

**VILLAGE OF CHAGRIN FALLS  
COMMITTEE OF THE WHOLE COUNCIL  
October 10, 2019**

Members present: DeBernardo, Evans, Grube, Newell, Rogoff  
Also present: Mayor Tomko, Bloom, Lannon, Himes, Gordon, Jamieson, Knauff,  
Edwards

The meeting was called to order at 6:30 p.m. by Nancy Rogoff.

**EPA LICENSE RENEWAL AND UPGRADE REQUIREMENTS FOR THE WASTE  
WATER TREATMENT PLANT**

Mayor Tomko said the Waste Water Treatment Plant is nearing fifty years old and much of the equipment is in need of replacement and modernization. We have an EPA License renewal, which primarily involves eliminating of all of the Sanitary Sewer Overflows (SSO). Currently we have about three or four SSO events a year. The EPA wants that number to be zero and we have a plan to do that. The objective for tonight is to go over all of the alternatives that we have considered, which have been comprehensive, and why we think what we are recommending is the lowest and best cost option for the plant.

Ben Himes gave an overview of the history of the treatment plant. He and Mr. Lannon made a presentation on the upcoming plan. Comments were heard and questions were answered, both from Council and the audience.

The meeting adjourned at 7:40 p.m.

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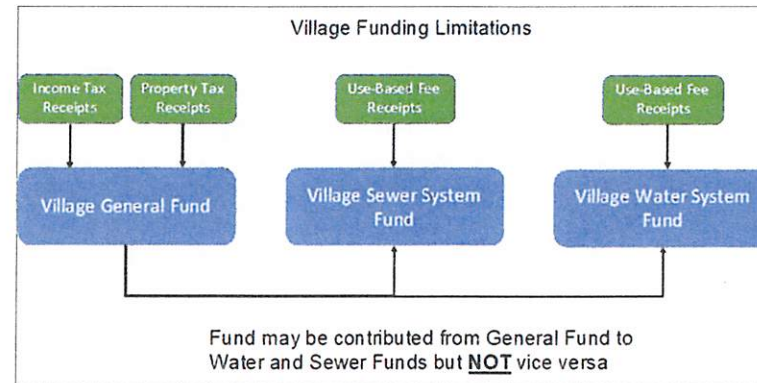
Nancy Rogoff, Council President  
lgb

## Village of Chagrin Falls Water and Sewer Plan Summary

October 10, 2019

- The Village water and sewer systems are confronted by two different challenges that are becoming urgent and require near term action. The planning for these challenges has been on-going for many years and is now sufficiently developed to be presented publicly in advance of the requirement to renew the EPA license for our system.
- The first challenge is a “good/bad” one and the result of Village residents participating in the positive national water conservation trend. People are simply using less water on a per capita basis. In addition to greater general consciousness about water conservation, the deployment of technologies such as “low flow” plumbing fixtures and appliances means we are just using less water and processing less flow through our systems. The downside to the Village is that “flow rate” is the basis for water and sewer revenue and with generally static Village population, the unavoidable math is that revenue is not keeping up with operating costs. In fact, if the Waste Water Treatment Plant (WWTP) billed for the same volume of water it billed in 2016 we would have generated positive revenue of ~\$200,000 Vs. the projected 2019 loss of ~\$90,000.
- The second challenge is our aging infrastructure for both water and sewer operations and the need to maintain compliance with the EPA system license to continue operating the system to meet the water and sewer needs of Village citizens.
  - For example, there are leaking sewer lines along Village Streets that were built over 110 years ago. There have obviously been fixes and some relining of many of these lines over the years, but some of the basic infrastructure remains in need of eventual replacement or major rehabbing. At various points sewer joints and manholes are leaking seriously, causing excessive infiltration into the system. This ground water infiltration uses up valuable WWTP treatment capacity that cannot be billed for and adds to plant operating cost. Water main breaks cause service disruption and costly repair and water that leaks from the distribution system is a major cost. Adding to the problems many sanitary sewer connection pipes, called laterals, on resident premises that connect to the system also have leaking joints and add to ground water infiltration into the system.
- The Ohio Environmental Protection Agency (EPA) license for the Village’s sewer system MUST be renewed by 2021. Today the Village is in compliance with the EPA permit requirements but under orders to take action to eliminate Sanitary Sewer Overflows (SSO) in order to maintain compliance with the terms of the license. An SSO is an overflow of the sanitary sewer system directly into the Chagrin River.
- There is no choice but to take action and unfortunately there are significant unavoidable capital cost implications over a 10+ year period that must be managed. This issue was also identified in the 2016 Citizens Financial Review Advisory Committee Report, which highlighted the EPA mandated capital project and others that exceeded \$10M in required infrastructure investment in the Village water and sewer systems. Since that report, Village administration staff and consultants have been researching and developing specific response plans and reviewing all options to maintain service to Village residents.

- Before getting deeper into the details, there is a key regulatory fact that must be emphasized. The Village finances are segmented into three parts with restrictions set by law on how they are managed. We have a General Fund, and two Utility funds; Water System Fund and a Sewer Fund. We are allowed to transfer funds from the General Fund to either of the Water or Sewer Funds for operations and capital projects. However, funds collected from user fees in either of the Water or Sewer funds may only be used for appropriate expenditures of the fund collecting the fees ... water fees for water system expenditures only and sewer fees for sewer expenditures only. The graphic immediately below depicts this requirement and limitations which becomes important. This limitation frames – to some degree – how the Village must fund the required corrective action programs and restricts our flexibility.



**What are the systems and infrastructure problems with the Water and Sewer systems that must be addressed?**

The current sewer system does not have sufficient capacity to process flows during peak periods (e.g. heavy storms). Storm sewers that flow directly into the river collect much of storm run-off, but a significant flow surge also occurs into the sanitary sewer system. Rain water enters the sanitary sewer system through direct inflow and infiltration from high ground water via leaky underground pipes. We believe we have identified most or all of the current direct connections and eliminated them, but illegal connections are an ongoing problem. Today, the Village has an Equalization or EQ tank to the west of Solon Road and east of the river, south of the Miles Rd and Solon Rd intersection. This has been the existing solution for surge periods allowing for deferred waste water processing through the sewer plant facilities. By current EPA regulations, this Village system is not compliant since there are still occasional SSOs. One proposed solution is to build additional storage capacity at a 2016 estimated capital cost approaching \$7M. The existing EQ tank is sized to accommodate a 5-year storm, the OEPA wants us to be able to accommodate a 10 year storm without having an SSO event.

- The Village's proposed plan that will be outlined in this document has been reviewed and approved by the Ohio EPA as acceptable, but construction must begin by the end of 2020 to be in compliance with the license. Various construction schedule milestones must be achieved through the project as well as overall compliance with license provisions which will be reviewed periodically by Ohio EPA staff.
- Processing waste water at the plant obviously requires collection and transfer to the plant through the network of Village-owned sewer pipes and resident pipes connecting with the Village-owned infrastructure. Also, Geauga County owns and operates its own collection system and sends its flow to the WWTP as well. Parts of this system are deteriorating, primarily due to its age and the reality that original designs did not contemplate the demands of modern society. A major problem is that breaks and leaks in aging sewer pipes allow large quantities of ground water to infiltrate the sewer system, artificially stressing the system with flow unrelated to true sewer-originated flow.
- A formal study of major sewer lines identified 23 Village roads with deteriorated sewer pipes and prioritized them based on water main break experience, road condition, and the potential to reduce infiltration and increase effective system capacity and a means to gain compliance. Follows is a prioritized schedule ranking these streets based on; age and condition of sanitary sewer and water lines, existence of storm water problems, and roadway condition.

## Priority Sorted by Street (1)

	Total Rehab (2)	Amended Rank	Average PRIORITY Rating	Sanitary Rehab Cost	Watermain Replace Cost	General Fund [Road + Storm]	Resurfacing Cost	Drainage Cost
WASHINGTON ST. - EAST	\$ 2,773,750.00	1	1.3	\$ 1,175,000	\$ 600,000	\$ 998,750	\$ 470,000	\$ 528,750
S. FRANKLIN ST. - South of Carriage Stone	\$ 337,500.00	2	6.3	\$ 187,500	\$ 65,625	\$ 84,375	\$ 75,000	\$ 9,375
BRADLEY AVE.	\$ 421,875.00	3	5.3	\$ 187,500	\$ 131,250	\$ 103,125	\$ 75,000	\$ 28,125
COTTAGE ST. - EAST	\$ 796,250.00	4	4.3	\$ 325,000	\$ 227,500	\$ 243,750	\$ 130,000	\$ 113,750
CENTER ST.	\$ 686,000.00	5	4.5	\$ 280,000	\$ 196,000	\$ 210,000	\$ 112,000	\$ 98,000
WATER ST.	\$ 492,500.00	6	5.5	\$ 212,500	\$ 140,000	\$ 140,000	\$ 80,000	\$ 60,000
HALL ST.	\$ 748,000.00	7	6.5	\$ 340,000	\$ 238,000	\$ 170,000	\$ 136,000	\$ 34,000
Bell - Cleveland to Carriage	\$ 483,750.00	8	6.3	\$ 215,000	\$ 150,500	\$ 118,250	\$ 86,000	\$ 32,250
MAPLE ST.	\$ 752,500.00	9	6.8	\$ 350,000	\$ 245,000	\$ 157,500	\$ 140,000	\$ 17,500
OLIVE ST.	\$ 731,000.00	10	6.8	\$ 340,000	\$ 238,000	\$ 153,000	\$ 136,000	\$ 17,000
WALNUT ST.	\$ 715,000.00	11	6.7	\$ 325,000	\$ 227,500	\$ 162,500	\$ 130,000	\$ 32,500
COTTAGE ST. - WEST	\$ 340,000.00	12	6.3	\$ 200,000	\$ -	\$ 140,000	\$ 80,000	\$ 60,000
CHURCH ST.	\$ 645,000.00	13	7.3	\$ 300,000	\$ 210,000	\$ 135,000	\$ 120,000	\$ 15,000
AMERICAN ST.	\$ 281,250.00	14	7.2	\$ 125,000	\$ 87,500	\$ 68,750	\$ 50,000	\$ 18,750
COLUMBUS ST.	\$ 231,000.00	15	7.5	\$ 105,000	\$ 73,500	\$ 52,500	\$ 42,000	\$ 10,500
PLEASANT DRIVE - north	\$ 161,250.00	16	7.8	\$ 75,000	\$ 52,500	\$ 33,750	\$ 30,000	\$ 3,750
CLEVELAND ST.	\$ 153,750.00	17	7.8	\$ 102,500	\$ -	\$ 51,250	\$ 41,000	\$ 10,250
MAY CT. (C-D-S)	\$ 123,250.00	18	8.2	\$ 85,000	\$ -	\$ 38,250	\$ 34,000	\$ 4,250
WILLIAMS ST.	\$ 91,375.00	19	8.2	\$ 42,500	\$ 29,750	\$ 19,125	\$ 17,000	\$ 2,125
MAY CT.	\$ 217,500.00	20	8.3	\$ 150,000	\$ -	\$ 67,500	\$ 60,000	\$ 7,500
MAIN ST. - SOUTH	\$ 732,250.00	21	8.7	\$ 505,000	\$ -	\$ 227,250	\$ 202,000	\$ 25,250
ROBENS CT.	\$ 172,000.00	22	8.8	\$ 80,000	\$ 56,000	\$ 36,000	\$ 32,000	\$ 4,000
S. FRANKLIN ST. - Washington to Bellview (E + W)	\$ 698,250.00	23	9.0	\$ 570,000	\$ -	\$ 128,250	\$ 114,000	\$ 14,250
	<b>\$ 12,785,000</b>							

- In parallel with the focus on sewer system needs, a similar analysis was conducted on the water system main structure. This identified various issues in that system and on the same Village roads such as insufficient fire flow capacity in the event of emergency and reliability issues due to water main breaks. It would make sense to fix both pipe systems on target streets that are due for resurfacing at the same time to minimize long term investment and operating costs.
- Much of the control systems, motors and filtration equipment in use at the sewer and water plants is original equipment from when the plant was built in 1972. This equipment is at or very close to the end of its useful life. This results in increased operating cost, mainly higher electrical power usage, and maintenance costs more frequent equipment break downs and higher cost repairs. Upgrading this equipment will provide multiple layers of efficiency and performance benefits as well as some operating cost advantages in the long run.

**What alternative approaches were considered when determining this solution options to this Village sewer and water system infrastructure challenge?**

- The alternative options are actually few, because the largest root cause element is the aging deteriorated water and sewer main and distribution system in the Village that must be upgraded. This is an unavoidable Village responsibility.
- For the sewer plant infrastructure upgrades, we explored the potential of combining plant infrastructure with other municipalities and possibly abandoning the Village's plant. No nearby communities have sufficient capacity and even if they did, the capital cost of connecting (e.g. installing major sewer mains and pumping capability) exceeds the costs of fixing and upgrading our current system. Even if consolidation with another community were possible, the Village would still be left with the deteriorated water and sewer main system inside the Village which would still require rehab investment and ongoing operation and maintenance at Village expense. Further we would be at the mercy of the community system we connect to with regard to the rates we pay for treatment. Currently and projected rates from Northeast Ohio Regional Sewer District. (NEORS) are higher than the Chagrin Falls rates.
  - As an example, one alternative option (that may seem practical to some) would be to consolidate with the NEORS. This was considered but quickly deemed impractical. The connection point would be in Shaker Heights, requiring the Village to construct a prohibitively costly large capacity sewer main to that point and the Village would need to install a major pumping capability to deliver flow to the NEORS connection point. Economically, this option would cost a multiple of the cost of correcting the existing Village system infrastructure, and the challenges to transit multiple communities (possibly some combination of Bentleyville, Moreland Hills, Orange, pepper Pike, Beachwood and Shaker Heights) with a major construction project to connect are highly unpredictable.

- The 2016 Citizens Financial Review Advisory Committee Report highlighted the mandated EPA requirement to expand Equalization tank capacity storage at an estimated 2016 cost of \$6.8M for the tankage facility alone. Proceeding with this option is a possibility that would solve the immediate EPA requirement. However, the downside that makes this option unattractive is that the Village would still need to fix the 100+ year old sewer and water main infrastructure which will continue to deteriorate. Using 2000's technology; underground piping has an engineer's estimated service life of 50 to 75 years. We are well past the life of piping installed in the early 20'th century. Implementing a plan to fix the water/sewer main system and plant systems on schedule over the next 10-14 years has the potential to meet all requirements and avoid the need to spend \$6.8M (probably more at today's costs) on an additional flow equalization tank.
- A more recently considered options for which we have confirmed EPA approval is to conduct specific corrective work on E. Washington as a pilot study to confirm the ability of sewer rehabilitation to reduce inflow and infiltration into the sanitary sewer collection system.
- At the WWTP plant site, there are options to expand peak flow capacity with specific equipment additions and upgrades, although EPA will have to approve all design changes. A Phase 1 plan could include tertiary filters that can handle the higher flow of 3.75 MGD (million gallons per day), increased from the current 3.0 MGD and eliminate the high volumes of backwash water generated by the existing filters that is restricting plant peak capacity. The combination of reducing I/I in the system and increasing plant peak flow capacity will greatly reduce if not eliminate the need for additional expensive equalization tank capacity. These options will be discussed tonight by our engineer and Ben Himes.
- Tonight's meeting will be continued on October 16 when we will discuss how all of these upgrades will be paid for while maintaining required Village capital expenditures in other areas.

CHAGRIN FALLS WWTP PROCESS UPGRADES - 10/10/2019

Process #	Process	*	**	Phase 3 - O&M + Efficiency Items	Further Study	Future	Notes/Efficiency
		Phase 1 - NPDES Compliance	Phase 2 - Expand to 3.75 MGD				
1	Raw Sewage Pumping						
	Valves and Appurtenances		X				
	Replace Motors, impellers & 1 New Pump		X	x			
	Influent MAG Meter		X	X			
2	Headworks						
	New Screening & Grit Removal		X	X			
3	Primary Clarifiers						
	Concrete Tank Repairs			X			
4	Aeration Tanks and Systems						
	concrete to waterline			X			
	New Rate of Flow Control Valves on Blowers			X			Potential efficiency item
	DO Probe and Controller			X			
	Fine Bubble Diffusers			X			Efficiency Item
5	Final Clarifiers						
	Concrete Tank Repairs			X			
	Bearing Seals (completed by village)						
5A	Return Building						
	Replace Pumps and Motors			X			
6	Tertiary Filters						
	Replace Traveling Bridge Sand Filters with Disc Filters	X		X			
7	Disinfection						
	Concrete Tank Repairs			X			
	Replace Hypo with UV	z	X	X			
8	Plant Water System						
	Replace Pumps, valves and Appurtenances, Add Filter			X			
	Expand where feasible (supply to new HW)			X			Expand where feasible
9	Aerobic Digestion						
	Concrete Tank Repairs			X			
	Building Masonry Repairs			X			
	Replace Blowers - Posi/VFD's			X			Strictly Energy Consideration
10	Digestors - Solids Handling				X	X	Consider Regional approach
11	Site Work						
	Street Sweepings storage in Sludge Beds			X			
	Pavement, sidewalk, etc. Repairs			X			
	Drainage Improvements			X			
	Piping, Valves, utilities			X			
12	Electrical (2)						
	Replace Switchgear		X	X			
	400 kw Standby Generator	z	X	X			
	SCADA		X	X			
	General Upgrade		X	X			
13	General Upgrade						
	HVAC			X			
	Architectural			X			
	Administration Building Addition 2,000 SF					X	
	New Vehicle Maintenance Building (80x75 Ft)					X	
14	Miscellaneous						
	EQ Diversion Automation		X	x			
	EQ Grit Removal		X	X			
Other	E. Washington Street Sanitary Sewer		X	z			
*	Permit Requirement to Commence Construction by 12/31/2020, Complete by 11/1/2021						
**	Commence Construction by 12/31/2020, Technically met by Starting E. Washington Sewer as part of "Integrated Approach" to SSO Elimination [Plant Wet Weather Expansion plus I/I Reduction]						



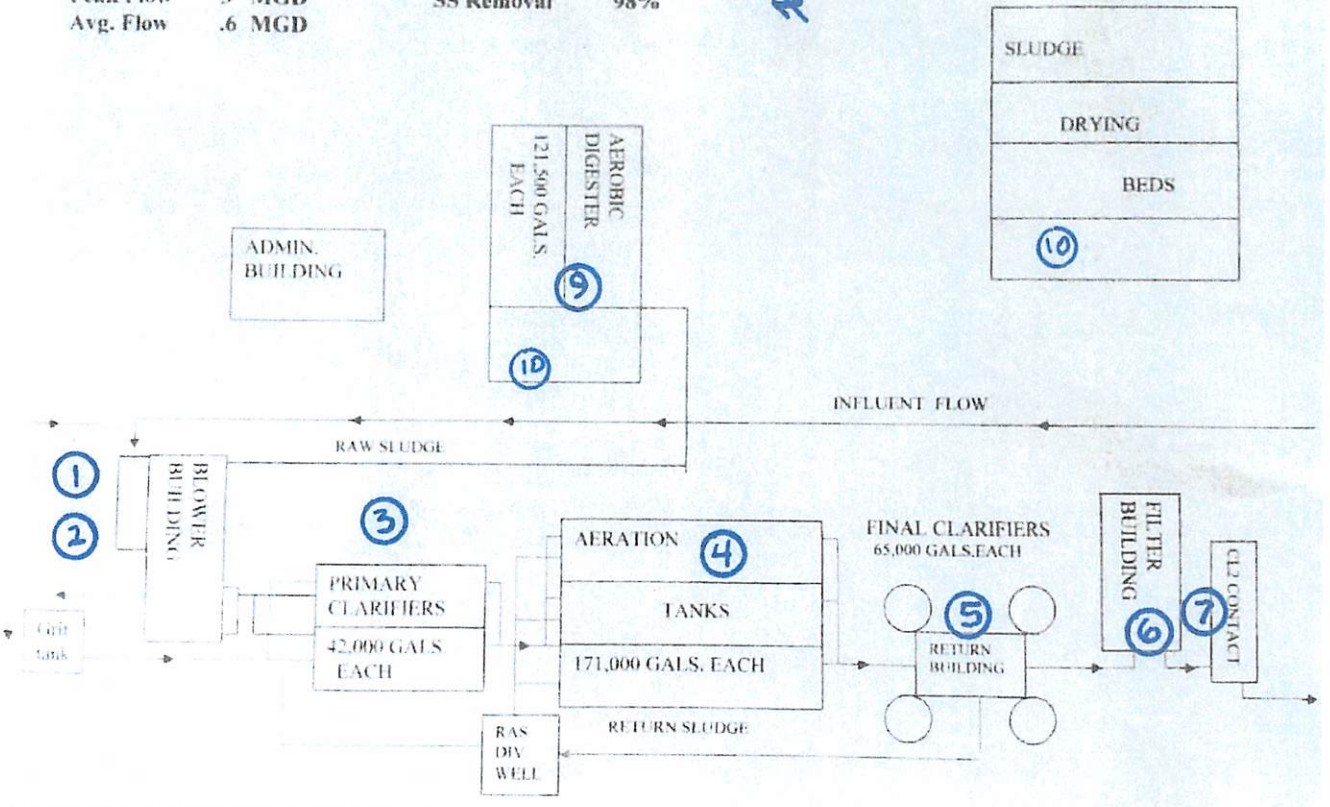
RIVER

### Chagrin Falls WWTP

Design Flow 1 MGD  
 Peak Flow 3 MGD  
 Avg. Flow .6 MGD

BOD Removal 97%  
 SS Removal 98%

MEADOW LN.



RIVER