Town of Callicoon

Sullivan County, New York

Youngsville Water District
Water Tank Replacement Project

2022 New York State Consolidated Funding Application

Prepared for:

Town of Callicoon, NY
19 Legion Street
Jeffersonville, NY 12748

May 31, 2022

Prepared by:

DELAWARE ENGINEERING, D.P.C

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EXECUTIVE SUMMARY

The Town of Callicoon owns and operates the public water supply and distribution system on behalf of the Youngsville Water District. The public water system serves approximately 283 community residents through ±132 service connections in the hamlet of Youngsville**.** The water system provides fire protection to the community.

The Town has identified a project that will address immediate problems with the system's aging ±125,000 gallon water storage tank which has exceeded its useful service life. The 90+ year-old concrete tank is in a state of advanced deterioration and, as noted in a 2020 NYS Department of Health Sanitary Survey, the tank does not meet the minimum standards of the New York State Sanitary Code for finished water storage. The Survey concluded that the tank "has entered what should be its terminal decline" and the Department supports the submittal of funding applications to repair or replace the tank. NYSDOH Tank Inspection Reports and a Letter of Project Support is included in **Appendix A – NYSDOH Inspection Reports and Letters of Support**.

The Town is proposing to replace the existing concrete tank with a glass lined steel tank located on the same lot and in the same footprint of the existing tank. An engineer's estimate of probable cost for the project is $1,044,850.

The project will replace aging infrastructure, improve the sanitation and security of the public water supply and fire protection system, and preserve natural resources. This project will benefit the residents of the Youngsville Water District. There are no outside users that will benefit from the project.

A 2019 income survey determined that more than 57% of the hamlet residents are low-to-moderate income, and the area median household income (MHI) is $40,000/year, 56% of the NY's Statewide MHI. Due to limited number of service connections, debt service for capital upgrades have a disproportionate financial impact on small system users. The Town has investigated other funding sources including the NYSEFC Drinking Water State Revolving Fund (DWSRF) program. However, the project only qualifies for market rate financing which will strain affordability for the economically struggling community. The Town is seeking $999,850 in CDBG funding assistance to replace the aging tank.

The Town understands its obligation for ensuring compliance with all local, state, and federal regulations associated with capital projects and CDBG grants. The Town has completed publicly funded infrastructure projects in the past and their workforce has the requisite skills and experience to guide this project. In addition, the Town has assembled a highly experienced team of professionals to provide engineering and grant administration services to assure the timely and successful completion of this project.

I. PROJECT PLANNING

Location

The Town of Callicoon, a rural municipality located in northwestern Sullivan County, is home to the hamlets of Callicoon Center, North Branch, Shandelee, and Youngsville. The Village of Jeffersonville also lies within the Town's geographic boundaries.

The hamlet of Youngsville is located in southeastern Callicoon along NYS RT 52, 4 miles east of Village of Jeffersonville and 3 miles west of the Town of Liberty. A Site Location Map is included in **Appendix B – Site Maps**.

Environmental Resources Present

This section will focus on the environmental resources specific to the hamlet of Youngsville, and not will not include resources in the greater Town area.

Surface Waters

The hamlet of Youngsville has two year-round surface water bodies. The smaller of the bodies is Panther Rock Brook, a Class C(T) stream that feeds the East Branch Callicoon Creek from the north, running more or less parallel with Shandelee Road. East Branch, also Class C(T) stream, is renowned for its trout fishing. There are no known use restrictions associated with either water body.

The proposed project is not in the vicinity of either stream and, therefore, the project is **not** anticipated to have any impact on local surface water resources.

Wetlands

A 7+ acre freshwater wetland is located just south of the hamlet where several tributary creeks converge on East Branch. These wetlands are located well south of the project site and will not be disturbed as a result of the proposed project. There are no wetlands located on or near the project site, and the project is **not** anticipated to impact any identified wetland resources. A map which includes the National Wetlands Inventory data, with the project location indicated, is included as **Appendix C –Environmental Resource Map 1**.

Flooding

Youngsville flood mapping is provided on FEMA Panels Numbers 36105C0260F and 36105C0270F. *Special Flood Hazard Areas* are centered on East Branch and its tributary streams. The project site is not located in, nor is the project anticipated to impact any SFHAs. The hamlet's SFHAs in the hamlet are indicated in **Appendix C – Environmental Resource Map 2.**

Other Resources

According to public open-source records, the project site:

- does not contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened,
- does not contain any areas identified as habitat for an endangered or threatened species,
- does not contain any species of plant or animal that is listed by NYS as either rare or as a species of special concern, or
- does not contain a significant natural community

In addition, consultation with the NYS Office of Historic Preservation has determined that the project will have No Impact on any Federal or State historic or cultural resources.

Population Trends

The population for the Town of Callicoon has remained relatively stable over the last 40 years.

Historic Population

Year	Population
1980	2,998
1990	2,999
2000	3,052
2010	3,057
2020	2,989

Youngsville is not a census designated place (CDP) and, therefore, historic population figures for the hamlet are unavailable. An income study conducted in 2019 estimated the hamlet's total population and the median household income (MHI) as 283, and $40,000, respectively.

There is no proposed or anticipated development planned within the water district boundaries. Additional storage beyond the existing 125,000 gallon capacity is not anticipated to be required in the long-term.

Community Engagement

This project was submitted for CDBG funding during both 2021 funding rounds and for each application, and in accordance with HCR program guidelines, a public hearing was duly noticed and held allowing for public engagement.

II. EXISTING FACILITIES

The Town of Callicoon owns and operates the public water supply (PWS ID NY5203349) and distribution system on behalf of the Youngsville Water District. A map of the Youngsville Water District is included in **Appendix B Site Maps**.

The Youngsville water system includes two groundwater well sources, a pump/treatment facility that provides filtration and chemical disinfection, ±10,000 lineal feet of transmission and distribution mains, and a 125,000 gallon reinforced concrete finished water storage tank. The water system provides fire protection to the community. A water district map (G-1), which includes the location of the storage tank, is included in **Appendix B – Maps**.

The wells, treatment building and tank are all located at 1699 Shandelee Road, on a 0.5 acre parcel owned by the Town (Long -74.88213; 41.81274). Finished water is stored in a partially buried 125,000 gallon reinforced concrete tank constructed circa 1930.

The 2021 Water Quality Report for the Youngsville Water System indicates there are 132 (154) current users connected to the water system. Daily metered water use for the year averaged 34,473 gallons per day (gpd). There were no microbiological contaminant exceedances noted in the report.

There are no large commercial or industrial users connected to the system.

Water District Boundaries

The water district starts at the northern boundary of 1738 Shandelee Rd, travels ±2,400 ft south to State Route 42, and then east ± 2,000 ft and west about ±3,800 ft, pulling in all land 500 ft on either side of both roads. This includes parcels which do not border either road and have 9-1-1 addresses on side roads (west to east): Hessinger and Lare Road, Pammer Road, Kehrley Drive, Sheri Lane, Tremper Road, and C Spielman Road.

Source

Water for the district is provided from two groundwater wells. The original well, a split-cap type, is located inside the treatment building and is the primary source for the water district. The newer well, installed in 2002, has a pitless unit and is located outside, northwest of the former chlorinator shed. This well is a variable "peaker" source, and is used when demand exceeds the capacity of the primary well.

The proposed project does not include any work on the water sources.

Treatment

Both wells pump to the treatment building for filtration and disinfection. Water is chlorinated by a flow-paced diaphragm pump. No work is planned on the treatment system as part of this proposed project.

Distribution

Finished water flows via gravity to the distribution system which consists of ±10,000 lf of water mains, valves, hydrants and appurtenances. The proposed project does not include any work on the water distribution system.

Storage

From the treatment building, water is pumped to a ±125,000-gallon covered water storage tank that dates back to 1930 when the water system was established. The reinforced concrete tank has a wood-truss framed gable roof with a metal roofing system. The exterior gable ends are covered with siding and vented at the peak. A flow switch in the water tank controls the well pumps to keep the tank level within operating range. In 2010, the Town installed a plastic tank liner as a temporary measure to mitigate tank leakage.

Under the proposed project, the Town will be replacing the failing water storage tank.

III. NEED FOR THE PROJECT

This project is needed to replace aging infrastructure and will ultimately improve the sanitation and security of the public water supply and fire protection system, and preserve NYS natural resources. The proposed project will address immediate problems with the district's aging water storage tank which is in a state of advanced deterioration, has exceeded its useful service life, and does not meet the minimum standards of the New York State Sanitary Code for finished water storage.

Water tank – Southwest Corner

As can be seen in the photo, the concrete shows signs of severe distress and is clearly failing. This condition likely began with the appearance of hairline fractures that allowed water to seep into the concrete, rusting the reinforcement bar. The oxidized iron bar swells and separates from the concrete causing more cracking, spalling and eventually disintegration.

The vertical rust lines in the photo are indicative of the early stages of this process.

The visible portion of the concrete shows signs of cracking, spalling, and excessive corrosion of the now exposed reinforcement bar. This condition is likely compounded by the annual freeze/thaw cycle which causes further deterioration of the concrete.

The tank side wall depth is reported as 12', and the majority of the tank is buried in the ground. As such, the condition of the sub-surface tank cannot be determined.

Given the distressed condition of the exposed portion of the tank, it is unlikely that the buried portion of the tank has retained its integrity.

Water Storage Tank

Water Tank - Northwest Corner

Screened Gable Vents

Tank Interior with plastic liner

Metal Roof

The overall condition of the tank is poor and the roof is showing signs of age and disrepair. The DOH survey identified two active leaks in the tank. Although no measurements were made to determine the leakage rate, the DOH visual inspection concluded that water loss is in the range of 6-12 gallons per minute, upwards of 17,000 gpd.

In addition, the Youngsville Fire Department relies on the storage capacity to provide necessary fire flow. A more substantial leak could hinder the Departments ability to adequately respond to a fire emergency.

The NYS Department of Health requires public water storage tanks to meet *the Recommended Standards for Water Works* (RSSW), commonly known as the *Ten State Standards* (TSS).

The following is a list of requirements from the *Ten States Standards (2012)* that the existing water tank does **not** meet and which any newly constructed tank would be obligated to meet. **Appendix D** includes the applicable sections of the *Ten States Standards* for finished water storage facilities.

1) More than 50% of the tank is buried in the ground.

   Location of Reservoirs (TSS 7.0.2b) - *The bottom of ground level reservoirs and standpipes should be placed at the normal ground surface. If the bottom of a storage reservoir must be below the normal ground surface, at least 50 percent of the water depth must be above grade.*

2) Vented gable ends and voids in the structure envelope provide inadequate protection from contamination.

   Protection from Contamination (TSS 7.0.3) - *All finished water storage structures shall have suitable watertight roofs which exclude birds, animals, insects, and excessive dust.*

3) The water tank lacks mixing equipment or other design considerations to avoid water stagnation. Additionally, the tank's square geometry restricts the natural water circulation patterns that can be maintained within a properly-sized, cylindrical water tank which would not necessarily require a mixer.

   Stored Water Age (TSS 7.0.6) - *Finished water storage designed to facilitate fire flow requirements and meet average daily consumption should be designed to facilitate turnover of water in the finished water storage to minimize stagnation and/or stored water age. Consideration should be given to separate inlet and outlet pipes mixing, or*

other acceptable means to avoid stagnation and freezing. Poor water circulation and long detention times can lead to loss of disinfectant residual, microbial growth, formation of disinfectant byproducts, taste and odor problems, and other water quality problems.

4) The undersized single access door does not provide reasonably convenient access and much of the tank is inaccessible for inspection and maintenance.

Access (TSS 7.0.8) - *Finished water storage structures shall be designed with reasonably convenient access to the interior for cleaning and maintenance.*

5) The tank does not have a sampling tap to sample water before the first service connection.

Provisions for Sampling (TSS 7.0.19) - *Smooth-nosed sampling tap(s) shall be provided to facilitate collection of water samples for both bacteriological and chemical analyses. The sample tap(s) shall be easily accessible.*

6) Tank overflow terminates a few inches above grade and discharges to the ground.

All water storage structures shall be provided with an overflow which is brought down to an elevation between 12 and 24 inches above the ground surface, and discharges over a drainage inlet structure or a splash plate.

Users currently pay approximately $325 ($380)/year in water use fees. A NYSEFC market rate (assuming 6%) loan with a 28-yr term will raise annual water rates an additional $472/year to $797 ($852), a 145% (124%) increase and equivalent of 2% of the hamlet's MHI.

Without grant assistance, this project is simply unaffordable to district residents. This project will benefit the residents of the Youngsville Water District. There are no outside users that will benefit from the project.

IV. ALTERNATIVES CONSIDERED

In order to address the immediate concern of an aging water storage tank and address noncompliance with regulatory standards, the following conceptual alternatives were considered:

- No Action
- Connect to an Existing System
- Rehabilitate the Existing Tank and Retrofit Mixing Equipment

- Replace the Existing Tank with a new 125,000-gallon water tank. Three options were considered under the replacement alternative.
    - Welded Steel
    - Pre-stressed Concrete
    - Glass-lined Steel

Each of these alternatives is discussed below.

No Action:
During the tank survey, the Department of Health identified two active leaks in the water tank. This wasted water costs district users through increased operations costs and squanders an important natural resource. If No Action is taken, the water tank will continue to deteriorate and the established leaks will likely worsen. Since the water storage tank is necessary for fire protection, public safety could be compromised should the tank completely fail.

In addition, the tank currently does not provide adequate protection from outside contamination. This condition represents a known water quality threat and would be difficult to mitigate without reconstruction of the entire roofing system. Therefore, taking No Action is not the recommend alternative.

Connect to an Existing System
The nearest public water supply is the Town of Liberty's White Sulphur Springs Water District, located ±3 miles east of Youngsville. With a capital cost to connect the two systems estimated at $250/ft, the total cost to furnish and install the more than 15,000 ft of transmission main along NYS Rte 52 is anticipated to exceed $4 million, which makes this the least cost-effective option.

Rehabilitate the Existing Tank:
In order to ensure that the water district preserves local natural resources and the finished water supply maintains quality and is protected from contamination, the following upgrades would need to be made to the existing tank:

- Repair and seal concrete walls
- Install a new roof
- Close/seal all gaps and openings in the building envelope
- Install new mixer and chlorine residual meter

Repair of the concrete tank would first require a comprehensive inspection of the tank condition including the subsurface areas. This would minimally require draining the tank and providing temporary water storage to maintain water service to system users. The liner would then be removed for to facilitate wall inspection.

However, the extent of the concrete degradation on the exposed surfaces is so advanced that it is more than likely that the subsurface walls are similarly distressed. If subsurface concrete repairs are determined to be necessary, the exterior of the tank would need to be excavated to expose the tank walls. Judging from the visible rust-colored staining on the exterior walls, it is evident that the internal reinforcement bars are rusting and the concrete will eventually fail at those locations. It is unlikely that the concrete could be rehabilitated adequately to ensure the long-term reliability of the tank. Therefore, this alternative has been determined to be technically infeasible.

Replace the Existing Tank with New 125,000 Gallon Water Tank:

Replacing the existing tank with a new tank and mixer will eliminate the potential for water contamination, help preserve local resources, and protect the finished water supply. The Town has identified three possible alternatives for the tank replacement. All three alternatives involve replacement of the sub-surface tank with an aboveground tank. Additionally, each alternative will require site work, foundation construction, and the installation of piping, mixing and monitoring equipment. Temporary water storage tanks will be employed for the duration of the project to prevent service disruptions.

The Town has reviewed the following options for water tank replacement:

- Installation of a 125,000 gallon pre-stressed concrete water tank
- Installation of a 125,000 welded-steel water tank
- Installation of a 125,000 gallon glass-lined steel water tank

Pre-stressed concrete

A pre-stressed concrete tank of this size is significantly more costly than the other alternatives. In addition, the project site is too small (0.5 ac) and congested, and the staging area inadequate for installation of a pre-stressed concrete tank which requires a substantial area for panel construction and winding. Therefore, a pre-stressed concrete tank is technically infeasible.

Welded-steel

While welded-steel tanks have successfully been used for decades, these tanks are prone to corrosion. Maintenance and repair of a welded-steel tank, which includes the periodic re-coating of the interior and exterior of the tank typically every 15-20 years, makes this a more expensive long-term option than a glass-lined steel tank.

Glass-lined steel

Glass-lined steel tanks are comparable in price to welded-steel tanks and eliminate the need for regular re-coating of the interior and exterior of the tank. There is adequate area for the removal

of the old tank and the installation of the new tank in the same location and in the same footprint as the existing tank. Glass-lined steel tanks have a probable useful life of up to 50 years.

Maintenance and repair for glass-lined storage tanks is minimal compared to welded steel tanks, but regular inspection is recommended. (ref. **Appendix E – Water Tank Inspection and Maintenance Plan**).

V. SELECTION OF AN ALTERNATIVE

After reviewing both the short and long-term costs associated with the above alternatives, the Town has determined that replacing the tank with a new aboveground glass-lined steel water tank, in the same location as the existing tank is the preferred option. This option was selected based on the site access, initial costs and the long-term costs associated with repair and maintenance of the tank. A submersible tank mixer will be installed to mitigate freezing and ice build-up associated with the new tank.

The planned improvements for the recommended option "Installation of New Glass-Lined Steel Water Tank" includes the following:

- Removal and disposal of existing tank
- Provide temporary tankage for water supply during tank construction
- Installation of a new concrete foundation
- Installation of new 125,000-gallon glass-lined steel water tank
- Installation of new supply piping to tank
- Installation of new submersible tank mixer
- Installation of level monitor and controls
- Site restoration

<u>Estimated Costs</u>

An engineer's estimate of project capital cost for the recommended viable alternative, "Installation of New 125,000 Gallon Glass-lined Steel Water Tank" is $1,044,500. Table 1 provides a detailed cost estimate.

The costs include anticipated construction costs, as well as related engineering, construction inspection, legal, administrative, fiscal assistance, bond counsel, and other related project expenses. Further, the estimated construction costs assume Federal and State Prevailing Wages apply, and that Federal, State, and local procurement standards also apply.

VI. PROPOSED PROJECT/RECOMMENDED ALTERNATIVE

Proposed Project Budget

The anticipated overall project budget, including administration of the $999,850 NYS Office of Community Renewal CDBG grant, is as follows:

Total Estimated Project Cost: $1,044,850 (See Table 1 – Detailed Budget)

Anticipated Project Funding:

- CDBG Grant $999,850
- Hamlet Water District Funds $ 45,000

Total: $1,044,850

The Village has committed $45,000 of local funds towards the project for grant administration. This will allow for the administrative portion of the project to commence immediately and allow for construction to begin within six months of grant award notification.

Permits and/or Approvals Required

Project plans and specifications will be submitted to the NYS OCR for review. NYSDOH will also require the Town to submit plans and specifications for review and approval.

Excavation required for the tank installation and total ground disturbance for the recommended alternative will be less than one-acre therefore, the work will not be subject to NYSDEC Storm Water General Discharge Permit requirements and a stormwater pollution prevention plan (SWPPP) will not be required or prepared.

For purposes of State Environmental Quality Review (SEQR), this type of project (construction or expansion of a primary or accessory/appurtenant, non-residential structure or facility involving less than 4,000 square feet of gross floor area and not involving a change in zoning or a use variance and consistent with local land use controls, but not radio communication or microwave transmission facilities) is a Type II action. Type II actions have been predetermined not to have a significant impact on the environment and are otherwise precluded from environmental review.

Therefore, anticipated permits or approvals for implementation of the recommended alternative includes:

- OCR review and comments on the project specifications
- NYSDOH review and approval of plans and specifications

Anticipated Project Schedule

The following schedule is based on notification of NYS-OCR CDBG funding approval for the recommended project in December 2022, and allows for construction to begin within six months of the grant award notice.

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Retain Grant Administrator (locally funded):	April 2022
Conduct Environmental Review:	May – June 2022
RFQ to Retain Engineer:	June 2022
Submit Environmental Review Record (ERR), Funding Application and Engineering Report:	July 2022
Notice of Funding Award:	December 2022
Publication of NOI – RROF Ad:	December 2022
NYS OCR CDBG Release of Funds:	January 2023
Project Design:	January – February 2023
NYSOCR and NYSDOH Plan Review:	March 2023
Finalize Bid Documents:	April 2023
Construction Bidding:	May 2023
Award & Execution of Construction Contract:	June 2023
Construction:	July – November 2023
Project Completion:	December 2023

VII. CONCLUSIONS AND RECOMMENDATIONS

The Town of Callicoon desires to replace its 90+ year-old, 125,000-gallon water storage tank which has exceeded its useful service life. Towards that end, the Town commissioned Delaware Engineering to prepare this Preliminary Engineering Report, suitable for submission to the NYS Office of Community Renewal, to determine available options and costs and to provide a recommended alternative. After examining various alternatives, it was determined that, given the site conditions and relative costs, the preferred alternative was a new glass-lined steel water tank installed in the same location and the same footprint as the existing tank.

1. In its current condition, the Youngsville water storage tank does not meet the minimum standards recognized by the NYS Department of Health for finished water storage facilities.

2. The Youngsville Fire Department relies on the storage capacity to provide fire protection to the community necessary. A more substantial leak could compromise the Department's ability to effectively respond to a fire emergency.

3. Installation of a new glass-lined steel water tank in the same location as the existing tank was chosen as the recommended alternative to address potential health and safety concerns associated with the existing tank.

4. The estimated cost for the recommended alternative is $1,044,850. These costs include anticipated construction costs, as well as professional services, legal, administrative, and related project expenses. Further, the construction costs assume Federal and State Prevailing Wages apply, and that Federal, State, and local procurement standards also apply.

5. The costs represented in this report are opinions of probable costs and are subject to variability due to bid market conditions.

6. The Town understands its obligation for ensuring compliance with all local, state, and federal regulations associated with capital infrastructure projects and CDBG grant administration. The Town has assembled a highly experienced team of professionals to provide engineering and grant administration services to assure the timely and successful completion of the project.

7. NYS OCR comments and NYSDOH review and approval of the construction plans and specifications are the only anticipated regulatory agency reviews/approvals needed for project implementation.

8. The project is scheduled to be completed by November 2023, assuming determination of the CDBG grant is received by December 2021.

Prepared By:

DELAWARE ENGINEERING, D.P.C.

Dave Ohman, P.E.

TABLES

Table 1 – Project Cost Estimate for Recommended Alternative

Table 1

Town of Callicoon, NY
Youngsville Water District Improvements
New 125,000 Gallon Water Storage Tank

Item No.	Work Item	Project Cost Estimate for the Recommended Alternative	Quantity	Units	Unit Cost	Rev Unit Cost	Est. Cost	Major Cost Items
A)	**Construction**							
	1.)	Mobilization, Demobilization, Bonds & Insurance (Fixed Maximum at 3% Construction Cost)	1	Lump Sum	$ 20,000.00	$ 20,000.00	$ 20,000	$ 20,000
								$ -
	2.)	Utility Clearance/Support During Construction	1	Lump Sum	$ 10,000.00	$ 10,000.00	$ 10,000	$ 10,000
								$ -
	3.)	Furnish and Install New Glass lined steel water storage tank with concrete foundation, submersible tank mixer, and piping						$ -
	A.	New 125,000 gallon glass lined steel water tank	1	Lump sum	$ 300,000	$ 315,000.00	$ 315,000	$ 315,000
	B.	Sitework, Piping and Valves in front of New Tank	1	Lump sum	$ 200,000	$ 210,000.00	$ 210,000	$ 210,000
	C.	Temporary Water Storage Tanks	1	Lump sum	$ 75,000	$ 78,750.00	$ 78,750	$ 78,750
	D.	Tank Level Monitoring and Controls	1	Lump Sum	$ 25,000	$ 26,250.00	$ 26,250	$ 26,250
	E.	Tank Mixer	1	Lump Sum	$ 10,000	$ 10,500.00	$ 10,500	$ 10,500
	F.	Demolition and Disposal of Existing Tank	1	Lump Sum	$ 50,000	$ 52,500.00	$ 52,500	$ 52,500
	4.)	Site Restoration	1	Each	$ 35,000	$ 36,750.00	$ 36,750	$ 36,750
	5.)	Construction Inspection (2 1/2 Months Full Time)	2.5	Per Month	$ 19,200	$ 20,160.00	$ 50,400	$ 50,400
	6.)	Construction Contingency (about 10%)	1	Lump Sum	$ 74,420	$ 77,000	$ 77,000	$ 77,000
				Subtotal - Construction			$ 887,150	$ 887,150
B)	**Other Costs**							
	1.)	Engineering/Professional Services						
		Preliminary Design	1	Lump Sum	$ -	$ -	$ -	$ 110,700
		Topographic Survey	1	Lump Sum	$ 7,500	$ 7,875	$ 7,875	
		Geotechnical	1	Lump Sum	$ 7,500	$ 7,875	$ 7,875	
		Design	1	Lump Sum	$ 48,250	$ 50,663	$ 50,663	
		Bid/Award	1	Lump Sum	$ 7,000	$ 7,350	$ 7,350	
		Construction Administration (3 Months Full Time 3 months parttime)	4.5	Per Month	$ 7,500	$ 7,875	$ 35,438	
		Construction Inspection (2 1/2 Months Full Time - Included in Construction Cost Above)	2.5	Per Month	$ -	$ -	$ -	
		As-Builts	1	Lump Sum	$ 1,500	$ 1,500	$ 1,500	
				Subtotal - Engineering/Professional Services:			$ 110,700.00	$ 110,700
	2.)	Archaeological Phase 1A and 1B Survey	1	Lump Sum	$ -		$ -	$ -
	3.)	Legal and Bond Counsel	1	Lump Sum	$ 1,000		$ 1,000	$ 1,000
	4.)	Town Costs						
	A.)	Force Account						$ 1,000
	i.	Construction Inspection	1	Lump Sum	$ -		$ -	
	ii.	Admin	1	Lump Sum	$ -		$ -	
	iii.	Other (bid notices,etc)	1	Lump Sum	$ 1,000		$ 1,000	
	iv.							
	5.)	CDBG Grant Requirements/Admin	1	Lump Sum	$ 45,000		$ 45,000	$ 45,000
	6.)	Short Term Financing (1-year BAN) - Not required	0	Lump Sum	$ -		$ -	$ -
				Subtotal - Other Costs		*otal Other Costs:*	$ 157,700	$ 157,700
				Total Estimated Project Cost		*ted Project Cost:*	$ 1,044,850	$ 1,044,850

Notes:
1.) Cost estimate factors in Federal, State and local procurement rules.
2.) Budget factors in Federal and State prevailing wage rates.

APPENDICES

Appendix A – NYSDOH Correspondence

- Tank Inspection Reports and Letter of Support

NEW YORK STATE OF OPPORTUNITY | Department of Health

HOWARD A. ZUCKER, M.D., J.D. — COMMISSIONER

LISA J. PINO, M.A., J.D. — EXECUTIVE DEPUTY COMMISSIONER

February 19, 2021

Supervisor Tom Bose
Town of Callicoon
PO Box 687
Jeffersonville, NY 12748-0687

Re: Finished water storage tank
Grant-seeking for improvements
Youngsville Water District
(T) Callicoon, Sullivan County

Mr. Supervisor Bose:

As an employee of the Monticello District Office of the New York State Department of Health, I performed the 2020 sanitary survey of the township-owned Youngsville Water District (YWD) public water supply. On October 7, I visited 1699 Shandelee Rd where the district's active sources, treatment, and water storage are all located. The water district was represented by Joseph Kavleski, its State-certified water operator. I inspected the water system facilities, which includes its single storage tank.

The tank is a partially buried concrete structure holding "finished" water, that is, water ready to be supplied to customers. We do not have engineering plans of it, but a letter of April 29, 1930 to the State Commissioner of Health gives it 18 in. walls, dimensions of "about" 35 ft × 40 ft, 12 ft of depth, and 125 000 gallons capacity. Some 1990s letters say 105 000 gallons, the capacity if the *exterior* dimensions were 35 ft × 40 ft. Our current approval is for 120 000 gallons. The overflow pipe invert (bottom) is about 1 ft below the top edge and not mentioned in the letter, so the usable depth could be closer to 11 ft.

A gable roof of wood framing, cement shingle siding, and metal roofing rests on the tank walls. Its center height is about 8 ft. The eaves and gable peaks are screened for air flow. A padlocked wooden door at the top of an exterior staircase is the only access to the inside.

Inside this is a plywood platform about 3 ft square. Crouching, sitting, or laying is needed to view the water. Two spotlights point southward to light up the water surface and show the float switches. These control the well pumps to keep the tank level within operating range.

The ground touching the tank appeared level within 2 ft, but less than 3 ft away from the south end and west side it slopes steeply away towards very wet ground on a neighbor's land. Except for a single growth of some thorny vine on the west side, the exterior is fully accessible.

We understand from you that the Town of Callicoon, as owner of the Youngsville Water District, is seeking grants to replace (your preference) or repair this part of the public water supply. We endorse this with these reasons:

Design of this storage tank

Equipment that the Department of Health approved in the past, even decades ago, may remain in use indefinitely at its public water supply, unless it would be a public health hazard. This section describes the differences between the YWD storage tank current design requirements, only to show the changes in the expectations over the 90 or so years.

In New York State, "public water supply" is defined and regulated by 10 NYCRR Part 5. The design standard for water storage is the "Recommended Standards for Water Works" (RSWW), see 10 NYCRR 5-1.22(b)(1). Both the group that publishes it and RSWW itself are commonly called "Ten States". The in-force in New York State edition, 2012, is incorporated by reference as 10 NYCRR Appendix 5-A. The 2018 edition, not yet adopted by New York State, has the same or more stringent requirements for storage tanks.

The timber frame roof covering the finished water is susceptible to animal damage, fungal growth, chemical attack, and fire. The roof trusses sit above the water, so splinters, fungal spores, wood-eating vermin and their rejecta may drop into it. Any chlorine in the water volatilizes (dissolves into the air) and will corrode chemically vulnerable surfaces.

The structure has no fire detection or suppression, is not staffed, and, although about 100 ft higher than Shandelee Road, it is completely hidden by the forest. Fire would likely not be detected and extinguished before the roof collapsed into the tank, and not before burnt wood fell into the finished water. It is impossible to prevent "vandalism and sabotage" (RSWW 7.0.4 Protection from trespassers) by arson.

A frame roof with gable and eave vents will never be satisfactory at preventing "insects, and excessive dust" (RSWW 7.0.3 Protection from contamination) from entering and is forbidden in new tanks by RSWW 7.0.9 (Vents). The galvanized mesh on the eaves and screening on the ends can keep out larger foreign objects, but natural convection will always draw in dust, while the texture of wood gives dust particles a surface to "stick" to. The complexity of the trusses gives it too many places to do that.

Since there is unfrozen water, dim light, air movement, wood, and concealment, any living thing that appreciates these and is smaller than the largest mesh opening will set up shop inside. Predators that are not too large will follow and an ecosystem of very small animals living, eating, and discharging wastes – probably into the water – will flourish and make a permanent reservoir of contamination and waste of chlorine.

(New water tanks have vents, at one spot to avoid drafts, allow minimal light in, have fine mesh screening, and use smooth surfaces throughout.)

Underground storage tanks are now discountenanced by water system engineering. Buried walls are acted on by ground forces, water tables, freeze/thaw cycles, and are impossible to inspect. Burying of new tanks is approvable only when unavoidable, and not ever with more than 50% of the storage depth buried (RSWW 7.0.2.b Location of reservoirs). We do not know if anything precludes a ground level tank here, a design professional must determine that, but we

know this tank rises 3 ft (or less) above ground and is 12 ft deep, so at best 75% is buried. Considering the overflow removes the top 1 ft from us, the value is closer to 10 ft/12 ft or 83%.

The single access door at one end of the superstructure does not provide "reasonably convenient access to the interior for cleaning and maintenance" (RSWW 7.0.8 Access), especially in the southern half of the structure. Examining the inside walls, necessary to cleaning or maintenance, is hindered by the draped liner.

Sections 7.0.2 (Location of reservoirs) and 7.0.16 (Grading) in RSWW forbid standing water within 50 ft of a storage tank. Less than 30 ft west and southwest is a large wet area. The leaks in the tank contribute to this. (The major cause is likely the continuous ground level discharge from an offsite reservoir. This is out of the scope of this letter, so is in the sanitary survey letter.)

The site of the tank is expected to have "Fencing, [...] and other necessary precautions [...] to prevent trespassing, vandalism, and sabotage." (RSWW 7.0.4 Protection from trespassers) Any new water tank is required to be fenced. If it is co-located with other water system infrastructure, such as wells and treatment, they must be within the fence also.

The discharge from this tank is the "entry point" – where the water is treated and should be ready for immediate use. RSWW 7.0.19 (Provisions for sampling) requires a sampling tap here, which this tank does not have; there is no way to sample before the first service connection.

Other parts of RSWW 7.0 are not exactly applicable because word choice reflects current design expectations, but their intent is clearly not met by this one: 7.0.12 Safety (guardrails on platform) and 7.0.14 Internal catwalk (ledge around platform).

Similarly, RSWW does not envision storage tanks that allow storing things other than water. The trusswork invites unsanitary storage, like an unfinished attic. Found at inspection were a pinecone, tree branches, scrap lumber, coiled wire, an extraordinarily rusted folding chair, a dead bird, and a swimming pool skimmer. (Everything except the skimmer was removed.)

Condition of this storage tank

At about 90 years old, the tank has entered what should be its terminal decline. Direction on correcting these is given in the sanitary survey letter.

1. The southwest corner of the tank has a large hole that was wasting an estimated 5 to 10 gallons per minute of finished water. Without testing, I estimated a person could put their arm in far enough to touch the tank liner, more than 18 inches in.

2. A crack about 1 ft away from the hole above, begins at a deep spall and extends below grade. Water was leaking from the spall site at maybe 1 to 2 gallons per minute.

3. A seep about 2 ft to the other side of the hole was trickling water. This may be mendable by lowering the water level to seal it with material suitable for drinking water contact.

4. Besides these 3 penetrations, the concrete was flaking near the ground, for example below the "seep". Superficial concrete cracks were visible on all sides of the tank.

5. The plastic liner was not keeping the water contained. Flashlight pictures at the hole in the southwest corner show the water maintaining its level outside the liner.

6. The eave in the north east that the electrical conduit enters was unscreened.

7. The north eastern corner was missing siding, showing large holes in the wood beam.

8. The access stairs have no handrail, smooth treads, and are exposed to the weather, risking the operator slipping.

9. The non-telemetry electric fittings (an outlet, a switch, and two floodlights) are not meant for wet or corrosive environments.

10. The sill plate serving as threshold to the door features a large rusty bolt and nut rising about ¾ inch above its surface, a tripping and clothes/skin tearing hazard.

11. The roof ridge sags in the middle.

12. Tree branches are growing over the roof at the southern end. Saplings are resting branches on the roof from both sides.

13. The overflow discharge does not discharge over a splash plate and had no non-corrodible screen.

You have the Department of Health's full endorsement of applications for funding, such as grants, to hire qualified persons or firms to repair these conditions or replace this storage tank with one that meets the current standards.

If you have questions, call me at (845) 794-2045 or email keith.mciver@health.ny.gov. We are open 8:30 am to 4:45 pm on weekdays, except State holidays.

Yours,

Keith McIver
Assistant Engineer

cc: Glenn Illing, P. E., NYS DOH
File

New York State Department of Health

LISA J. PINO, M.A., J.D.

February 19, 2021

Supervisor Tom Bose
Town of Callicoon
PO Box 687
Jeffersonville, NY 12748-0687

Re: Sanitary Survey, 2020
Youngsville Water District (YWD)
PWS: NY5203349
(T) Callicoon, Sullivan County

Mr. Supervisor Bose:

On October 7, 2020, I visited the Youngsville Water District at 1699 Shandelee Rd with your certified water operator, Joseph Kavleski. On October 20, 2020, with you I visited the two YWD reservoirs. From these visits, research, and correspondence, I have completed the sanitary survey of this public water supply (PWS) to check its compliance with 10 NYCRR Part 5.

System inventory

There are 2 unused reservoirs owned by (T) Callicoon and still connected, so are parts of the public water supply and subject to regulation. These are in Callicoon 10.-1-10 (no 9-1-1 address) and Callicoon 13.-1.3 (also no 9-1-1 address). The active sources (2 wells), treatment, and storage are located at 1699 Shandelee Rd, or Callicoon 18.-1-20.3.

All 3 parcels are "landlocked" – separated from a public right of way by others. Callicoon has access rights to 10.-1-10 and 18.-1-20.3 (1699 Shandelee Rd) through adjacent parcels, thinks it does for 13.-1-13, and has a right of way for a buried line between them. For 1699 Shandelee, access is through 1713 Shandelee Rd (Callicoon 13.-1-22), whose resident has made unsettling threats and interfered with authorized persons, to the point of requiring a law officer to respond.

The intake in each reservoir is "inactive" to us because it does not supply water to the PWS, but they are not disconnected. A buried pipe runs from the higher reservoir south, under Hardenburgh Rd, past the lower reservoir, on to 1699 Shandelee Rd. Valves allow them to feed the water storage tank. Because of their elevations (1650+ ft v. 1600 ft), only one can be used at a time as the larger reservoir would try and fill the lower until it overtopped its dam.

A constant flow through this line is kept up, stated to be to prevent the buried line freezing. At 1699 Shandelee it discharges at 50+ gpm (estimate) to waste on the ground. This probably is the major reason the ground to the west and south of the storage tank is very wet and soupy.

For surface water sources, the State Sanitary Code at 10 NYCRR 5-1.30(b) and (c) requires approved filtration or successful filtration avoidance. The town investigated filtration in the 1990s

but in 2002 drilled another well at 1699 Shandelee. Both Mr. Kavleski and yourself describe the current groundwater-only operation as satisfying the township and the district's users.

The original well, a split-cap type, is inside the treatment building. The newer well has a pitless unit and is outside, north northwest of the ex-chlorinator shed. It is a variable "peaker" source, used when demand drains the tank to its minimum level despite the other well's pump.

Both wells pump into two sets of 2 parallel filters, left from surface water filter testing. (We do not object to groundwater filtration if it does not worsen water quality.) Their output is chlorinated by a flow-paced diaphragm pump and descends to the 120 000-gallon storage tank. From here, the finished water flows by gravity to the distribution system and its customers.

The water district starts at the northern boundary of Callicoon 18.-1-12 (1738 Shandelee Rd), travels south to State Route 42, and then east about 2 000 ft and west about 3 800 ft, pulling in all land 500 ft either side of the road center. This includes parcels which do not border either road and have 9-1-1 addresses on the side roads (west to east): Hessinger and Lare, Pammer, Kehrley, Sheri Ln, Tremper, and Carl Spielman.

Requirements for compliance

Written words can sound harsher than intended, so softer words ("please", "we request", "should", ...) are used to try and reduce this. Items under this heading *are* mandatory, though.

Of the reservoirs

The Department of Environmental Conservation's Dam Safety Section will let you know directly of their regulations and expectations for the structures that form these impoundments.

1. If the north-of-Hardenburgh reservoir is sold but *not* the south-of-Hardenburgh one, the pipe from the northern reservoir must be physically disconnected from the "T" fitting at the base of the southern dam so it is impossible for its water to enter YWD's lines.

2. If both reservoirs are sold, the buried line between the south-of-Hardenburgh parcel and 1699 Shandelee must be disconnected and sealed at both ends.

3. If emergency surface water is kept, it should connect after the storage tank to avoid possibly contaminating it with *cryptosporidium*, which is very resistant to chlorine.

4. The discharge to waste at 1699 Shandelee must be cut back as much as possible to reduce the standing water within 50 ft of the storage tank. In nonfreezing times, it should be completely stopped unless it serves a function then as well as in the winter.

Of the inside well (WL001) and appurtenances

5. The inside well's vent must be screened, downward facing, and terminate at least 12 inches above grade or six inches above the floor. The screen needs a non-corrodible material, 20 to 30 mesh per inch and not reduce the vent's open area by more than 50%.

6. The outside of the casing is corroded. Please remove the rust and expose sound metal, then coat it with a corrosion inhibitor.

7. The existing split cap does not sit level. Please remove it, check its elastomeric seal and corrosion, and reseat it. If it is not reusable, please replace it with a new one.

8. There is an unsealed hole in the well cap, currently used by a ground wire. This must be sealed watertight around the wires or closed with a watertight inset.

Of the outside well (WL002) and appurtenances

9. The well cap's loose fasteners (bolts) must be made tight to make the sanitary seal.

10. Please provide all-around protection against vehicle strikes for the well casing and cap. (Concrete manhole sections have been used for this as well as individual bollards.)

Of the treatment plant (TP001) and its building

11. If a fire extinguisher is kept here, it should be inspected and recharged as scheduled.

12. The grate set into the cement blocks of the southern outside wall has lost much of its screening. Please install a new screen here to discourage unwanted animals here.

13. Ensure sodium hypochlorite carboys are removed as they are emptied and, in order of preference, returned to the supplier, recycled, or discarded responsibly.

Of the water storage tank (ST001)

This is part of YWD is detailed in the separate letter about (T) Callicoon seeking grants to improve or replace it. These items are required while this tank is in use by the water supply.

14. Lower the maximum water level to dry up the leaks in the south west corner. If pressure in distribution falls below 35 psig or the well pumps "short cycle" (turn on and off rapidly), reduce the maximum level as much as possible.

15. If it is possible to seal the "seep" on the west side wall with any substance acceptable for contact with drinking water, do so. If this requires lowering the tank level temporarily, and distribution pressure falls below 35 psig, but remains above 20 psig, this is allowable.

16. Seal the non-leaking spalls and cracks in the outside walls to prevent more damage.

17. The sill plate serving as threshold to the door features a large rusty bolt and nut rising about ¾ inch above its surface, a tripping and clothes/skin tearing hazard. If this can be, cut it off. If not, please file the edges down or cap it with a bright colored smooth cover.

18. A thicket starting on the west side must be removed before this (2021) spring begins.

19. Spiders or similar had made webs inside around the platform. If these can be removed without risk of dropping them in the water or falling in, please do so.

20. Tree branches are growing over the roof at the southern end. Saplings are resting branches on the roof from both sides. These must be cut off or cut down.

21. The plastic liner was not containing the water. Flashlight pictures at the large hole in the corner show the water maintaining its level outside the liner. This must be repaired.

22. The eave in the north east that the electrical conduit enters must be screened or closed.

23. The north eastern corner was uncovered, showing large holes in the wood beam. Please cover this with siding. It does not have to match the existing siding in look or material.

24. The access stairs have no handrail, smooth treads, and are exposed to the weather, risking the operator slipping. Please install a firmly fixed handrail on at least the down grade (west) side and non-skid treads on the steps.

25. The non-telemetry electrical service (outlet, switch, floodlights) uses parts not intended for wet or corrosive environments. Please replace with proper parts or remove them.

26. The roof ridge sags in the middle. Please have a professional examine this, as much as safety and water protection allow, and give an opinion of its cause, risk to the roof, options to fix it (if any), and its expected life if repairs are and are not made.

27. The overflow discharge requires a splash plate to discharge down on to and needs a twenty-four mesh non-corrodible screen installed within the pipe. It should require tools to be removed, to stop stronger animals from dislodging it.

Of 1699 Shandelee Road

28. There are several valve boxes and valve stems around the shed and storage tank, many with make-do tops. Please provide proper covers and remove any that are obsolete.

29. The land should be kept clean and spare parts stored out of the weather. Leaf litter should be raked away from the side of the tank once or twice a year.

30. The old chlorinator shed has many needs:

    a. The floor is partly missing and pit underneath it is several feet down, a major hazard. This must be made complete and solid at once.

    b. The outside step in front of the door was not secured to anything and rocked when stepped on, a fall hazard. Please firm this up at once.

    c. The outer cover of the VFD control mounted on the wall was missing. For safety and reliability, please find (or order a new one) and (re)install it.

    d. The glass pane in the shed door was partly broken. This should be removed and replaced, preferably with tempered glass or shatter-resistant plastic.

    e. There is a bird nest in the wires over the door to be removed.

f. The outside of the door was very weathered and needs repainting for protection.

g. The disused wall penetrations for the heater and ventilator must be closed.

h. Please remove all spent, unused, and unusable equipment (the gas chlorinator, various electrical parts on the shelves, the fuel-burner on the wall, unused wiring/fittings, and obsolete branch circuits) and rubbish inside.

i. The pit needs to be cleaned of loose objects (discarded fittings, wood, a sad iron, others) and the line from the gas chlorinator.

j. Where wood paneling was peeling off the walls and ceiling, please take it down.

k. The attic had been harboring vermin and their predators for some time and must be cleaned out. If not needed, remove the ceiling to eliminate the hiding space.

l. Wood underlaying the metal roofing is discolored in places, suggesting a leak. Please check for these and if any are found, repair them.

Of the distribution system (DS001)

31. Please verify the valves west of the storage tank are on YWD's land or there is a legal right to access them.

    a. These require tall, distinctive, well-seated markers to be findable in the grass.

    b. Their use must be recorded, and a copy kept on-site for the water operator.

32. The water district must have a cross-connection control program to prevent hazardous and objectionable water flowing back into the mains from service connections.

Recommendations for improvement

Neither the Public Health Law nor State Sanitary Code require these. We provide these to systems to use as they choose, without penalty from us.

A. The two reservoirs, officially kept for fire flow emergencies, are large uncertainties for the township in general. We recommend (T) Callicoon consider the benefits of keeping v. not keeping either or both, with values or estimates of maintenance and insurance against dam failure, accidents, and malicious attack on them.

    a. If the north-of-Hardenburgh reservoir is sold, its buried line is risk to Hardenburgh Rd; a break could undermine ~ 200 ft of pavement down to the bridge and its abutment. If not dealt with beforehand, it should be part of the terms of sale.

    b. If both reservoirs are sold, we recommend taking up the entire buried line at 1699 Shandelee to reduce confusion and effort for future excavations.

B. Please let the owner of the field we parked by, Callicoon 10.-1-9.1, know that that valve box and stem in that field can be removed at pleasure.

C. Accessing water infrastructure through someone else's property is unsatisfactory in general. Please pursue purchase or condemnation of an access, as a long-term goal.

D. We request you, as owner of Callicoon 18.-1-20.3, contact the Sullivan County Office of Real Property Services to assist revision of the Callicoon Section 18 tax map. The public PDF marked "Current to: 10/3/2016" shows the parcel about 450 ft south of true.

E. If the tank is replaced or remodeled, we suggest preserving the current door somewhere as a historical item because of the written (by Deming Krum?) records on its inside.

F. If the valves in the pit are obsolete without gas chlorination, we recommend removing them completely. This would allow the pit to be filled up, an improvement to safety.

G. We recommend relocating the WL002 VFD and electric services to the treatment building. If the pit is filled in, the shed could be removed completely.

H. The WL001 casing could be extended so it ends at least 12 inches above the finished floor and the small "pit" filled with concrete to level the floor.

I. A tumble-down house sits on the border of 1699 and 1743 Shandelee. If that property owner is friendly, please work with them to remove this. These attract malicious and mischievous children and adults, who may also attack your water system buildings.

If you have questions, call me at (845) 794-2045 or email [illegible]. We are open 8:30 am to 4:45 pm in the workweek, but not State holidays.

Yours,

Keith McIver
Assistant Engineer

cc: Glenn Illing, PE, NYS DOH
Alon Dominitz, PE, NYS DEC
Joseph Kavleski, Certified Water Operator
File

NEW YORK STATE OF OPPORTUNITY. | Department of Health

KATHY HOCHUL
Governor

MARY T. BASSETT, M.D., M.P.H.
Commissioner

KRISTIN M. PROUD
Acting Executive Deputy Commissioner

May 19, 2022

Supervisor Tom Bose
Town of Callicoon
PO Box 687
Jeffersonville, NY 12748-0687

Re: Grant seeking endorsement
Youngsville Water District
(T) Callicoon, Sullivan County

Mr. Supervisor Bose:

As an employee of the Monticello District Office of the New York State Department of Health, I performed the 2020 sanitary survey of the Youngsville Water District (YWD). Sanitary surveys are mandated inspections public water supplies to check compliance with the State Sanitary Code. YWD's system inventory is 2 wells, 2 intakes (currently unused), 1 treatment plant, 1 storage tank, and its 1 distribution system. The storage tank holds "finished" chlorinated water (that is, water ready to enter the distribution system for fire suppression or customer use).

This tank is an in-ground concrete block structure that had been built before April 29, 1930, the date of our oldest record of it. It is covered by a wood frame truss with metal roofing and cement shingle siding. A door at one end is the access to the interior. Two floodlights point across the inside to show the water surface and pump float switches. Its problems are enduring, so this information has not changed, unless the condition of the tank has gotten worse.

Design of this storage tank

The New York State Department of Health requires public water supply storage tanks to meet the "Recommended Standards for Water Works" (RSWW), often called the "Ten States' Standards", see 10 NYCRR 5-1.22(b)(1). Comparing the storage tank to current expectations:

The timber is susceptible to animal, fungal, chemical, and fire damage. The roof sits above the water surface, so any dirt, insects, fungus, and similar may drop into it. The chlorine in water volatilizes (dissolves into the air) and will corrode chemically vulnerable surfaces.

It is impossible to prevent "vandalism and sabotage" (RSWW 7.0.4) by arson, and it would likely be damaged or destroyed before a fire was detected and suppressed.

The gable and eave vents will never prevent "insects, and excessive dust" (RSWW 7.0.3) from entering. The natural convection will draw in dust and also cause the chlorine to volatilize, reducing protection against biological contamination. With water, darkness, fresh air, and concealment, insects and any living thing that appreciates these and is small enough to enter will set up shop inside. Predators not themselves too large will follow and an ecosystem of very small animals living, dying, and discharging wastes will flourish.

Partially buried storage tanks must have at least 50% of their storage volume above ground (RSWW 7.0.2.b). This tank 75% or more underground.

A door at one end does not provide "reasonably convenient access to the interior for cleaning and maintenance" (RSWW 7.0.8), especially for the opposite end of the structure.

RSWW does not envision tanks storing things other than water. This trusswork amounts to an unfinished attic that had collected scrap lumber, coiled wire, and a rusted folding chair.

Condition of this storage tank

The tank is ~90 years old and had numerous failings in 2020. The last 2 winters will have only made these worse:

1. *The* large crack at the southwest corner of the tank was wasting 5 to 10 gal/min. I estimated a person could put their arm in to touch the tank liner, maybe 25 inches in.
2. A smaller crack nearby extended below grade was leaking maybe 1 to 2 gal/min above ground and an unknown amount below ground.
3. A seep nearby was trickling water at maybe 1 gal/min.

These all contribute to the swamp to the south and east, which is closer than 50 ft and so a violation of RSWW 7.0.2 and 7.0.16.

4. The concrete was flaking and cracking near ground level on all sides of the tank.
5. The plastic liner had failed – if it was intact the cracks would not be leaks.
6. The outlet, a switch, and floodlights are not meant for wet or corrosive environments.
7. The roof ridge sags in the middle.

I have left out conditions that are easily corrected to emphasize these deeper ones.

You have the Department of Health's endorsement for applications for funding to correct these deficiencies, preferably by replacement with a new storage tank designed and built to current standards, and our best wishes for success in securing that funding.

If you have questions, call me at (845) 794-2045 or email keith.mciver@health.ny.gov. We are open 8:30 am to 4:45 pm on weekdays, except State holidays.

Yours,

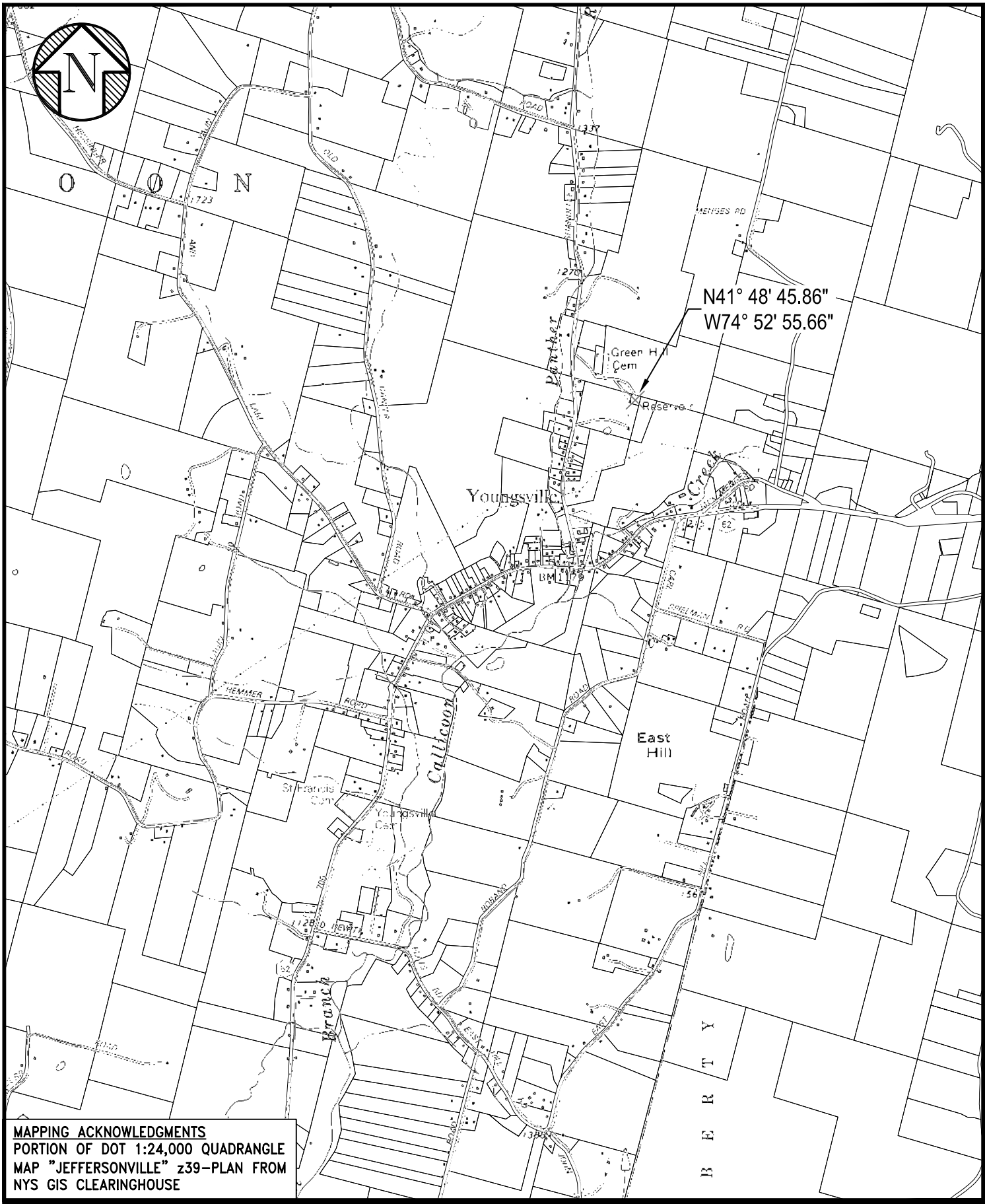
Keith McIver

Keith McIver
Assistant Engineer

cc: Glenn Illing, PE, NYS DOH
File

Appendix B – Site Maps

- Site Location Map
- Water District Map



MAPPING ACKNOWLEDGMENTS
PORTION OF DOT 1:24,000 QUADRANGLE MAP "JEFFERSONVILLE" z39-PLAN FROM NYS GIS CLEARINGHOUSE

SHEET NO:

FIG 1

YOUNGSVILLE WATER DISTRICT
WATER STORAGE TANK REPLACEMENT
TOWN OF CALLICOON
SULLIVAN COUNTY, NY

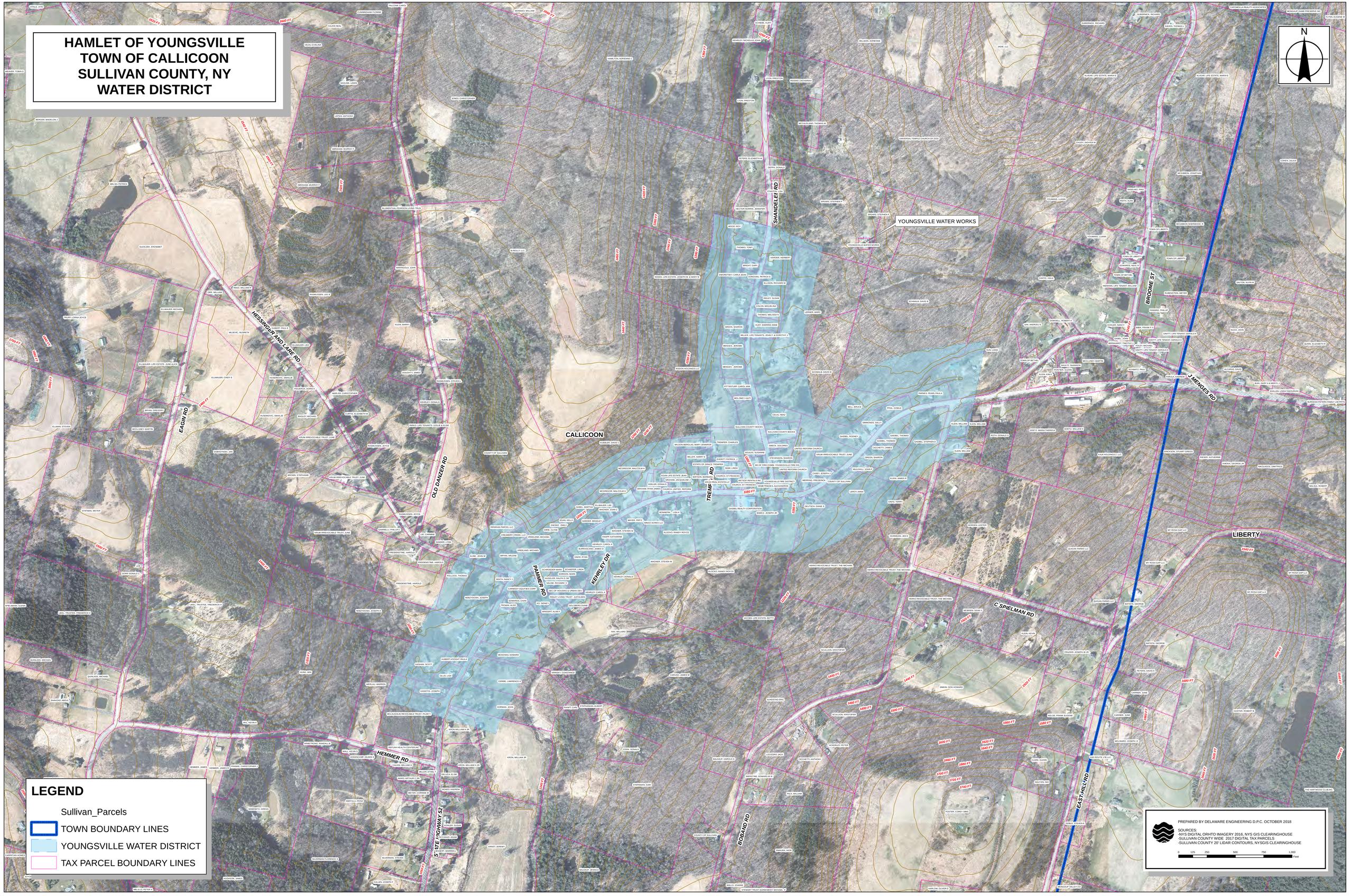
DATE:	2/24/2021
DRAWN BY:	MO
SCALE:	1"=2,000
REVIEWED BY:	DRO
PROJECT NO.:	21-2138
FILE:	(T) CALLICOON\YOUNG

DELAWARE ENGINEERING, D.P.C.

ONEONTA, NY - 607.432.8073
ALBANY, NY - 518.452.1290
WALTON, NY - 607.865.9235
LIBERTY, NY- 845.747.9952
MONTICELLO, NY- 845.791.7777
RED HOOK, NY- 518.452.1290
GOSHEN, NY- 845.615.9232

WWW.DELAWAREENGINEERING.COM

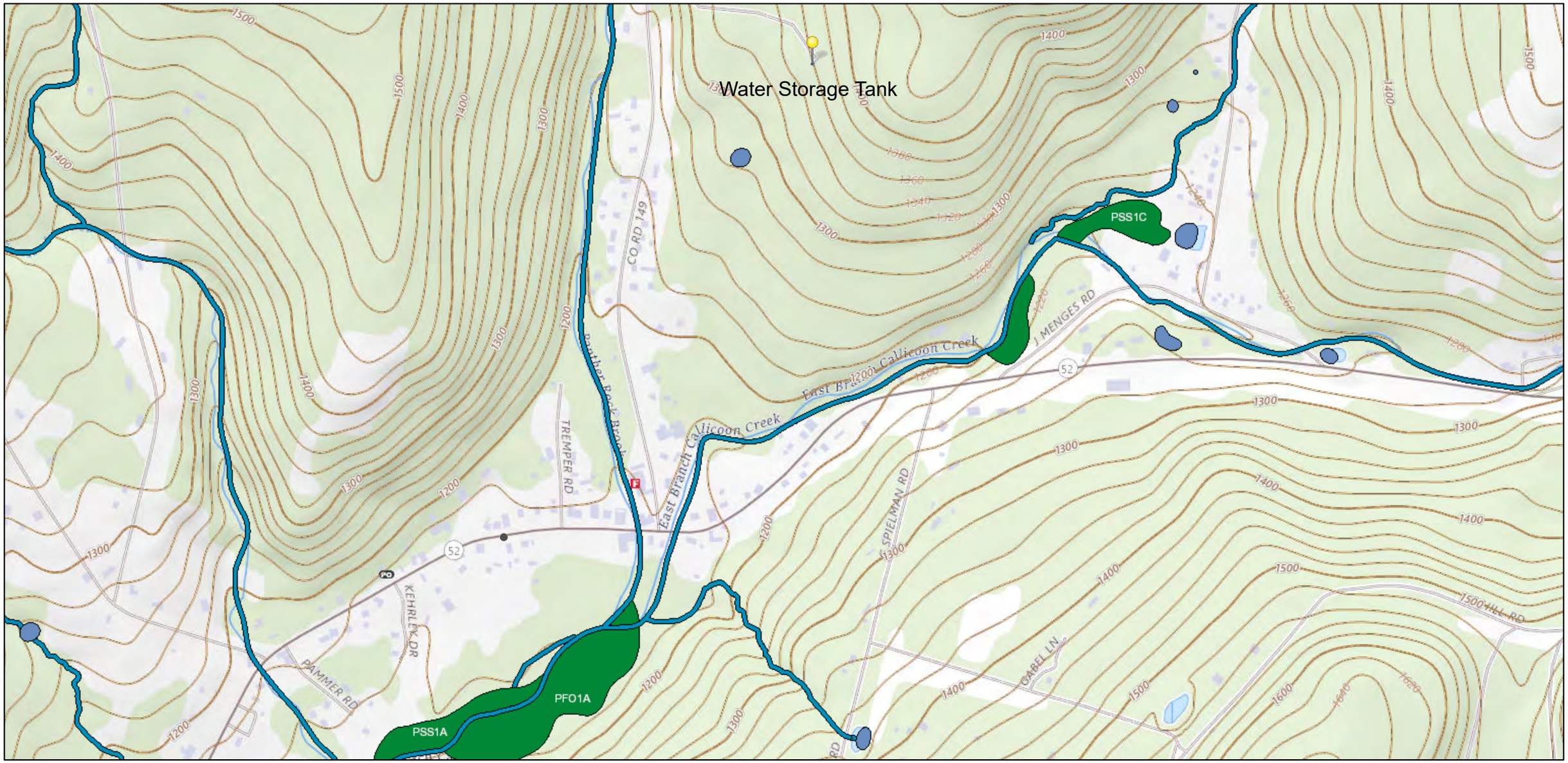
HAMLET OF YOUNGSVILLE
TOWN OF CALLICOON
SULLIVAN COUNTY, NY
WATER DISTRICT



Appendix C – Environmental Resource Maps

- ARCGIS Map with National Wetlands
- ARCGIS Map with Flood Map Overlay

ARCGIS National Wetlands Map



5/30/2022, 10:11:44 AM

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

Override 1

Wetlands

Estuarine and Marine Deepwater

Estuarine and Marine Wetland

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Lake

Other

Riverine

Normal Intermediate Contours

Normal Index Contours

U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@fws.gov, USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National

USGS

2021 USGS

Appendix D – Excerpts from Ten States Standards

- *Ten States Standards for Water Works (2012)*
  Part 7 Finished Water Storage

7.0 GENERAL

The materials and designs used for finished water storage structures shall provide stability and durability as well as protect the quality of the stored water. Steel structures shall follow the current AWWA standards concerning steel tanks, standpipes, reservoirs, and elevated tanks wherever they are applicable. Other materials of construction are acceptable when properly designed to meet the requirements of Part 7.

7.0.1 Sizing

Storage facilities should have sufficient capacity, as determined from engineering studies, to meet domestic demands, and where fire protection is provided, fire flow demands.

a. The minimum storage capacity (or equivalent capacity) for systems not providing fire protection shall be equal to the average daily consumption. This requirement may be reduced when the source and treatment facilities have sufficient capacity with standby power to supplement peak demands of the system.

b. Excessive storage capacity should be avoided to prevent potential water quality deterioration problems.

c Fire flow requirements established by the appropriate state Insurance Services Office should be satisfied where fire protection is provided.

7.0.2 Location of reservoirs

a. The lowest elevation of the floor and sump floor of ground level reservoirs shall be placed above the 100 year flood elevation or the highest flood of record, whichever is higher, and at least two feet above the groundwater table. Sewers, drains, standing water, and similar sources of possible contamination must be kept at least 50 feet from the reservoir. Gravity sewers constructed of water main quality pipe, pressure tested in place without leakage, may be used at distances greater than 20 feet but less than 50 feet.

b. The bottom of ground level reservoirs and standpipes should be placed at the normal ground surface. If the bottom of a storage reservoir must be below the normal ground surface, at least 50 percent of the water depth must be above grade. The top of a partially buried storage structure shall not be less than two feet above normal ground surface. Clearwells constructed under filters may be exempted from this requirement when the design provides adequate protection from contamination.

7.0.3 Protection from contamination

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.

7.0.4 Protection from trespassers

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.

7.0.5 Drains

No drain on a water storage structure may have a direct connection to a sewer or storm drain. The design shall allow draining the storage facility for cleaning or maintenance without causing loss of pressure in the distribution system.

7.0.6 Stored Water Age

Finished water storage designed to facilitate fire flow requirements and meet average daily consumption should be designed to facilitate turnover of water in the finished water storage to minimize stagnation and/or stored water age. Consideration should be given to separate inlet and outlet pipes mixing, or other acceptable means to avoid stagnation and freezing. Poor water circulation and long detention times can lead to loss of disinfectant residual, microbial growth, formation of disinfectant byproducts, taste and odor problems, and other water quality problems.

7.0.7 Overflow

All water storage structures shall be provided with an overflow which is brought down to an elevation between 12 and 24 inches above the ground surface, and discharges over a drainage inlet structure or a splash plate. No overflow may be connected directly to a sewer or a storm drain. All overflow pipes shall be located so that any discharge is visible.

a. When an internal overflow pipe is used on elevated tanks, it should be located in the access tube. For vertical drops on other types of storage facilities, the overflow pipe should be located on the outside of the structure.

b. The overflow for a ground-level storage reservoir shall open downward and be screened with twenty-four mesh non-corrodible screen. The screen shall be installed within the overflow pipe at a location least susceptible to damage by vandalism.

c. The overflow for an elevated tank shall open downward and be screened with a four mesh, non-corrodible screen or mechanical device, such as a flap valve or duckbill valve , to keep animals or insects . The screen shall be installed within the overflow pipe at a location least susceptible to damage by vandalism.

d. The overflow pipe shall be of sufficient diameter to permit waste of water in excess of the filling rate.

e. When a flapper or duckbill valve is used, a screen shall be provided inside the valve. In cold climates, use of a flapper or duckbill should be considered to minimize air movement and hence ice formation in the tank. In cold climates, provisions must be included to prevent the flapper or duckbill from freezing shut.

7.0.8 Access

Finished water storage structures shall be designed with reasonably convenient access to the interior for cleaning and maintenance. At least two (2) manholes shall be provided above the waterline at each water compartment where space permits.

7.0.8.1 Elevated Storage or Dome Roof Structures

a. At least one of the access manholes shall be framed at least four inches above the surface of the roof at the opening. They shall be fitted with a solid water tight cover which

overlaps the framed opening and extends down around the frame at least two inches, shall be hinged on one side, and shall have a locking device.

b. All other manholes or access ways shall be bolted and gasketed according to the requirements of the reviewing authority, or shall meet the requirements of (a).

7.0.8.2 Ground Level or Flat Roof Structures

a. Each manhole shall be elevated at least 24 inches above the top of the tank or covering sod, whichever is higher.

b. Each manhole shall be fitted with a solid water tight cover which overlaps a framed opening and extends down around the frame at least two inches. The frame shall be at least four inches high. Each cover shall be hinged on one side, and shall have a locking device.

7.0.9 Vents

Finished water storage structures shall be vented. The overflow pipe shall not be considered a vent. Open construction between the sidewall and roof is not permissible. Vents:

a. shall prevent the entrance of surface water and rainwater;

b. shall exclude birds and animals;

c. should exclude insects and dust, as much as this function can be made compatible with effective venting;

d. shall, on ground-level structures, open downward with the opening at least 24 inches above the roof or sod and covered with twenty-four mesh non-corrodible screen. The screen shall be installed within the pipe at a location least susceptible to vandalism;

e. shall, on elevated tanks and standpipes, open downward, and be fitted with either four mesh non-corrodible screen, or with finer mesh non-corrodible screen in combination with an automatically resetting pressure-vacuum relief mechanism, as required by the reviewing authority.

7.0.10 Roof and sidewall

The roof and sidewalls of all water storage structures must be watertight with no openings except properly constructed vents, manholes, overflows, risers, drains, pump mountings, control ports, or piping for inflow and outflow. Particular attention shall be given to the sealing of roof structures which are not integral to the tank body.

a. Any pipes running through the roof or sidewall of a metal storage structure must be welded, or properly gasketed. In concrete tanks, these pipes shall be connected to standard wall castings which were poured in place during the forming of the concrete. These wall castings should have seepage rings imbedded in the concrete.

b. Openings in the roof of a storage structure designed to accommodate control apparatus or pump columns, shall be curbed and sleeved with proper additional shielding to prevent contamination from surface or floor drainage.

c. Valves and controls should be located outside the storage structure so that the valve stems and similar projections will not pass through the roof or top of the reservoir.

d. The roof of the storage structure shall be well drained. Downspout pipes shall not enter or pass through the reservoir. Parapets, or similar construction which would tend to hold water and snow on the roof, will not be approved unless adequate waterproofing and drainage are provided.

e. The roof of concrete reservoirs with earthen cover shall be sloped to facilitate drainage. Consideration should be given to installation of an impermeable membrane roof covering.

f. Reservoirs with pre-cast concrete roof structures must be made watertight with the use of a waterproof membrane or similar product.

7.0.11 Construction Materials

The material used in construction of reservoirs shall be acceptable to the reviewing authority. Porous material, including wood and concrete block, are not suitable for potable water contact applications.

7.0.12 Safety

Safety must be considered in the design of the storage structure. The design shall conform to pertinent laws and regulations of the area where the water storage structure is constructed.

a. Ladders, ladder guards, balcony railings, and safely located entrance hatches shall be provided where applicable.

b. Elevated tanks with riser pipes over eight inches in diameter shall have protective bars over the riser openings inside the tank.

c. Railings or handholds shall be provided on elevated tanks where persons must transfer from the access tube to the water compartment.

d. Confined space entry requirements shall be considered.

7.0.13 Freezing

Finished water storage structures and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing which will interfere with proper functioning. Equipment used for freeze protection that will come into contact with the potable water shall meet ANSI/NSF Standard 61 or be approved by the reviewing authority. If a water circulation system is used, it is recommended that the circulation pipe be located separately from the riser pipe.

7.0.14 Internal catwalk

Every catwalk over finished water in a storage structure shall have a solid floor with sealed raised edges, designed to prevent contamination from shoe scrapings and dirt.

7.0.15 Silt stop

The discharge pipes from water storage structures shall be located in a manner that will prevent the flow of sediment into the distribution system. Removable silt stops should be provided.

7.0.16 Grading

The area surrounding a ground-level structure shall be graded in a manner that will prevent surface water from standing within 50 feet of it.

7.0.17 Painting and/or cathodic protection

Proper protection shall be given to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both.

a. Paint systems shall meet ANSI/NSF standard 61 and be acceptable to the reviewing authority. Interior paint must be applied, cured, and used in a manner consistent with the ANSI/NSF approval. After curing, the coating shall not transfer any substance to the water which will be toxic or cause taste or odor problems. Prior to placing in service, an analysis for volatile organic compounds is advisable to establish that the coating is properly cured. Consideration should be given to 100 % solids coatings.

b. Wax coatings for the tank interior shall not be used on new tanks. Recoating with a wax system is strongly discouraged. Old wax coating must be completely removed before using another tank coating.

c. Cathodic protection should be designed and installed by competent technical personnel, and a maintenance contract should be provided.

7.0.18 Disinfection

a. Finished water storage structures shall be disinfected in accordance with AWWA Standard C652. Two or more successive sets of samples, taken at 24-hour intervals, shall indicate microbiologically satisfactory water before the facility is placed into operation.

b. Disposal of heavily chlorinated water from the tank disinfection process shall be in accordance with the requirements of the state regulatory agency.

c. The disinfection procedure specified in AWWA Standard C652 chlorination method 3, section 4.3 which allows use of the highly chlorinated water held in the storage tank for disinfection purposes, is not recommended. The chlorinated water may contain various disinfection by-products which should be kept out of the distribution system.

   If this procedure is used, it is recommended that the initial heavily chlorinated water be properly disposed.

7.0.19 Provisions for sampling

Smooth-nosed sampling tap(s) shall be provided to facilitate collection of water samples for both bacteriological and chemical analyses. The sample tap(s) shall be easily accessible.

7.1 TREATMENT PLANT STORAGE

The applicable design standards of Section 7.0 shall be followed for plant storage.

7.1.1 Filter washwater tanks

Filter washwater tanks shall be sized, in conjunction with available pump units and finished water storage, to provide the backwash water required by Section 4.3.1.11. Consideration must be given to the backwashing of several filters in rapid succession.

7.1.2 Clearwell

Clearwell storage should be sized, in conjunction with distribution system storage, to relieve the filters from having to follow fluctuations in water use.

a. When finished water storage is used to provide disinfectant contact time(see Section 4.4.2) special attention must be given to tank size and baffling. (See Section 7.1.2.b below.)

b. To ensure adequate disinfectant contact time, sizing of the clearwell should include extra volume to accommodate depletion of storage during the nighttime for intermittently operated filtration plants with automatic high service pumping from the clearwell during non-treatment hours.

c. An overflow and vent shall be provided.

d. A minimum of two clearwell compartments shall be provided.

7.1.3 Adjacent storage

Finished or treated water must not be stored or conveyed in a compartment adjacent to untreated or partially treated water when the two compartments are separated by a single wall, unless approved by the reviewing authority.

7.1.4 Other treatment plant storage tanks

Unless otherwise allowed by the reviewing authority, other treatment plant storage tanks/basins such as detention basins, backwash reclaim tanks, receiving basins and pump wet-wells for finished water shall be designed as finished water storage structures.

7.2 HYDROPNEUMATIC TANK SYSTEMS

Hydropneumatic (pressure) tanks, when provided as the only water storage are acceptable only in very small water systems. Systems serving more than 150 living units should have ground or elevated storage designed in accordance with Section 7.1 or 7.3. Hydropneumatic tank storage is not to be permitted for fire protection purposes. Pressure tanks shall meet ASME code requirements or an equivalent requirement of state and local laws and regulations for the construction and installation of unfired pressure vessels. Non-ASME, factory-built hydropneumatic tanks may be allowed if approved by the reviewing authority.

7.2.1 Location

The tank shall be located above normal ground surface and be completely housed.

7.2.2 System sizing

a. The capacity of the wells and pumps in a hydropneumatic system should be at least ten times the average daily consumption rate.

b. The gross volume of the hydropneumatic tank, in gallons, should be at least ten times the capacity of the largest pump, rated in gallons per minute. For example, a 250 gpm pump should have a 2,500 gallon pressure tank, unless other measures (e.g., variable speed drives in conjunction with the pump motors) are provided to meet the maximum demand.

c. Sizing of hydropneumatic storage tanks must consider the need for disinfectant contact time.

7.2.3 Piping

The hydropneumatic tank(s) shall have bypass piping to permit operation of the system while the tank is being repaired or painted.

7.2.4 Appurtenances

Each tank shall have an access manhole, a drain, and control equipment consisting of a pressure gauge, water sight glass, automatic or manual air blow-off, means for adding air, and pressure operated start-stop controls for the pumps. A pressure relief valve shall be installed and be capable of handling the full pumpage rate of flow at the pressure vessel design limit. Where practical the access manhole should be 24 inches in diameter.

7.3 DISTRIBUTION SYSTEM STORAGE

The applicable design standards of Section 7.0 shall be followed for distribution system storage.

7.3.1 Pressures

The maximum variation between high and low levels in storage structures providing pressure to a distribution system should not exceed 30 feet. The minimum working pressure in the distribution system should be 35 psi (240 kPa) and the normal working pressure should be approximately 60 to 80 psi (410 - 550 kPa). When static pressures exceed 100 psi (690 kPa), pressure reducing devices shall be provided on mains or as part of the meter setting on individual service lines in the distribution system.

7.3.2 Drainage

Finished water storage structures which provide pressure directly to the distribution system shall be designed so they can be isolated from the distribution system and drained for cleaning or maintenance without causing a loss of pressure in the distribution system. The storage structure drain shall discharge to the ground surface with no direct connection to a sewer or storm drain.

7.3.3 Level controls

Adequate controls shall be provided to maintain levels in distribution system storage structures. Level indicating devices should be provided at a central location.

a. Pumps should be controlled from tank levels with the signal transmitted by telemetering equipment when any appreciable head loss occurs in the distribution system between the source and the storage structure.

b. Altitude valves or equivalent controls may be required for a second and subsequent structures on the system.

c. Overflow and low-level warnings or alarms should be located where they will be under responsible surveillance 24 hours a day.

Appendix E

Water Tank Inspection & Maintenance Plan

Town of Callicoon, NY

Youngsville Water District

Water Tank Inspection and Maintenance Plan

for

Glass-lined Steel Water Storage Tank

The following periodic inspections shall be performed by Water Department personnel:

Annual Exterior Inspection

The exterior of the tank on a yearly basis, while the tank is in service.

1. Inspect overflow pipes, overflow weirs, and pipe terminations for signs of corrosion and/or damage to assure that they will perform their design function. Ensure the overflow pipe is clear of debris and operates as intended.
2. Inspect the tank ventilation systems, including screens designed to prevent birds, insects, and debris from entering the tank.
3. Inspect the exterior coating of the tank for possible damage. If damage is noted, contact the manufacturer for recommended methods of repairs.
4. Inspect ladders, locks, platforms, and ladder cages, for corrosion and/or damage.
5. Inspect the dome of the water tank: Note the condition of the flashing, batten-bar screws, and the handrail for loose or missing hardware. Tighten loose hardware or replace as necessary.
6. Inspect the cathodic protection system for damage
7. Perform any necessary maintenance and repairs of deficiencies noted during the inspection

Interior Inspection (Five-year intervals)

The interior of the water tank should be inspected at a minimum interval of five (5) years, or more frequently if and as experience indicates. Interior tank inspections should be performed only by qualified personnel. The following interior tank elements should be inspected:

1. Inspect for internal sheet and roof coating integrity, particularly in areas where external damage may have occurred.
2. Inspect tank/roof coating in general at all fastener locations and at sheet edges.
3. Inspect the condition of the sealant used in all joints, at the tank wall to floor junction, in the area of sumps, and other tank or floor penetrations.
4. Inspect the silt stop (if applicable) for function and integrity.
5. Inspect the coating on galvanized parts.
6. Inspect other interior tank components, riser pipes, level gages, overflow weirs, etc., as appropriate for each device.
7. Inspect the floor for signs of damage and silt accumulation.
8. Perform any necessary maintenance and repairs during the time the tank is out of service for the inspection.

Town of Callicoon, NY
Finished Water Storage Tank Inspection Log

Inspection Date:

Inspector Name & Title:

	YES	NO	ACTION TAKEN:
1. Do overflow pipes, weirs and terminations show signs of corrosion or damage?			
2. Is the ventilation system clear of debris that would Prevent the proper functioning of system?			
3. Is there any visual damage to the exterior tank coating?			
4. Are the ladders, locks, platforms and ladder cages free of corrosion and/or damage?			
5. Is the dome roof including all flashing, batten-bar screws and handrail fasteners tight and free of damage and/or corrosion?			
6. Is there corrosion and/or damage to the cathodic protection system?			

Notes:

Inspector Signature: