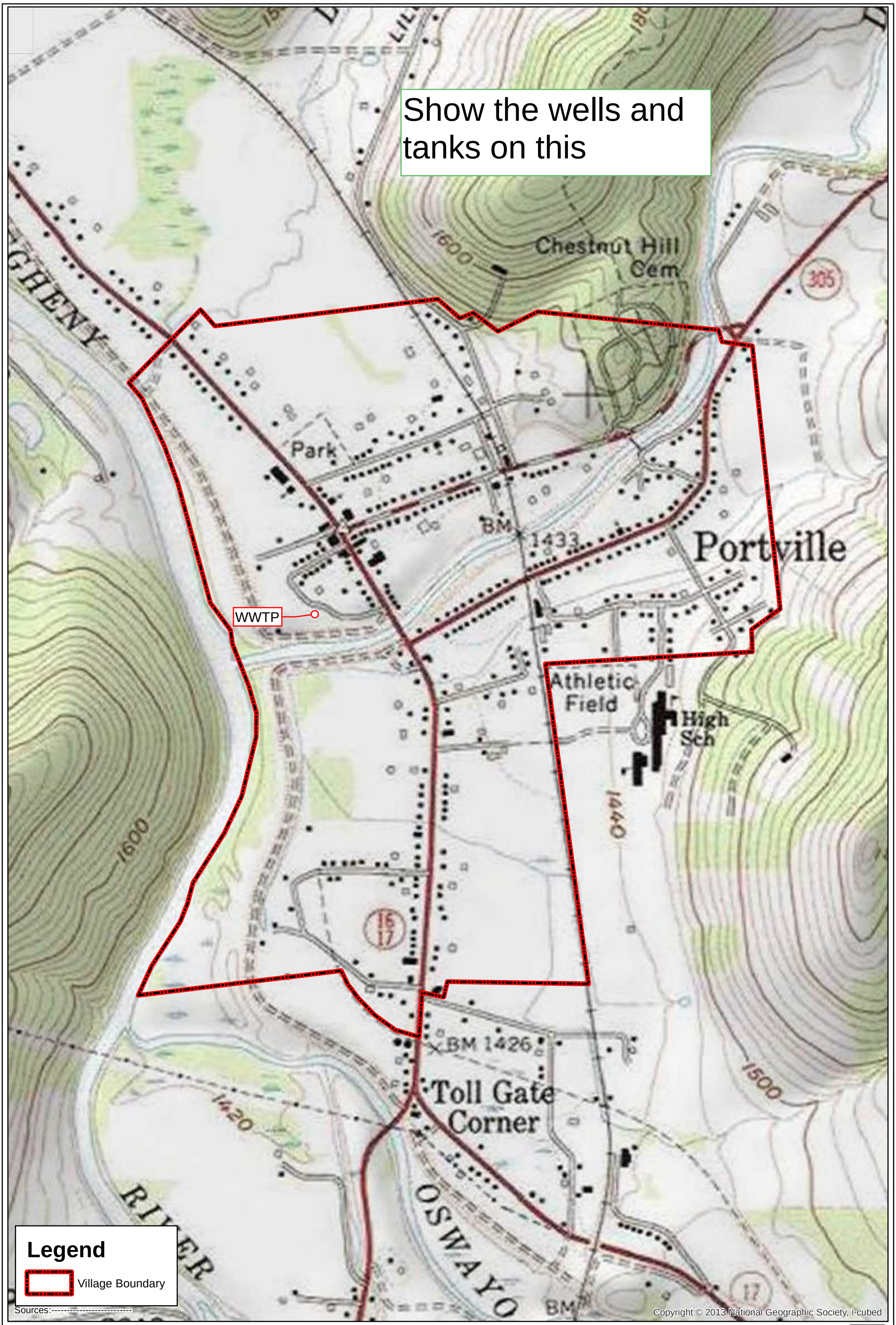
NYS Department of Environmental Conservation
Not a legal document



Barton & Loguidice

μ

1 inch = 700 feet

Village of Portville

Topographic Map

Cattaraugus County

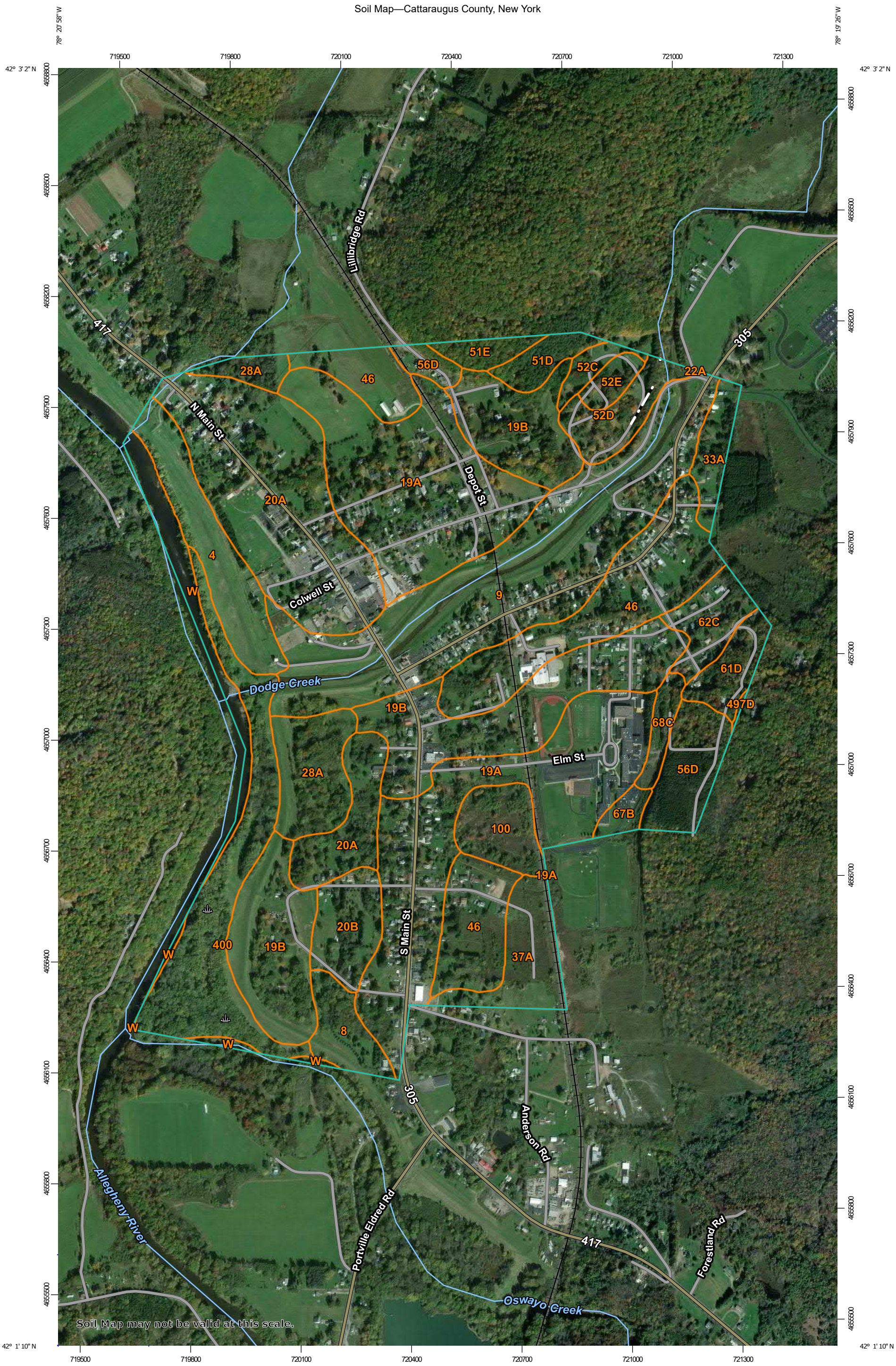
8/18/2020

New York

Appendix A

Project No. 2302.001

Path: K:\Projects\2301\2302.001\Topographic.mxd



Map Scale: 1:9,670 if printed on B portrait (11" x 17") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Cattaraugus County, New York
Survey Area Data: Version 20, Sep 16, 2019

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

Date(s) aerial images were photographed: Aug 24, 2009—Jun 2, 2017

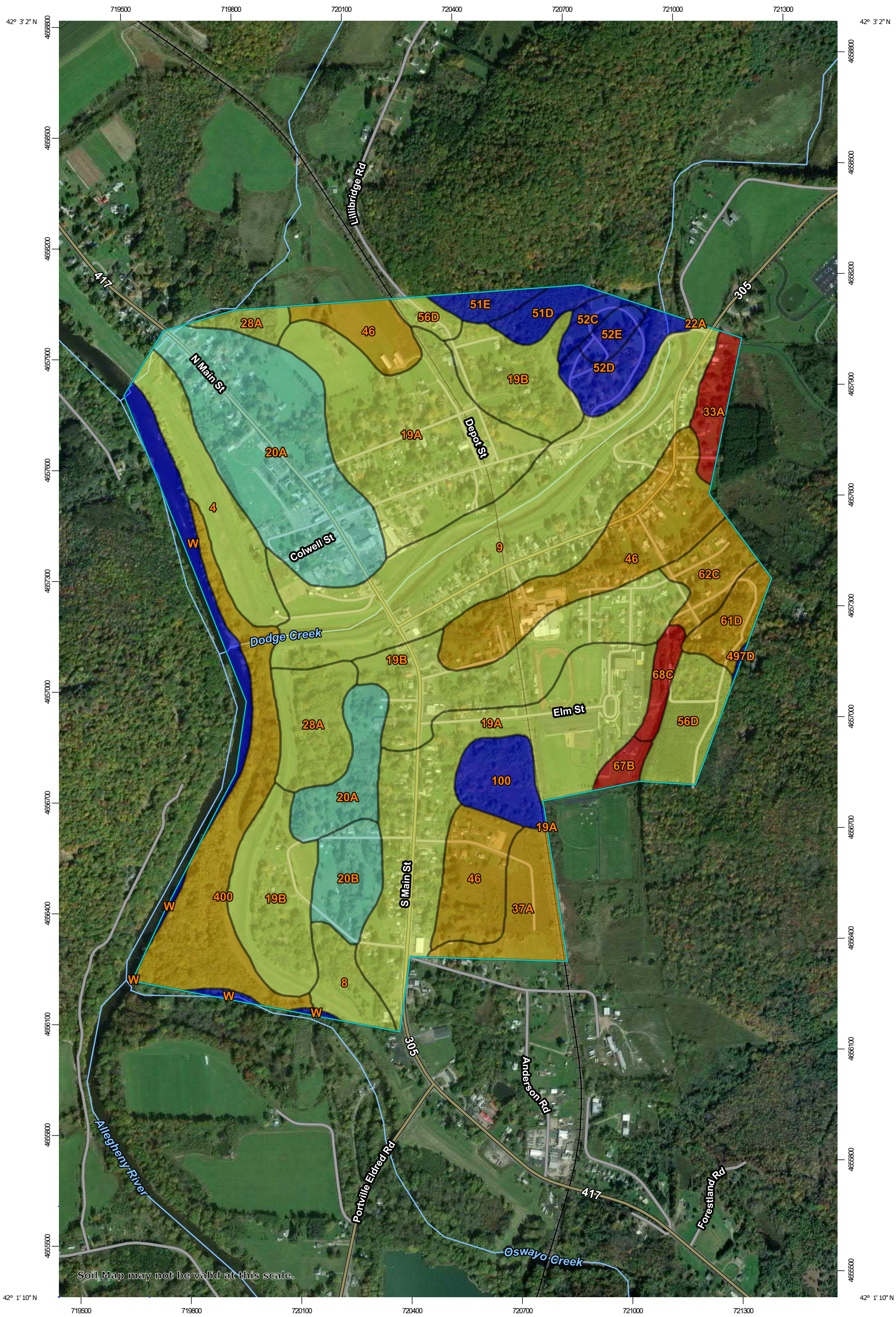
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Teel silt loam	21.2	3.4%
8	Middlebury silt loam	9.1	1.5%
9	Pawling silt loam	79.7	12.9%
19A	Olean silt loam, 0 to 3 percent slopes	116.2	18.8%
19B	Olean silt loam, 3 to 8 percent slopes	79.6	12.9%
20A	Unadilla silt loam, 0 to 3 percent slopes	70.9	11.4%
20B	Unadilla silt loam, 3 to 8 percent slopes	12.2	2.0%
22A	Allard silt loam, 0 to 3 percent slopes	0.0	0.0%
28A	Scio silt loam, 0 to 3 percent slopes	19.7	3.2%
33A	Wallington silt loam, 0 to 3 percent slopes	6.9	1.1%
37A	Tonawanda silt loam, 0 to 3 percent slopes	14.3	2.3%
46	Swormville silt loam	59.2	9.6%
51D	Chadakoin channery silt loam, 15 to 25 percent slopes	5.6	0.9%
51E	Chadakoin channery silt loam, 25 to 35 percent slopes	4.3	0.7%
52C	Valois gravelly silt loam, 8 to 15 percent slopes	3.4	0.5%
52D	Valois gravelly silt loam, 15 to 25 percent slopes	10.2	1.7%
52E	Valois gravelly silt loam, 25 to 35 percent slopes	3.7	0.6%
56D	Chautauqua silt loam, 15 to 25 percent slopes	16.6	2.7%
61D	Schuyler silt loam, 15 to 25 percent slopes	7.9	1.3%
62C	Mardin channery silt loam, 8 to 15 percent slopes	9.6	1.5%
67B	Dalton silt loam, 3 to 8 percent slopes	3.0	0.5%
68C	Volusia channery silt loam, 8 to 15 percent slopes	4.3	0.7%
100	Udorthents, loamy-skeletal	11.2	1.8%
400	Wakeville silt loam	37.4	6.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
497D	Rayne channery silt loam, 15 to 25 percent slopes	0.3	0.0%
W	Water	12.9	2.1%
Totals for Area of Interest		**619.4**	**100.0%**

Depth to Water Table—Cattaraugus County, New York



Map Scale: 1:9,670 if printed on B portrait (11" x 17") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

Soil Survey Area: Cattaraugus County, New York
Survey Area Data: Version 20, Sep 16, 2019

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

Date(s) aerial images were photographed: Aug 24, 2009—Jun 2, 2017

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

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
4	Teel silt loam	54	21.2	3.4%
8	Middlebury silt loam	54	9.1	1.5%
9	Pawling silt loam	54	79.7	12.9%
19A	Olean silt loam, 0 to 3 percent slopes	54	116.2	18.8%
19B	Olean silt loam, 3 to 8 percent slopes	54	79.6	12.9%
20A	Unadilla silt loam, 0 to 3 percent slopes	125	70.9	11.4%
20B	Unadilla silt loam, 3 to 8 percent slopes	125	12.2	2.0%
22A	Allard silt loam, 0 to 3 percent slopes	>200	0.0	0.0%
28A	Scio silt loam, 0 to 3 percent slopes	54	19.7	3.2%
33A	Wallington silt loam, 0 to 3 percent slopes	25	6.9	1.1%
37A	Tonawanda silt loam, 0 to 3 percent slopes	31	14.3	2.3%
46	Swormville silt loam	31	59.2	9.6%
51D	Chadakoin channery silt loam, 15 to 25 percent slopes	>200	5.6	0.9%
51E	Chadakoin channery silt loam, 25 to 35 percent slopes	>200	4.3	0.7%
52C	Valois gravelly silt loam, 8 to 15 percent slopes	>200	3.4	0.5%
52D	Valois gravelly silt loam, 15 to 25 percent slopes	>200	10.2	1.7%
52E	Valois gravelly silt loam, 25 to 35 percent slopes	>200	3.7	0.6%
56D	Chautauqua silt loam, 15 to 25 percent slopes	56	16.6	2.7%
61D	Schuyler silt loam, 15 to 25 percent slopes	46	7.9	1.3%
62C	Mardin channery silt loam, 8 to 15 percent slopes	43	9.6	1.5%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
67B	Dalton silt loam, 3 to 8 percent slopes	23	3.0	0.5%
68C	Volusia channery silt loam, 8 to 15 percent slopes	21	4.3	0.7%
100	Udorthents, loamy-skeletal	>200	11.2	1.8%
400	Wakeville silt loam	31	37.4	6.0%
497D	Rayne channery silt loam, 15 to 25 percent slopes	>200	0.3	0.0%
W	Water	>200	12.9	2.1%
Totals for Area of Interest			**619.4**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

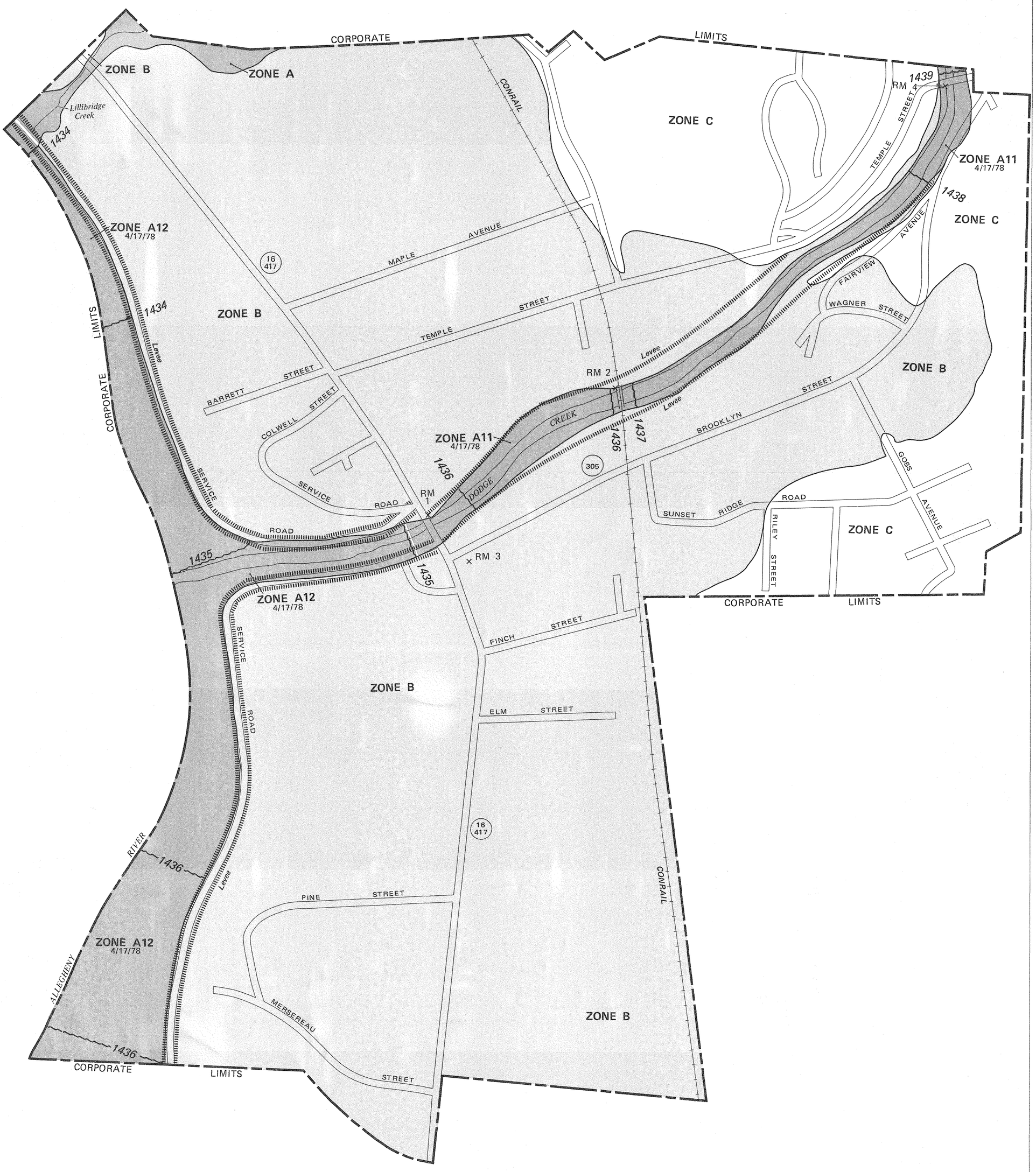
Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 1	1,431.66	Square out on top of upstream right bank wing wall by Route 417 bridge over Dodge Creek.
RM 2	1,432.517	At Portville, New York, about 0.1 mile south of CONRAIL station at bridge 76/37, in the west end of the north bridge seat, 10 feet west of track and about 4.5 feet lower than the top of the track. A standard disk stamped "K 68 1934" (USC&GA).
RM 3	1,426.369	At Portville, New York, about 1,565 feet west of junction of CONRAIL with the PS&N Railroad about 120 feet east of the intersection of Highway Routes 305 and 417. At the PS&N Railroad bridge in the south end of west bridge seat, 6 feet south of track and 3.5 feet lower than track. A standard disk stamped "S 69 1934" (USC&GS). Note: PS&N Railroad is abandoned.
RM 4	1,441.24	Chiseled square on south corner of pier, 3 feet north of end pier carrying Temple Street over Dodge Creek (SCS-BM).

[1] National Geodetic Vertical Datum of 1929.

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 DATE
ZONE A5 DATE
ZONE B

Base Flood Elevation Line With Elevation in Feet — 513

Base Flood Elevation Where Uniform Within Zone — (EL 987' NGVD)**

Elevation Reference Mark — RM7 X

River Mile — • M1.5

**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 with flood depth 1 to 3 feet; product of flood depth (feet) and velocity (feet per second) less than 15.
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 a flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Area between limits of 100-year flood and 500-year flood; areas of 100-year shallow flooding where depths less than 1 foot (Medium shading).
C	Areas outside 500-year flood. (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.
V0	Areas of 100-year shallow flooding with velocity; flood depth 1 to 3 feet; product of depth (feet) and velocity (feet per second) more than 15.
V1–V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTE: Certain areas not in the Special Flood Hazard Areas (Zones A and V) may be protected by flood control structures.

This map is for insurance purposes only and may not show all planimetric information outside of Special Flood Hazard Areas.

INITIAL IDENTIFICATION
MAY 25, 1973

CONVERSION TO REGULAR PROGRAM
APRIL 17, 1978

Consult the Federal Insurance Administration's Regional Office or call (800) 424-8872 (toll free) to determine if properties in this community are eligible for flood insurance.

APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

VILLAGE OF PORTVILLE, NEW YORK
CATTARAUGUS COUNTY

COMMUNITY-PANEL NUMBER
360094 0001 B

PAGE 1 OF 1

EFFECTIVE
APRIL 17, 1978

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

Appendix B
CCDOH Water System Sanitary Survey

CATTARAUGUS COUNTY HEALTH DEPARTMENT

1 Leo Moss Drive, Olean, NY 14760, Tel. (716)701-3386, Fax (716) 701-3737

Public Health
Prevent. Promote. Protect.
Cattaraugus County Health Department
Established 1923

Kevin D. Watkins, M.D., MPH, *Public Health Director*

Eric W. Wohlers, PE
Environmental Health Director

January 29, 2020

Mr. Anthony Evans, Mayor
Village of Portville
P.O. Box 436
Portville, NY 14770

Re: Portville Village – Public Water Supply
Sanitary Survey Results
PWS ID: NY0400347, Portville (V)

Dear Mayor Evans,

Attached to this letter are the results of the Sanitary Survey of the Village of Portville's Public Water System. A Sanitary Survey involves the inspection of the following (8) Areas;

- Source
- Treatment
- Distribution System
- Finished Water Storage
- Pumps, Pump Facilities and Controls
- Operator Compliance with State Requirements
- Monitoring, Reporting and Data Verification.
- Management and Operation

The sanitary survey identified several significant deficiencies[1] in the water system which will require immediate attention by the Village of Portville. The required corrective action(s) are listed below each violation in the included report. There are several compliance dates to pay attention to. I have highlighted those dates for your convenience. One of the requirements is to submit a written corrective action plan to our office detailing how you will alleviate the significant deficiency[2] cited in that violation.

If you have any questions or concerns regarding the sanitary survey, or the requirements within, do not hesitate to contact me directly at (716) 701-3388. I look forward to working with you on this.

Sincerely,

Timothy D. Zerfas
Water Resource Specialist

Enclosures

Cc: E. Wohlers, EHD
C. Covert, PHS
D. Long, ORC

---

[1] 10 NYCRR Part 5-1.1(ci) Significant deficiency means a defect in a system's design, operation or maintenance, or a failure or malfunction of its source, treatment, storage, or distribution, that causes or is reasonably expected to cause the introduction of contamination into water delivered to consumers. Significant deficiencies also include: loss of ability to deliver an adequate quantity of water; inadequate barriers of protection including failure of monitoring; conditions that pose an obvious security risk to the water system; or any other condition with the potential to cause a future public health hazard (i.e. before the next scheduled sanitary survey).

[2] 10 NYCRR Part 5-1.71(c) If the State notifies the supplier of water that a significant deficiency exists, the supplier of water shall consult with the State within 30 days regarding corrective action. Within 120 days of being notified that a significant deficiency exists (or earlier if the State determines that action is necessary to protect public health), the supplier of water shall correct the significant deficiency or be in compliance with a corrective action plan to correct the deficiency. The corrective action plan must specify appropriate modifications and/or improvements to the existing system or facility as may be necessary to fully conform to the requirements of this Subpart.

CATTARAUGUS COUNTY HEALTH DEPARTMENT

1 Leo Moss Drive, Olean, NY 14760, Tel. (716)701-3386, Fax (716) 701-3737

Public Health
Prevent. Promote. Protect.
Cattaraugus County Health Department
Established 1923

Kevin D. Watkins, M.D., MPH, *Public Health Director*

Eric W. Wohlers, PE
Environmental Health Director

January 29, 2020

Mr. Anthony Evans, Mayor
Village of Portville
P.O. Box 436
Portville, NY 14770

Re: Portville Village – Public Water Supply
Sanitary Survey Results
PWS ID: NY0400347, Portville (V)

Dear Mayor Evans,

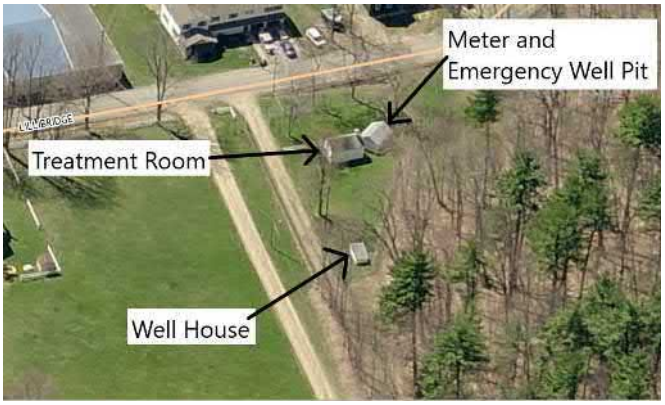
On Thursday, January 9th 2020, I met with Dustin Long, the newly designated Operator in Responsible Charge (ORC) for the Village of Portville's community Public Water System (PWS), to perform a sanitary survey. A sanitary survey involves the inspection and examination of infrastructure, operation, and management of a given water system in its entirety.

Water System Background

The Village of Portville (VOP) water system currently utilizes ground water from two wells; North Well #1- on Lillibridge Road, and South Well #3 behind Portville Central School (see Appendix A). The School and Lilliebridge Wells are treated at the well sites and pumped directly into the distribution system. The Lillibridge well site is also home to an auxiliary emergency well which is not treated, and has not been used in a very long time. In 1978 the current emergency well at Lillibridge lost its capacity to pump more than a few hours before breaking suction, this prompted the push for the development of an additional source of water known as Well #2, or the Wellington Drive Well.

The Wellington Drive Well and treatment plant have not been used in approximately 28 years due to objectionable water quality. The Wellington Drive Well, and treatment plant were originally proposed around 1971 when water quantity issues were at the forefront of the Villages concern. At that time the capacity of the wells on Lillibridge Rd had significantly decreased, and were believed to have already been in service beyond their anticipated life span as full time production wells. Planning and engineering began on the Wellington Drive Well in 1978. The well and treatment plant were built and put into production shortly after. Water quality quickly deteriorated and public complaints about highly discolored water became a normal occurrence. It was found that the water was moderately to highly corrosive, and that the turbidity and discoloration were thought to be a result of the corrosion of the cast iron pipes which made up much of the Village's distribution system. The well was quickly removed from normal production. In the early 1990's the Village hired a consulting engineer to address these problems. Plans were approved through the NYSDOH and the project had an estimated cost of $253,000. Work was never undertaken, and the Village officially decided to abandon the Wellington Drive source around 2001. In 2013 the Village decided to re-evaluate the potential for using the Wellington site as an additional source of water. Additional pump testing and water chemistry analysis were performed. In 2014 Engineering plans were approved through our office for the rehabilitation of that wellsite and treatment plant to address the water quality issues and bring the treatment plant up to current standards. At this point in time it is estimated that 80%-90% of that work has been completed, but the treatment plant is currently still not in working condition.

There are two reservoirs in the Village's water system simply called the "North Reservoir" (directly uphill of the Lillibridge Well site), and the "South Reservoir" (directly uphill of the South well site near the school). Each reservoir provides water to the distribution system via gravitational feed, and are filled by the well pumps when the water level sensors in the reservoirs call for the well pumps to turn on



North Well #1 and Treatment Plant on Lillibridge Rd.

The North Well is located on the east side of Lillibridge Rd on the very edge of the Village border. The well is a 12" diameter, 195' deep rock well that produced 300gpm during initial pump testing during its original development in 1954. The north well previously utilized a gas chlorination system and was retrofitted with liquid sodium hypochlorite. As a result, a small portion of untreated water is taken from near the well pump immediately after it gets pumped out of the ground, and is treated with the sodium hypochlorite and fluoride solution (see line diagram in Appendix A) before being added back to the water main to mix with the rest of the water being pumped out of the ground. The water is also treated with a blend of ortho/poly phosphate (a corrosion inhibitor). The treated water is pumped into the distribution system where it heads directly up the hill to the reservoir, or offsite of the treatment plant directly out to the distribution system.

South Well #3 and Treatment Plant Behind Portville School

The South Well is located directly east of the school and was drilled and developed in January 1996. The well is 10" diameter, 200' deep rock well that produced approximately 150gpm during initial pump testing. Much like the North Well, the South Well once utilized gas chlorination for disinfection, but has since been switched over to liquid sodium hypochlorite. The water is treated with ortho/poly phosphate, liquid sodium hypochlorite, and then fluoride before it goes directly into the distribution system (see line diagram in Appendix A).

Figure 1: North Reservoir during truss construction (late fall 2019)

North Reservoir on Lillibridge Rd

The North Reservoir directly uphill from the North Well is an old concrete reservoir which is covered by a wood frame structure. Originally the reservoir was used to collect spring water which was piped some 3.5 miles from north of the Village by gravity. The reservoir has a capacity of 240,000 gallons according to a 1954 engineering report. This past fall the reservoir was temporarily taken off line in order to replace the severely deteriorated roof. Work on the roof structure was mostly complete at the time of the inspection.

Figure 2: South Reservoir to the East of Portville Central School

South Reservoir behind Portville School

The South Reservoir is located to the east of Portville School. This reservoir is reported to have a capacity of 160,000 gallons, and is constructed the same as the North Reservoir with a wood frame roof.

Inspection Findings

Well Houses and Treatment (source and treatment)

Violations-

1. **The Village of Portville (VOP) is in Violation of 10 NYCRR Part 5-1.71(b)**[1] for failing to maintain the water softeners which fill the up-flow saturators for the fluoride treatment process. The water softener at the north treatment plant has been completely removed from the treatment plant and has not yet been replaced. The water softener at the south treatment plant was found to be non-functioning during the time of inspection. The salt in the brine tank had bridged over and was as solid as ice.

   Requirement- the VOP must replace and/or repair the water softeners used to fill the solution tanks for the fluoride saturators. Fluoride will combine with calcium and magnesium hardness in the make-up water. Since both calcium and magnesium fluoride are only slightly soluble, they will precipitate causing loss of fluoride and clogging of internal piping. The use of softened water will eliminate this precipitation. The raw water quality at the North and South well sites have hardness which exceed the lower design limit for up-flow saturators. Multiple engineering plans regarding initial installation and modifications to the chemical feed systems required softening at the VOP treatment plants. Both small water softening units must be repaired or replaced by March 31, 2020

   The VOP is in Violation of the 10 NYCRR Part 5-D.3(b) (Special Requirements for Wells Serving Public Water Systems)[2] at the North Well site. 10 NYCRR 5-D went into effect in November 2005, long after the well was initially constructed.

   Requirement- Well casings must extend a minimum of 18 inches above grade, if the well is located in a well house, the floor must be 6 inches above grade, and the well casing must extend 12 inches above the floor. Any future capital improvement projects made at the North Well sites must address this violation.

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[1] The supplier of water and the person or persons operating a water treatment plant or distribution system shall exercise due care and diligence in the operation and maintenance of these facilities and their appurtenances to ensure continued compliance with the provisions of this Subpart. Facilities approved by the State shall be operated in accordance with their design unless otherwise authorized under the provisions of sections 5-1.22, 5-1.23or 5-1.24of this Subpart

[2] Well casing shall extend a minimum of 18 inches above finished grade. If a well is located in a well house, the floor of the well house shall be at least six inches above grade and the permanent casing shall extend at least twelve inches above the floor.

Inspection Findings

Well Houses and Treatment (source and treatment)

2. **The VOP is in Violation of 10 NYCRR Part-5-A 5.1.10(j)**[3] for the lack of secondary containment of liquid chemicals at both the North and South Treatment plants.

   Requirement- appropriately sized spill containment pallets must be provided for bulk storage of chemical by April 30, 2020.

3. **The VOP is in Violation of 10 NYCRR Part 5-A.2.10**[4] for not having a finished water tap for daily residual monitoring of the water being pumped and treated. The only "finished water tap" is located between the reservoir and the entry into the distribution system. (see line diagram in appendix A *This line diagram was created off of the best information available on record from previous engineering reports*). The water meter is located near the same point, and cannot be used to quantify pumping rate, daily production etc. The water meter simply measures the amount of water leaving the reservoir, which may falsely account for water leaving the reservoir which previously flowed into the reservoir by gravity from the South Well pump or South Reservoir.

   Requirement- The VOP must be able to accurately test the water before it leaves to go out to the distribution system *OR* the reservoir (see line diagram). If the chemical feed pumps fail or lose prime, thousands of gallons of untreated water could be entering the distribution system or be sent up to the reservoir before the water operator is aware of the failure in treatment equipment. A new finished water tap must be installed at an approved location by April 30, 2020.

4. **The VOP is in Violation of 10 NYCRR Part 5-A.2.10**[5]**.** Several areas of the North Well site security fence are broken or in need of repair.

   Requirement- Repair the barbed wire on top of the fence as needed by April 30, 2020.

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[3] Liquid storage tanks shall be located and secondary containment provided so that chemicals from equipment failure, spillage or accidental drainage shall not enter the water in conduits, treatment or storage basins. Secondary containment volumes shall be able to hold the volume of the largest storage tank. Piping shall be designed to minimize or contain chemical spills in the event of pipe ruptures.

[4] Sample taps shall be provided so that water samples can be obtained from each water source and from appropriate locations in each unit operation of treatment, and from the finished water. Taps shall be consistent with sampling needs and shall not be of the petcock type. Taps used for obtaining samples for bacteriological analysis shall be of the smooth-nosed type without interior or exterior.

[5] The station shall be protected to prevent vandalism and entrance by animals or unauthorized persons. The pump station should be located within a secure area such as a locked building or fenced area;

Inspection Findings

Finished Water Storage

Violations-

5. **The VOP is in violation of 10 NYCRR Part 5-1.32[6] and 10 NYCRR Part 5-A 7.0.3[7] and 10 NYCRR Part 5-1.71(b)[1]** for several unfinished portions of the wood structure which can currently allow birds or other animals into the reservoir (mainly the eaves- see Appendix A), and failing to complete the roof replacement in a timely manner. In 2017 the VOP was cited for significant deficiencies where "Both North and South Reservoirs have locations where vermin and detritus can enter the treated water storage facilities".

It is my understanding through conversations with the previous Operator in Responsible Charge (ORC) that the plan was to sheet the roof with plywood, and cover the openings of the eves and overhangs using plywood so that closed cell spray foam insulation could be sprayed onto the plywood from the inside of the structure, effectively sealing the plywood off from the moisture, and providing some insulating value to the interior structure. Since Oriented Strand Board (OSB) plywood was used, it is imperative that the project be completed in a timely manner. OSB plywood takes longer to absorb moisture or water than normal laminated plywood, and also takes longer to dry out once it has been saturated. OSB plywood is not meant to be used in conditions where excessive moisture exists.

Requirement- VOP must tightly block off the ends on the remaining eaves and install appropriate 20-30 mesh stainless steel screens in those eves where they will be intended to provide ventilation to the interior of the reservoir by March 31, 2020.
The VOP must also submit a written Corrective Action Plan no later than February 28, 2020 detailing the steps it will take to evaluate and address the condition of both reservoirs, and create a plan to mitigate the moisture issue with the OSB plywood.

6. **The VOP is in violation of 10 NYCRR Part5-A 7.0.4[8]** for inadequate security at the North and South Reservoir. The new door which has been installed to access the interior of the concrete reservoir has a normal exterior locking door handle.

Requirement- VOP must install a deadbolt or high quality stainless steel padlock hasp on the door at the North Reservoir by February 28, 2020. "Consideration should be given to the installation of high strength, cut resistant locks or lock covers to prevent direct cutting of a lock." [6] The VOP shall budget to install security fencing around the reservoirs. Or include in the next capital improvement project planned for the reservoirs (include in the corrective action plan)

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[6] Finished water storage facilities which deliver water to the user without later treatment shall be covered, or the water from an uncovered finished water storage facility shall be continuously treated to achieve inactivation or removal of at least 99.99 percent virus, 99.9 percent Giardia lamblia, and 99 percent Cryptosporidium in a manner approved by the State, in accordance with section 5-1.22(b) of this Subpart, before being discharged to the distribution system

[7] All finished water storage structures shall have suitable watertight roofs which exclude birds, animals, insects, and excessive dust. The installation of appurtenances, such as antenna, shall be done in a manner that ensures no damage to the tank, coatings or water quality, or corrects any damage that occurred.

[8] Fencing, locks on access manholes, and other necessary precautions shall be provided to prevent trespassing, vandalism, and sabotage. Consideration should be given to the installation of high strength, cut resistant locks or lock covers to prevent direct cutting of a lock. Refer to Section 2.19for security considerations.

Inspection Findings

Distribution System

Violations-

7. **The VOP is in violation of 10 NYCRR Part 5-1.31(a)(3)**[9] for failing to enforce and implement the Cross Connection Control Program (CCCP) (*Village of Portville Local Law #1 of 1993*). All backflow prevention devices (BPD's) must be tested initially during installation, and continue to be tested annually while in service. The current water operator was unaware if any BPD's had been tested in 2019. I spoke with the VOP Clerk / Treasurer on January 22, 2020 and asked what records were on file for test reports for 2019 for the Village. She reported that there were test reports in a folder leading up to 2017, however there were no test reports for 2018, or 2019 on file.

   The VOP was previously cited in 2017 for failure to enforce the CCCP on February 27, 2017 and was ordered to test the devices. It was also recommended that the Village Board give attention to the re-organization, training, and implementation of the CCCP to ensure continued compliance and minimize public health hazards.

   Requirement- The VOP must send notices to all BPD owners and direct them to have their devices tested within 30 days, or submit proof of 2018 test results, and send the results to the VOP. For those device owners who cannot provide proof that the devices were tested in 2018, the VOP should enforce Article IV of Local Law #1 of 1993. Copies of all BPD test reports in service must be sent to CCHD no later than April 30, 2020.

8. **The VOP is in violation of 10 NYCRR Part 5-1.71(b)** for failing to employ a distribution system flushing, and valve exercise program. Routine valve exercise is important to ensure that valves will operate when needed in emergency and routine maintenance or repair of the distribution system. Semi-annual flushing is important to the maintenance of the distribution lines to maximize water quality, and minimize public health concerns.

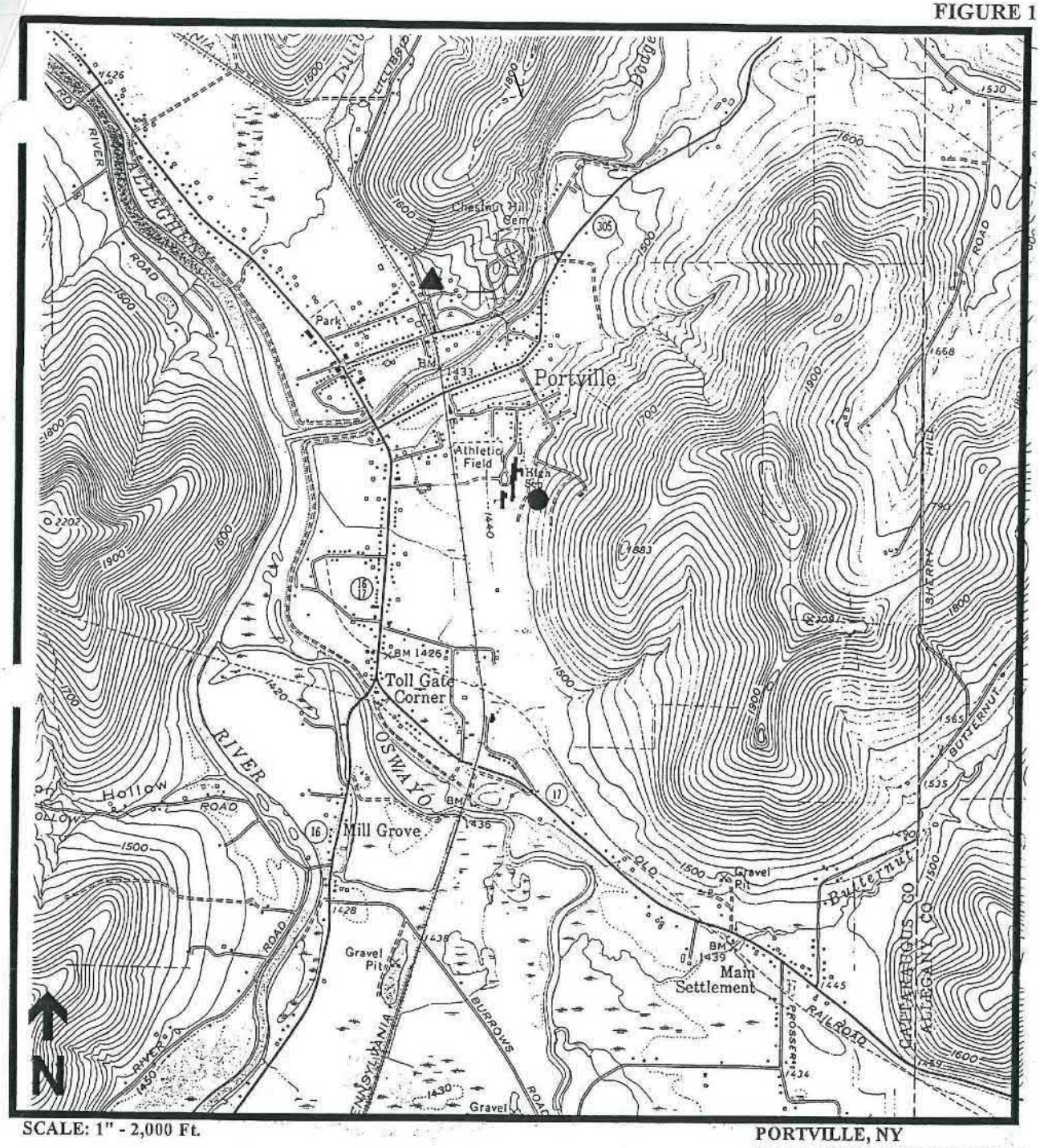
   Requirement- The VOP must initiate and document a distribution system maintenance program which should include the regular exercise of valves, and flushing. The New York Rural Water Association (NYRWA) is available to help create a distribution system flushing program, which can incorporate valve exercise to create unidirectional flushing.

Recommendations- Continue to monitor for new leaks, repair existing leaks, and monitor daily production. Consider hiring a consultant to perform a water budget which quantifies "non-revenue" or lost water and look at your water rates and recommend periodic small increases, rather than large adjustments after many years.

[9] Assuring all protective devices are inspected and tested by a certified backflow prevention device tester, as prescribed in subdivision (b) of this section, at the time of initial installation, after each repair, and annually thereafter. Records of such tests shall be made available to, reviewed by, and maintained by the supplier of water. All protective device tests and inspections shall be conducted by a certified backflow prevention device tester ("tester").

Appendix A

FIGURE 1



SCALE: 1" - 2,000 Ft.

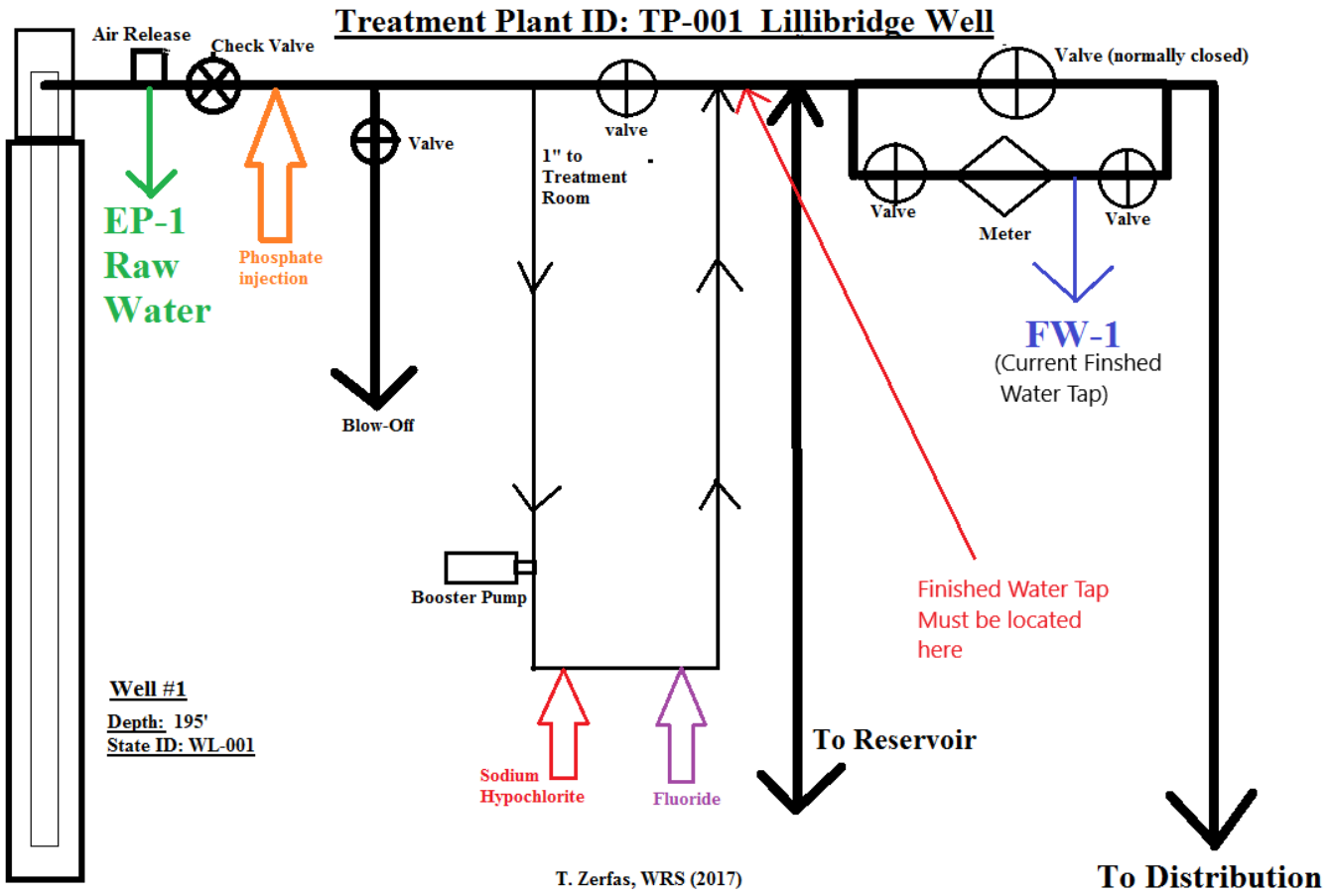
PORTVILLE, NY
7 1/2 MINUTE TOPOGRAPHIC
QUADRANGLE

WELL LOCATION MAP
VILLAGE OF PORTVILLE, NEW YORK

● PORTVILLE SCHOOL PRODUCTION WELL

▲ LILLIBRIDGE ROAD WELL

Prepared by:
MOODY AND ASSOCIATES, INC.


Treatment Plant ID: TP-001 Lillibridge Well
Air Release
Check Valve
Valve (normally closed)
Valve
valve
1" to Treatment Room
Valve
Meter
Valve
EP-1 Raw Water
Phosphate injection
FW-1
(Current Finshed Water Tap)
Blow-Off
Booster Pump
Finished Water Tap Must be located here
Well #1
Depth: 195'
State ID: WL-001
Sodium Hypochlorite
Fluoride
To Reservoir
To Distribution
T. Zerfas, WRS (2017)

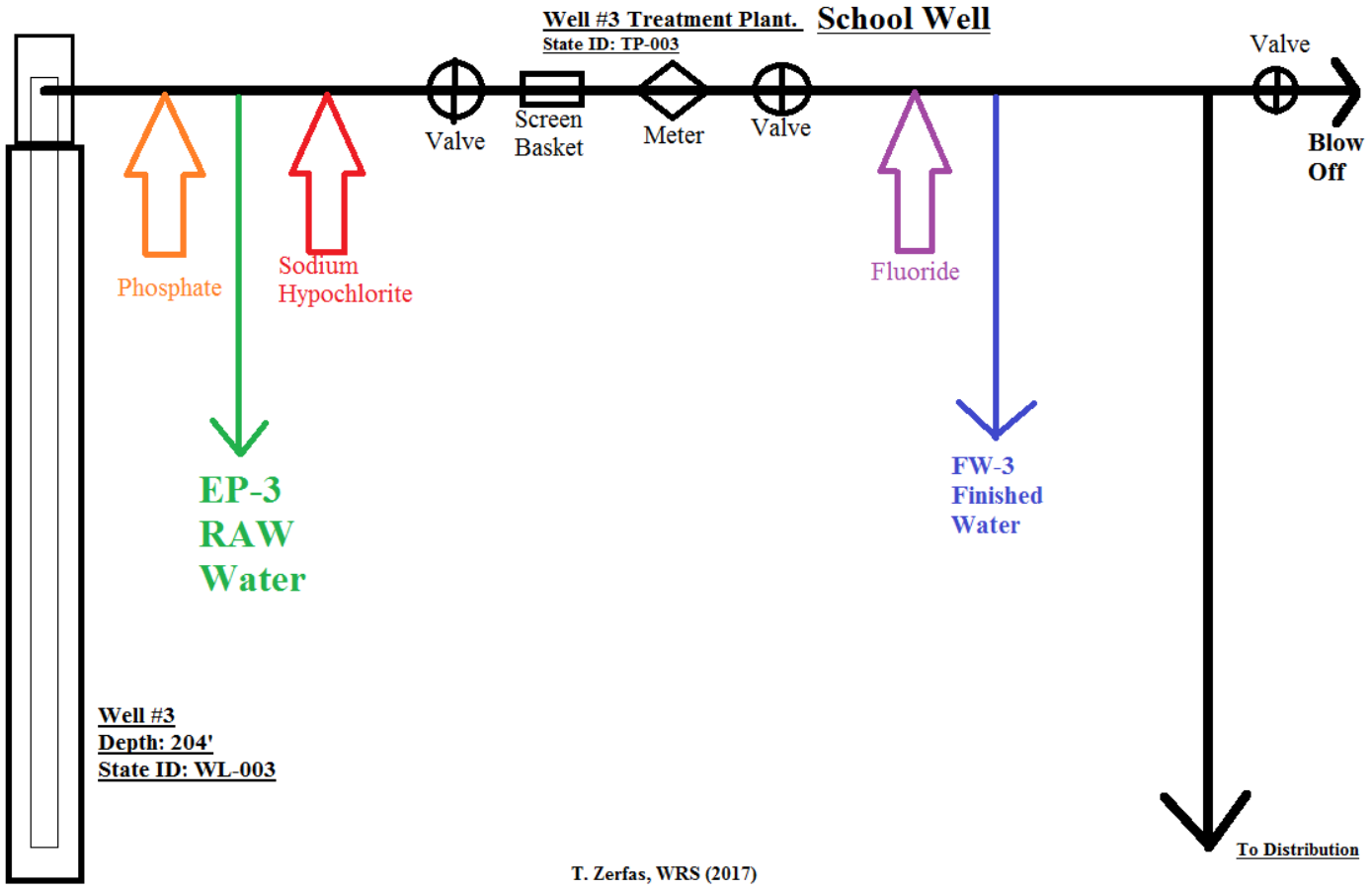

Well #3 Treatment Plant.
State ID: TP-003
School Well
Valve
Valve
Screen Basket
Meter
Valve
Blow Off
Phosphate
Sodium Hypochlorite
Fluoride
EP-3 RAW Water
FW-3 Finished Water
Well #3
Depth: 204'
State ID: WL-003
To Distribution
T. Zerfas, WRS (2017)

Figure 1- Photograph showing the chemical feed pumps at the north treatment building, and the lack of water softening equipment, and secondary containment for the 55 gallon drums of chemicals.

Figure 2- Photo of the North Reservoir showing the open eves on one end of the building. Bird, animals, and insects are free to enter unchecked.

Figure 4- Another photograph of the North Reservoir showing the open / unscreened /unfinished eves where birds or rodents are free to enter. Also note the discoloration on the OSB plywood from the continuous moisture extreme.

Figure 5- Photograph showing part of the security fencing around the North Well in need of repair.

Figure 6-Photo of the entry way into the South Reservoir above the school. The wood frame structure is in need of complete replacement and sealing to prevent entry from birds and rodents.

Appendix C
Site Visit Photos

North Reservoir Exterior

South Reservoir Exterior

North Well Treatment Building Exterior

North Well Head Building Exterior

North Well Treatment Building Exterior

North Well Head Building Interior

North Well Treatment Building Interior

North Well Treatment Building Interior

South Well Treatment Building Exterior

South Well Head

South Well Treatment Building Interior

South Well Treatment Building Interior

South Well Treatment Building Interior

South Well Treatment Building Interior

Wellington Well Building Exterior (Not in use)

Wellington Well Building Interior - Second Floor

Wellington Well Building Interior - First Floor

Appendix D
Water Usage Data

Portville Comprehensive Water Assessment Study
Appendix D - Water Use Data

	2018		
	Monthly Avg. Produced Daily (GPD)	Monthly Max. Produced Daily (GPD)	Monthly Min. Produced Daily (GPD)
JAN	167,194	253,000	100,000
FEB	125,500	168,000	55,000
MAR	124,645	165,000	80,000
APR	125,700	173,000	68,000
MAY	136,323	207,000	62,000
JUN	130,400	185,000	75,000
JUL	128,581	169,000	88,000
AUG	132,226	179,000	61,000
SEP	131,867	175,000	88,000
OCT	136,290	193,000	71,000
NOV	123,100	232,000	7,000
DEC	126,774	185,000	86,000
AVG	**132,383**		

	2019		
	Monthly Avg. Produced Daily (GPD)	Monthly Max. Produced Daily (GPD)	Monthly Min. Produced Daily (GPD)
JAN	133,452	171,000	65,000
FEB	157,000	725,000	91,000
MAR	143,935	527,000	95,000
APR	128,800	198,000	94,000
MAY	132,355	163,000	101,000
JUN	135,633	233,000	103,000
JUL	132,645	198,000	77,000
AUG	130,903	190,000	89,000
SEP	119,833	157,000	84,000
OCT	114,000	168,000	61,000
NOV	113,800	145,000	68,000
DEC	131,258	401,000	76,000
AVG	**131,135**		

Note: Numbers in Red are assumed to be wrong or abnormal (i.e. well pump inadvertently left on in hand)

Top 15 Days	
Date	Water Usage (gal.)
2/10/2019	725,000
3/16/2019	527,000
12/2/2019	401,000
1/8/2018	253,000
1/12/2018	244,000
1/15/2018	244,000
6/5/2019	233,000
11/24/2018	232,000
1/29/2018	231,000
1/11/2018	213,000
1/10/2018	211,000
5/25/2018	207,000
2/8/2019	198,000
4/17/2019	198,000
7/10/2019	198,000

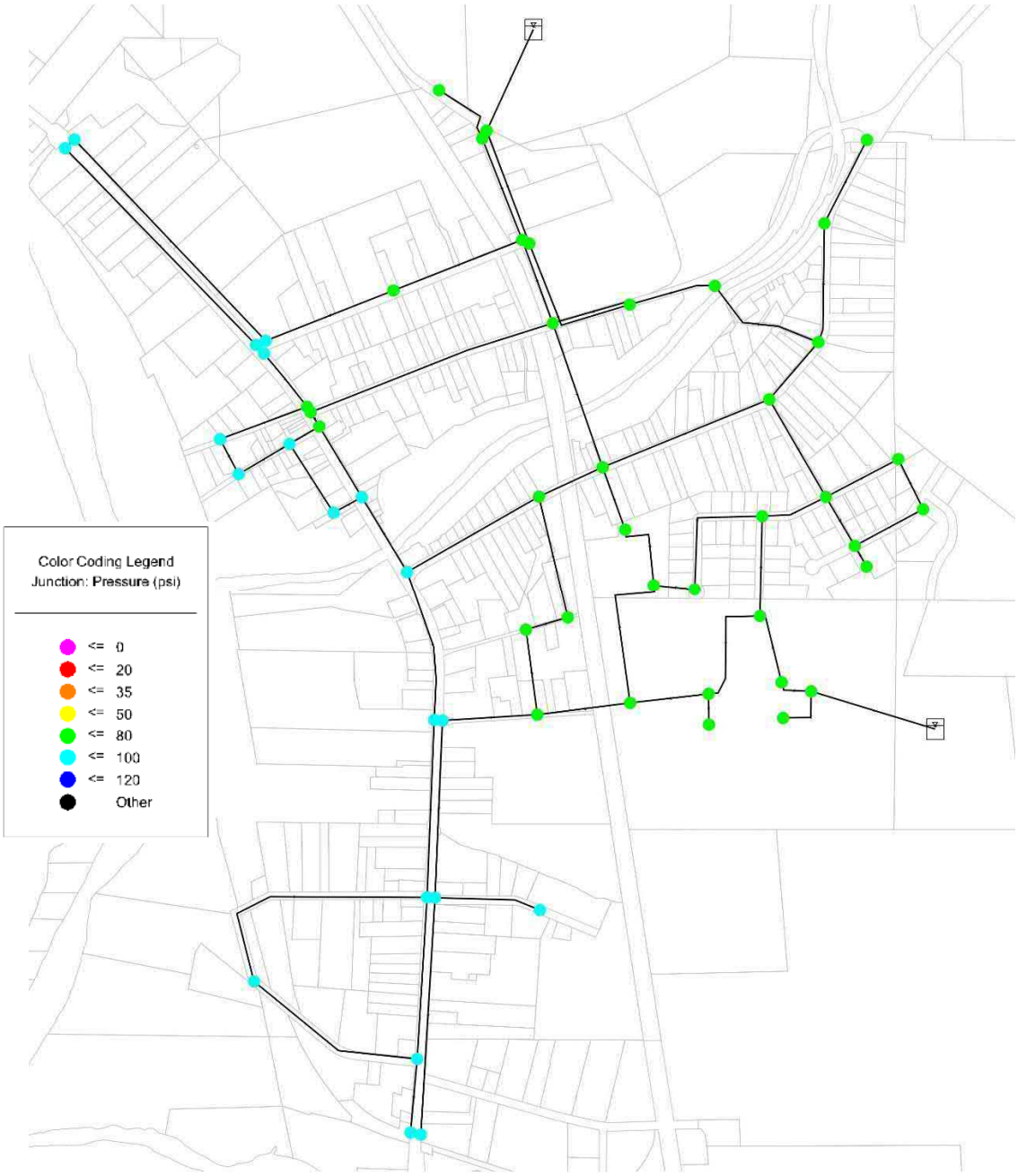
Summary	
Average Daily Water Production (GPD)	131,759
Average Daily Meter Water Use (GPD)	74,358
Estimated Total Unaccounted for water %	44%
Max. Month Daily Demand (Jan. 2018)	167,194
99% Max. Day Demand	231,710
Est. Peak Hour Demand (GPM)	322
Est. Peak Fire Flow Demand (GPM)	1300
Two Hour Peak Fire Flow Demand (Gal.)	156,000

Estimated Water Storage Required	
99% Max. Day Demand	231,710
Two Hour Peak Fire Flow Demand (Gal.)	156,000
Two Hour Max. Well Pump Output	54,000
Ideal Min. Usable Storage Volume (Gal.)	333,710
Current Usable Storage Volume (Gal.)	400,000
Estimated Average Demand (GPM)	91
Estimated Pumping Rate during Tank Fill (GPM)	450
Current Estimated Avg. Tank Turnover (Days)	3.8

Appendix E
Hydraulic Model

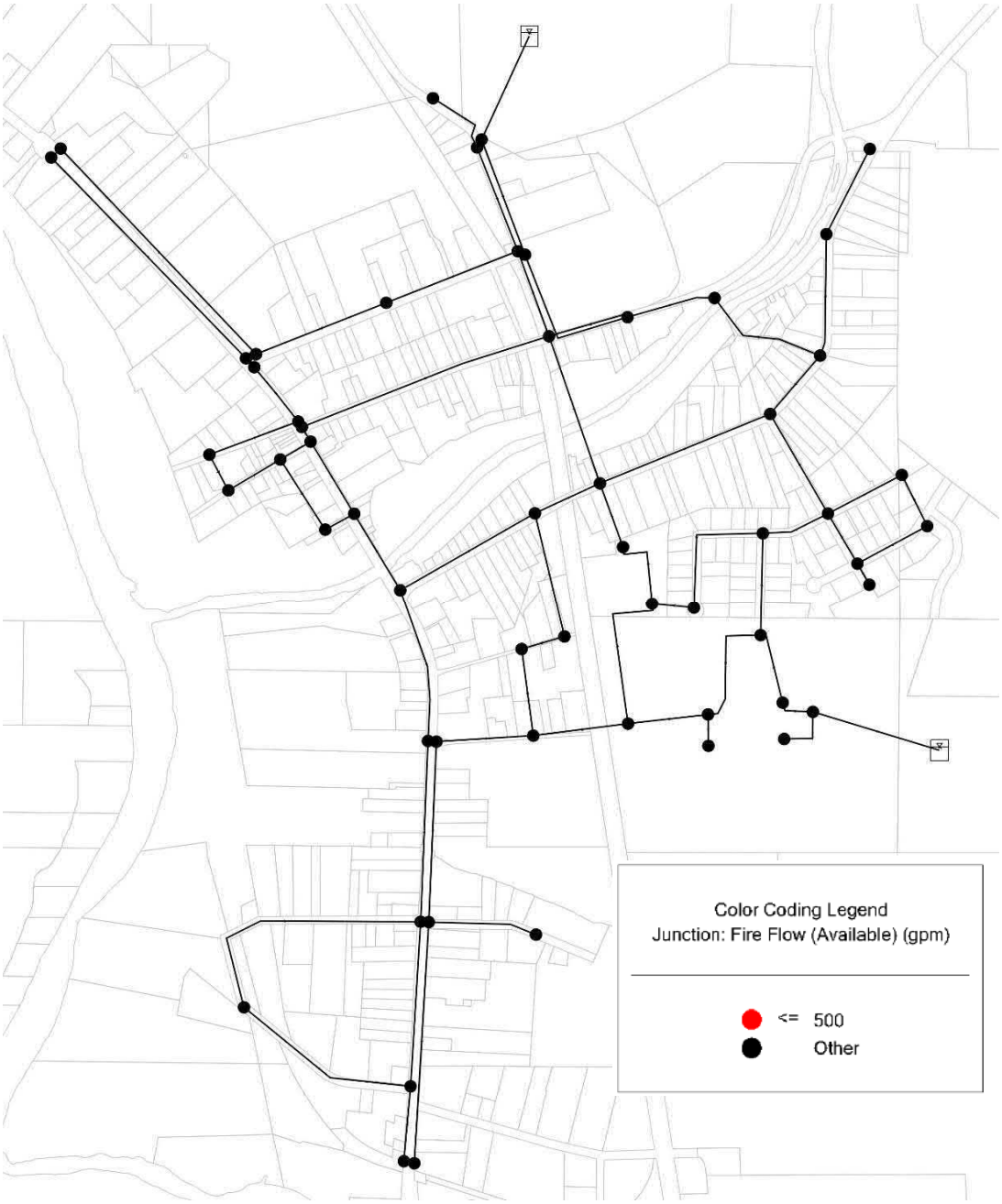
EXISTING WATER SYSTEM

The map below depicts static pressures within the Village of Portville's water distribution system. Low pressure areas are found near the concrete water storage tank at higher elevation areas.



EXISTING FIRE FLOW CONDITIONS

The map below depicts modeled Fire Flow conditions in the Village of Portville. Red nodes depict junctions with fire flow less than 500 GPM at residual pressure of 20 PSI. There are no locations where fire flow or residual pressure are insufficient.

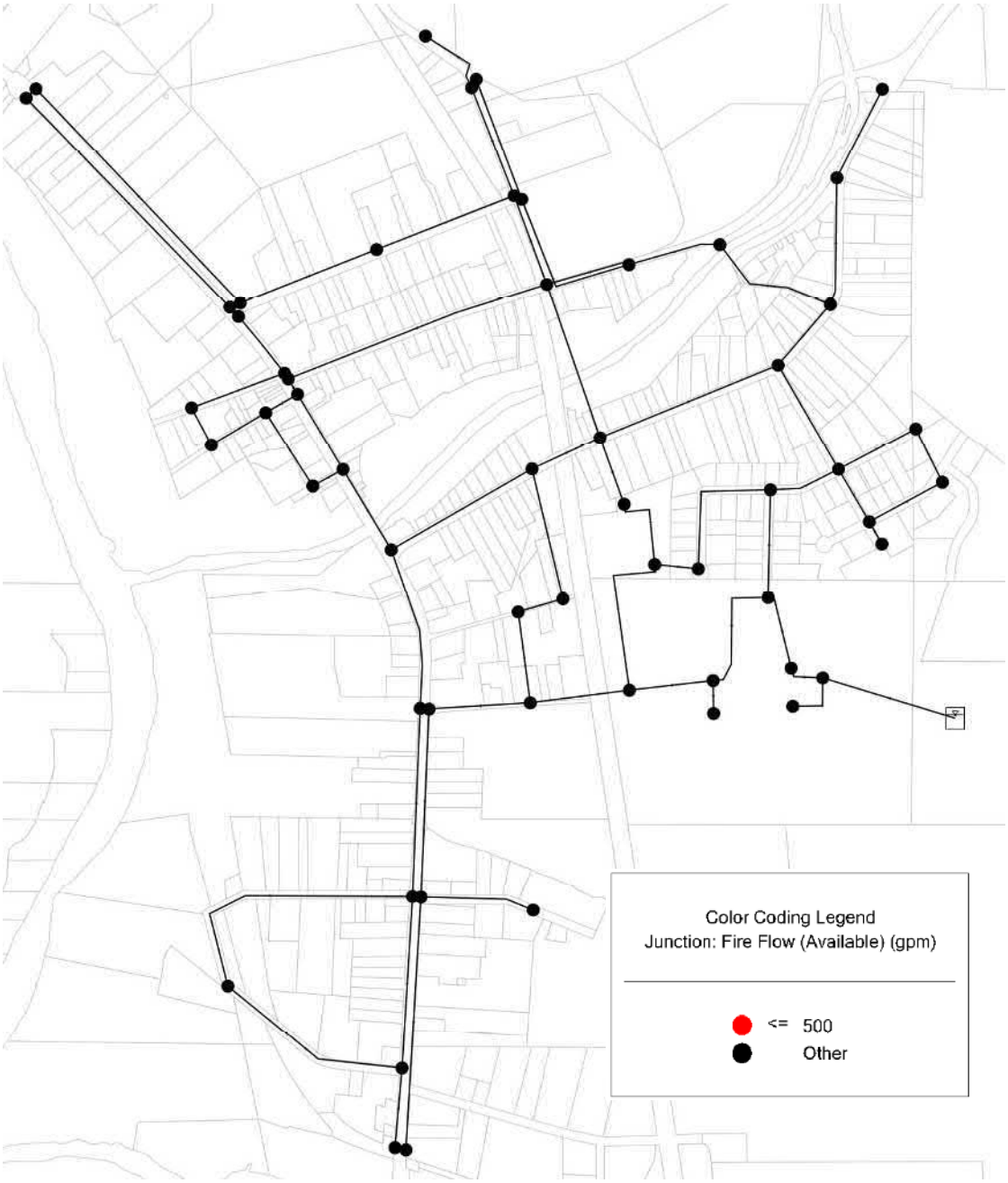


EXISTING WATER SYSTEM – NORTH TANK OUT OF SERVICE

The map below depicts static pressures in the Village of Portville's water distribution system with the North Reservoir out of service. Pressures remain largely unchanged throughout the distribution system, with only a 1-2 PSI drop at some junctions.

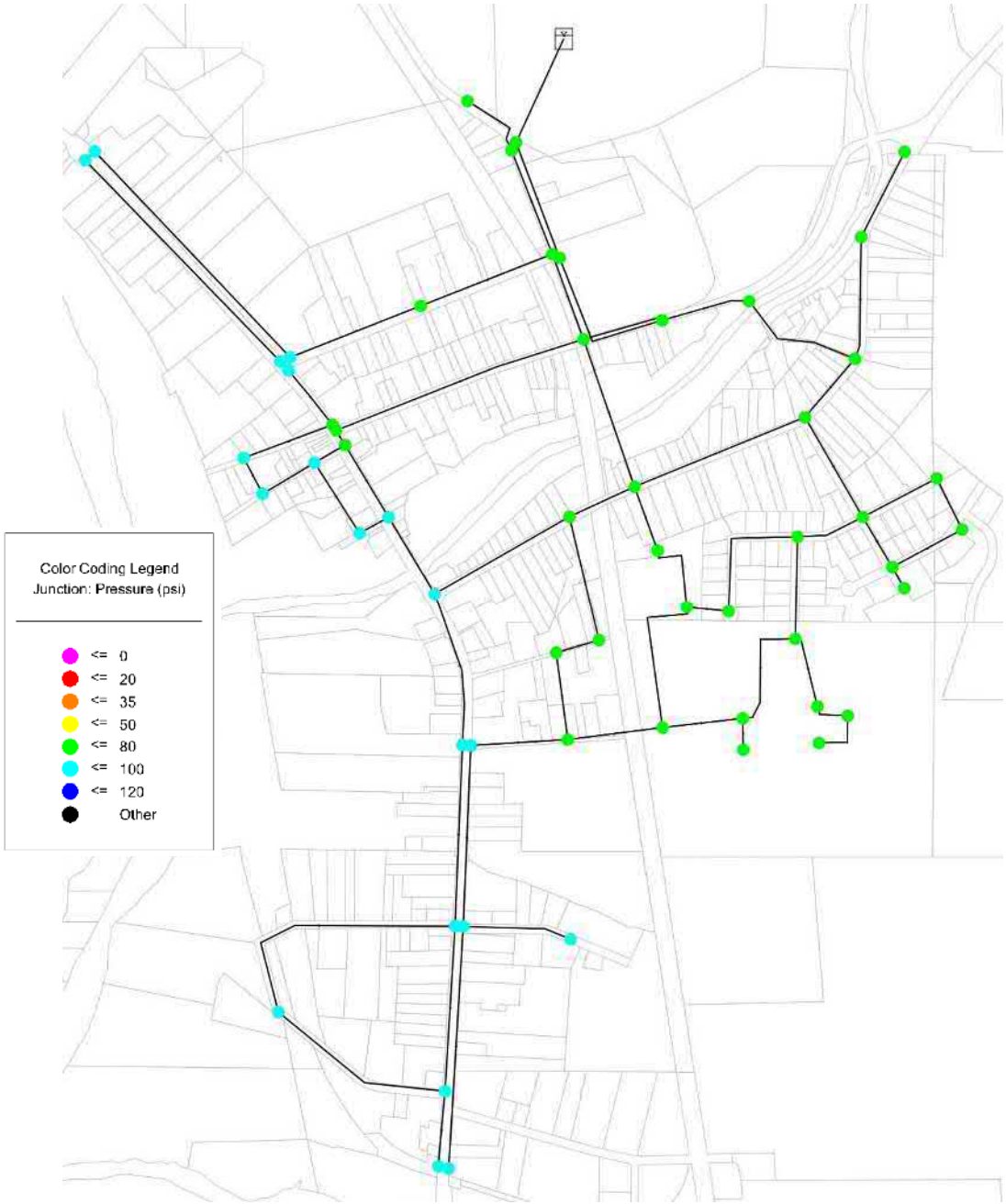
EXISTING FIRE FLOW CONDITIONS – NORTH TANK OUT OF SERVICE

The map below depicts modeled Fire Flow conditions in the Village of Portville with the North Reservoir out of service. Red nodes depict junctions with fire flow less than 500 GPM at residual pressure of 20 PSI. There are no locations where fire flow or residual pressure are insufficient.



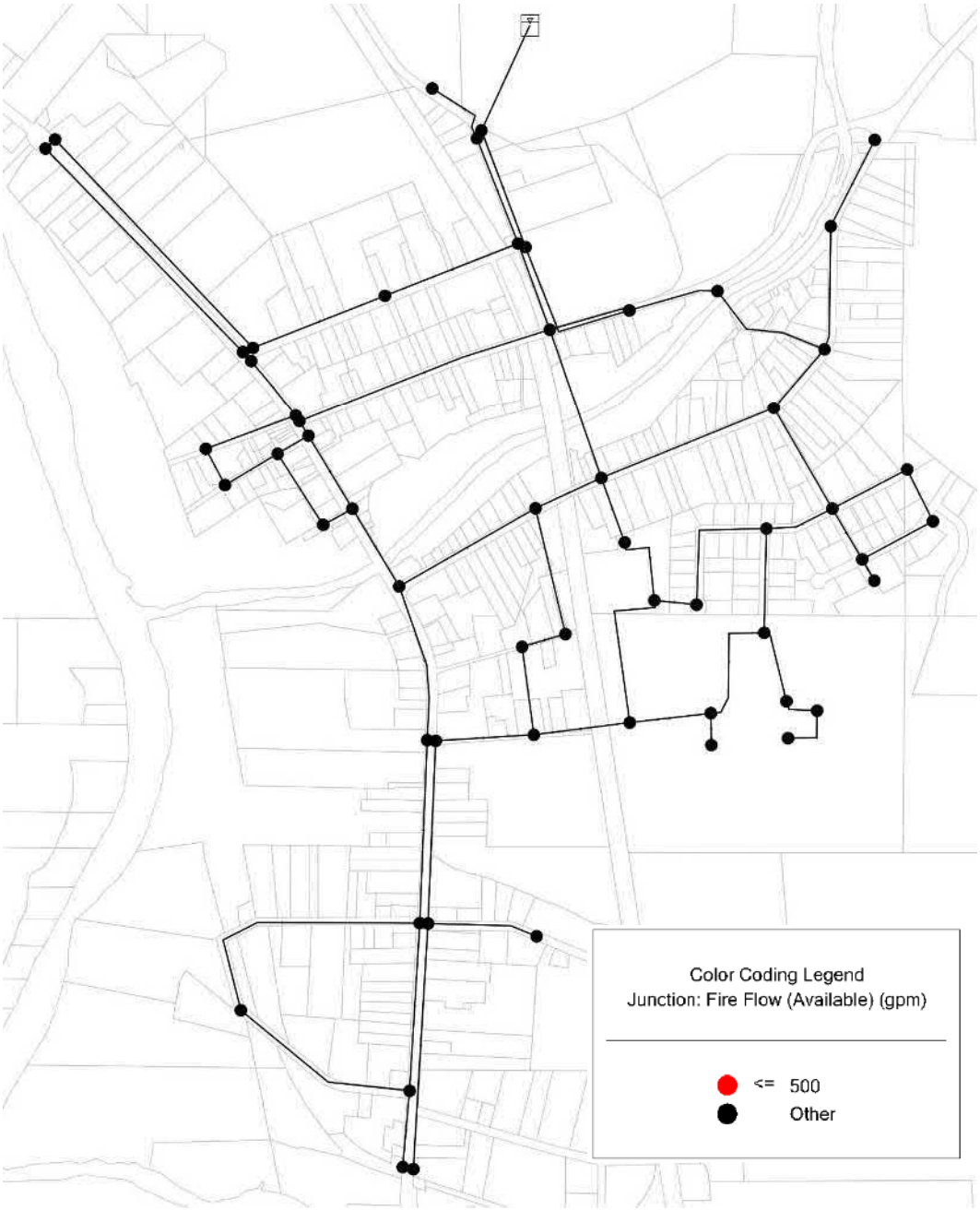
EXISTING WATER SYSTEM – SOUTH TANK OUT OF SERVICE

The map below depicts static pressures in the Village of Portville's water distribution system with the South Reservoir out of service. Pressures remain largely unchanged throughout the distribution system, with only a 1-2 PSI drop at some junctions.



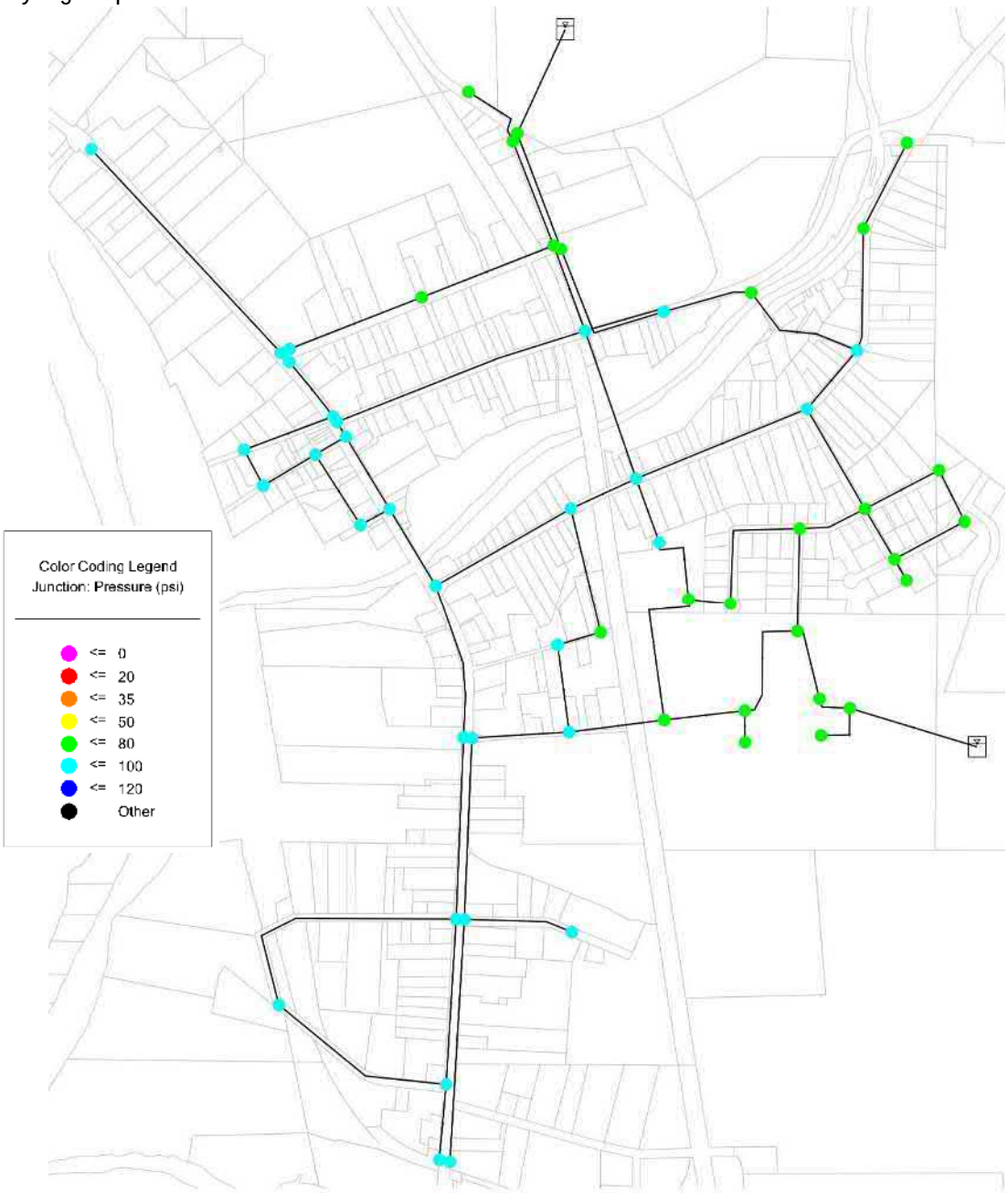
EXISTING FIRE FLOW CONDITIONS – SOUTH TANK OUT OF SERVICE

The map below depicts modeled Fire Flow conditions in the Village of Portville with the South Reservoir out of service. Red nodes depict junctions with fire flow less than 500 GPM at residual pressure of 20 PSI. There are no locations where fire flow or residual pressure is insufficient.



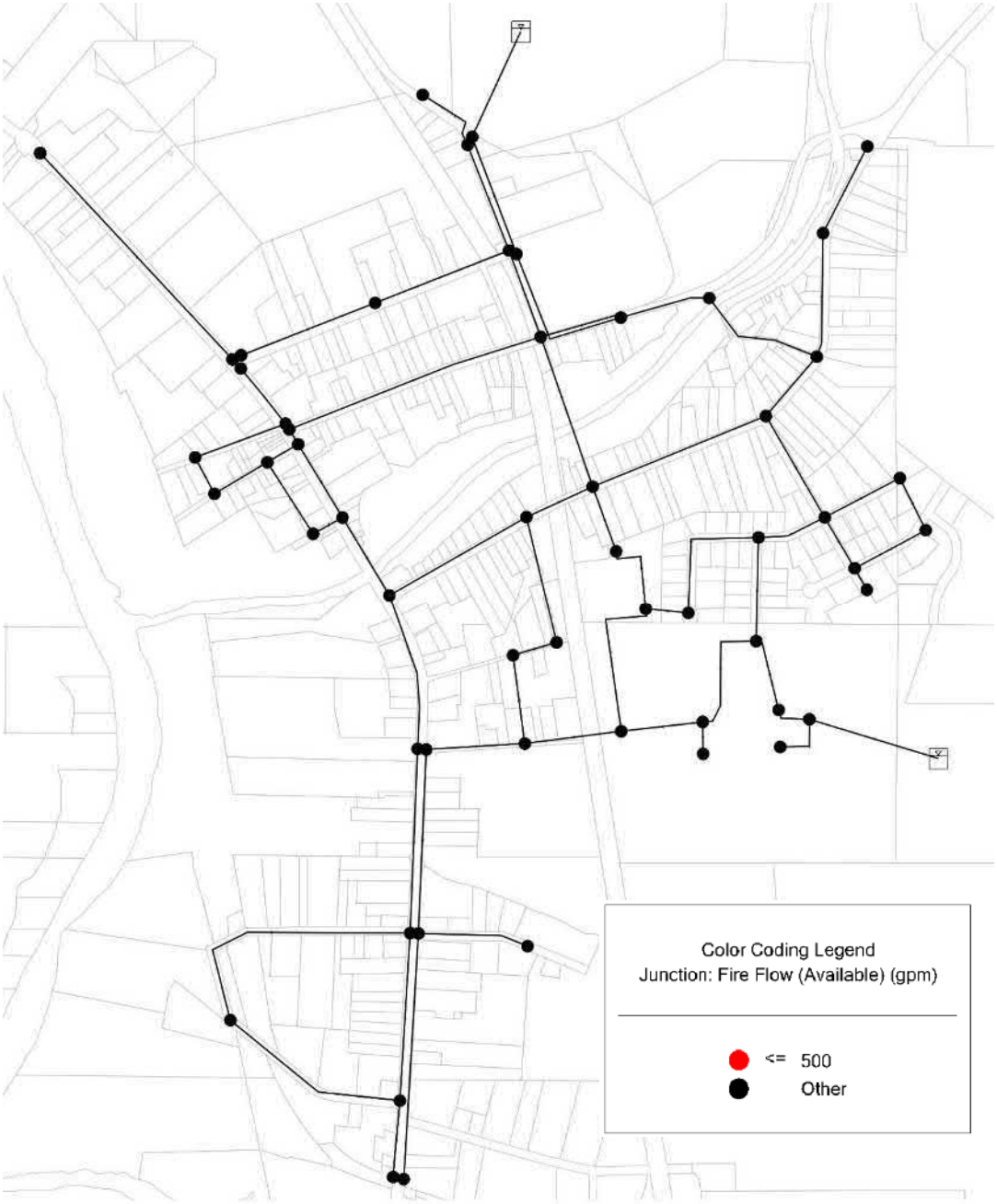
PROPOSED WATER SYSTEM

The map below depicts the Village of Portville's water distribution system after the proposed improvements outlined in the report have been made. The new 400,000 gallon storage tank will be 10-15 feet taller than the existing water storage tank. As a result, some areas of the Village will see slightly higher pressures.



PROPOSED FIRE FLOW CONDITIONS

The map below depicts modeled Fire Flow conditions in the Village of Portville after proposed improvements have been made. Red nodes depict junctions with fire flow less than 500 GPM at residual pressure of 20 PSI. There are no locations where fire flow or residual pressure is insufficient.



Appendix F
Chlorine Contact Time Calculations

Barton & Loguidice

JOB	2302.002 - (V) Portville Water PER		
SHEET NO.	1	OF	1
CALCULATED BY	MJZ	DATE	7/30/2020
CHECKED BY	KMK	DATE	9/14/2020
SUBJECT	Chlorine Contact Time Calculations - South Well		

Existing Chlorine Contact Time

Design Flow	150	gpm
Pipe Type	DR18 C905 PVC	
Inner Diameter	8	inches
Length of CT Pipe	580	feet
Pipe Volume	1,514	gallons
Contact time	**10.10**	**min**

Min. Required Chlorine Contact Volume for 4 Log Removal

Pipe Volume	1,600	gallons

Min. Required Chlorine Contact Volume for 15 min. CT

Contact time	**15.00**	**min**
Pipe Volume*	2,250	gallons

* Ideal min. volume, but not required if 4 log removal

Log Removal of Viruses by Free Chlorine

Baffling Factor	1

CL Conc	pH	Temp	Peak Flow	Storage Volume	Total Detention Time (TDT)	Contact Time	CT Calc	Ct Req	Inactivation Ratio	Log Removal
mg/L		^{o}C	GPM	Gallons	Vol/Peak Flow	min	Cl Conc x Contact Time	Table B2*	CT calc / CT req	4 X Inactivation Ratio
0.75	7	5	150	1,514	10.10	10.10	7.57	8	0.95	3.79
0.75	7	5	150	1,600	10.67	10.67	8.00	8	1.00	4.00
0.75	7	5	150	2,250	15.00	15.00	11.25	8	1.41	5.63

Minimum of 4 Log Removal Required

* Source: EPA Guidance Manual (LT1ESWTR Disinfection Profiling and Benchmarking)

Pipe Volume	**1,600**	gal
~Req. Length of 8" pipe	613	ft
~Req. Length of 10" pipe	392	ft
~Req. Length of 12" pipe	272	ft
~Req. Length of 16" pipe	153	ft
~Req. Length of 24" pipe	68	ft

Pipe Volume	**2,250**	gal
~Req. Length of 8" pipe	862	ft
~Req. Length of 10" pipe	552	ft
~Req. Length of 12" pipe	383	ft
~Req. Length of 16" pipe	215	ft
~Req. Length of 24" pipe	96	ft

Note: Existing waterline lengths, sizes, and locations were assumed. The Village lacks engineering drawings of the syster
Actual watermain layouts and sizes should be confirmed prior to final design.

Appendix G

NYS DWSRF Capacity Development Form

CAPACITY DEVELOPMENT PROGRAM

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

SYSTEM NAME: Village of Portville Water System

COUNTY: Cattaragus **PWSID #:** _____

COMPLETED BY: Barton and Loguidice **DATE:** 8/12/20

Technical Capacity

A. System Infrastructure

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

   ☐ Yes ☒ No ☐ Not Applicable

   If the system lacks certain plans, please specify:
   Very minimal record drawings exist.

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

   ☐ Yes ☒ No ☐ Not Applicable

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

   ☒ Yes ☐ No ☐ Not Applicable

4. Does the system have a water conservation plan?

   ☐ Yes ☒ No ☐ Not Applicable

5. Are all customers on the water system metered?

   ☒ Yes ☐ No ☐ Not Applicable

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

   ☒ Yes ☐ No ☐ Not Applicable

B. Source Water Evaluation

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

   ☐ Yes ☐ No ☐ Not Applicable UNKNOWN

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

   ☐ Yes ☐ No ☐ Not Applicable UNKNOWN

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

   ☐ Yes ☐ No ☐ Not Applicable UNKNOWN

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

   ☐ Yes ☐ No ☐ Not Applicable UNKNOWN

C. Technical Knowledge

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

   ☒ Yes ☐ No ☐ Not Applicable

   If system can't meet regulations, please specify: Detailed in Engineering Report

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

   ☒ Yes ☐ No ☐ Not Applicable

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

   ☒ Yes ☐ No ☐ Not Applicable

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

   ☒ Yes ☐ No ☐ Not Applicable

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

   ☒ Yes ☐ No ☐ Not Applicable

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

☐ Yes ☒ No ☐ Not Applicable

D. Certified Operators

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

☒ Yes ☐ No

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

☐ Yes ☐ No ☒ Not Applicable

Managerial Capacity

A. Staffing and Organization

1. What type of training/continuing education did system personnel attend within the last two years (please specify)? Several water training classes at various locations.

2. Who is responsible for policy and operational decisions for the water system *(name and title)*?
Dustin Long (Operator) and the Village Board

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

4. Who is responsible for approving expenditures *(name and title)*?
Village Board (5 Members)

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

☐ Yes ☐ No ☒ Not Applicable

B. Ownership

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

   ☐ Yes ☐ No ☒ Not Applicable

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

   _____

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

   ☐ Yes ☐ No ☐ Not Applicable

   Unknown in regards to land where South tank is located

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

   ☐ Yes ☐ No ☒ Not Applicable

C. Consolidation/Restructuring

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

   ☒ Yes ☐ No ☐ Not Applicable

   b) Selling ownership to an existing water system?

   ☐ Yes ☐ No ☒ Not Applicable

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

   ☐ Yes ☒ No ☐ Not Applicable

D. Emergency/Disaster Response Plans

1. Has the system developed an Emergency Response Plan?

   ☐ Yes ☒ No ☐ Not Applicable

2. Does the Emergency Response Plan:

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

   ☐ Yes ☐ No ☒ Not Applicable

b) Provide for emergency phone and radio capabilities?

☐ Yes ☐ No ☒ Not Applicable

c) Describe public and health department notification procedures?

☐ Yes ☐ No ☒ Not Applicable

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

☐ Yes ☒ No ☐ Not Applicable

E. Water System Policies

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

☒ Yes ☐ No ☐ Not Applicable

F. Record Keeping

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

☒ Yes ☐ No ☐ Not Applicable

Financial Capacity

A. Budget Projection – Revenues and Expenses

1. Does the system have a water budget?

☒ Yes ☐ No ☐ Not Applicable

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

☐ Yes ☒ No ☐ Not Applicable

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

☒ Yes ☐ No ☐ Not Applicable

Endddndnndndn

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

[X] Yes [ ] No [ ] Not Applicable

B. Reserves

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

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

   [ ] Yes [X] No [ ] Not Applicable

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

   [ ] Yes [X] No [ ] Not Applicable

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

   ____ Fixed Amount ____Percentage of Revenues ____Percentage of Expenses

   ____Other (please specify) _____

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

   _____Operation and Maintenance _____Capital Projects _____Debt Service

   _____Other (please specify)_____

C. Capital Improvement Plan

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

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

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

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

   Unknown

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

_____Commercial bank loan	____Bonds
__X__DWSRF	__X__Other State or federal loan/grant program
_____Surcharge	____Personal Capital
_____Reserve Account	____Revenue from other business

_____Other (Please specify) _____

D. Water System Rates

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

   [X] Yes [ ] No [ ] Not Applicable

2. What is the frequency of billing (e.g., 12, 6, or 4 times per/year)? __4__times/year

3. Where applicable, what are the system's water rates? ~$286 / user / year

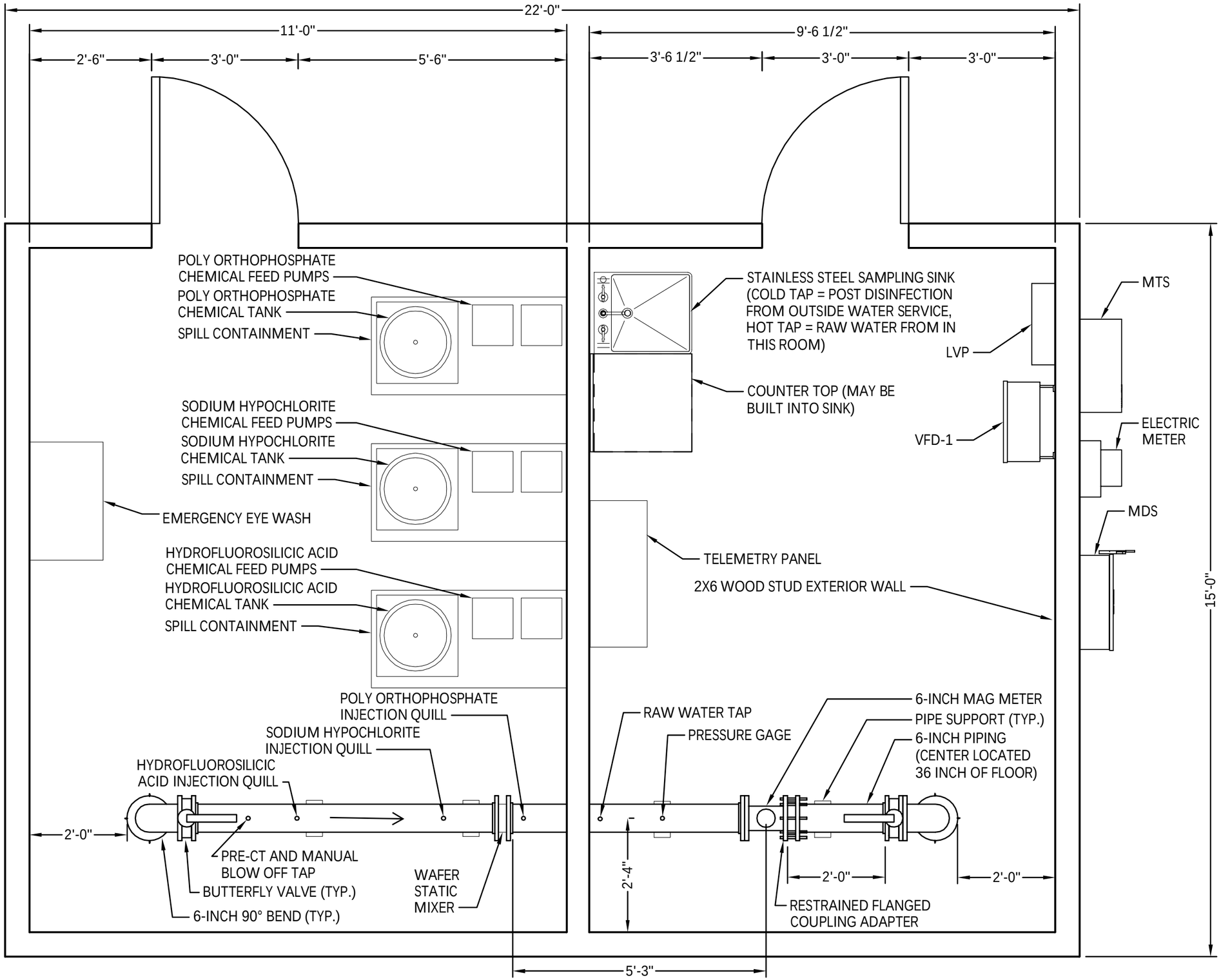
4. What are rates based on?

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

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

END OF DOCUMENT

Appendix H
Concept Well Treatment Building Floor Plan



VILLAGE OF PORTVILLE
WATER SYSTEM EVALUATION

WELL TREATMENT BUILDING

CATTARAUGUS COUNTY, NEW YORK

VILLAGE OF PORTVILLE

Barton & Loguidice

Date
AUGUST, 2020

Scale
1/2" = 1'

APPENDIX
H

Project Number
2302.002

Plotted: Aug 19, 2020 – 11:33AM SYR By: ajm
Z:\BL-Vault\D2\18217AD2-1C71-4823-8927-99D5C4054147\0\2108000-2108999\2108042\LL\Proposed Well Building (ID 2108042).dwg

Appendix I
Fluoride Memo

Barton & Loguidice

Memo To:	Eric W. Wholers, PE Cattaraugus County Department of Health	Date:	August 3, 2020
From:	Kenneth M. Knutsen, P.E. Barton and Loguidice, D.P.C.	Project No.: Phase No.:	2302.002 PER
Re:	Village of Portville Water System Improvements - Fluoride Addition at North and South Wells		

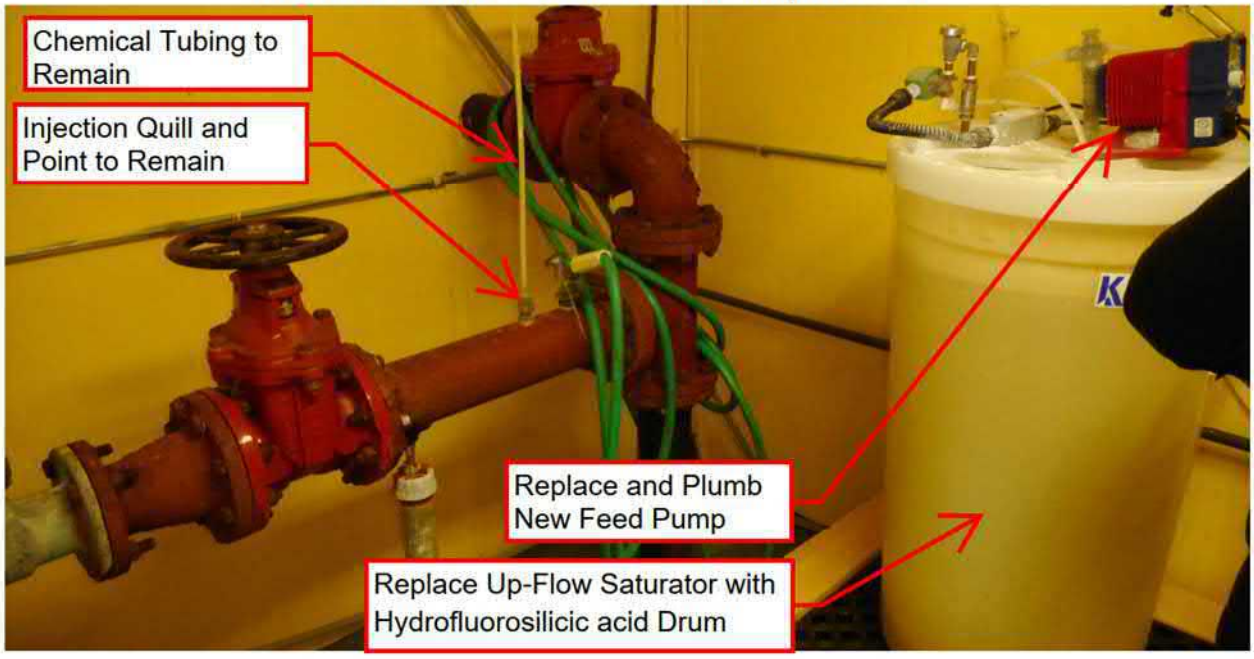
It is our understanding that the Village of Portville has been issued a water system violation by the Cattaraugus County Department of Health regarding the current state of the fluoride treatment process at the Village's North and South Wells. The Village currently uses an Up-flow Fluoride Saturator system which combines granular sodium fluoride power with raw well water to create a solution that is then injected into the well water using a chemical feed pump. This type of system requires the mixing water to be soft as the powder fluoride will combine with water hardness and precipitate out prior to chemical injection. This precipitate causes the chemical feed piping to clog and interrupts the proper dosing of fluoride.

In speaking with the Village water operator, the current water softening up-flow saturator fluoridation process has been difficult to operate and maintain. The water operator would strongly prefer to remove the current process and replace it with a liquid HydroFluorosilicic acid chemical feed process for fluoride addition. The HydroFluorosilicic acid chemical feed process would simply utilize a small feed pump to dose well water with the liquid HydroFluorosilicic acid solution. The solution would be delivered to the well site as a liquid in 55-gallon reusable plastic containers. This process could utilize the same chemical injection point as the up-flow saturator, and would not require the use of a water softener or powdered chemical. This should eliminate the pipe clogging issue and, once properly set, provide a more consistent fluoride dose with respect to concentration and volume, ultimately leading to long-term efficiency and cost savings to the Village.

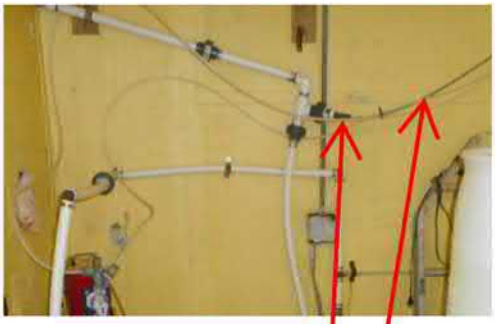
Schematics of the proposed improvements for each well site are detailed below. Due to the age and the condition, the North Well site will require the chemical tubing and injection quill to be replaced; however, the South Well will not. The injection points at each well site will remain the same as is currently used. The proposed chemical dosing rate are summarized below; supporting calculations are attached to this memo. A chemical feed pump capable of the required feed rate must be utilized. The operator should purchase HydroFluorosilicic acid containers that contain a gradation scale, or measure and mark a gradation scale on the side of the containers that will allow the chemical usage to be monitored and recorded daily. During startup of the new system, the operator should closely monitor HydroFluorosilicic acid addition to ensure the proper residuals are being obtained at the feed points and within the system.

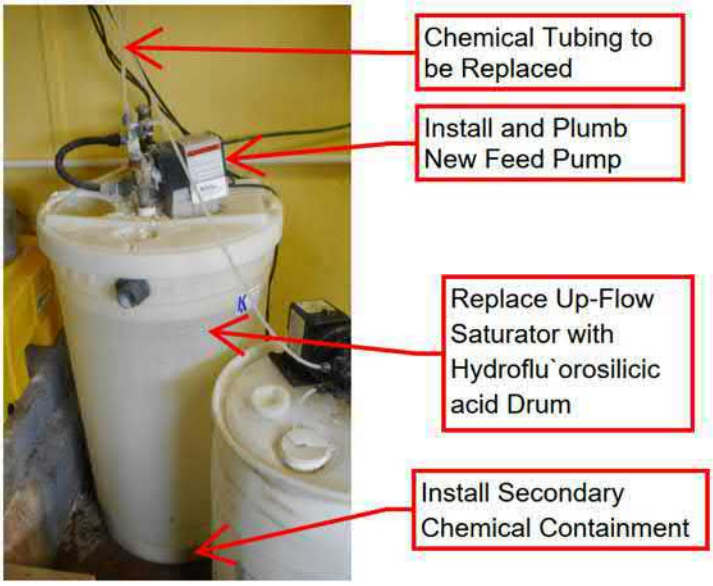
	North Well	South Well
Estimated Pumping Rate:	300 GPM	150 GPM
Estimated Chemical Dosing Rate:	0.099 GPH	0.049 GPH
Average Daily Well Usage:	82,000 GPD	55,000 GPD
Estimated Daily Chemical Required:	0.45 GPD	0.30 GPD

South Well - Fluoride Chemical Addition Improvements



North Well - Fluoride Chemical Addition Improvements





(V) Portville Water System
HydroFluorosilicic Acid Dosing Rate Calculations for North and South Wells

Barton & Loguidice

Chemical Information
HydroFluorosilicic Acid

Concentrations
Fluorosilicic Acid 23%-25%
Fluoride 18.20%

Dosing Rates
Design Dosing Rate 1 ppm of Fluoride

Well Pumping Rate (GPM)	Well Pumping (GPH)	Dosing Rates Chemical Dosing (GPH)	
0	0	0.000	
50	3,000	0.016	
75	4,500	0.025	
100	6,000	0.033	
110	6,600	0.036	
120	7,200	0.040	
130	7,800	0.043	
140	8,400	0.046	
150	9,000	0.049	South Well
160	9,600	0.053	
170	10,200	0.056	
180	10,800	0.059	
200	12,000	0.066	
225	13,500	0.074	
250	15,000	0.082	
260	15,600	0.086	
270	16,200	0.089	
280	16,800	0.092	
290	17,400	0.096	
300	18,000	0.099	North Well
310	18,600	0.102	
320	19,200	0.105	
330	19,800	0.109	

	North Well	South Well
Estimated Pumping Rate (GPM):	300	150
Est. Chemical Dosing Rate (GPH):	0.099	0.049
Average Daily Well Usage (GPD):	82,000	55,000
Est. Daily Chemical Required (Gal):	0.45	0.30

7/31/2020

Calc By: MJZ
Check By: KMK

Appendix J
South Water Tank Replacement Cost Estimate

Generations Strong

2662 US Route 20, Suite 5, Cazenovia, NY 13035 | 781.224.5183

Email Transmission: mzarbo@bartonandloguidice.com

August 20, 2020

Mr. Matthew J. Zarbo, P.E.
Barton & Loguidice, D.P.C.
600 Riverwalk Parkway
Suite 400
Tonawanda, New York 14150

Reference: Proposed Water Storage Tank Options
Portville, New York

Dear Mr. Zarbo:

Thank you for your interest in prestressed concrete tanks. Based on potential 2021 construction costs, suitable budget-estimating figures for wire-wound precast prestressed concrete tanks are as follows:

SIZE	DIAMETER	CONSTRUCTION TIME	PRICE
400,000 Gallons	58.4' ID x 20.0' SWD	9 Weeks	$630,000.00
400,000 Gallons	52.2' ID x 25.0' SWD	9 Weeks	$610,000.00

On-site construction time required is approximate for the tank only and does not include site work.

The budget estimating figure includes the tank complete including the foundation, hatch, vent, and overflow. It does not include site work or additional tank accessories. Local, state, and federal taxes, if applicable, are not included in the above price.

We would anticipate adding accessories at an approximate cost of **$15,000.00** for any of the above tank options. Potential accessories include such items as an aluminum exterior ladder with OSHA fall prevention, anti-climb plate; and an aluminum handrail around the hatch.

> **The above tank is designed and constructed in accordance with AWWA standard D110, Type III, precast concrete walls with steel diaphragm, wire prestressing, and freestanding concrete dome roof.**

To assist in developing the contract documents DN Tanks can provide the following information:

1. Preliminary design drawings and calculations in electronic format
2. Complete performance specification in electronic format
3. Geotechnical requirements for wire-wound concrete tanks and geotechnical report review
4. Value engineering from our Engineering and Estimating departments
5. Site layout and estimated site work cost from our Estimating Department
6. Review of preliminary drawings and specifications to provide updated tank and site work budget estimates

The above services will assist in providing a quality project with complete budgeting information and minimal questions at bid time.

Thank you for this opportunity to be of service. Please feel free to contact me if you have any questions or if I can be of any further assistance.

Sincerely,

Jamie Howard

Jamie Howard Regional Manager
DN TANKS | *Generations Strong*
2662 US Route 20, Suite 5, Cazenovia, NY 13035
Cell: 917.826.2544
Jamie.Howard@dntanks.com | *www.dntanks.com*

Above pricing does not include Site Work, Excavation, and Miscellaneous Improvements such as Fencing. Additional improvements have been estimated to be approximately $350,000.

Appendix K
Budgetary Project Cost Estimate

Appendix K - Alternative No. 1 Budgetary Project Cost Estimate MJZ
Upgrade Existing Water System 8/13/20

Item	Description	QTY	Unit	Unit Cost	Total
Water Source and Treatment					
1	Scope and Redevelop Existing Wells	3	EA	$15,000	$45,000
2	North Well - CT Piping	190	LF	$200	$38,000
3	North Well - Extend Casing, New Well Pump, Remove Building	1	LS	$100,000	$100,000
4	North Well - New Treatment Building and Equipment	1	LS	$175,000	$175,000
5	North Well - Site Improvements	1	LS	$50,000	$50,000
6	South Well - Various Improvements	1	LS	$50,000	$50,000
7	Wellington Drive Well - Various Improvements	1	LS	$75,000	$75,000
				Category Sub Total	**$533,000**
Distribution and Transmission					
1	6-inch PVC Water Main	1,400	LF	$75	$105,000
2	8-inch PVC Water Main	8,600	LF	$80	$688,000
3	Dodge Creek Crossing Additional Cost	1	LS	$50,000	$50,000
4	Hydrants	25	EA	$5,500	$137,500
5	Valves	25	EA	$2,000	$50,000
6	Water Service Piping (Pex)	4,500	LF	$25	$112,500
7	Water Service Transfers	120	EA	$2,000	$240,000
				Category Sub Total	**$1,383,000**
Water Storage Improvements					
1	North Reservoir Improvements	1	LS	$50,000	$50,000
2	Replacement of South Reservoir	1	LS	$630,000	$630,000
3	Site Work at South Reservoir	1	LS	$325,000	$325,000
				Category Sub Total	**$1,005,000**
Telemetry Improvements					
1	DPW Garage Main Telemetry Control Panel	1	LS	$40,000	$40,000
2	5 Additional Telemetry Sites	5	EA	$25,000	$125,000
				Category Sub Total	**$165,000**
Metering Improvements					
1	Purchase of Water Meters	365	EA	$250	$91,250
2	Meter Reading System, Software, and Support	1	LS	$15,000	$15,000
3	Installation of Water Meters	360	EA	$250	$90,000
				Category Sub Total	**$196,250**
				Total of all Categories	**$3,282,000**
				Inflation to 2024 8%	**$263,000**
				Contractor General Condition 5%	**$164,000**
				Contingency 15%	**$492,000**
				SUBTOTAL OF CONSTRUCTION COSTS	**$4,201,000**
				Engineering/Legal/Administrative 25%	**$1,050,000**
				Project Total	**$5,251,000**

Appendix K - Alternative No. 2 Budgetary Project Cost Estimate MJZ
Water Supplied by Olean 8/13/20

Item	Description	QTY	Unit	Unit Cost	Total
Water Source and Treatment					
1	8" Water Main Connection to Olean	14,500	LF	$80	$1,160,000
2	Main Water Pump Station	1	LS	$325,000	$325,000
3	Provisions for Emergency Well Source	1	LS	$75,000	$75,000
				Category Sub Total	**$1,560,000**
Distribution and Transmission					
1	6-inch PVC Water Main	1,400	LF	$75	$105,000
2	8-inch PVC Water Main	8,600	LF	$80	$688,000
3	Dodge Creek Crossing Additional Cost	1	LS	$50,000	$50,000
4	Hydrants	25	EA	$5,500	$137,500
5	Valves	25	EA	$2,000	$50,000
6	Water Service Piping (Pex)	4,500	LF	$25	$112,500
7	Water Service Transfers	120	EA	$2,000	$240,000
				Category Sub Total	**$1,383,000**
Water Storage Improvements					
1	North Reservoir Improvements	1	LS	$50,000	$50,000
2	Replacement of South Reservoir	1	LS	$630,000	$630,000
3	Site Work at South Reservoir	1	LS	$325,000	$325,000
				Category Sub Total	**$1,005,000**
Telemetry Improvements					
1	DPW Garage Main Telemetry Control Panel	1	LS	$40,000	$40,000
2	3 Additional Telemetry Sites	3	EA	$25,000	$75,000
				Category Sub Total	**$115,000**
Metering Improvements					
1	Purchase of Water Meters	365	EA	$250	$91,250
2	Meter Reading System, Software, and Support	1	LS	$15,000	$15,000
3	Installation of Water Meters	360	EA	$250	$90,000
				Category Sub Total	**$196,250**
				Total of all Categories	**$4,259,000**
				Inflation to 2024 8%	**$341,000**
				Contractor General Condition 5%	**$213,000**
				Contingency 15%	**$639,000**
				SUBTOTAL OF CONSTRUCTION COSTS	**$5,452,000**
				Engineering/Legal/Administrative 25%	**$1,363,000**
				Project Total	**$6,815,000**

Appendix L
Short Lived Assets

Alternative No. 1 - Upgrade Existing Water System					
Item	**QTY**	**UNIT COST**	**TOTAL COST**	**Estimated Life (Years)**	**Required Annual SLA Reserve Contribution**
Water Treatment Pumps and Equipment	3	$15,000	$45,000	20	$2,250
I/C Allowance	1	$10,000	$10,000	10	$1,000
Emergency Power	1	$5,000	$5,000	10	$500
Building Maintenance	3	$5,000	$15,000	10	$1,500
Flow Meters	3	$4,000	$12,000	20	$600
Chemical Feed Equipment	3	$3,000	$9,000	10	$900
Water Meters	465	$250	$116,250	20	$5,813
Miscellaneous Allowance	1	$2,000	$2,000	1	$2,000
Total Annual SLA / Reserve Contribution					$15,000

Alternative No. 2 - Water Supplied by Olean					
Item	**QTY**	**UNIT COST**	**TOTAL COST**	**Estimated Life (Years)**	**Required Annual SLA Reserve Contribution**
Water Pump Station	1	$30,000	$30,000	20	$1,500
I/C Allowance	1	$10,000	$10,000	10	$1,000
Emergency Power	1	$7,500	$7,500	20	$375
Building Maintenance	1	$5,000	$5,000	10	$500
Flow Meters	1	$4,000	$4,000	20	$200
Water Meters	465	$250	$116,250	20	$5,813
Miscellaneous Allowance	1	$2,000	$2,000	1	$2,000
Total Annual SLA / Reserve Contribution					$12,000

Appendix M
Preliminary DWSRF IUP Scoring Sheet Estimate

(III) Priority Ranking System Scoring Criteria

The numerical scores in the DWSRF priority ranking system are based on technical and non- technical criteria. The technical criteria are A.) MCL/treatment technique violations; B.) Other sanitary code violations; and C.) system reliability and dependability issues. The non-technical criteria are D.) governmental needs and E). financial needs. The total numerical score for the project or project segment being scored shall be the sum of the scores for criteria A, B, C, D and E. Projects must be adequately supported by technical documentation, data, reports, etc.

Technical Factors

A. MCL/Treatment Technique Violations. Points awarded are based on treatment of MCL exceedances and/or replacement with an alternate source of supply, and for interconnection with, or purchase from adjacent water system(s) in lieu of treatment (more than one item may apply):

		Score
1. Microbiological		
a) Surface Water Treatment Rule		
i. Filtration		100
ii. Filtration Performance Criteria		50
iii. CT Disinfection	Lack of Chlorine Contact Time at North Well Site; Local DOH Violation	30
b) *E. coli*		80
c) Total Coliform		40
2. Organics		
3. Organic chemicals (POC/UOC) and disinfection by-products		40
4. Lead and Copper/Corrosion (mandated)		30
5. Radiological		25
6. Inorganic/Physical		
a) Nitrates	- Top of North Well located several feet below grade and prone to contamination, Local DOH Violation	50
b) Other health-related	- Unprotected openings and insecure storage reservoir, Local DOH Violation	25
c) Aesthetic		10

B. Non-treatment Sanitary Code Violations (more than one item may apply):

1. Inadequate Source Capacity (public health hazard)	50
2. Inadequate Distribution Pressure (public health hazard)	25
3. Uncovered Finished Water Storage (public health hazard)	25

C. System Reliability/Dependability Issues (more than one item may apply):

	Score
1. Complete replacement or major rehabilitation of existing treatment facility for primary contaminants that has exceeded design life and/or does not meet the design standards in the current edition of Recommended Standards For Water Works. In lieu of treatment, replacement with an alternate source of supply, and/or interconnection with, or purchase from, adjacent water system.	20
- Complete Replacement of main water source treatment infrastructure (North Well) as it does not meet design standards and has exceeded service life, Local DOH Violations	
2. Upgrade, replace and/or install major vulnerable system components to meet the design standards in the current edition Recommended Standards For Water Works. Any of the following apply.	10
a) A principal component integral to an existing filtration process such as sedimentation, flocculation, filtration, chemical feed, or backwashing (can only receive points for Criteria C.2a. or C.1.)	
- Various improvements meeting this criteria to address Local DOH Violations	
b) Pump stations	
c) Existing wells	
d) Existing disinfection system for a groundwater/surface water supply	
e) Transmission main	
f) Finished water or distribution storage	
g) Other water treatment systems for secondary contaminants only (or replacement of source instead of treatment)	
3. Aged mains and appurtenances	5
Various Aged Mains being replaced	
4. Redundancy of critical components (pumps, valves, chemical feed-systems, etc.)	5
Addition of Wellington Well, Needed to service demands with North Well out of service	
5. Asbestos main replacement	5
6. Control/automation for operational efficiency (computerization, control valves, metering, laboratory upgrading)	5
Addition of Control and Monitoring System	
7. Inadequate source capacity which is not a public health hazard (can only receive points for Criteria B1 or C7)	5
Addition of Wellington Well, Needed to service demands with North Well out of service. Existing South Well can not always service demands by itself	

Non-Technical Factors: Score

D. Governmental Needs (more than one may apply)

Additional points will be assigned to a project on the basis of state or local government needs, policies, and/or requirements.

1. Development of a water system or extending existing system to service contaminated or insufficient yielding private wells at existing residential housing (new systems are not eligible for points under Criteria A, B or C) — 40

2. Consolidation of water systems (can include improving technical, managerial and financial capacity development) — 25

3. System dependent on a Sole Source Aquifer for its source. (These points can only be obtained if system scores points from Criterion A, B, C.1. or C.2.g.) — 25

4. A project that has received written commitment of funding from another governmental source (e.g., co-funded with Clean Water SRF, Rural Development, HUD, etc.). These points do not apply to refinancing of projects. — 10

5. Consistent with Water Resources Management Strategy — 5

6. Proposes operational changes that improve and insure adequate technical, managerial and financial capacity of the system in order to insure compliance — 5

Various stated in Report, including short lived asset savings

E. Financial Need

1. The Median Household Income (MHI) of the community in which the water service area is located is used as a numerator and the Statewide MHI is used as the denominator in the following equation to determine the financial need factor.

$$\frac{\text{Community MHI} \times 100}{\text{Statewide MHI*}} = \text{Factor}$$

MHI = $50,179

Factor	≤70	>70 -≤77.5	>77.5 - ≤85	>85 - ≤92.5	>92.5 - ≤100	>100
Points	25	20	15	10	5	0

*2013 MHI is $58,003.

The MHI of the community in which the water service area is located and the Statewide MHI will be determined from the 2013 U.S. Census Bureau's American Community Survey 5 year income data. If there is reason to believe that the census data is not an accurate representation of the MHI within the area to be served, the reasons will be documented and applicant will furnish, or the Department may obtain, additional information regarding the MHI. Information will consist of reliable data from local, regional, state or federal sources or from an income survey conducted by a reliable impartial source. Communities have the option of conducting an income survey to ensure the accuracy of the MHI used.

Total Possible Points: 125 Points

Appendix N
Annual User Cost Estimate

Total Estimated Project Cost	$5,251,000			
	Scenario No. 1: EFC 0% Hardship Loan and 60% Grant	Scenario No. 2: EFC 2.2% Subsidized Loan and 60% Grant	Scenario No. 3: EFC 2.2% Subsidized Loan	Scenario No. 4: USDA 1.125% Poverty Rate Loan and 60% Grant
Rate	0%	2.20%	2.20%	1.125%
Term Length	30	30	30	38
DWSRF/WIIA Grant (60%)	$3,150,600	$3,150,600	$0	$3,150,600
Annualized Project Cost	$70,013	$96,381	$240,953	$68,233
Number of EDU's 465				
Additional Annual O&M Cost	$0	$0	$0	$0
Suggested Annual Short Lived Asset Savings Account Contribution	$15,000	$15,000	$15,000	$15,000
Existing Annual Cost of Water	$286	$286	$286	$286
Additional Annual Capital Debt Charge Per User	$151	$207	$518	$147
Additional Annual O&M Charge Per User	$0.00	$0.00	$0.00	$0.00
Annual Short Lived Asset Reserve Savings Charge Per User	$32	$32	$32	$32
Total Additional Annual User Cost	$183	$240	$550	$179
Estimated Future Avg. Annual Cost of Water	$469	$526	$836	$465

Appendix O
Smart Growth Assessment Form

NEW YORK STATE OF OPPORTUNITY. | Department of Health | Environmental Facilities Corporation

Smart Growth Assessment Form

This form should be completed by the applicant's project engineer or other design professional.[1]

Applicant Information

Applicant: Village of Portville Project No.: TBD

Project Name: Portville Water System Evaluation

Is project construction complete? ☐ Yes, date: ☑ No

Project Summary: (provide a short project summary in plain language including the location of the area the project serves)

The project will rehabilitative the well sites, construct a new water storage tank, and replace some distribution system in the Village of Portville. The well site rehabilitation will mainly consist of replacement of groundwater pumps, construction of a new treatment building with contact time piping, fluoridation upgrades, and the reinstation of Well No. 3. The construction of a new water storage tank would be completed to reaplce the existing south tank. New controls will also be installed to monitor the wells and storage tank as none are currently being implemented.

Section 1 – Screening Questions

1. Prior Approvals

1A. Has the project been previously approved for EFC financial assistance? ☐ Yes ☑ No

1B. If so, what was the project number(s) for the prior approval(s)? Project No.:

Is the scope of the project substantially the same as that which was approved? ☐ Yes ☐ No

IF THE PROJECT WAS PREVIOUSLY APPROVED BY EFC'S BOARD AND THE SCOPE OF THE PROJECT HAS NOT MATERIALLY CHANGED, THE PROJECT IS **NOT** SUBJECT TO SMART GROWTH REVIEW. SKIP TO SIGNATURE BLOCK.

2. New or Expanded Infrastructure

2A. Does the project add new wastewater collection/new water mains or a new wastewater treatment system/water treatment plant? ☐ Yes ☑ No

Note: A new infrastructure project adds wastewater collection/water mains or a wastewater treatment/water treatment plant where none existed previously

2B. Will the project result in either: ☐ Yes ☑ No

An increase of the State Pollutant Discharge Elimination System (SPDES) permitted flow capacity for an existing treatment system;

OR

An increase such that a NYSDEC water withdrawal permit will need to be obtained or modified, or result in the NYSDOH approving an increase in the capacity of the water treatment plant?

Note: An expanded infrastructure project results in an increase of the SPDES permitted flow capacity for the wastewater treatment system, or an increase of the permitted water withdrawal or the permitted flow capacity for the water treatment system.

[1] If project construction is complete and the project was not previously financed through EFC, an authorized municipal representative may complete and sign this assessment.

IF THE ANSWER IS "NO" TO BOTH "2A" and "2B" ON THE PREVIOUS PAGE, THE PROJECT IS NOT SUBJECT TO FURTHER SMART GROWTH REVIEW. SKIP TO SIGNATURE BLOCK.

3. Court or Administrative Consent Orders

3A. Is the project expressly required by a court or administrative consent order? ☐ Yes ☑ No

3B. If so, have you previously submitted the order to NYS EFC or DOH? If not, please attach. ☐ Yes ☐ No

Section 2 – Additional Information Needed for Relevant Smart Growth Criteria

EFC has determined that the following smart growth criteria are relevant for EFC-funded projects and that projects must meet each of these criteria to the extent practicable:

1. Uses or Improves Existing Infrastructure

1A. Does the project use or improve existing infrastructure? ☑ Yes ☐ No

Please describe:

This project will involve replacement of various assets of the Village water system including well pumps, aging water mains and water storage tanks.

2. Serves a Municipal Center

Projects must serve an area in either 2A, 2B or 2C to the extent practicable.

2A. Does the project serve an area **limited** to one or more of the following municipal centers?

i. A City or incorporated Village ☑Yes ☐No

ii. A central business district ☑Yes ☐No

iii. A main street ☑Yes ☐No

iv. A downtown area ☑Yes ☐No

v. A Brownfield Opportunity Area ☐Yes ☑No
(for more information, go to www.dos.ny.gov & search "Brownfield")

vi. A downtown area of a Local Waterfront Revitalization Program Area ☐Yes ☑No
(for more information, go to www.dos.ny.gov and search "Waterfront Revitalization")

vii. An area of transit-oriented development ☐Yes ☑No

viii. An Environmental Justice Area ☐Yes ☑No
(for more information, go to www.dec.ny.gov/public/899.html)

ix. A Hardship/Poverty Area ☑Yes ☐No
Note: Projects that primarily serve census tracts and block numbering areas with a poverty rate of at least twenty percent according to the latest census data

Please describe all selections:

The Village of Portville is a densely populated Village with a downtown business district surrounded by neighborhoods.

2B. If the project serves an area located outside of a municipal center, does it serve an area located adjacent to a municipal center which has clearly defined borders, designated for concentrated development in a municipal or regional comprehensive plan and exhibit strong land use, transportation, infrastructure and economic connections to an existing municipal center? ☐Yes ☑No

Please describe:

The project upgrades existing infrastructure and does not look to extend water to new areas for future planned development.

2C. If the project is not located in a municipal center as defined above, is the area designated by a comprehensive plan and identified in zoning ordinance as a future municipal center? ☐Yes ☑No

Please describe and reference applicable plans:

The project is located in a municipal center

3. Resiliency Criteria

3A. Was there consideration of future physical climate risk due to sea-level rise, storm surge, and/or flooding during the planning of this project? ☑Yes ☐No

Please describe:

Portions of the distribution system within the Village is located in a 100-year and 500-year FEMA flood zone. The Village's well's, treatment buildings, and storage tanks are located outside flood zones.

Signature Block: By entering your name in the box below, you agree that you are authorized to act on behalf of the applicant and that the information contained in this Smart Growth Assessment is true, correct and complete to the best of your knowledge and belief.

Applicant: Village of Portville	Phone Number: 716-933-8407
(Name & Title of Project Engineer or Design Professional or Authorized Municipal Representative)	
	8/25/20
(Signature)	(Date)

Matthew J. Zarbo P.E.

Appendix P
EFC Engineering Report Certification Form

Engineering Report Certification

During the preparation of this Engineering Report, I have studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is being sought from the New York State Drinking Water State Revolving Fund. In my professional opinion, I have recommended for selection, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of constructing the project or activity, the cost of operating and maintaining the project or activity over the life of the project or activity, and the cost of replacing the project and activity.

Title of Engineering Report: Portville Water System Evaluation Preliminary Engineering Report

Date of Report: September 2020

Professional Engineer's Name: Kenneth M. Knutsen

Signature:

Date: 9/14/2020

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