

# City of Erie Stormwater and Sewer Improvement Project Report and Summary

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City of Erie  
Public Works Department  
Charles R. Zysk, Director



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# Stormwater

## Overview

The Environmental Protection Agency defines stormwater as “runoff (that) is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, oils, and dirt/sediment that can harm our rivers, streams, lakes, and coastal waters.” The City of Erie stormwater system consists of 500 plus miles of pipe and lines. Segments of the stormwater systems are over 100 years old, with some lines being installed in the late 1800s.

Stormwater management is essential to protect the City of Erie’s community health and the environment. Many streams contribute to the stormwater system that run through the Erie Region. The most well-known of these creeks or streams are Mill Creek, Cascade Creek, and Garrison Run. The Stormwater system itself contains additional run-off from the region; all contributing to the overall environmental health of Presque Isle Bay and Lake Erie.



**This is a view from Chautauqua Park, located in the City of Erie. From this vantage point, a resident can see the end of the Presque Isle Peninsula where it leads into Lake Erie. Chautauqua Park is located on Lakeside Drive in Erie, Pa.**

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The following report includes seven projects that are direct, priority needs of the City of Erie's stormwater system. Included in the description of each project are estimated costs, potential neighborhood impacts, improvement descriptions, anecdotal evidence, and photographs of impact.

## **Projects:**

**The following are projects that have been identified by the Department of Public Works that have a direct and immediate need for repair, re-lining, capacity relief, or replacement.**

### **Garrison Run Rehabilitation Project**

Garrison Run is located on the foot of East 5<sup>th</sup> Street, adjacent to the Frontier Lumber business. Most recently, in July 2021, the stormwater pipe leading to the outfall of Garrison Run, experienced a catastrophic failure. A sinkhole occurred on Frontier Lumber's property, and a residential property located on East 5<sup>th</sup> Street experienced significant basement damage. Below is a picture of the sinkhole that occurred:



After inspection, it was determined that the area where the clay tile pipe (featured in following pictures) abutted to the corrugated metal pipe suffered from severe erosion over the years. This could have resulted from general rust and grout failure along the clay tile. The clay tile (installed around 1917) is double-lined, which when combined with grout failure invites water leaking through the joints.

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Below are pictures of the clay tile, these pictures also highlight the massive size of the pipe. This pipe is 96 inch (8 foot) and was inspected after the failure by the City of Erie Sewer crews and the Bureau of Engineering:



The above pictures highlight the deterioration of clay pipe and rust throughout the life of stormwater pipes. When grout erodes from the tile, this allows stormwater to seep through, causing cave-ins and property damage. In September of 2021, Garrison Run's outfall and pipe leading to East 5<sup>th</sup> Street is going to be replaced with a combination of concrete and plastic pipe. The process is intricate and involves slip-lining pipe into the existing piping structure. After this is complete, grout foam will be spread through the gap in the pipe to solidify the system.

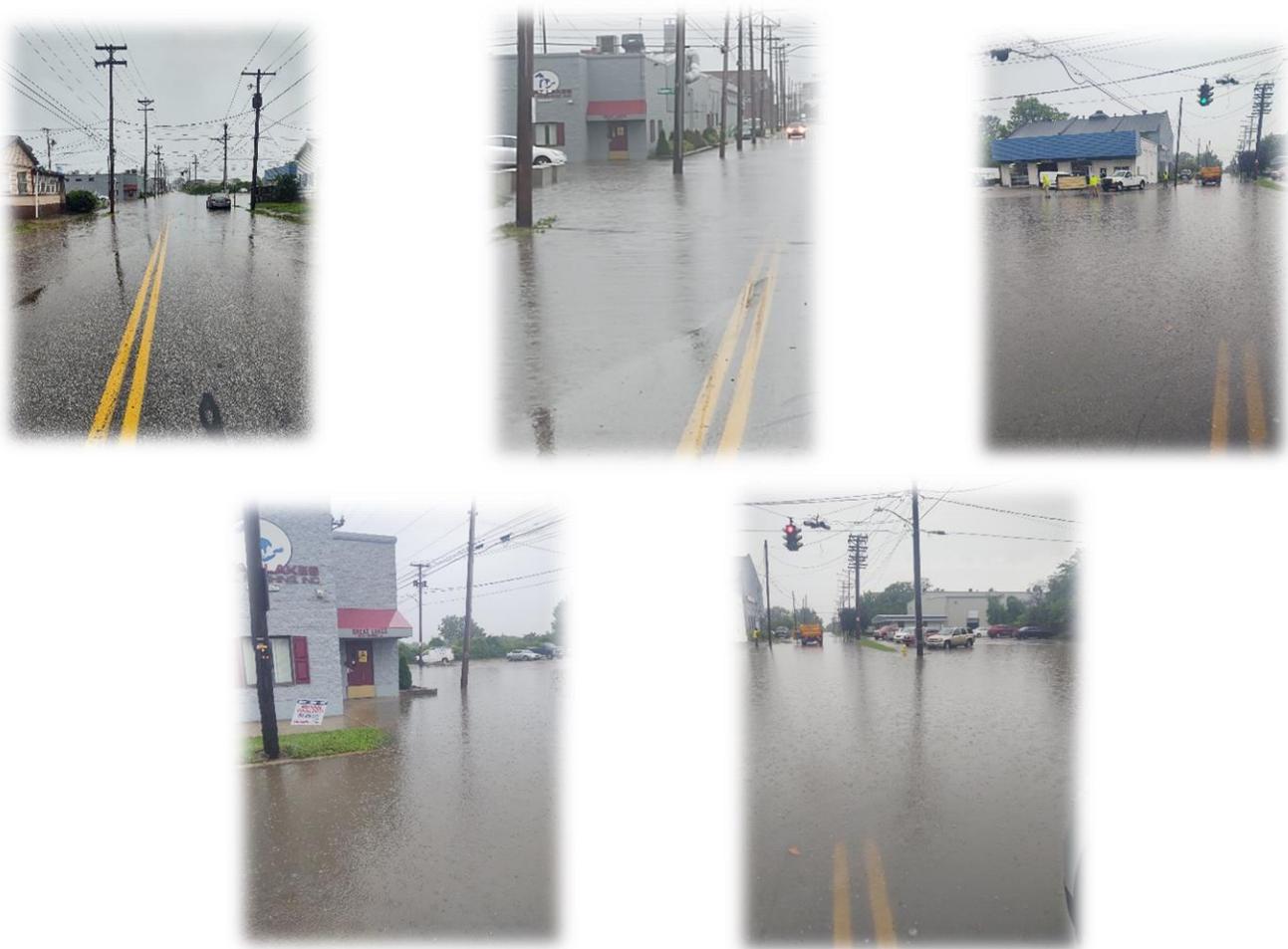
In addition to this work, there is a direct need to extend the pipe re-lining from East 5<sup>th</sup> Street to East 12<sup>th</sup> Street. This rehabilitation project would replace pipe that is over 100 years old and improve the safety of all residential properties that are above this stormwater system. The Garrison Run Rehabilitation Project includes re-lining or replacing 3,086 feet of 96-inch pipe, connecting an estimated 54 in-feeds, 7 manholes, one inlet, and one punch-thru.

The total estimated Garrison Run Rehabilitation Project cost is \$5,248,776.

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## **Cascade Creek – West 16<sup>th</sup> and Cranberry Rehabilitation**

This area has experienced flooding and capacity issues for years. City of Erie Sewers has attempted to incrementally address it over the past few years, but without total funding, there is only so much that can be done. The main goal of this rehabilitation project is to replace two 24-inch tile storm sewers on West 16<sup>th</sup> Street, between Cranberry Street and the Cascade Creek Tube. There will be approximately 750 linear feet of large diameter storm sewer, along with sewer appurtenances (associated components), installed within this project scope. This rehabilitation project will replace deteriorated tile pipes, reduce flooding in upstream neighborhoods, and alleviate storm sewer overloads.



The total estimated cost of the Cascade Creek – West 16<sup>th</sup> and Cranberry Rehabilitation Project is \$235,100.

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## **Lower Myrtle Street Storm Sewer Rehabilitation Project:**

The lower Myrtle Street stormwater area is another portion of the system that needs direct rehabilitation. The goal of this project is to replace two 36-inch tile storm sewers on Myrtle Street, between West Front Street and West 5<sup>th</sup> Street. There is approximately 3,500 linear feet of large diameter storm sewer, along with appurtenances (chambers, connections, etc.), that will be replaced. The system in this area is unique. Given that the lines are considered twins, and due to the age, both must be rehabilitated in unison. It would not be cost-effective and would be structurally-impossible to try to fix one at a time. Sewer crews and Engineering have conducted television inspection of these storm sewers, which has consistently revealed significant issues with structural integrity of the pipes. The condition of these two main pipe lines has deteriorated at a much faster pace in the past 10 years. The remaining life expectancy of these lines is minimal, and the potential exists for a major failure. The construction project will provide a permanent solution and eliminate the City's on-going maintenance and repair costs.

The following pictures are from 2018. Each showcases the deteriorated conditions of the stormwater lines located on lower Myrtle and Front Street:



The total estimated cost for the Lower Myrtle Street Stormwater Rehabilitation Project is \$1,126,800.

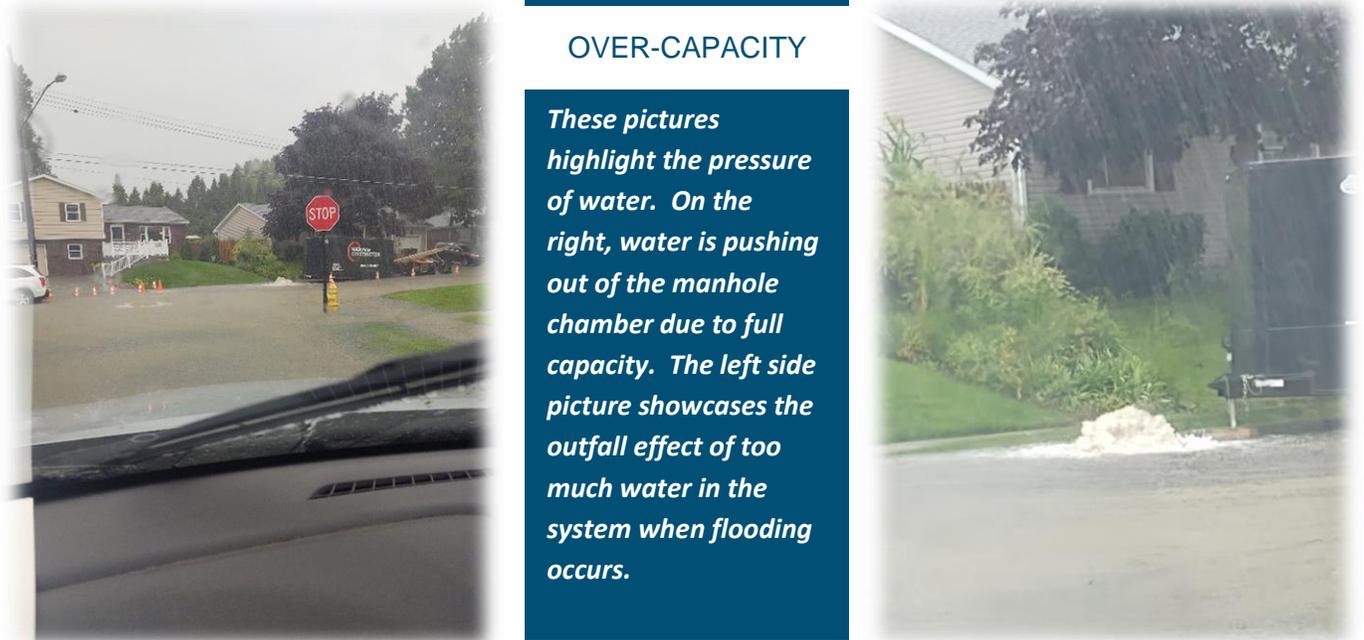
## **Southeast Erie Stormwater Improvement Project:**

The scope of the Southeast Erie Stormwater Improvement Project is large and intricate. It would be the intention of City of Erie Engineering to solicit consultant proposals to study, present alternatives, perform preliminary engineering, and provide final design services to improve the stormwater system in southeast Erie. Possible construction projects may include the construction of storm relief sewers, upsizing of existing pipes, and/or the installation of stormwater retention/ detention systems.

The overall goals of the project include:

- 1) Reduce flooding in residential neighborhoods
- 2) Improve the conveyance of upstream flows
- 3) Alleviate storm sewer overloads
- 4) Improve the existing drainage system

Below are pictures from July 2021 that provide a visual representation of the capacity issues that occur in Southeast Erie during large rain events:



The total estimated cost for the Southeast Erie Stormwater Rehabilitation Project is \$2,979,880. Almost 8,000 feet of stormwater pipe, 20 manholes/chamber, 10 connections, 10 inlets, and associated components will be rehabilitated through this project.

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## **Foot of Sassafras Stormwater Improvement Project**

At the foot of Sassafras Street, between West Front Street and the Bayfront Parkway, there are capacity issues when heavy rain events occur. Manhole covers have lifted off their chambers and floated, which is a major safety concern and indicates flow issues. The existing configuration results in flooding and surcharging during heavy rain events. This project will re-route approximately 200 linear feet of large diameter storm sewer. A proposed pipe replacement would increase capacity and alleviate flow issues. The rehabilitation would include re-routing approximately 200 foot of 48-inch PVC replacement pipe and two chambers. The proposed work will provide both hydraulic and capacity improvements to the existing system.



*The above picture was taken at the City of Erie's Bayview Park.*

The total estimated project cost is \$80,000.

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## Sanitary Projects

Sanitary Sewers are different from Stormwater Sewers. Sanitary Sewers discharge waste water and flow to the City of Erie's Waste Water Treatment Plant located on Port Access Road. The City's Waste Water Treatment Plant (WWTP) is a true regional asset and a significant revenue-generator for the City of Erie. The WWTP is also essential to the environmental health and longevity of Erie's Bayfront, Presque Isle Bay, and Lake Erie. All of the geographical locations provide economic, residential, and recreational impact to the City of Erie and Erie Region as a whole. The City of Erie takes great pride in the treatment of the water that is discharged to the WWTP and Stormwater System. Having limited financial resources makes this task cumbersome at times, but successes are still achievable. Perhaps the greatest representation of success is the event "Swim Across the Bay". An event like this could have never taken place 15 to 20 years ago, but now the healthier waters provide an avenue for such events.

The following projects highlight certain sanitary system upgrades that are direct, priority needs for the City of Erie's system. It is the hope of the City of Erie to utilize American Relief Funding to pay for these projects, but it is important that the Department of Public Works highlight the various, intricate needs of the sewer system as a whole for a long-range view of the impact and the potential of each project.

### **West 8<sup>th</sup> Street Corridor Sanitary Sewer Replacement Project**

West 8<sup>th</sup> Street is one of the most well-known problem areas in the City of Erie. This problem is rather intricate. The pipe, which was installed in the 1890s, is deteriorating, and this erosion is causing profiling of West 8<sup>th</sup> Street. In recent times, the City has performed numerous point repairs on these lines. The lines have open joints and structural problems and are susceptible to additional failures and repair costs. This cause and effect occurring beneath the foundation of the road creates a visual reminder above ground on the pavement and is negatively impacting taxpayers. This project will focus on the separation of the West 8<sup>th</sup> Street storm sewer on West 8<sup>th</sup>

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Street from Cascade to Liberty Streets. This storm sewer is a 24-inch tile line. Due to this being a combined sanitary sewer/stormwater, it would be Public Work's intention to utilize the appropriate funding components for the different scopes (stormwater fees and ARP). Approximately 730 linear feet of 15-inch tile, 1,110 linear feet of 24-inch tile sanitary mains, and associated appurtenances will be replaced.

This project is necessary to:

- 1) Eliminate costly street flooding on West 8<sup>th</sup> Street.
- 2) Rebuild the sanitary and storm sewer. This combined sanitary and storm sewer was built in 1893 and is well past its useful life and in need of a major rebuild.
- 3) Resolve the issues in a comprehensive way. This specific sewer line has been repaired numerous times due to high flows and open joints in the pipe, but the problems persist because we could not attack the root cause.
- 4) Re-pave 8<sup>th</sup> Street. This project will enable the City of Erie to pave 8<sup>th</sup> Street and permanently address road repair issues. This project has been delayed for a substantial time period because the City of Erie's Public Works Department knew that any money that was invested in it would only temporarily alleviate the problem and would be a poor use of funds due to the fact that the underlying issues would remain and the problems would re-occur.

Below are pictures that showcase the cause and effect of the condition of the sewers on the pavement surface:



Both pictures are from West 8<sup>th</sup> Street. The left-side picture shows the deterioration of the street and right-side picture shows point repair cuts.



The total estimated cost of this project is \$425,600.

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## **Chautauqua Boulevard Sanitary Force Main Installation Project**

The City of Erie Sewer System has a network of lift stations that assist the flow of waste water to the WWTP. Located throughout the sewer grid, some handle more flow than others. On Lakeside Drive, two Lift Stations are situated. One is located at Chautauqua Park and the other located on the foot of Cranch (on City of Erie-owned property).

The goal of this project is to install a dedicated force main from the Chautauqua lift station to the East Side Interceptor. The work will take place adjacent to Chautauqua Boulevard, between Lakeside Drive and East Lake Road. At present, the Chautauqua Lift Station pumps sewage to the Cranch Lift Station. This configuration results in the sewage being pumped two times. This project will eliminate the redundancy, thereby reducing associated maintenance and repair costs. Approximately 2,350 linear feet of 6-inch force main and associated appurtenances will be installed.



*Chautauqua Lift Station*



*Cranch Lift Station*

The total estimated project cost is \$403,550.

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## **Project Scope De-Briefing and Summary**

An investment in the City of Erie's Stormwater structure would have profound effects on the long-term viability of the system. The City of Erie relies on Lake Erie, Presque Isle, and the Bayfront for economical, recreational, and residential impacts. Perhaps, the City's greatest asset, the waterfront, needs to be a priority to protect for the future of the region. A stormwater management fee would enable the City of Erie to **directly** invest into the stormwater system. The Department of Public Works would be able to utilize immediate ARP funding to address the most pressing issues. It is vital to pass a re-occurring stormwater fee to enable us to establish and implement a long-term capital improvement plan to proactively address our aging stormwater infrastructure.

Fees of this nature are direct investments that residents can make, not only in their properties, but in the future economic vitality of the City of Erie. This has a direct economic impact and the potential for enhanced property values.

The projects listed throughout this report, represent the most direct needs that would be addressed immediately if funding is provided. Public Works believes these projects would address decades' worth of deterioration and would allow the City of Erie to invest the stormwater management fee into the continued health and maintenance of the system. Between ARP funding and potential Federal Infrastructure Money, these needs will be able to be addressed correctly without taking shortcuts due to lack of funding. Building a long-term plan for maintenance of the stormwater system would be generationally transformative for the City of Erie.

Additional projects not listed in this report include areas such as the walls of the Mill Creek Tube and Norman Way Bridge, along with countless others. The City of Erie would be able to improve all of the stormwater discharge sites from east to west that drain into the Lake and Presque Isle Bay. Obviously, it would not be possible to implement everything in Year 1, but a gradual, phased plan would be implemented with a true, realistic, expectation of completion that would attack the most concerning issues as soon as possible. A stormwater management plan would help eliminate land loss and erosion and secure better public access for City of Erie residents for decades into the future.

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## APPENDIX

- 1) Stormwater Management and MS4 Compliance
- 2) Map of Storm Sewer Needs and Impact Areas
- 3) Map of Sanitary Needs and Impact Areas
- 4) Estimated Budget and Project Scope

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## **MS4 Compliance**

The City must comply with a Municipal Separate Storm Sewer System (MS4) permit issued by the Pennsylvania Department of Environmental Protection (PA DEP). The permit, which is a requirement of the federal Environmental Protection Agency (EPA) Clean Water Act, authorizes the City to discharge stormwater to waters of the United States, subject to six minimum control measures. These measures include:

- (1) public education and outreach
- (2) public involvement
- (3) illicit discharge detection and elimination
- (4) construction site runoff controls (erosion and sediment control)
- (5) post-construction runoff controls (stormwater management facilities)
- (6) municipal operations pollution prevention and good housekeeping

The City submits an annual report to PA DEP to demonstrate implementation of the permit's requirements.

One of the main functionalities of a Stormwater Fee would be to increase the City of Erie's abilities to efficiently work within the compliance measures of the PA DEP. The City of Erie has taken steps to increase cross-department documentations, identify areas of improvement, hire a compliance project engineer focusing on MS4, and implement continuous improvement efforts. A fee of this nature would ensure the continuance of completing objectives, focusing on compliance, and exceeding the requirements.

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**Please see the attached map denoting Storm Sewer Needs with Impact Areas.**

- The green lines represent the actual projects and the shading highlights the impact areas.
- There is no green bar for the Southeast Erie Area since a specific project has not been identified.
- The impact areas for the Myrtle and Sassafras projects overlap. Thus, the blue and pink shadings are used.

**Please see the attached map denoting Sanitary Needs with Impact Areas.**

- The green lines represent the actual main lines of repair.
- The highlighted green lines, show the outfall effect of the projects and impact on the overall City of Erie neighborhood grid.

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**Please see attached Estimated Budget and Project Scope**