Croton Falls Sewers

Conceptual Sewer Design

TOWN OF NORTH SALEM

Supervisor Warren J. Lucas

11/15/2019

This document discusses the components of the sewer system and the estimated costs for each. Croton Falls currently is 100% septic. We are looking to hook the hamlet up to the Heritage Hill Sewer plant in Somers which will require the Town of Somers approval.

1. Introduction and Background

The Hamlet of Croton Falls expanded rapidly in the 1800's due to the source of hydropower, the falls on the Croton River. In 1847 the New York Central line laid tracks to the village. The hamlet became an industrial center with large volume of shipments of raw materials; lumber and dairy going to NYC with finished good coming back to Croton Falls. In the 1800's the Juengst factory, pictured here, made metal cutting equipment and had a generator using the Croton Falls to power their equipment and the village. Croton Falls had some of the first streetlights in Westchester County.

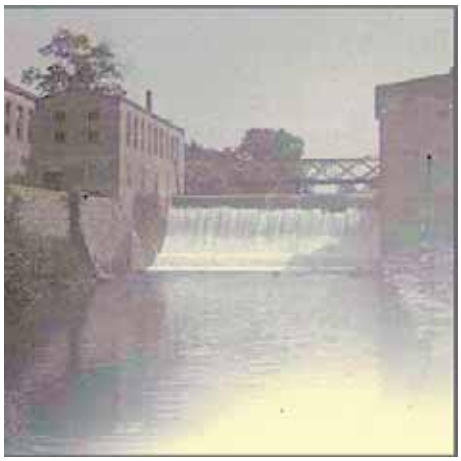


Figure 1 1800's picture of the Croton Falls Juengst Factory. Croton Falls was an early manufacturing hub before the surrounding property was condemned by NYC. The factory still exists and is now offices.

In the 1890's, to build the Croton reservoir system, NYC Waterworks with New York State approval condemned much of the land used by the hamlet and forced the existing buildings onto smaller lots, many of which were moved from the banks of the Croton River to where they exist today.

The Croton Falls Hamlet is sitting on a large mound of glacial sand which is the reason the current septic systems tend not to have problems unless grease from wet uses closes off the interstitial spaces in the sand. Even so, many of the septic tanks and tile fields are on what is now NYS DEP property. In areas of the Croton Falls Hamlet the NYC DEP actually owns the sidewalks. This makes it almost impossible for business owners to repair their existing systems when there is an issue. Many of the hamlet septic systems are under existing roadways on NYC DEP property.

In the early 2000's naturally occurring Radium and Uranium was found in the Croton Falls Water District's one well that was supplying water to 74 homes and businesses. The Town of North Salem, working with the NYC DEP drilled wells in many areas looking for potable water. All of the artesian wells we dug (about five) came back with significant amounts of Radium in the water. Finally in 2010 two shallow wells (42 feet and 45 feet deep) were dug and are currently providing drinking water to the district. Both of these wells, the only two in the district, are "GUDI" wells which are under the influence of ground water. Multiple Croton Falls Hamlet septic systems are uphill from and inside the 250 foot setback from the wells. This is a second reason a sewer system is required as soon as possible.

2. Existing Conditions and Recommended Improvement:

Forty four buildings with minimally sixty five residences/dwelling and additional businesses need to be connected to sewers. The glacial sand that the septic gray water is being put into has instantaneous percolation. New septic systems would not be allowed in this soil by the Department of Health. All grey water is simply flowing through the sand and into the reservoir below. We regularly look at the nitrate levels in the GUDI well water to make sure there are no septic infiltration issues.

The Croton Falls Hamlet's zoning district is call *General Business* or GB. GB allows for dense and mixed use development with apartments over storefronts and wet uses. See Appendix A "*GB District Zoning Chapter 250 table".* We currently have multiple wet uses which offer services to the Townspeople and train commuters. We have met with the business owners and they are in support of sewers in the hamlet. Owners of these buildings have been unable to expand their buildings or put in a wet use if one did not already exist. Sewers would encourage economic development and would allow Croton Falls to attain is zoning potential.

The reasons for installing the sewers are;

2.1. Protect the *Croton Falls Water District's* GUDI wells from adjacent septics.
2.2. Encourage and expand economic development in the hamlet allowing for the fuller use of the Hamlet's GB zoning.
2.3. Remove the untreated effluent impact on the Muscoot Reservoir.
2.4. Enable the Hamlets to handle the additional MTA parking lot (425 cars) coming online in 2021.
2.5. Supply sufficient bathroom capacity for train traffic during the daily commute and at times of the year such as apple picking months when thousands arrive by train to visit North Salem. Currently businesses do not have septic capacity to allow this.
2.6. Improve the overall quality of life for the residents and allow us to complete our *Croton Falls 2025 Vision.*

3. Sanitary Sewer Design

The proposed collection system would target the business properties and residential properties along the Muscoot Reservoir on Route 22 including the area along Route 22 adjacent to the Croton Falls Water System GUDI wells. We are not targeting the homes further up on the hills in Croton Falls. These are further away from the business hamlet, GUDI wells and Muscoot Reservoir. The area we are focusing on is the area with the most septic issues and providing sewers would have the greatest impact on water quality and the septic created zoning restrictions. Several of the homes in this area are not in good condition and it is doubtful if these owners would be able to pay for the connection to the sewer. We also have a eight affordable housing units in the designated area.

The existing topography was evaluated by Hahn Engineering and it was determined that a gravity system to a lower point in the hamlet would be the most economical to build with the pump station capable of handling about 18,000 GPD max flow over time. The pump station would optimally pump the effluent to the Heritage Hills Sewer plant on Greenbrier Drive where an existing gravity sewer to the plant exists. *See Appendix B Part 1/Part2*

Gravity Sewer

The Croton Falls hamlet will have gravity sewers from the residences and business These systems will collect the wastewater flow via a gravity sewer and the flow will terminate in a pump station. The pipe diameter is expected to be about 6-8 inches with manholes at intervals along the pipe for system maintenance and any flushing that is necessary. Manholes will be placed every 300 feet or where the sewer main line changes pitch. The slope will be a minimum of .04% grade in accordance with the Ten State Standards. The total length of gravity sewer main is 4,850 feet.

Item NO.	Description	Unit	EST. Quantity	Unit Price	Amount
PVC	Gravity Sewer (Paved)	LF	2,150	$ 250	$ 537,500
PVC	Gravity Sewer (Paved-DOT)	LF	2,700	$ 350	$ 945,000
SM	Sewer Manholes	EA	30	$ 7,500	$ 225,000

4. Pump Station Design

The gravity sewers will flow into a pump station located at the lowest point on the sewer district in the vicinity of Back Street. The elevation of the pump station location is approximately 226 feet above sea level.

The pump station will be a duplex station and have redundant pump chambers connected by a valved pipe, each pump chamber will have redundant pumps. The total daily volume is approximately 14,000 gallons or approximately 10 GPM. The pump station will also have a generator and an oxidation system such as Bioxide or an Ozone generator to stop the sewage from going 'septic'. The pump station will also have an antennae based communication system such as those provided by *CAI* or *Mission* to provide data to the SCADA system at the Heritage Hills Plant.

The pump station tank size and pump sizes will require specific engineering design and will focus on making sure the volumes can be handled correctly with the proper flow but also design a system that will handle failures of any component with no impact to the environment. We have just built a similar system connecting the North Salem schools to the Peach Lake sewer plant.

The design will also be compliant with the Ten State Standards, the wet-well size must maintain a maximum 30-minute fluid stagnation time.

5. Force Main

The Force Main will connect the pump station to the Heritage Hills Sewer plant. The closest location in the Heritage Hills Sewer system to Croton Falls is a gravity feed main to the plant which already exists on Green Briar Drive in Somers at an elevation of 376 feet above sea level.

The length of the force main to Green Briar Drive sewer manhole is 8,000 feet, some on Town and some on State roads as noted below. While we have discussed connecting to the Heritage Hills Sewer plant with the owners of the plant *(See letter Appendix D*) we still need permission from the Town of Somers to make the connection. Green Briar Drive is the closest and therefore the least expensive site at which to connect. [1]

The Green Briar Drive location does have an elevation variance of 150 vertical feet which will place a minimum 70 PSI static load at the pump station. The engineering needs to be reviewed to support

[1] *Somers has requested the main run down Route 202 which is a further distance and cost. Est. about $2.4M of additional monies would be needed for the 13,200 distance. At of 11/13/19 we have no formal approval from the Town of Somers to connect to the Heritage Hills Sewer Plant although the plant owners are ok with it and Somers Town Board has verbally agreed if they are allowed to hookup to the Peekskill plant for Lake Lincolndale and Lake Shenorock.*

sewage flow without column separation of the effluent. The force mains will follow the Ten State Standard Guidance.

Item NO.	Description	Unit	EST. Quantity	Unit Price	Amount
FM	Force Main (4" Paved)	LF	4,500	$ 200	$ 900,000
FM	Force Main (4" Paved-DOT)	LF	3,500	$ 300	$ 1,050,000

Cleanouts will be at manholes at regular 300 foot intervals. About 45% of the proposed gravity sewer and force main would be located under State and Federal Highways, (NY 22 and US 202 Respectively). Construction along these highways will require NYSDOT permitting, design, and construction materials.

At the Green Briar Drive connection point, the sewage will be delivered to the wastewater treatment plant via gravity sewer mains already present on Green Briar Drive.

There is a benefit to the Town of Somers in having the main travel down Route 202 as the sewer line could be used for hookups from their downtown and Lake Purdy's area. The distance to the Heritge Hills entrance on Route 202 is 13,200 Linear Feet which would increase the total cost of the system another $2.4M creating additional benefit for the Town of Somers.

Item NO.	Description	Unit	EST. Quantity	Unit Price	Amount
Additional cost to Connect to Heritage Hills Sewer line west of the Somers Town Hall					
FM	Savings from GreenBriar Hookup	LF	3,800	200	$ (760,000)
FM	Savings from GreenBriar Hookup	LF	3,500	300	$ (1,050,000)
FM	Force Main (4" Paved-DOT)	LF	13,200	300	$ 3,960,000
SM	Additional Clean-Out Manholes	EA	30	$ 7,500	$ 225,000
Estimated cost difference					**$ 2,375,000**

6. Community Outreach

We have met with business owners as far back as 2012 to discuss sewers. We also have had articles in the local paper and on social media pages discussing the *Croton Falls 2025* vision. We have buy in from the business owners and the rental property owners as they understand the problems the community would have if uses had to stop because of existing septic issues.

The Town is working on a capital plan for Croton Falls following the *Croton Falls 2025* vision which was called for in the Town's Master Plan. $20,000 has been set aside for that in the 2020 budget. As part of that project which will run from January through June 2020 we will have a structured process that will require scheduled community meetings in Croton Falls.

The Town completed a salary survey in this area and many of the families income is below the AMI requirements for affordable housing. That data was given to the County Planning Department in May of 2019.

The *Croton Falls 2025* document is a 15 page document created in May 2019 which discussed the revitalization initiatives that we are looking to accomplish in the Croton Falls. That document has been widely distributed.

7. Service Area

The proposed collection system would supply sewer services along Route 22 adjacent to the Muscoot Reservoir. There are 44 properties with approximately 80 units. North Salem's General Business (GB) Zoning allows for apartments over businesses and those types of uses already exist in the hamlet. There are some one story businesses that would expand their uses building higher.

The total water usage is currently about 12,000 GPD for the service area. We anticipate that the usage will increase by 50% over time to a high of 18,000 GPD with sewers. The service area has two building lots that do not have structures on them.

The business hamlet contains the most important buildings to hookup as well as residences adjacent to the existing GUDI wells used for the water district. Businesses and residences further away from the hamlet are less critical to hookup day 1. *See Appendix C*

8. Pump outs for existing septics/seepage pits.

Table 6: Number of pump outs for the wet uses

Owner name	Street address	Total Pumpouts
PRIMAVERA RESTAURANT	592 RT 22, North Salem	137
GORDON'S CAFE/DELI	10 FRONT ST, North Salem	34
WHO'S COOKING DELI	14 FRONT ST, North Salem	31
CROTON CREEK INN	4 W CROSS ST, North Salem	30
BPD 14 FRONT ST LLC	14 FRONT ST, North Salem	22
POPE	2 FRONT ST, North Salem	18
FRANK'S PIZZA	2 W CROSS ST, North Salem	8
PUTNAM COUNTY NATIONAL BANK	3-5 FRONT ST, North Salem	7

The above is from County septic pump out data for some of the businesses in the Hamlet. This shows the septic pump outs from the various wet uses on Front and Cross Street since 2011. The septics at 14 Front Street and 2 Front Street had problems and had to be repaired. *Frank's Pizza* was closed for a number of years and opened up recently. *Pope* is not a wet use, but a rental apartment. Many of these septic tanks are actually older cesspools. This list totaling 287 pump outs are about a $106,000 expenditure by the businesses.

Who's Cooking for example is a 1,500 to 3,500 gallon "SEEPAGE_PIT" according to the County septic data records. While all the County records show *"No Evidence of Septage"* we do know that this septic and others had problems and the SEEPAGE areas had to be expanded.

Primavera is right on the edge of the designated sewer district and would likely wish to be included in the district.

9. Options

The Town has looked at several options;

1. Building a sewer plant on DEP property adjacent to the hamlet. The DEP looked into this and decided that insufficient space is available between the Muscoot Reservoir and the Parking area to go subsurface with the needed water volume of about 18,000 GPD.
2. Purchase land behind *PrimaVera* restaurant on Route 22. We visited the site with the DEP and Hahn Engineering and it was deemed unlikely it would be able to take all of the water needed. Estimates was that it could accommodate about 10,000+ GPD subsurface without additional engineering work on the soils. It is possible this could be used but that would require significant engineering to come up with a definitive answer.
3. Install a plant on DEP property (#1 above) but go subsurface with the water from a plant on the new MTA parking lot at the St Joseph's parking lot. The MTA's Marx Mannix sent the following back to us on July 9th 2019:

We plan to award design of the new parking facility in a few weeks and proceed to conceptual design by the end of 2019. Demolition of the site would begin in early 2020 and construction is scheduled to start in fall of 2020. The project is receiving federal funding, which ads an additional layer of scrutiny and monitoring with respect to meeting the project schedule and staying within budget.

As indicated in our past project briefings and as shown in the concept plan below, we intend to use most of the useable property (approximately half of the parcel involves a steep slope which cannot be used for parking) for the 450-parking space facility which also requires space for a storm water detention system. And at some point in the future additional parking spaces may be warranted. Given our schedule, funding and project plan, there are many unknowns regarding the feasibility and timing of including a sewer system for Croton Falls on our site.

Our need to use the entire useable portions of the parcel indicates that your proposed system would have to be located under the parking lot. This entails concerns over additional design to assure the integrity of the lot and how access to and maintenance of the system would take place.

Based on the above considerations and the following project plan It does not appear feasible to allow the system you propose.

10. Cost Estimate

Table 1: Showing the cost estimates for the Croton Falls Sewer District including lateral connections and contingency of $5.8M. Costs are dependent on the per foot price to dig the Force Main. Horizontal drilling will reduce costs as we have seen elsewhere. We need concurrence from Somers to allow us to connect to the Heritage Sewer Plant.

Force Main Connection to Heritage Hills at Green Briar Drive					
Item NO.	Description	Unit	EST. Quantity	Unit Price	Amount
FM	Force Main (4" Paved)	LF	4,500	$ 200	$ 900,000
FM	Force Main (4" Paved-DOT)	LF	3,500	$ 300	$ 1,050,000
PVC	Gravity Sewer (Paved)	LF	2,150	$ 250	$ 537,500
PVC	Gravity Sewer (Paved-DOT)	LF	2,700	$ 350	$ 945,000
PS	Pump Station	EA	1	$ 500,000	$ 500,000
SM	Sewer Manholes	EA	30	$ 7,500	$ 225,000
SM	Clean-Out Manholes	EA	16	$ 7,500	$ 120,000
LC	Lateral Connections	EA	44	$ 7,500	$ 330,000
Contruction Total					**$ 4,607,500**
Connection Fee ($200,000 per 10,000 Gallons)					$ 400,000
Soft Costs Including Engineering (8% of Construction Total)					$ 368,600
Contingency (10% of Construction Total)					$ 460,750
Total					**$ 5,836,850**

Table 2: Forced Main costs going to Green Briar Drive manhole.

Forced Main					
FM	Force Main (4" Paved)	LF	4,500	$ 200	$ 900,000
FM	Force Main (4" Paved-DOT)	LF	3,500	$ 300	$ 1,050,000
SM	Clean-Out Manholes	EA	16	$ 7,500	$ 120,000
					$ 2,070,000

Table 3: Forced Main additional cost if required to go to Heritage Hill west of the Somers Town Hall.

Additional cost to Connect to Heritage Hills Sewer line west of the Somers Town Hall					
FM	Savings from GreenBriar Hookup	LF	3,800	200	$ (760,000)
FM	Savings from GreenBriar Hookup	LF	3,500	300	$ (1,050,000)
FM	Force Main (4" Paved-DOT)	LF	13,200	300	$ 3,960,000
SM	Additional Clean-Out Manholes	EA	30	$ 7,500	$ 225,000
Estimated cost difference					**$ 2,375,000**

Table 4: Cost of gravity sewer line to all residences.

Gravity Sewer					
PVC	Gravity Sewer (Paved)	LF	2,150	$ 250	$ 537,500
PVC	Gravity Sewer (Paved-DOT)	LF	2,700	$ 350	$ 945,000
SM	Sewer Manholes	EA	30	$ 7,500	$ 225,000
					$ 1,707,500

Table 5: Cost of Pump station

Pump Station					
PS	Pump Station	EA	1	$ 500,000	$ 500,000
					$ 500,000

Appendix A

Appendix A: Croton Falls Sewer District's GB Zoning

250 Attachment 10

Town of North Salem
Table of General Use Requirements
GB District

[Amended 5-28-1991; 7-13-1993 by L.L. No. 4-1993; 10-25-1994 by L.L. No. 4-1994; 2-24-1998 by L.L. No. 4-1998; 11-9-2010 by L.L. No. 2-2010; 11-8-2011 by L.L. No. 5-2011; 7-23-2013 by L.L. No. 5-2013; 9-23-2014 by L.L. No. 5-2014; 6-23-2015 by L.L. No. 2-2015; 4-25-2017 by L.L. No. 1-2017]

A	B	B-1	C	C-1	D	D-1	E	F		G
								Minimum Off-Street		
District	Uses Permitted by Right	Use Group	Conditional Uses by Planning Board (1)	Use Group	Uses by Special Permit of Town Board or Board of Appeals (1)	Use Group	Accessory Uses by Right	Parking For	Minimum Spaces Required	Additional Use Requirements
GB	Personal service businesses, provided that the total floor area occupied by a single proprietorship shall not exceed 3,500 square feet	1	Apartments accessory to commercial establishments	(2)	**TOWN BOARD**		Parish houses, parish halls or rectories, and religious education	Accessory apartments	2 per apartment	A buffer with a minimum dimension of the respective required yard may be required as condition of approval for any conditional use in Column C or for special permit use in Column D where such uses may affect the residential character of the neighborhood or the use of the adjoining lot. Such buffer area may be reduced where local conditions warrant and substitute measures are prescribed for the protection of neighboring properties or where adjacent use is similar to that proposed for conditional or special permit approval.
	Uses of the Town of North Salem	N/A	Indoor recreation	e	Private schools	d	The keeping of customary household pets, but not more than 3 dogs, together with the young thereof not more than 6 months old	Churches or other places of worship	1 for each 5 seats or 200 square feet of gross floor area, whichever is greater plus 3 for accessory rectories	
	Public schools	N/A	Public utilities	N/A	Churches or other places of worship	b	Off-street parking and loading facilities	Child and adult day-care centers	1 for each 5 children and adults plus 1 for each administrative and staff member	
	Fire or ambulance stations	1	Multifamily dwellings	n	Hotels	m	Customary storage of goods and materials incidental to the principal use and within a fully enclosed building, except as otherwise permitted	Libraries, museums and studios and art galleries	1 per 200 square feet of gross floor area	
	Libraries, museums and art studios and galleries	k	Motor vehicle service stations	1	**BOARD OF APPEALS**		Accessory food service ancillary to a permitted retail use, consisting of limited kitchen facilities providing quickly prepared and packaged food items (i.e., delicatessen, seasonal food or baked goods) involving only over the counter service with or without limited convenience seating not to exceed 16 seats (combined interior or exterior), which convenience seating area shall be subject to the standards set forth in § 250-77.7G, H, I, J, K, L and M of this chapter.	Membership clubs	4 per court, plus 1 per 200 square feet of gross floor area of accessory use	
	Business offices or professional offices and banks	1	Multifamily dwellings containing all affordable housing dwelling units	o	Accessory satellite dish antennas (earth receiving stations)	(2)	Accessory solar energy systems in accordance with § 250-19 of this chapter.	Retail stores, personal service businesses barbershops, etc.	1 per 200 square feet of gross floor area	Any permitted use in this district, which is located on a lot, the lot lines of which lie within 15 feet of a residential district boundary, shall be screened along such lot lines
	Restaurants and other food service establishments where customers are served only when seated at tables or counters	1	Nursery schools	1	Apartments accessory to single-family detached dwellings	(2)		Business or professional offices and banks	1 per 150 square feet ground gross floor area, plus 1 per 300 square feet of gross floor area for all other areas	No accessways, parking, loading or storage areas shall be provided within 15 feet of any residence district, and such areas shall be landscaped so as to screen such areas from said adjoining district.
	Barbershops and beauty parlors, shoe repair and tailor shops	1	Communication towers and facilities for the installation of antennas for telephone, radio and television and other communication antennas	p	The serving of food	(2)		Medical and dental offices or clinics	4 per practitioner, plus 1 per employee	
	Medical and dental offices or clinics	1	Child and adult day-care centers	1	Accessory seasonal outdoor restaurant seating	L		Accessory retail use food service (seating)	1 per 4 seats	
	Retail businesses including stores and shops for the sale of baked goods, drugs, dry goods, groceries, fruits, vegetables, meats, liquor, notions, stationery, toilet articles, books and flowers, provided that the total floor area occupied by a single proprietorship shall not exceed 3,500 square feet	1	Charitable, fraternal or social membership clubs	J				Hotels	1 per guest room, plus 1 for each 2 employees, plus accessory use parking as required	All uses except parking, loading, recreation, communication and utility facilities shall be within fully enclosed structures or as otherwise permitted.
	Retail businesses including stores and shops for the sale of antiques, art supplies, clothing, furniture, garden and farm supplies and equipment, gifts, household appliances, music, jewelry, hardware, shoes and video supplies, provided that the total floor area occupied by a single proprietorship shall not exceed 3,500 square feet.	1						Multifamily dwellings including those containing affordable housing dwelling units	1 per dwelling and plus 0.5 per bedroom	
	Railroad passenger stations customary accessory convenience services.	N/A						Permitted uses not listed	Reasonable and appropriate parking areas based on highest anticipated parking demand as determined by the Planning Board	
								Motor vehicle service stations	1 per 200 square feet of gross floor area, excluding service and repair garages	

NOTES:
(1) Subject to specific supplemental use standards in Article XIII, Conditional Use and Special Permit Standards.
(2) Same use group as principal use.

Appendix B

LEGEND

- PROP. SANITARY SEWER MAIN
- PROP. SANITARY MANHOLE
- PROP. PUMP STATION
- PROP. SANITARY FORCE MAIN
- N.Y.S.D.E.C. WETLANDS BOUNDARY

Appendix B: Part 1: Croton Falls Sanitary Sewer District Gravity sewers showing coverage area, location of pump station and the beginning of the Force Main.

NOTE:
1. THE PROPOSED WORK SHOWN HEREON IS SCHEMATIC IN NATURE ONLY AND IS NOT FOR CONSTRUCTION.
2. TOPOGRAPHIC AND BOUNDARY INFORMATION BASED ON WESTCHESTER COUNTY G.I.S.

100 0 100 200 300

Scale 1" = 100'

REV.	DATE

TITLE: CONCEPTUAL SEWER PLAN

PROJECT:

PROPOSED
CROTON FALLS
SANITARY SEWER SYSTEM

TOWN OF NORTH SALEM, WESTCHESTER COUNTY, NEW YORK

UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS A VIOLATION OF SECTION 7209 (2) OF THE NEW YORK STATE EDUCATION LAW. THIS PLAN IS NULL AND VOID FOR CONSTRUCTION PURPOSES WITHOUT THE SIGNATURE AND SEAL OF THE DESIGN ENGINEER.

JAMES J. HAHN ENGINEERING, P.C.
Putnam Business Park
1689 Route 22
Brewster, New York 10509
Tel: (845) 279-2220

SCALE	DATE
1" = 100'	11/14/19
DRAWING NO.	SHEET NO.
C-1	1 OF 1

N

LEGEND

- PROP. SANITARY SEWER MAIN
- PROP. SANITARY MANHOLE
- PROP. PUMP STATION
- PROP. SANITARY FORCE MAIN
- N.Y.S.D.E.C. WETLANDS BOUNDARY

Appendix B Part 2: Croton Falls Sanitary Sewer System showing force main to Green Briar Drive.
We currently have no approvals from the Town of Somers to hook into the Heritage Sewer System.

300 0 300 600 900

Scale 1" = 300'

NOTE:
1. THE PROPOSED WORK SHOWN HEREON IS SCHEMATIC IN NATURE ONLY AND IS NOT FOR CONSTRUCTION.
2. TOPOGRAPHIC AND BOUNDARY INFORMATION TAKEN FROM WESTCHESTER COUNTY GIS

REV.	DATE

TITLE: CONCEPTUAL FORCE MAIN PLAN

PROJECT:

PROPOSED
CROTON FALLS
SANITARY SEWER SYSTEM

TOWN OF NORTH SALEM, WESTCHESTER COUNTY, NEW YORK

UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS A VIOLATION OF SECTION 7209 (2) OF THE NEW YORK STATE EDUCATION LAW. THIS PLAN IS NULL AND VOID FOR CONSTRUCTION PURPOSES WITHOUT THE SIGNATURE AND SEAL OF THE DESIGN ENGINEER.

JAMES J. HAHN ENGINEERING, P.C.
Putnam Business Park
1689 Route 22
Brewster, New York 10509
Tel: (845) 279-2220

SCALE	DATE
1" = 300'	01/08/19
DRAWING NO.	SHEET NO.
C-2	1 OF 1

C:\Users\chris\Appdata\local\Temp\AcPublish_11412\conceptual 4-way connection.dwg Jan 14, 2019 12:12pm

Appendix C:

Croton Falls Sewer District properties with water volume readings for 2018

A	B	C	D	E	
Total Gallon	*See Key*	GPD	# properties		
3,807,425	*to right*	10,431	44 with 63 residen a	Colum B Key: *'**y**' business district, '**x**' and '**y**' in sewer district, '**no**' in water district but not sewer district.*	
392,280	x	0000002031 OWENSVILLE HOUSING DEVEL 606 ROUTE 22 002 000310 04/13/2018			Affordable housing
390,960	y	0000002008 4 W CROSS ST REALTY LLC 4 W CROSS ST 002 000080 07/17/2018			
374,147	y	0000002002 BPD 14 FRONT STREET LLC 14 FRONT STREET 002 000020 07/10/2018			
290,112	y	0000002057 WHITE SQUIRREL PROPS LLC 21 HARVEY ROAD 002 000570 07/19/2018			
167,270	x	0000002011 WESTHAB, INC. 2 EAST CROSS ST 002 000110 07/11/2018			Affordable housing
122,760	y	0000002005 CENTER AND FRONT LLC 10 FRONT STREET 002 000050 07/11/2018			
121,920	y	0000002074 PUTNAM CNTY NATL BK OF C 12 FRONT STREET 002 000740 07/11/2018			
117,772	x	0000002044 MAYA MIGUEL 14 MAPLE AVENUE 002 000440 07/17/2018			
103,000	x	0000002016 GALLAGHER R. & ADAMS P. 629 ROUTE 22 002 000160 07/19/2018			
102,320	x	0000002017 BERTOLOTTI KIRSTEN 631 ROUTE 22 002 000170 07/09/2018			
91,722	x	0000002037 SCHULTZ PETER 10 MAPLE AVENUE 002 000370 04/28/2018			
87,520	y	0000002001 BBCD % COLLEY GROUP 4 FRONT STREET 002 000010 07/11/2018			
86,000	x	0000002007 GUILIANO PETER M. 1 BRIDGE STREET 002 000070 07/11/2018			
86,000	x	0000002034 DEPAOLI JAMES R 619 ROUTE 22 002 000340 07/10/2018			
74,707	x	0000002023 633 ROUTE 22 LLC C/O F&S LUGJURAJ 002 000230 07/07/2018			
72,367	x	0000002009 FSAA LLC 2 WEST CROSS STREET 002 000090 07/11/2018			
66,240	x	0000002045 JOLLEY FRANKLIN M & ALIC 5 MAPLE AVENUE 002 000450 04/28/2018			
66,190	x	0000002042 BABON GREGORY. & EKIZIAN 2 MAPLE AVENUE 002 000420 04/28/2018			
65,000	x	0000002041 JACOBSEN JON & MERIAM 4 MAPLE AVENUE 002 000410 04/28/2018			
62,137	x	0000002024 624 ROUTE 22 LLC 624 ROUTE 22 002 000240 07/19/2018			
58,415	x	0000002018 DEPAOLI JR THOMAS & DEBO 622 ROUTE 22 002 000180 07/10/2018			
58,340	y	0000002006 TWENTY ELEVEN REAL ESTAT 6 & 8 FRONT STREET 002 000060 07/11/2018			
55,840	x	0000002020 RUE JOHN C & BARBARA 626 ROUTE 22 002 000200 07/07/2018			
55,530	x	0000002030 ISOP J. GERHARD 613 ROUTE 22 002 000300 07/11/2018			
54,710	x	0000002015 DELEON PATRICK A. 627 ROUTE 22 002 000150 07/20/2018			
52,482	x	0000002040 GURRIERI JOSEPH & MARIA 3 MAPLE AVENUE 002 000400 04/28/2018			
48,000	x	0000002029 DUFFY-KORNBLUTH NATALIA KORNBLUTH MICHAEL J 002 000290 07/20/2018			602 route
45,580	x	0000002014 RYAN PATRICK & FLORENCE 639 ROUTE 22 002 000140 07/07/2018			
43,610	x	0000002021 LEONARD THOMAS & THOMAS 635 ROUTE 22 002 000210 07/10/2018			
43,040	x	0000002013 O'LEARY RICHARD & ELIZAB 637 ROUTE 22 002 000130 05/25/2018			
41,280	x	0000002038 MILANES MICHAEL & NZINGH 11 MAPLE AVENUE 002 000380 07/07/2018			
39,890	x	0000002012 SMITH B HAWLEY 4 EAST CROSS STREET 002 000120 07/09/2018			
35,220	x	0000002035 CROTON CODY LLC CORP C/O RICHARD L. RAPP 002 000350 07/10/2018			
28,315	y	0000002010 MANDIA JACQUELINE S 2 CENTER STREET 002 000100 07/11/2018			
25,000	y	0000002004 CARROZZA MARIO 2 FRONT STREET 002 000040 07/11/2018			
16,490	x	0000002036 SCHULTZ PETER 10 MAPLE AVENUE 002 000360 07/20/2018			
15,759	x	0000002032 615 ROUTE 22 LLC C/O N. 615 ROUTE 22 002 000320 07/06/2018			
13,390	x	0000002033 LIFT TRUCKS PROJECT LLC 3 EAST CROSS ST 002 000330 07/10/2018			
12,810	y	0000002003 1-3 FRONT ST. % CHRISTOP 3 FRONT STREET 002 000030 07/10/2018			
10,000	x	0000002019 BROJAJ MANDALENA & BASHK 625 ROUTE 22 002 000190 07/30/2018			
10,000	y	0000002076 NORTH SALEM CAPITAL PART C/O KENNETH LIPPMANN 002 000760 07/30/2018			
8,300	x	0000002043 TEJEDA LUIS E 12 MAPLE AVENUE 002 000430 04/28/2018			
45,000	x	0000002022 PALMESI MARGARET 641 ROUTE 22 002 000220 07/30/2018			
50,000	x	0000002047 ISOP GERHARD INC 7 MAPLE AVENUE 002 000470 04/28/2018			

List of locations included in the sewer district. Average GPD of this group today is 12,000.

Appendix D:

TOWN OF NORTH SALEM
Delancey Hall
266 Titicus Road
North Salem, N.Y. 10560

Office of the Supervisor

January 18, 2018

Mr. Keith Sorenson
President
Heritage Hills Sewage Works, Corp.
465 Heritage Road
PO Box 873
Southbury, CT 06488

Re: Croton Falls hookup request to the Heritage Hills Sewer Works

Dear Keith,

I am the Supervisor of North Salem and recently had discussions with Supervisor Morrissey of Somers and Assistant Commissioner David Warne and Section Chief Mike Meyers of the NYC Department of Environmental Protection (DEP) about the Croton Falls hamlet septic needs.

The reason for this letter is to ask if Heritage Hills Sewer Works would accept about 10,000 gpd of sewage from the Croton Falls hamlet.

The Croton Falls hamlet is a small business district in the village of Croton Falls which is part of North Salem. The NYC DEP owns all of the property surrounding the buildings and some of the existing septics systems are under the paved roadways, many of them on NYC DEP and NYS Department of Transportation properties. Because the ground under the hamlet is primarily sand with very rapid percolation, most of the septics are able to take the volume of water but per my discussions with the DEP and others we feel fairly confident that much of the grey water flows significantly untreated into the reservoir below.

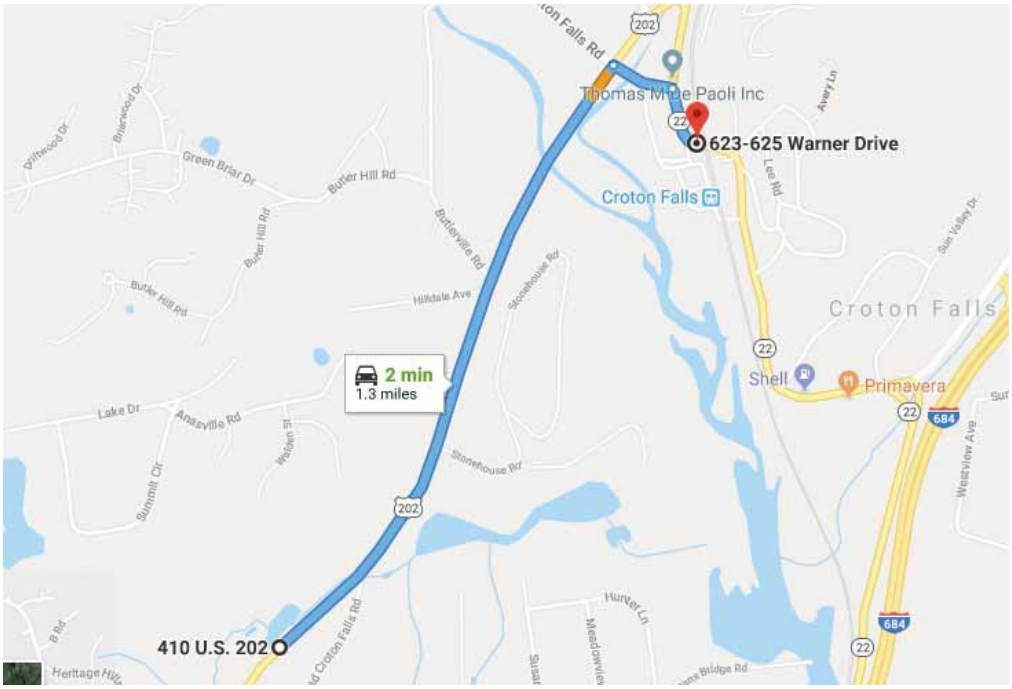
Over the past couple of years I have been in discussions with David Warne, Sabrina Ty President of the Environmental Facilities Corporation and Pamela Young formerly Chief of the NYC Watershed of the NYS Department of Health on how to deal with the septics in the business district. We have a small volume of water used by these businesses, about 7,000 gallons per day, but there is no space to actually put a communal septic system or small sewer plant as the Town owns no property in the vicinity and the soils in the area would not qualify to handle the existing septics. Because of another issue, Radium naturally occurring in the bedrock, my water system's artesian wells in the Croton Falls Water District have been replaced with shallow wells that are 'under the influence of ground water' and for that reason we are also trying to come up with an alternative that moves the grey water out of the hamlet.

North Salem does have the Peach Lake Sewer plant about 6 miles away and the hookup of the North Salem High School/Middle School, which the DEP is paying for, is being completed. The

Telephone: 914-669-5110 Fax: 914-669-5167 Email: wlucas@northsalemny.org

School has a max flow of about 7,000 gpd so I am very aware of the cost and the general technology we will need.

The Heritage Hills Sewer building I am familiar with is about 1.3 miles from the center of the Croton Falls hamlet as the attached map shows;



Below are the 18 properties that would be included in the district along with their water usage in 2016. Additional lots would be added that have septic issues.

Count	Name	Address	Water Consumption yearly	Comments	GPD
1	BBCD - Colley Group	4 Front Street	178,440		488.88
2	BPD 14 Front Street	14 Front St	371,032		1,016.53
3	Christopher1-3 Front St	3 Front St	2,520		6.90
4	White Squirrel Props LLC	2 Front St	113000		309.59
5	Front Center realty	10 Front St	158,100		433.15
6	Twenty Eleven Real Estate	6 & 8 Front Street	66,720		182.79
7	Guilanno Peter	1 Bridge St	71,000		194.52
8	4 W Cross St Realty Inc	4 W Cross St	293,490		804.08
9	the Four Dogs	2 W Cross St	91,188		249.83
10	Jacqueline Mandia	2 Center St	15,790		43.26
11	Westhab Inc	2 E Cross St	98,770		270.60
12	Smith B Hawley	4 E Cross St	41,200		112.88
13	ACE	602 Route 22	100,000	Empty, est. 2 esidences	273.97
14	Lift Trucks	3 E Cross St	20,160		55.23
15	Owensville Housing Dev.	606 Route 22	307,990		843.81
16	Lakland Lumber	621 Route 22	200,000	Estimated	547.95
17	CFFD	Currently not billed	109,500	No meter, estimated @ 300/day	300.00
18	Putnam County Savings Bank	12 Front Street	61,090		167.37
			2,299,990		**6,301.34**

I would expect the volume to increase if there was a sewer connection but not that much more than 10,000 gallons per day.

Telephone: 914-669-5110 Fax: 914-669-5167 Email: wlucas@northsalemny.org

I would be most interested in having a discussion with you about the possibility of hooking up to your system and I look forward to hearing for you.

Sincerely,

Warren J Lucas
Supervisor

Telephone: 914-669-5110 Fax: 914-669-5167 Email: wlucas@northsalemny.org

Appendix E:

JAMES J. HAHN
ENGINEERING, P.C.

Putnam Business Park
1689 Route 22
Brewster, NY 10509

Tel: 845-279-2220
Fax: 845-279-8909
jhahn@hahn-eng.com

January 14, 2019

Honorable Warren Lucas
Supervisor
Town of North Salem
Town Hall
266 Titicus Road
North Salem, NY 10560

Re: Croton Falls Sewers

Dear Mr. Lucas:

Pursuant to your directive, we have studied the possibility as shown on the attached drawings, and cost estimate, to connect to the Heritage Hills Sewage Treatment Plant, to relieve septic conditions in the Hamlet of downtown Croton Falls. The Hamlet is currently being served by ground water wells within the vicinity of the existing septic areas. These septic systems have a potential adverse impact on the Hamlet's water system. There is a need to find alternative wastewater disposal options for Croton Falls.

We have reviewed the possibility of providing a sanitary sewer force main connection between Croton Falls and the Heritage Hills sewer system. Heritage Hills is a development in the Town of Somers, NY with its own wastewater treatment plant and is located approximately 1.5 miles west of croton Falls.

Various sewer layouts, pump station locations, and force main routes were evaluated for this conceptual study. A system of gravity sewers would collect wastewater from the Hamlet and be directed to a low point. At this location, a pump station would be required to pump the sewage to Heritage Hills. A meeting with the Heritage Hills wastewater treatment plant operator confirmed that the facility has the ability to accept additional sewage and could receive a connection along Green Briar Drive in the Town of Somers, NY.

Approximately 1.5 miles of force main would be required to reach Green Briar Drive. The force main would start near the intersection of Front Street and NY-22 at a pump station. The force main would follow roadways along the shortest route to Green Briar Drive and the proposed connection point. Clean-out manholes will be required along the length of the force main at low and high points. Refer to the attached drawings.

About 45% of the proposed gravity sewer and force main would be located under state and federal highways (NY 22 and US 202, respectively). Construction along these highways will require NYSDOT permitting, design, and construction materials. At the Green Briar Drive connection point, the sewage will be delivered to the wastewater treatment plant via gravity sewer mains. Attached are two drawings showing the layout of sewers (C-1 "Conceptual Sewer Plan") and force main connection (C-2 "Conceptual Force Main Plan").

A conceptual cost estimate based on the conceptual drawings has been provided for the force main connection. It is estimated that the project would cost approximately $4.7 million. This budget should not be considered exact and only representative of the conceptual level of design.

A review of water usage data and a list of properties to be included is required to create a representative sewer flow and to proceed with schematic design.

If there are any questions or comments, please do not hesitate to contact me at your earliest convenience.

Very truly yours,

James J. Hahn, P.E.

JH:WJA

Attachments

P:\Town of North Salem\Croton Falls\Sewers\Conceptual Sewer Design Report.docx

CROTON FALLS SEWER CONNECTION
Town of North Salem
January 14, 2019

Force Main Connection to Heritage Hills at Green Briar Drive					
ITEM NO.	**DESCRIPTION**	**UNIT**	**EST. QUANT.**	**UNIT PRICE**	**AMOUNT**
FM	Force Main (4", Paved)	LF	4,500	$ 200.00	$ 900,000.00
FM	Force Main (4", Paved-DOT)	LF	3,500	$ 300.00	$ 1,050,000.00
PVC	Gravity Sewer (Paved)	LF	2,150	$ 250.00	$ 537,500.00
PVC	Gravity Sewer (Paved-DOT)	LF	1,700	$ 350.00	$ 595,000.00
PS	Pump Station	EA	1	$ 500,000.00	$ 500,000.00
SM	Sewer Manholes	EA	30	$ 7,500.00	$ 225,000.00
SM	Clean-Out Manholes	EA	16	$ 7,500.00	$ 120,000.00
CONSTRUCTION TOTAL					**$ 3,927,500.00**
Connection Fee ($200,000/10,000 gal of sewage)					$ 200,000.00
Soft Costs Including Engineering (8% of Construction Total)					$ 314,200.00
Contingency (10% of Construction Total)					$ 392,750.00
PROJECT TOTAL					**$ 4,834,450.00**