



CITY OF WASHINGTON, ILLINOIS

Committee of the Whole Agenda Communication

Meeting Date: 10-16-2023

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Agenda Item: Sewer Treatment Plant 1 – Wet Weather Storage Discussion

Background: At the October 9, 2023, Committee of the Whole and Special Council Meetings, the City Council asked for discussion on the possibility of a wet weather storage basin at the site of decommissioned Sewer Treatment Plant 1 (STP1). The wet weather storage was a part of the 2005 Facilities Plan that laid out the future for both STP1 and Sewer Treatment Plant 2 (STP2). Strand had been selected to perform the Phase 2A contract and while rebuilding from the tornado, the City used its previous QBS submittals to reaffirm to continue using Strand as their sewer engineer and CMT as their water engineer.

As Strand was designing Phase 2A, they were also doing a more in-depth look at the sanitary sewer system. They were aware of the capacity issues of both the interceptor sewer as well as the wet well/influent pumping station at STP2. The Facilities Plan update for the Phase 2A funding then showed a change from the wet weather storage basin to a new interceptor. Shortly after the Facility Plan update was completed, a consent order was issued and the tornado occurred in 2013. The paper trail between 2013 and 2016 gets extremely limited due to the recovery efforts and its magnitude of work. In 2016, the Council approved to move forward with Strand to design the interceptor sewer, which has since been called the Farm Creek Trunkline.

I&I Discussion:

During the loan application for Phase 2A, the City shared with IEPA that the City had considerable amounts of I&I. It was also considered more cost effective to convey and treat than to attempt to locate and eliminate. IEPA was apparently in approval as they accepted the Phase 2A loan application and approved of the project summary. The City has subsequently smoke tested the North Rolling Meadows subdivision and the older east side of Washington. With those results, we were unable to find a way to mathematically reduce the I&I to a point where our current trunkline can handle the flow.

It has been mentioned that the City should take care of its own system before asking the citizens to do any repairs. The city has been working on lining sanitary sewer for the last five years with between \$150,000 and \$300,000 budgeted per year. While the lining is more structural, it does create essentially a new pipe inside the old pipe. It does not do anything with private lateral connections to the main or the laterals themselves. The City has lined nearly every main that showed up as municipal defects in the Robinson report. While we have taken care of the mains that showed smoke, it is likely that another round of smoke testing would show other mains smoking as well. The smoke may have only found large cracks, offset joints or simply just areas where the soil allowed the smoke to surface. We have lots of older pipe that has looked significantly worse than areas that showed smoke. Simply put, older pipes just gets older every day.

Staff looked at 2024 bid prices and at all pipes inside the smoke testing area that are not concrete or PVC. These pipe materials are newer and should not be making significant contributions to the I&I. It

will cost the City over \$7.6 million (2024) to line the sewer constructed of the older materials (clay and Orangeburg) most likely to be in a condition to show large I&I. This lining does not include laterals or T liners for the lateral connections to the main. Including T liners while lining the main would likely double the cost and maybe even triple it.

Staff has been prioritizing lining areas that are in tough-to-reach areas like backyards, under houses, areas that showed smoke during smoke testing, and areas that staff has found to be in the worst condition during televising efforts.

It was shared during the I&I discussions of the past that there is likely just as much or more I&I coming from the private side. The older part of town has aging sanitary laterals that are mostly constructed of clay and Orangeburg pipe. Construction standards used to allow foundation tiles to be tied directly into the sanitary sewer. Residents have tied yard area drains into the sanitary sewer. There are downspouts and sump pumps connected. There are outdoor stairwell drains connected. Robinson's report laid out a lot of the easily locatable issues, but they did not find everything. Communities that can remove 15% of I&I are happy, and even the best community has not removed 40%. As a city that is approaching a bicentennial, older, outdated infrastructure is expected, which is continually falling in disrepair. That infrastructure followed the design guidelines for that era that have since been shown to be problematic.

If a home is older than the mid 1950's and does not have a sump pump, past construction practices show it is extremely likely that the foundation/footing tile is tied to the sanitary sewer. This could be outside the home or inside the home near a floor drain. The fix is to dig down to the tile, disconnect it from the sanitary, route it to a newly installed sump pump, and discharge it into the yard. The connection points might be in the middle of a finished basement, under nice landscaping, or even under decks. Removing some I&I is healthy for the system, but we have discussed in the past that enough cannot be removed to solely consider I&I removal as a solution to the undersized trunkline.

Storage Discussion:

The wet weather storage option could act as a sanitary sewer detention pond to store the I&I and then allow it to release back into the sanitary sewer and get treated at STP2. The question remains about how many millions of gallons will it need to store a specific rain event and whether the wet weather storage would actually fit on the property. How big of a storm would it need to handle? What would happen if we were to exceed that volume? Would we need to build a contact chamber similar to the basin at STP2 for direct discharge to the creek?

A quick calculation (Flow meters 7+8+9 – the bottleneck pipe capacity for 4 hours) from the August 2016 rainfall data showed that storage of 1.5 million gallons is needed for that year rain event in 2016. The rain event in 2016 is less than a 2-year event in 2023. There is no doubt that the wet weather storage would need to hold more than a 2-year event. The 2-year event is just the data we have to give reference to.

A lagoon does come with some drawbacks. It does not sit wet all the time, but when it does fill and the water recedes, there will be sewage that gets left in the grass of the bottom and the property does sit adjacent to three residential backyards. However, these homes were adjacent to a treatment plant in the past. Lagoons are also extremely difficult to mow and maintain without rutting or damaging the bottom. This wet weather storage basin should sit dry more often, so the maintenance may not be as difficult.

Existing Trunkline Discussion:

While the trunkline condition is currently unknown, it is undersized for the flows that get to it and any extra flows currently find their way into Farm Creek. If the wet weather storage allows the sewer itself to be kept in service, staff will need to plan to have it televised and eventually lined. There would be considerable maintenance and erosion control work needed to be done along the existing trunkline where the pipe or manholes are potentially exposed to the flows or creek debris. The trunkline currently has around 19 creek crossings and about 13 manholes that are either in the creek itself or along a bank that would need protected.

There was a pipe exposed in the creek on Jack Pudik's property in 2004. Mactec was consulted to provide a design for armoring the pipe with riprap (much like a riffle). Since the rock was above the streambed, a hydraulic model was needed to show whether the stream would increase the 100-yr floodplain by 0.10 feet. Since this simple armor job was going to increase the profile by 0.14 feet, a flood easement was needed from the upstream landowners and approval was needed through the Army Corp.

Additionally, Surveyors will need to stake the existing easement and it will likely need to be revised to fit the trunkline, as there are concerns the trunkline gets outside of the easement in areas. To get in to do the maintenance on manholes, televising, and lining, we will also have to do tree removal throughout our easement along the trunkline for access and to make sure we don't have cover issue where the pipe is shallow. Tree removal can likely only be done in the winter months due to the Indiana Bat habitat, which also coincides with hunting season.

Relief Sewers:

Hamilton proposed two relief sewers that could increase the capacity of the trunkline. While it does not increase the capacity enough by itself, it may be able to be done in coordination with the efforts to reduce the necessary size of the wet weather storage. The first relief sewer that is installed on the STP1 will need to be designed as to not impact the wet weather storage footprint. It is currently shown cutting through the property, which is exactly where the storage would need to go. It tracks through wetlands, the 100-year floodplain, and onto the Pudik Property. However, its location on the Pudik property is likely in the existing easement. The second relief sewer cuts through three private properties (two owners) that includes a well landscaped backyard area and forest/wetlands similar to that of all of the reviewed alternatives.

Scheduling:

The wet weather storage option would not be designed in time to get into line for funding in 2024. If the feasibility study takes six months with flow monitoring data being done in the Spring/Summer, it will likely not be concluded until the fall of 2024. If the feasibility study bears fruit and this direction is chosen, a final design contract would need to be passed and design work would need to be significantly complete so that a rate study could be completed to show how an IEPA loan would be funded. Staff has reservations in believing this would be all completed by March 2025 to get in line for funding. The best case is to submit for funding in 2025 and being chosen for funding in 2025, but the more realistic likelihood is not getting selected in the first year and getting selected in the second or subsequent years. If we miss the funding in 2025, which is extremely possible, we would submit for funding in 2026 with likely construction in 2027 or later.

Fiscal Impact:

Staff was requested to provide a budgetary estimate to perform the feasibility study for the wet weather storage. Staff estimates this cost at \$50,000.

Staff has only budgeted \$75,000 for Phase 2B engineering.

For future construction reference only, the rough construction cost of a 10-million-gallon wet weather storage basin with a pump station would be around \$5-6 million. Design engineering would likely sit around 10% of the estimated construction cost.

Hamilton estimated the cost of the relief sewers to be around \$1.5 million. The relief sewers would need to be surveyed and designed. A 10% engineering cost would add another \$150,000.

Staff estimates the cost to televise the trunkline at \$100,000. An estimate to line the entire trunkline sewer around \$3-5 million. There is a large uncertainty on what by-pass pumping would cost and it's likely to be half the contract. This by-pass pumping cost would certainly want to be considered if partial lining versus full lining were to be considered.

Erosion control armoring for the existing trunkline will be in the hundreds of thousands of dollars and potentially as much as \$1 million with hydraulic modeling and Army Corp permitting likely involved when working inside the 100-year floodplain.

Action Requested: Staff requests further discussion on the wet weather basin alternative and direction for staff to pursue.