



CSO Annual Report for Calendar Year 2023

March 29, 2024

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1.0 Introduction

1.1 Purpose

The City of Peoria (Peoria) and the Greater Peoria Sanitary District (GPSD) are undertaking activities to reduce combined sewer overflow (CSO) discharges into the Illinois River to reduce water quality impacts and protect public health.

This annual report was prepared to share information with the public and document information required by Paragraph 77 of Peoria's CSO Consent Decree. This annual report documents the activities Peoria has undertaken in 2023 to reduce CSO discharges into the Illinois River. This report includes updates on CSO remedial measure projects, performance testing of installed projects, operations and maintenance (O&M) activities, and other items relating to Peoria's CSO reduction efforts and the Consent Decree.

Additional information is available at PeoriaCSO.com.

1.2 Background

The City of Peoria owns a sewer system comprised of both combined sewers and separate sewers that collect and convey flow to the Riverfront Interceptor (RFI). The RFI sewer runs parallel to the Illinois River and transports flow to the wastewater treatment plant (WWTP).

In areas served by separate sewers, sanitary flow and stormwater flow are conveyed through separate pipes. The sanitary flow is conveyed to the WWTP via the RFI, and a separate storm sewer system conveys stormwater runoff to receiving waters. In areas with combined sewers, stormwater runoff combines with the sanitary flow in the sewers, flows to the regulating structures and then the WWTP via the RFI.

During rainfall events, the flow in the combined sewers sometimes exceeds the system capacity. When this happens the regulating structures divert the excess flow to the Illinois River (river) via combined sewer overflow (CSO) outfalls. Peoria has 16 permitted CSO outfalls that discharge to the river. Twelve of the CSO outfalls are considered "active" while the other four are "emergency" CSO outfalls that rarely, if ever, overflow. The Peoria owns the CSO outfalls, combined sewers, and some of the separate sewers. GPSD owns and operates the RFI, WWTP, regulating structures, and some of the separate sewers. The attached Appendix A shows the combined sewer area and outfall locations.

1.3 History of CSO Reduction and Compliance

In May 1986, the Illinois Pollution Control Board (IPCB) issued an opinion granting the City of Peoria an exception to the CSO regulations in Title 35 of the Illinois Administrative Code. Peoria presented a comprehensive plan for reducing CSOs that was subsequently approved by the Illinois Environmental Protection Agency (IEPA), the state governing agency, pending the IPCB order. Final

design for the improvements began in May 1988, with construction of the first of the projects beginning in late 1989. Construction of most improvements was completed by December 1992, with final completion of the projects in July 1994.

In April of 1994 the U.S. EPA's Combined Sewer Overflow Policy (59 Federal register 18688) was enacted at the federal level. This federal policy requires CSO communities to develop a Long Term Control Plan (LTCP) to reduce CSO discharges and comply with the Clean Water Act requirements. Peoria developed its CSO LTCP in December 2008, and submitted a revised CSO LTCP in March 2010. Peoria's goal in completing the CSO LTCP was to develop a plan to achieve compliance with the terms and conditions of its National Pollutant Discharge Elimination System (NPDES) permit and to meet the objectives of the 1994 Combined Sewer Overflow Policy, the Clean Water Act, and the CSO control requirements of the Illinois Administrative Code.

From 2014 through 2020, Peoria and GPSD negotiated a Consent Decree with the U.S. EPA, IEPA, and United States Department of Justice (DOJ). The final Consent Decree has an effective date of March 4, 2021, and an 18-year period to implement CSO reduction projects. Both Peoria and GPSD will complete projects to achieve the CSO reduction goals in the Consent Decree. Peoria's specific compliance requirements are described in Section VI.A of the Consent Decree. GPSD's specific projects to reduce CSO discharges are described in Section VI.B.1 of the Consent Decree.

2.0 CSO Remedial Measures and Performance Testing

Peoria is implementing CSO remedial measures to reduce the frequency and volume of CSO discharges to the Illinois River. The Consent Decree allows Peoria flexibility to construct green and gray infrastructure CSO remedial measures via adaptive management throughout the implementation period.

Green infrastructure (GI) CSO remedial measures, such as permeable pavement, subsurface infiltration, and bioswales, are constructed within Peoria's combined sewer area upstream of existing inlets to capture the stormwater before it enters the combined sewer system (CSS). GI is often a cost-effective solution where the native soils have high infiltration capacity. Using GI also provides a more resilient and sustainable solution providing benefits such as reducing localized flooding, reducing pollutant loading to the river, and replenishing groundwater reserves.

Gray infrastructure projects are more traditional CSO remedial measures, such as in-system storage, storage tanks, storage sewers, or other sewer infrastructure, that are used to control wet weather flows. While these projects are effective to reduce CSOs, they do not provide the additional benefits of GI.

Most years, Peoria has CSO remedial measures projects in various stages, such as, planning, design, construction, and becoming operational. The below sections provide information on CSO remedial measures that are in progress or have been completed during the calendar year of this report and upcoming projects that will be started the following calendar year. The information provided in each section is summarized below.

- Section 2.1 Recently Completed CSO Remedial Measures discusses projects where construction was completed in the calendar year of this report and includes:
 - Project location, description, cost, and photos
 - Pre- and post-construction performance testing results
 - Implementation problems and resolutions
 - Volume of stormwater addressed and basis for performance estimates
- Section 2.2 In Progress CSO Remedial Measures discusses projects where construction was in progress during the calendar year for this report and includes:
 - Project location, description, and status update
 - Preliminary estimate of stormwater volume addressed based on the design
- Section 2.3 Upcoming CSO Remedial Measures discusses projects where construction will be started in the next calendar year and includes:
 - Project location and description
 - Preliminary estimate of stormwater volume that will be addressed based on the design
- Section 2.4 Future CSO Remedial Measures discusses projects in the planning stage during the calendar year for this report and includes preliminary project information.

2.1 Recently Completed CSO Remedial Measures

The section provides information on the CSO remedial measures that became operational within the past calendar year. Projects are considered operational once construction has been completed.

Table 1 | CD Requirements from Paragraphs 77.a.i, 77.a.iv, and 77.a.vi

CD PARAGRAPH	DESCRIPTION
77.a.i	Information on each CSO Remedial Measure (including Green Infrastructure, Gray Infrastructure, improvements to existing structures, etc.) that became operational during the preceding calendar year. For each project Peoria shall provide the description, location, Project ID, operational date, a representative picture or pictures of the completed project, amount of stormwater and wastewater captured, infiltrated, or otherwise addressed, the basis for all performance estimates, testing data, and a description of any problems in implementation and how those problems were resolved. Peoria shall provide the total actual capital cost of CSO Remedial measures that became operational during the preceding calendar year.
77.a.iv	Performance testing results for all previously completed GI CSO Remedial Measures.
77.a.vi	A representative picture or pictures of each Green Infrastructure project that became operational during the preceding calendar year taken between June 1st and August 31st.

2.1.1 Year 1 CSO Control Project

The Year 1 CSO Control Project (Year 1) utilized GI to reduce the amount of stormwater entering the combined sewer system in the Spring-Caroline sewershed. The project drainage area is bound by Glen Oak Avenue to the northwest, Cornhill Street to the northeast, Adams Street to the southeast, and Spring Street to the southwest. The project area and location of individual GI facilities are shown in Figure 1 and the project summary is provided in Table 2. The project reduces CSO discharges at the Spring-Caroline Street Outfall 003, the most upstream CSO outfall from the WWTP.

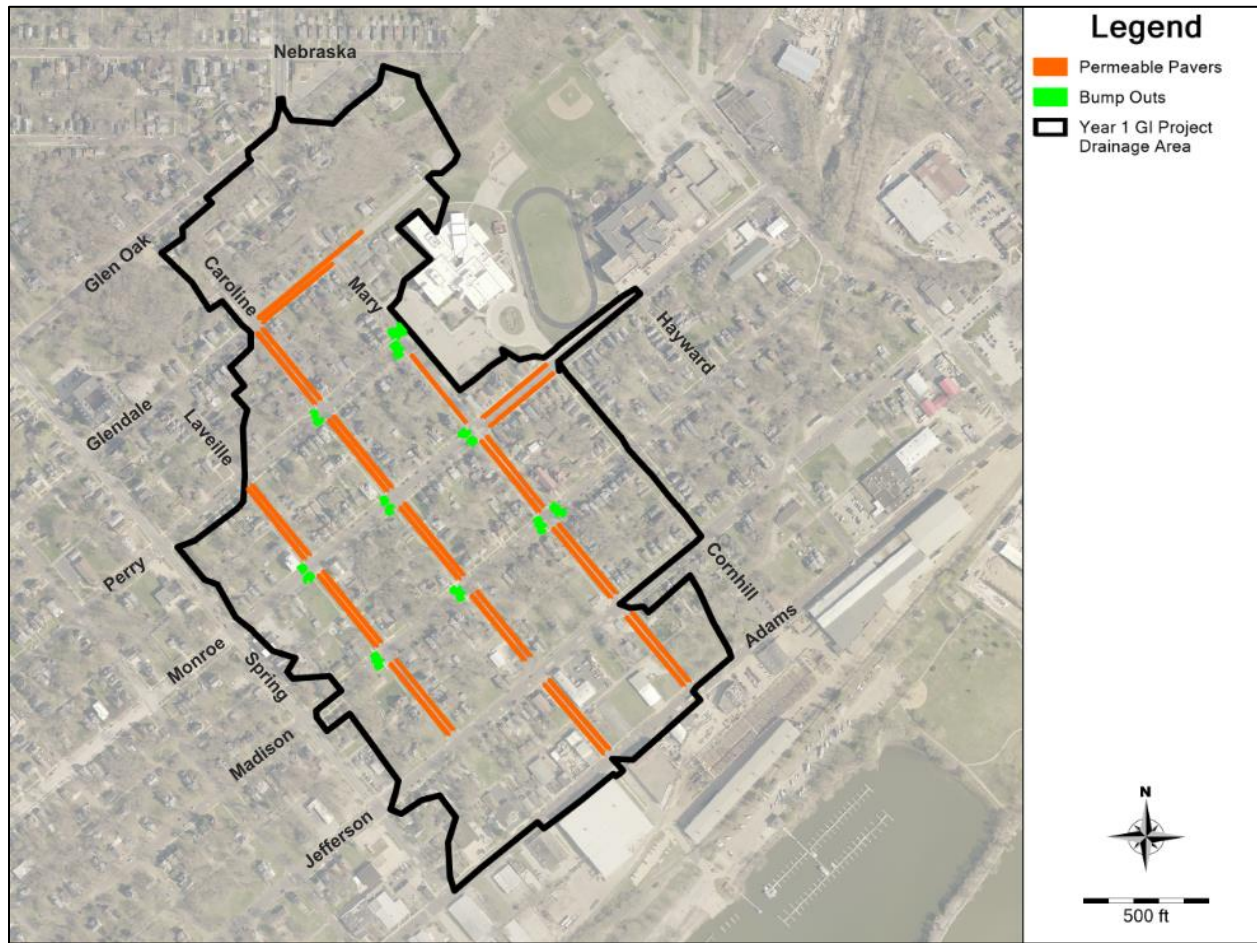


Figure 1 | Year 1 CSO Control Project Area and Locations of Green Infrastructure

Table 2 | Year 1 CSO Control Project Summary

Project ID	Year 1 CSO Control Project
Drainage Area Managed	65 acres
Total Actual Capital Cost	\$5,346,082
Permeable Pavers	14 blocks with permeable paver parking lanes
Stormwater Bump-Outs	20 stormwater bump-outs
Static Storage Volume	0.4 MG

The Year 1 project controls stormwater runoff from a drainage area of approximately 65 acres. The types of GI included in the project are permeable pavers (pavers) and stormwater bump-outs to subsurface storage and infiltration.

The permeable pavement constructed in the Year 1 CSO Control Project is PaveDrain paver blocks. The permeable pavers are located in the parking lane next to the curb and are 3-feet wide at the surface. The PaveDrain paver blocks have an open joint space and the blocks are approximately

6-inches thick and are underlaid by 3.5 feet of aggregate, resulting in the native soil interface being approximately 4 feet below ground surface. The width of aggregate at the native soil interface varies from 3 feet to 9 feet based on the drainage area managed, stormwater volume to be infiltrated, and the native soil infiltration rate. The permeable pavers are installed the full length of the block and, typically, on both sides of the street. The subsurface storage below the permeable pavers is interconnected across the street to equalize flow when stormwater bump-outs contribute stormwater.

The stormwater bump-outs constructed in the Year 1 CSO Control Project are a surface feature designed to collect and convey stormwater to the storage aggregate below the permeable pavers. Stormwater enters the bump-out through a curb cut, is directed to an inlet, then conveyed by storm pipes, and distributed by storm chambers to the storage aggregate below the permeable pavers. The stormwater bump-outs are not designed or constructed to have a surface infiltration component or storage below the bump-out; all flow is directed to the aggregate below the permeable pavers for storage and infiltration.

The Year 1 project includes more than 29,000 square feet (SF) of paver surface area on 14 blocks, 20 stormwater bump-outs, and over 37,000 SF of subsurface infiltration area. Co-benefits for the Year 1 project include 9,000 SF of sidewalks, 43 trees, 38 ADA compliant sidewalk ramps, 55 driveway aprons, 1.8 miles of concrete curb and gutter, and subsequent micro surfacing pavement in the project area.

Key project dates are summarized below.

- Design Work Order Issued: May 2021
- Bid Advertisement: December 2021
- Bid Opening: February 2022
- Construction Notice to Proceed: June 2022
- Construction Substantial Completion and Project Operational: June 2023

Figures 2 through 7 below show representative photos of the Year 1 project taken between June 1st and August 31st of 2023, the year the project became operational.



Figure 2 | Representative Photos for Permeable Pavers in Year 1 Project Area. Photo taken July 30, 2023.



Figure 3 | Representative Photos for Permeable Pavers in Year 1 Project Area. Photo taken July 30, 2023.



Figure 4 | Representative Photos for Bump Outs in Year 1 Project Area. Photos taken August 21, 2023.



Figure 5 | Representative Photos for Bump Outs in Year 1 Project Area. Photos taken August 21, 2023.



Figure 6 | Showing Inlets in Stormwater Bump Outs in Year 1 Project Area. Photos taken August 29, 2023.



Figure 7 | Showing Inlets in Bump-Outs in Year 1 Project Area. Photos taken August 29, 2023.

2.1.1.1 Performance Testing

Performance testing is implemented throughout the project life including pre-construction, post-construction, and long-term. The pre-construction performance testing is used to identify sites suitable for GI and determine the design native soil infiltration rate for planned projects. The post-construction performance testing is used to evaluate the performance and effectiveness of GI facilities after construction. Long-term performance testing is used to track changes in performance of existing GI facilities. Performance testing is also used to identify problems in green infrastructure implementation and identify maintenance needs.

2.1.1.1.1 Pre-Construction Performance Testing

Pre-construction performance testing is completed at or just below the native soil interface to determine the infiltration capacity for each green infrastructure facility. Pre-construction performance testing was completed for the Year 1 CSO Control Project using either a Guelph Permeameter, Compact Constant Head Permeameter, or lab permeameter. Figure 8 shows the pre-construction infiltration tests for the Year 1 CSO Control Project. The Year 1 project pre-construction infiltration test results are included in Appendix B.

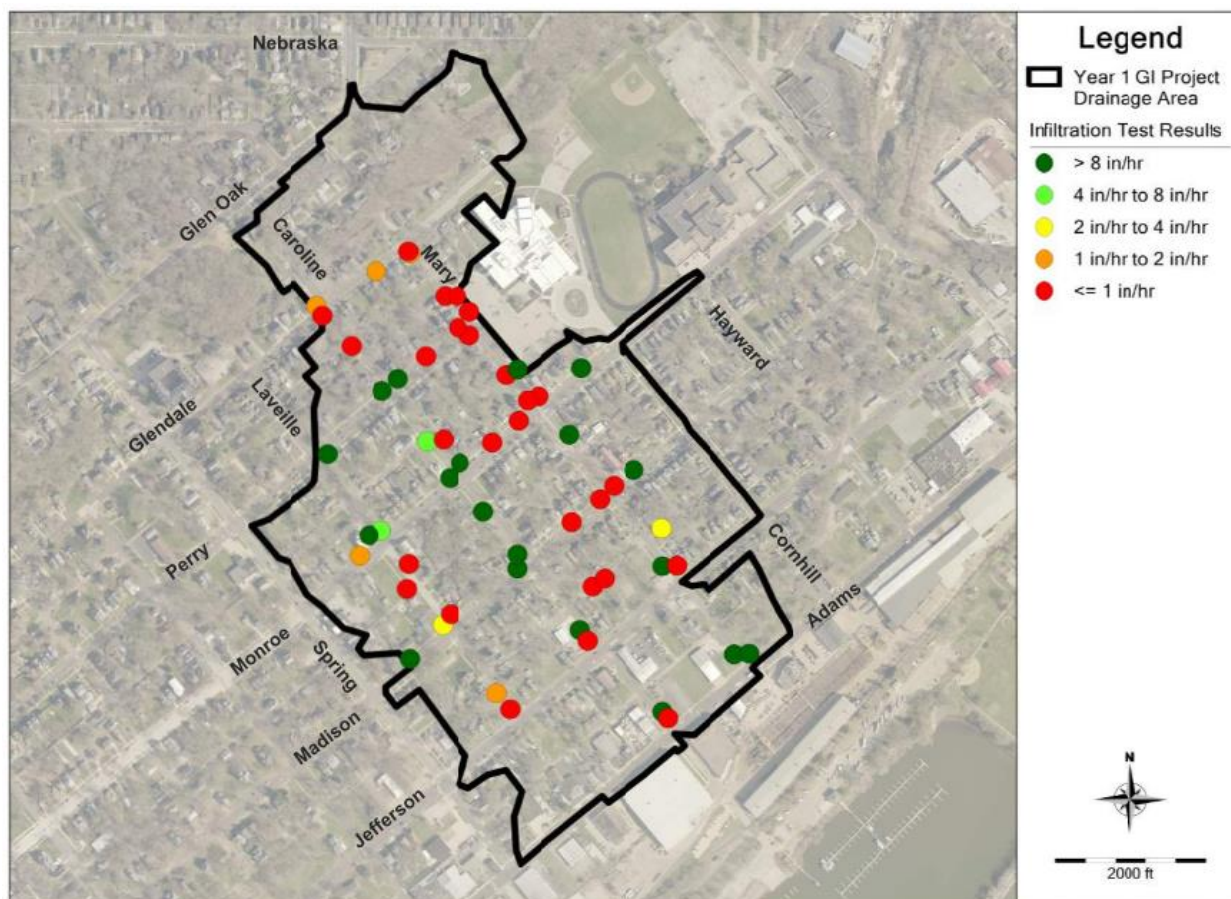


Figure 8 | Year 1 CSO Control Project Pre-Construction Infiltration Tests

2.1.1.1.2 Post-Construction Performance Testing

Post-construction performance testing was completed for the Year 1 CSO Control Project in 2023 following the requirements of the Consent Decree and the performance testing program described in the CSO Remedial Measures O&M and GI Performance Testing Plan (O&M and Performance Testing Plan). A total of 29,398 SF of permeable paver surface area and 37,756 SF of subsurface aggregate storage area below permeable pavers were installed. The subsurface area below permeable pavers manage flow collected by both the permeable pavers and stormwater bump-outs. The testing is required to be performed at a frequency of 1 test per 6,000 square feet of infiltration surface area. Therefore five permeable paver surface infiltration tests and seven subsurface infiltration tests are required for the Year 1 CSO Control Project. A total of seven permeable pavement surface infiltration tests and eight subsurface tests were performed, a summary of the results are included in Table 3 and Table 4, with the additional details of the tests and results included in Appendix C.

Seven permeable paver surface infiltration tests were completed using two different testing methods, ASTM C1781 and hydrant testing; the results are shown in Figure 9 and Table 3. The ASTM C1781 test is a standardized single ring infiltration test. The single ring test isolates the pavement test section creating uniform infiltration over the test area. Hydrant testing the pavement surface is

completed in combination with hydrant testing the native soil interface. The permeable pavement wetted area is measured following the test, and the surface infiltration rate is calculated by dividing the hydrant flow rate by the wetted area. The surface infiltration rate calculated from hydrant testing is conservative since it assumes uniform infiltration over the wetted surface area, whereas the field surface infiltration varies with distance from the hose. The ASTM C1781 tests are therefore considered to be more accurate and, as such, will typically be used in the future to evaluate permeable pavement pavers surface infiltration rates.

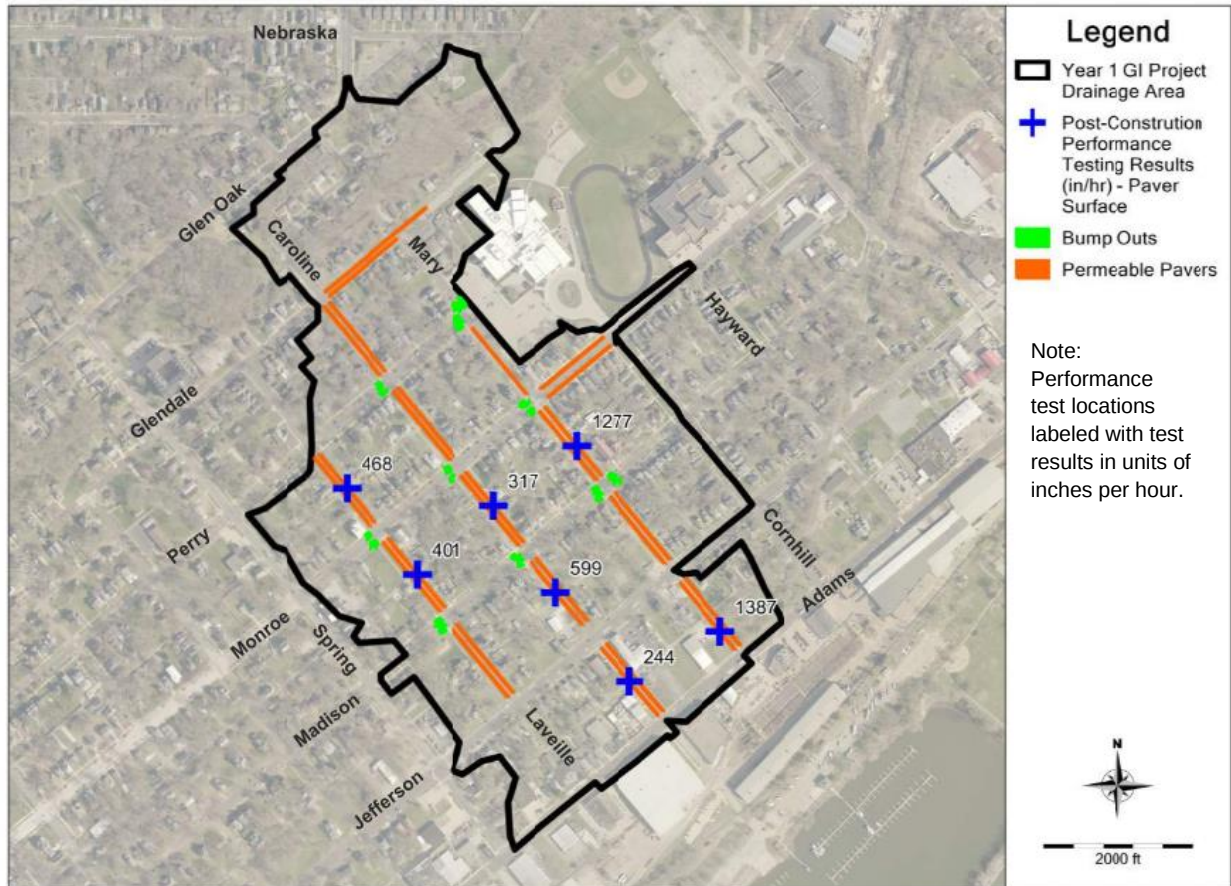


Figure 9 | Post-Construction Performance Test Results of Permeable Paver Surface

Table 3 | Post-Construction Surface Infiltration Tests Completed for Permeable Pavers in Year 1 CSO Control Project

Test Method	Facility ID	Design Rate ¹	Test Date	Test Result	Exceeding Design Rate?	Follow-up Actions
ASTM C1781 ²	Y1_PP-24	25 in/hr	8/28/2023	1277 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-27	25 in/hr	8/28/2023	1387 in/hr	Yes	Continue following O&M & Performance Testing Plan
Hydrant Test ²	Y1_PP-7	25 in/hr	9/26/2023	468 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-9	25 in/hr	9/26/2023	401 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-17	25 in/hr	9/27/2023	317 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-18	25 in/hr	9/27/2023	599 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-20	25 in/hr	9/26/2023	244 in/hr	Yes	Continue following O&M & Performance Testing Plan

¹ The permeability of new permeable pavement is typically hundreds of inches per hour. The design rate is set conservatively low to account for clogging and regeneration over the lifetime of the permeable pavement.

² The surface infiltration rate calculated from hydrant testing is conservative since it assumes uniform infiltration over the wetted surface area, whereas the field surface infiltration varies with distance from the hose. ASTM C1781 test is a standardized single ring infiltration test that isolates the pavement test section creating uniform infiltration over the test area and therefore provides a more accurate measurement of surface infiltration rates than hydrant testing.

Eight hydrant tests were performed to measure the infiltration rate of the soil below the GI storage, the results are shown in Table 4 and Figure 10. Five of the subsurface infiltration tests were performed as hydrant tests where the flow was directed to the permeable paver surface. For these tests, the native soil infiltration rate was calculated following procedures in the CSO Remedial Measures Operation & Maintenance and GI Performance Testing Plan. When an inlet or cleanout was available to observe the water level in the subsurface, the native soil infiltration rate was calculated from either the observed drawdown rate after the hydrant test ended or, if applicable, the steady state rate during the test. When an inlet or cleanout is not available for observation of the subsurface water level, the native soil infiltration rate was conservatively calculated from a mass balance and reported as greater than the calculated value.

Three of the subsurface aggregate storage tests were performed as hydrant tests where the flow was directed through a connected bump-out or inlet, to verify that water flows through the project as designed following procedures in the O&M and Performance Testing Plan. During the testing, a flow restriction was identified that prevented the completion of these subsurface infiltration tests. The flow restriction was identified when water was observed coming out of all connected inlets and cleanouts upstream of the subsurface storage within minutes of starting the hydrant test, well before the subsurface storage would have filled. The flow restriction is expected to be the storm chamber that is used to distribute flow into the subsurface storage since overflow was observed nearly simultaneously at all connected structures upstream of the storm chamber, but no overflow was observed from the subsurface storage downstream of the storm chamber. Storm chambers Y1_P-22A, Y1_P-32A, and Y1-P43, which were evaluated during the post-construction performance testing, were televised to help evaluate the issue. Additional investigation and corrective actions for the storm chambers are planned for 2024. Follow up performance testing will be completed after the corrective action is completed.

Table 4 | Post-Construction Subsurface Infiltration Tests Completed for Permeable Pavers and Stormwater Bump-Outs in Year 1 CSO Control Project

Test Method	Facility ID	Design Rate	Test Date	Test Result	Exceeding Design Rate?	Follow-up Actions
Hydrant Test Permeable Pavers to Subsurface Storage	Y1_PP-7	8 in/hr	9/26/2023	>9.5 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-9	2 in/hr	9/26/2023	12.4 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-17	8 in/hr	9/27/2023	13.3 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-18	8 in/hr	9/27/2023	13.6 in/hr	Yes	Continue following O&M & Performance Testing Plan
	Y1_PP-20	8 in/hr	9/26/2023	>8.4 in/hr	Yes	Continue following O&M & Performance Testing Plan
Hydrant Test Bump-Out Inlet to Piping to Storm Chamber to Subsurface Storage	Y1_PP-10	2 in/hr	7/21/2023	N/A ¹	Unknown	Perform corrective action and re-test
	Y1_PP-14	6 in/hr	7/21/2023	N/A ¹	Unknown	Perform corrective action and re-test
	Y1_PP-15	6 in/hr	7/21/2023	N/A ¹	Unknown	Perform corrective action and re-test

¹ The subsurface infiltration rate was not evaluated due to a flow restriction in the system, preventing flow from stormwater bump-outs from getting into the subsurface storage below permeable pavers.

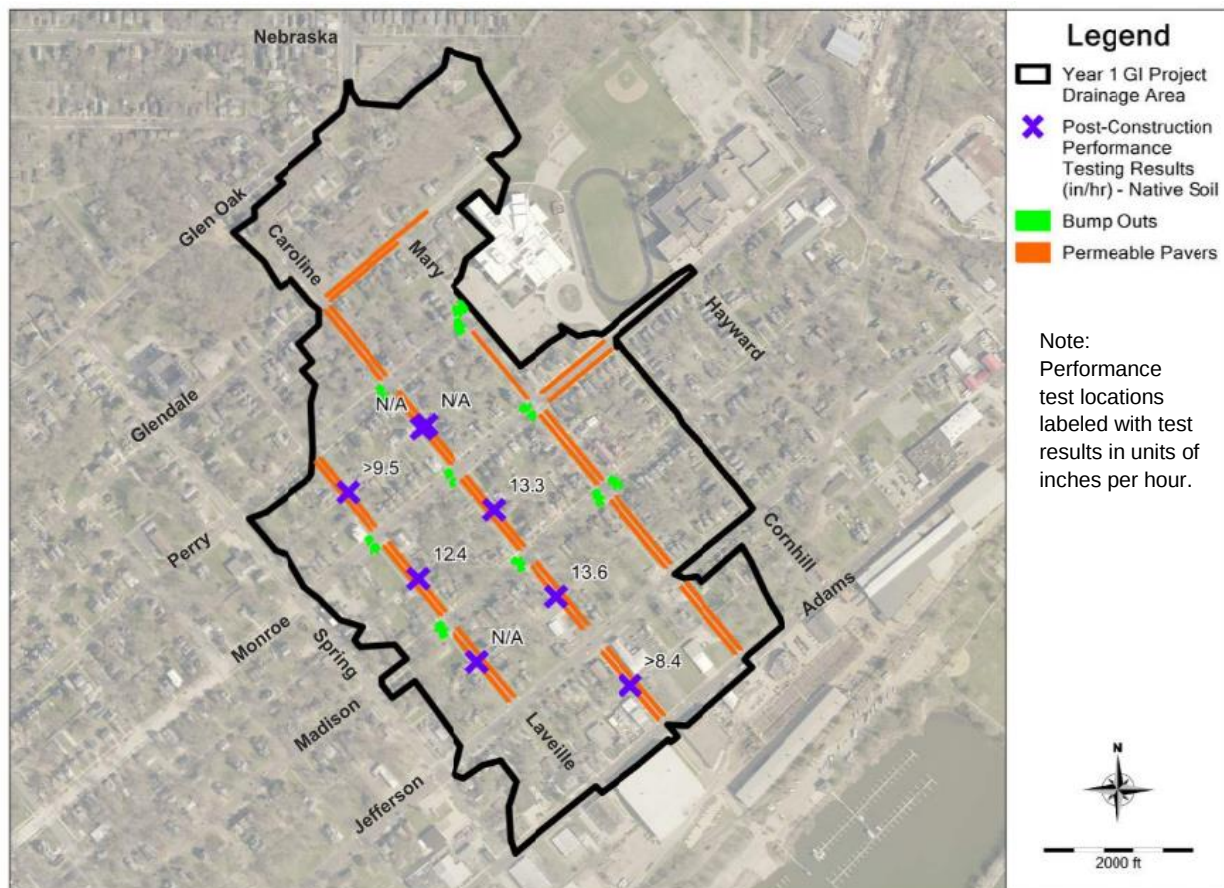


Figure 10 | Post-Construction Performance Test Results of Native Soil Below GI Storage

2.1.1.2 Implementation Problems and Resolutions

In accordance with Consent Decree paragraph 77.a.i, the problems with implementation and resolutions are discussed herein.

- Utility conflicts were identified during construction that prevented the installation of two pipes that were designed to interconnect the subsurface storage below permeable paver sections. The permeable pavers and storage were installed and will function without the ability to equalize the water level. However, without the piping, the subsurface storage and infiltration area on one side of the street has less capacity than is needed to control the design storm and the other side of the street has more capacity than is needed for the design storm. The impact of the reduced GI capacity will be made up for with future projects, as necessary, as part of Peoria's adaptive management approach to implementing CSO reduction projects.
- The storm chamber cleanout was relocated from the terrace behind the curb to the permeable pavers. Locating the cleanout in the pavers allowed the installation to be completed with a straight PVC rather than a bend to improve maintenance access. The cleanout casting was changed to a traffic rated lid.
- Thorough cleaning the permeable paver surface is key to maintaining the surface infiltration capacity. Permeable pavers are subject to clogging from leaves and other debris. Peoria

performed maintenance, which restored the surface infiltration capacity to like new conditions. Peoria continues to monitor the permeable paver surface infiltration rate via periodic infiltration testing and is using the data to inform and optimize maintenance activities.

- The stormwater bump-outs utilize curb cuts and inlets to capture stormwater and use pipes to convey the stormwater to the aggregate storage underlying the permeable pavers. Mulch that was used for weed suppression and erosion control in the bump-outs was identified as a clogging risk. Peoria plans to remove the mulch and replace it with turf grass or native plantings.
- The roadway grading around inlets and curb cut inlets impacts the flow capture capacity. Flow capture capacity increases substantially when inlets or curb cut inlets are constructed in a sag condition rather than an on-grade condition. Inlets and curb cut inlets are planned to be installed in a sag condition, where feasible, in future projects.
- Storm chambers were identified as a flow restriction between the bump-out and the aggregate storage beneath the paver blocks from performance testing. The storm chambers are not visible from the surface. Televising was completed to help evaluate the issue. Additional investigation and corrective actions are planned for 2024. Additional performance testing will be completed following the corrective action.

2.1.1.3 Basis for Performance Estimates

Performance estimates are based on the calibrated hydrologic and hydraulic (H&H) model without GI compared to the H&H model with GI. The Updated Starting Conditions H&H Model Report provides details regarding the model. The GI Design Manual has details on the procedure for representing GI in the model using LID Controls.

The Year 1 project performance estimated during design is based on the Year 1 design model that uses pre-construction performance testing data and reflects the proposed GI design. After construction, the modeled Year 1 project GI was updated based on the as-built condition. Then, the GI in the post-construction model was updated and calibrated/validated using post-construction data, including performance testing results, INFIL-tracker data, and post-construction flow meter data.

The native soil infiltration rates below the GI subsurface storage are estimated based on the pre-construction and post-construction performance test results, INFIL-Tracker data, and soil texture observed in excavations and documented during construction. The GI effectiveness, specifically the effectiveness of the stormwater bump-outs, is based on the findings from performance testing and the post-construction flow monitoring data. The post-construction model reflects the reduced effectiveness of the stormwater bump-outs due to the flow restriction observed between the stormwater bump-out and permeable paver subsurface storage discussed in Sections 2.1.1.1.2 and 2.1.1.2. Additional investigation and corrective actions for the storm chambers are planned in 2024. The performance of the stormwater bump-outs will be re-evaluated following those activities and performance estimates will be updated, as appropriate.

The Year 1 GI performance estimate for Peoria's design storm and Typical Year from the design model and post-construction model are summarized in Table 5. The Year 1 GI performance estimate may be updated based on storm chamber remediation and additional performance testing, INFIL-Tracker, and/or flow meter data.

Table 5 | Performance Estimate for Year 1 CSO Control Project

Performance Estimate	Date of Estimate	Estimated Volume of Stormwater Managed		Notes
		Peoria's Typical Year	Peoria's Six-Month Design Storm	
Design Estimate	October 2021	9.8 MG	0.6 MG	Based on pre-construction performance testing and GI design.
Post-Construction Estimate	February 2024	8.8 MG	0.4 MG	Based on constructed GI, post-construction performance testing, INFIL-Tracker data, soil texture documented during construction, and post-construction flow monitoring.

2.2 In Progress CSO Remedial Measures

The section provides information on the CSO remedial measures that were in progress during the calendar year for this report. Projects are considered to be in progress if the construction is occurring but the project has not yet become operational within the calendar year of this annual report.

Table 6 | CD Requirement from Paragraph 77.a.ii

CD PARAGRAPH	DESCRIPTION
77.a.ii	A status report on all CSO Remedial Measures in process that did not yet become operational in the preceding calendar year.

2.2.1 Year 2 CSO Control Project

The Year 2 CSO Control Project (Year 2) utilizes GI to reduce the amount of stormwater entering the combined sewer system in the Cedar sewershed. The project drainage area is within the following border streets: John H Gwynn Jr Avenue, MacArthur Highway, W Howett Street, S Western Avenue, W Butler Street, and S Webster Street. The project area and location of individual GI facilities are shown in Figure 11 and the project summary is provided in Table 7. Once operational the project will reduce CSO discharges at the Cedar Street Outfall 016.

The Year 2 project is currently under construction, with approximately 50% of the project construction complete. Construction is anticipated to be substantially complete in December 2024.

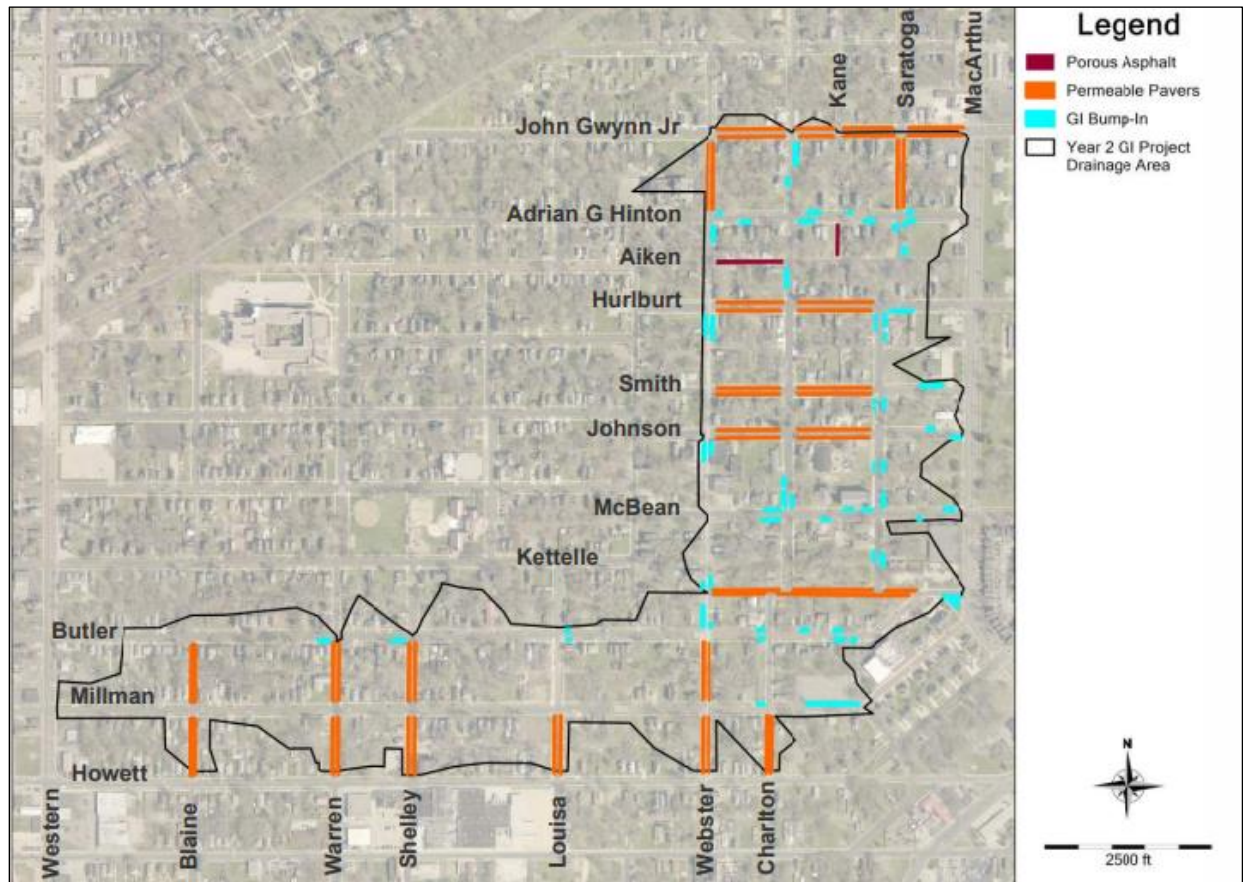


Figure 11 | Year 2 CSO Control Project Area and Locations of Green Infrastructure

Table 7 | Year 2 CSO Control Project Summary

Project ID	Year 2 CSO Control Project
Drainage Area Managed	105 acres
Total Actual Capital Cost	TBD
Permeable Pavers	25 blocks with permeable paver parking lanes
Porous Asphalt	2 blocks with full width porous asphalt
Stormwater Bump-Ins	54 stormwater bump-ins
Static Storage Volume	0.7 MG

The Year 2 project controls stormwater runoff from a drainage area of approximately 105 acres. The types of GI included in the project are permeable pavers (pavers), porous asphalt, and stormwater bump-ins.

The permeable pavers in the Year 2 CSO Control Project are PaveDrain paver blocks. The permeable pavers are located in the parking lane next to the curb and are 3-feet wide at the surface. The PaveDrain paver blocks have an open joint space and are approximately 6-inches thick. The pavers are typically underlaid by 3.5 feet of aggregate, resulting in the native soil interface being approximately 4 feet below ground surface. At some locations the pavers are underlaid with 18-inches of aggregate to capture and convey stormwater to the deeper aggregate. The deeper aggregate section is used to achieve the design storage volume and subsurface infiltration area while the shallower aggregate section is used to maintain uniformity at the surface at a reduced construction cost where additional subsurface storage and infiltration area is not needed. The width of aggregate at the native soil interface varies from 4 feet to 5.5 feet based on the drainage area managed, stormwater volume to be infiltrated, and the native soil infiltration rate. The permeable pavers are installed the full length of the block and on both sides of the street. Where feasible the permeable pavers subsurface storage is interconnected across the street to equalize flow and provide resiliency.

The porous asphalt in the Year 2 CSO Control Project infiltrates stormwater through the void space in the asphalt. The porous asphalt is constructed full width on 2 low traffic residential blocks. The porous asphalt is 4-inches thick and underlaid by 44 inches of aggregate, resulting in the native soil interface being approximately 4 feet below ground surface. A portion of the block is underlaid by 20 inches of aggregate to capture and convey stormwater to the deeper aggregate. The shallower aggregate section reduces the construction cost while the deeper aggregate section is used to achieve the design target.

The stormwater bump-ins in the Year 2 CSO Control Project use subsurface aggregate behind the curb to store and infiltrate stormwater. Stormwater enters the bump-in through an inlet and is distributed to the aggregate by a perforated pipe. The stormwater bump-in surface is not designed or constructed to infiltration stormwater.

The Year 2 project includes over 40,000 SF of paver surface area on 25 blocks, more than 8,000 SF of porous asphalt surface area on two blocks, and 54 stormwater bump-ins. Co-benefits for the Year 2 project include over 1 mile of sidewalks, 41 ADA compliant sidewalk ramps, 48 driveway aprons, 26 alley entrances, and 3.5 miles of concrete curb and gutter.

Key project dates are summarized below.

- Design Work Order Issued: April 2022
- Bid Advertisement: November 2022
- Bid Opening: January 2023
- Construction Notice to Proceed: May 2023
- Construction Substantial Completion and Project Operational: upcoming, anticipated December 2024

Based on the Year 2 GI design model, the project is estimated to control approximately 14.7 MG of stormwater for Peoria's Typical Year and 1.0 MG of stormwater for Peoria's Six-Month Design Storm.

2.3 Upcoming CSO Remedial Measures

The section provides required information on the CSO remedial measures that will be started in the calendar year following the calendar year of this annual report. Projects are considered to be upcoming if the construction is planned to begin in the calendar year following the calendar year of this report.

Table 8 | CD Requirement from Paragraph 77.a.iii

CD PARAGRAPH	DESCRIPTION
77.a.iii	A list of all CSO Remedial Measures expected to be started in the next calendar year, including location, project type, and estimated volume of stormwater/wastewater to be addressed.

2.3.1 Year 3 CSO Control Project

The Year 3 CSO Control Project (Year 3) utilizes GI to reduce the amount of stormwater entering the combined sewer system in the Cedar sewershed. The project drainage area is within the area bound by the following streets: W Butler Street, S Webster Street, John H Gwynn Jr Avenue, W Martin Luther King Jr Avenue, and S Western Avenue. The project area and location of individual GI facilities are shown in Figure 12 and the project summary is provided in Table 9. Once operational the project will reduce CSO discharges at the Cedar Street Outfall 016.

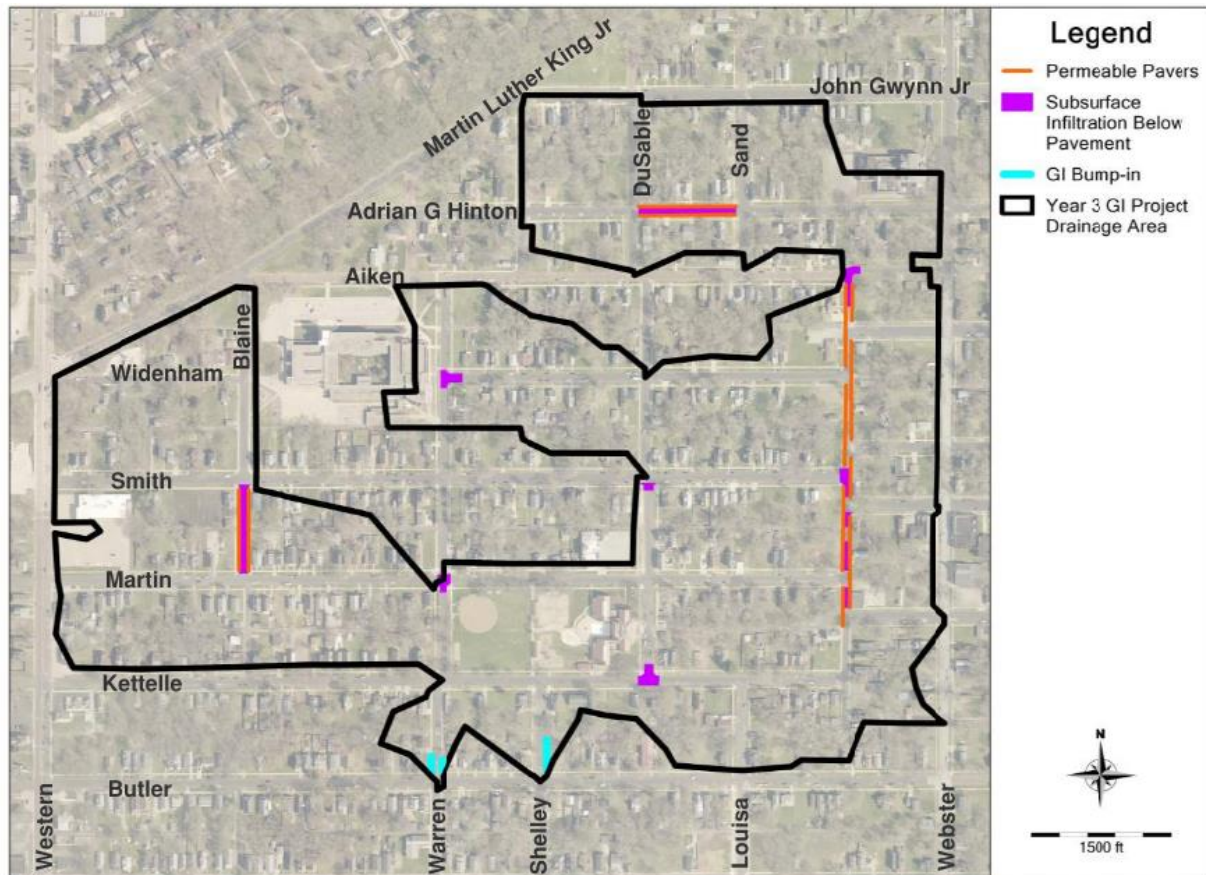


Figure 12 | Year 3 CSO Control Project Area and Locations of Green Infrastructure

Table 9 | Year 3 CSO Control Project Summary

Project ID	Year 3 CSO Control Project
Drainage Area Managed	84 acres
Total Actual Capital Cost	TBD
Permeable Pavers	8 blocks with permeable paver parking lanes
Subsurface Storage and Infiltration Below Pavement	11 subsurface infiltration facilities
Stormwater Bump-Ins	3 stormwater bump-ins
Static Storage Volume	0.3 MG

The Year 3 project controls stormwater runoff from a drainage area of approximately 84 acres. The types of GI included in the project are permeable pavers (pavers), subsurface storage and infiltration below pavement, and stormwater bump-ins.

The permeable pavers in the Year 3 CSO Control Project is PaveDrain paver blocks. The permeable pavers are located in the parking lane next to the curb and are 3-feet wide at the surface. The PaveDrain paver blocks have an open joint space and are approximately 6-inches thick and are underlaid by 3.5 feet of aggregate, resulting in the native soil interface being approximately 4 feet below ground surface. The width of aggregate at the native soil interface varies from 4 feet to 24 feet based on the drainage area managed, stormwater volume to be infiltrated, and the native soil infiltration rate. The permeable pavers will be installed the full length of the block and on both sides of the street. Where feasible permeable pavers will be interconnected across the street to equalize flow and provide resiliency.

The subsurface infiltration below pavement to be constructed in the Year 3 CSO Control Project consists of 42 inches of aggregate below pavement. The pavement may be conventional asphalt or PaveDrain paver blocks. Stormwater enters the aggregate either through an inlet and perforated distribution pipe or through PaveDrain paver blocks. Stormwater is stored in the aggregate until it can infiltrate.

The stormwater bump-ins to be constructed in the Year 3 CSO Control Project use subsurface aggregate behind the curb to store and infiltrate stormwater. Stormwater enters the bump-in through an inlet and is distributed to the aggregate by a perforated pipe. The stormwater bump-in surface is not designed or constructed to infiltration stormwater.

The Year 3 project includes over 8,000 square feet (SF) of paver surface area on 8 blocks, over 31,000 SF of subsurface infiltration below pavement including below conventional asphalt and permeable pavers, and 3 stormwater bump-ins. Co-benefits for the Year 3 project include over 3/4 mile of sidewalks, 56 ADA compliant sidewalk ramps, 18 driveway aprons, and 1 mile of concrete curb and gutter.

Key project dates are summarized below.

- Design Work Order Issued: February 2023
- Bid Advertisement: February 2024
- Bid Opening: March 2024
- Construction Notice to Proceed: upcoming
- Construction Substantial Completion and Project Operational: upcoming

Based on the Year 3 GI design model, the project is estimated to control approximately 9.1 MG of stormwater for Peoria's Typical Year and 0.7 MG of stormwater for Peoria's Six-Month Design Storm.

2.4 Future CSO Remedial Measures

The section provides information on future CSO remedial measures that were in the planning stage during the calendar year for this report.

2.4.1 Year 4 CSO Control Project

The Year 4 CSO Control Project (Year 4) will utilize GI to reduce the amount of stormwater entering the combined sewer system in the Sanger sewershed. The project is located in the area bound by Lincoln Avenue to the north, Westmoreland Avenue to the west, Adams Street to the south, and Louisa Street to the east. The preliminary project area is shown in Figure 13 below. Once operational the project will reduce CSO discharges at the Sanger Street Outfall 018.

Design for the Year 4 project started in 2023 and will be completed in 2024. The precise project locations and types of GI for the Year 4 project are still being determined by the design engineer. The preliminary Year 4 CSO Control Project drainage area generates approximately 2 MG of stormwater runoff for Peoria's 6-month design event. The preliminary estimate is the Year 4 project will control between 50% and 100% of the stormwater volume generated, resulting in an estimated stormwater infiltration volume between 1 and 2 MG for Peoria's Six-Month Design Storm.

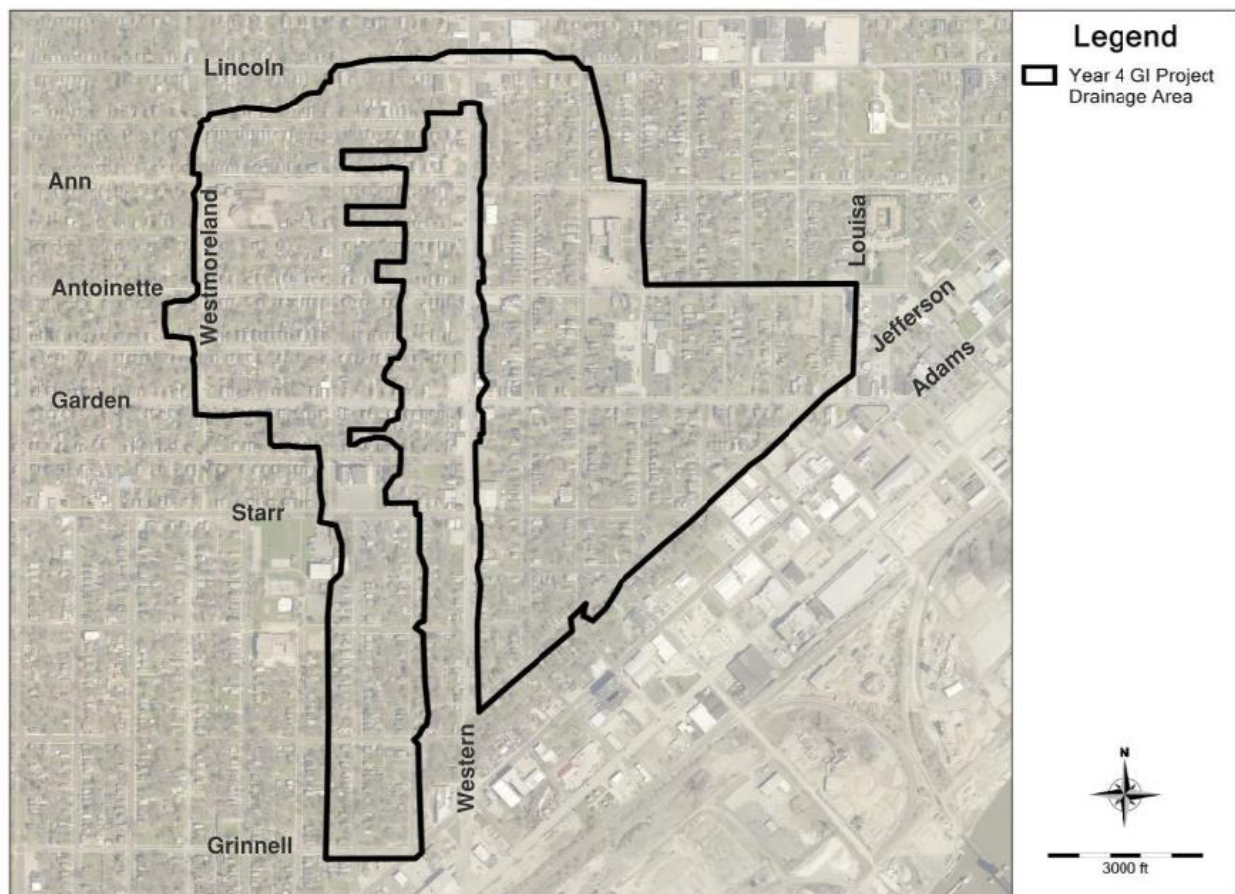


Figure 13 | Preliminary Area for Year 4 CSO Control Project

2.4.2 MacArthur Highway Rehabilitation Project

The MacArthur Highway Rehabilitation Project is located in the Cedar sewershed, in the corridor of MacArthur Highway from Jefferson Street to 4th Street. The portion of the project between Jefferson Street and Hurlburt Street is within the combined sewer area and therefore suitable for GI CSO remedial measures. Although this is primarily a road project, the project is planned to include green infrastructure to reduce the amount of stormwater that enters the combined sewer system for the portion of the project that is located in the combined sewer drainage area. The preliminary GI drainage area is shown in Figure 14 below. The design for the MacArthur project started in 2023.

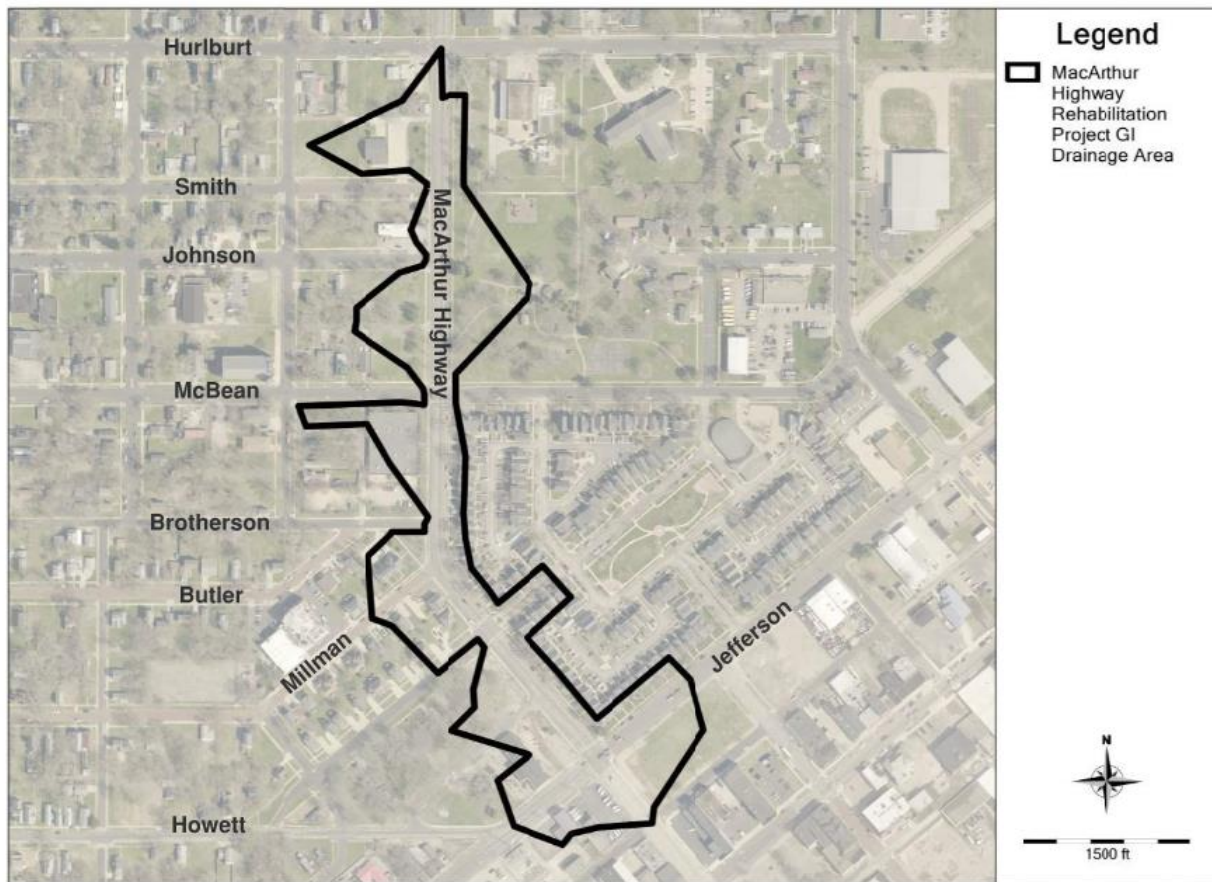


Figure 14 | Preliminary GI Drainage Area for MacArthur Highway Rehabilitation Project

2.4.3 Spring Street Complete Green Street Project

The Spring Street Complete Green Street Project is located in the Spring-Caroline sewershed and will include green infrastructure to reduce the amount of stormwater that enters the combined sewer system. The Spring Street Complete Green Street project will manage flow in the area bound by Glen Oak Avenue, Laveille Street, Adams Street, and Voris Street. The preliminary GI drainage area is shown in Figure 15 below. The preliminary design for the Spring Street Complete Street project started in 2023.



Figure 15 | Preliminary GI Drainage Area for Spring Street Complete Green Street Project

3.0 O&M Description

The section provides information on inspection and operation and maintenance (O&M) activities performed for completed CSO remedial measures during the calendar year of this report, in accordance with paragraph 77.a.v of the Consent Decree.

Table 10 | CD Requirement from Paragraph 77.a.v

CD PARAGRAPH	DESCRIPTION
77.a.v	A description of the O&M performed on previously-completed CSO Remedial Measures, including when routine inspections were conducted and a brief summary of each routine inspection, and any necessary corrective actions for previously-completed CSO Remedial Measures.

The Year 1 CSO Control Project was completed and turned over to Peoria in June 2023. Starting June 1, 2023, Peoria performed inspection and maintenance activities in accordance with the CSO Remedial Measures Operation and Maintenance and GI Performance Testing Plan. This includes inspections and maintenance, if needed, at least four times per year from March through November, with one inspection occurring in November, and within 48 hours (excluding weekends and holidays) after each rain event with more than 1-inch of rainfall. Rainfall events with more than 1-inch of rainfall are determined using Peoria's rain gauges. Each GI facility is associated with a specific rain gauge based on proximity using Theissen polygons. Due to variability of rainfall throughout the CSO area, rain gauge measurements differ from location to location. Therefore, all GI facilities may not require inspection for the same rainfall event.

Peoria also performed inspections and maintenance of other existing GI projects in the combined sewer area. Additional locations include the GI facilities on Western Avenue, Folkers Avenue, and SW Adams Street.

Inspection and maintenance activities were conducted and documented using the GI inspection and maintenance forms in the GI GIS tracking system. The appropriate forms are integrated with each GI facility and completed digitally using the Field Maps GIS mobile collection platform. Inspections are performed to identify items that may impact GI performance such as sediment or debris accumulation, erosion, obstruction of connecting piping, need for vegetation maintenance, evidence of standing water, and structural issues. Post-inspection maintenance activities are performed to address items identified during the inspections and ensure proper functioning of the GI facilities. Maintenance typically includes removal of trash, debris, sediment, invasive species, and landscaping.

Table 11 below summarizes when and where routine inspections were conducted and provides a brief summary of the inspection and maintenance activities. The additional investigation and corrective action planned for the storm chambers in the Year 1 CSO Control project are discussed in Section 2.1.

Table 11 | GI Inspection and Maintenance Summary

Inspection Overview	Summary of Inspection and Maintenance Activities
Inspection #1 Dates: 6/7/23, 6/8/23, 6/12/23 Reason: Familiarization with Year 1 project before project turnover from construction contractor to Peoria Rain Gauges with >1" Rainfall: • NA Projects Inspected: • Year 1 Project	• 4 GI inlets inspected ○ Maintenance: sediment removed from sumps • 20 cleanouts inspected ○ Maintenance: debris removed from cleanout and connecting piping • 20 stormwater bump-outs inspected ○ Maintenance: debris removed • 28 permeable paver sections inspected ○ Maintenance: none
Inspection #2 Date: 6/30/2023 Reason: >1" Rainfall and turnover of Year 1 project from construction contractor to Peoria Rain Gauges with >1" Rainfall: • RG018 • RG019 • TRG1 Projects Inspected: • Year 1 Project • Western Avenue • Folkers Avenue • SW Adams Street	• 44 GI inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps and downstream piping • 20 cleanouts inspected ○ Maintenance: debris removed from cleanout and connecting piping • 49 permeable paver sections inspected ○ Maintenance: vacuumed • 20 stormwater bump-outs inspected ○ Maintenance: debris and invasive species removed • 27 bioswales inspected ○ Maintenance: none needed • 20 overflow inlets inspected ○ Maintenance: overflow pipe cleaned • 24 dry wells inspected ○ Maintenance: grates and sumps cleaned
Inspection #3 Date: 7/6/2023 Reason: >1" Rainfall Rain Gauges with >1" Rainfall: • RG018 • RG019 • TRG1 Projects Inspected: • Western Avenue • Folkers Avenue • SW Adams	• 21 permeable pavers sections inspected ○ Maintenance: none • 27 bioswales ○ Maintenance: invasive species removed and curb cut inlet cleaned • 20 overflow inlets inspected ○ Maintenance: overflow pipe cleaned • 24 dry wells inspected ○ Maintenance: grates and sumps cleaned

Inspection Overview	Summary of Inspection and Maintenance Activities
Inspection #4 Date: 7/11/2023 Reason: >1" Rainfall and follow-up inspection of Year 1 project Rain Gauges with >1" Rainfall: • RG018 • RG019 • TRG1 Projects Inspected: • Year 1 Project • Western Avenue • Folkers Avenue • SW Adams	• 44 GI inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps and downstream piping • 20 cleanouts inspected ○ Maintenance: debris removed from cleanout and connecting piping • 49 permeable paver sections inspected ○ Maintenance: vacuumed • 20 stormwater bump-outs ○ Maintenance: debris and invasive species removed • 27 bioswales inspected ○ Maintenance: invasive species removed • 20 overflow inlets inspected ○ Maintenance: overflow pipe cleaned • 24 dry wells inspected ○ Maintenance: grates and sumps cleaned
Inspection #5 Date: 7/31/2023 Reason: >1" Rainfall Rain Gauges with >1" Rainfall: • Glen Oak Projects Inspected: • Year 1 Project	• 44 GI inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps and downstream piping • 20 cleanouts inspected ○ Maintenance: debris removed from cleanout and connecting piping • 28 permeable paver sections inspected ○ Maintenance: vacuumed • 20 stormwater bump-outs inspected ○ Maintenance: debris and invasive species removed
Inspection #6 Date: 8/7/2023 Reason: >1" Rainfall Rain Gauges with >1" Rainfall: • RG018 • RG019 • TRG1 • Glen Oak Projects Inspected: • Year 1 Project • Western Avenue • Folkers Avenue • SW Adams	• 74 GI inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps and downstream piping • 19 cleanouts inspected ○ Maintenance: none • 49 permeable paver sections inspected ○ Maintenance: vacuumed • 20 stormwater bump-outs inspected ○ Maintenance: none • 27 bioswales inspected ○ Maintenance: invasive species removed and curb cut inlets cleaned • 20 overflow inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps and downstream piping

Inspection Overview	Summary of Inspection and Maintenance Activities
Inspection #7 Date: 9/25/2023 Reason: >1" Rainfall Rain Gauges with >1" Rainfall: • RG018 • RG019 • TRG1 • Glen Oak Projects Inspected: • Year 1 Project • Western Avenue • Folkers Avenue • SW Adams	• 74 GI inlets inspected ◦ Maintenance: grates cleaned and sediment/debris removed from sumps • 20 cleanouts inspected ◦ Maintenance: debris removed from cleanout and connecting piping • 49 permeable paver sections inspected ◦ Maintenance: vacuumed • 20 stormwater bump-outs inspected ◦ Maintenance: debris, sediment, and invasive species remove • 27 bioswales inspected ◦ Maintenance: debris removed • 20 overflow inlets inspected ◦ Maintenance: grates cleaned and sediment/debris removed from sumps • 30 dry wells inspected ◦ Maintenance: grates and sumps cleaned
Inspection #8 Date: 10/16/2023 Reason: >1" Rainfall Rain Gauges with >1" Rainfall: • RG018 Projects Inspected: • Western Avenue	• 19 GI inlets inspected ◦ Maintenance: grates cleaned and sediment/debris removed from sumps • 15 permeable paver sections inspected ◦ Maintenance: None • 20 dry wells inspected ◦ Maintenance: grates and sumps cleaned
Inspection #9 Date: 10/30/2023 Reason: >1" Rainfall Rain Gauges with >1" Rainfall: • RG018 • RG019 Projects Inspected: • Western Avenue • Folkers Avenue	• 30 GI inlets inspected ◦ Maintenance: grates cleaned and sediment/debris removed from sumps • 21 permeable paver sections inspected ◦ Maintenance: vacuumed • 28 dry wells inspected ◦ Maintenance: grates and sumps cleaned

Inspection Overview	Summary of Inspection and Maintenance Activities
Inspection #10 Dates: 11/13/2023 – 11/16/2023 Reason: Required November Inspection Rain Gauges with >1" Rainfall: • NA Projects Inspected: • Year 1 Project • Western Avenue • Folkers Avenue • SW Adams	• 74 GI inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps • 20 cleanouts inspected ○ Maintenance: debris removed from cleanout and connecting piping • 49 permeable paver sections inspected ○ Maintenance: vacuumed • 20 stormwater bump-outs inspected ○ Maintenance: debris, sediment, and invasive species removed • 27 bioswales inspected ○ Maintenance: none • 20 overflow inlets inspected ○ Maintenance: grates cleaned and sediment/debris removed from sumps • 30 dry wells inspected ○ Maintenance: grates and sumps cleaned

4.0 CSO Reduction

The section provides information regarding the estimated reduction in CSO discharge events and volumes for the calendar year of this report, in accordance with paragraph 77.a.vii of the Consent Decree.

Table 12 | CD Requirement from Paragraph 77.a.vii

CD PARAGRAPH	DESCRIPTION
77.a.vii	The percentage of CSO Individual Event and CSO Evaluation Volume reductions from the preceding calendar year compared to the Starting Conditions H&H Model with detailed calculations as set forth in Paragraphs 33.d and 34.d.

The CSO Individual Event and CSO Evaluation Volume reduction calculations require use of the Starting Conditions H&H Model and meter data from the executed Flow Monitoring Implementation Plan. Peoria submitted its CSO Remedial Measures Program, including the Flow Monitoring Implementation Plan and Starting Conditions H&H Model, on August 31, 2022, in accordance with Paragraphs 15, 16, and 17 of the Consent Decree. To date, Peoria received and responded to two rounds of questions and comments from the U.S. EPA and IEPA (“the Agencies”) regarding the CSO Remedial Measures Program.

Paragraph 18.v of the Consent Decree requires that if new flow meters are being installed, they need to be fully operational within 60 days of the Agencies approval of the CSO Remedial Measures Program. Although the Agencies have not yet approved Peoria’s CSO Remedial Measures Program, Peoria has installed the new flow meters in anticipation of the Agencies approving the Program.

If Peoria does not receive new significant comments or requests for changes from the Agencies regarding the Flow Monitoring Implementation Plan or Starting Conditions H&H Model, then Peoria is positioned to begin reporting CSO Individual Event and CSO Evaluation Volume reductions for the 2024 calendar year in the next CSO Annual Report.

5.0 Additional Information

This section provides additional information that may not be applicable every year and other supplemental information, as appropriate.

5.1 Rain Gauges

One rain gauge was added to Peoria's rain gauge monitoring network during calendar year 2023. Below is information about the rain gauge in accordance with paragraph 16.c of the Consent Decree.

Table 13 | CD Requirement within Paragraph 16.c

CD PARAGRAPH	DESCRIPTION
16.c	Peoria may add and use additional rain gauges during and/or after the implementation of Peoria's CSO Remedial Measures Program if needed, provided that: i. The rain gauges shall utilize tipping bucket technology; ii. The rain gauges shall have a sensitivity of 0.01 inches; iii. The rain gauges can record precipitation in at least hour intervals; iv. The original rain gauge locations in the approved CSO Remedial Measures Program are unchanged (unless new locations are approved by EPA and Illinois EPA); v. The additional rain gauges are added within the Combined Sewer System or the Sanitary Sewer System that is tributary to the Riverfront Interceptor; and vi. The additional rain gauges are documented in Peoria's CSO Annual Report. Peoria's Annual Report documentation will include a description of the gauge type, a photograph of the new gauge location, an explanation of why the rain gauges were added, the date that the gauge went into service, and the submittal of an updated Rain Gauge Location Map if Peoria adds additional rain gauges.

5.1.1 Prospect Rain Gauge

Peoria added a rain gauge, Prospect, in response to the March 8, 2023 Agencies comments and questions on Peoria's Flow Monitoring Implementation Plan. Information about the Prospect rain gauge was provided in Peoria's May 5, 2023 response to the Agencies. The Prospect rain gauge is located in the separate sanitary sewer area on the north side of the area tributary to the RFI, near the intersection of North Prospect Road and East Sciota Avenue.

The rain gauge is an ADS RainAlert III wireless gauge that utilizes tipping bucket technology with a resolution of 0.01 inches that records data in 5 minute intervals and uses telemetry to transmit data in real time. Additional information about this type of rain gauge was provided in the Flow Monitoring Implementation Plan. The rain gauge was installed and operational as of April 18, 2023. Figure 16, below, is a photo of the rain gauge and the updated map showing rain gauge locations is included in Appendix A.



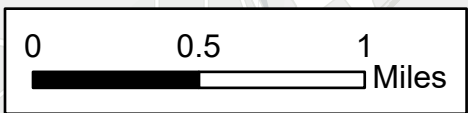
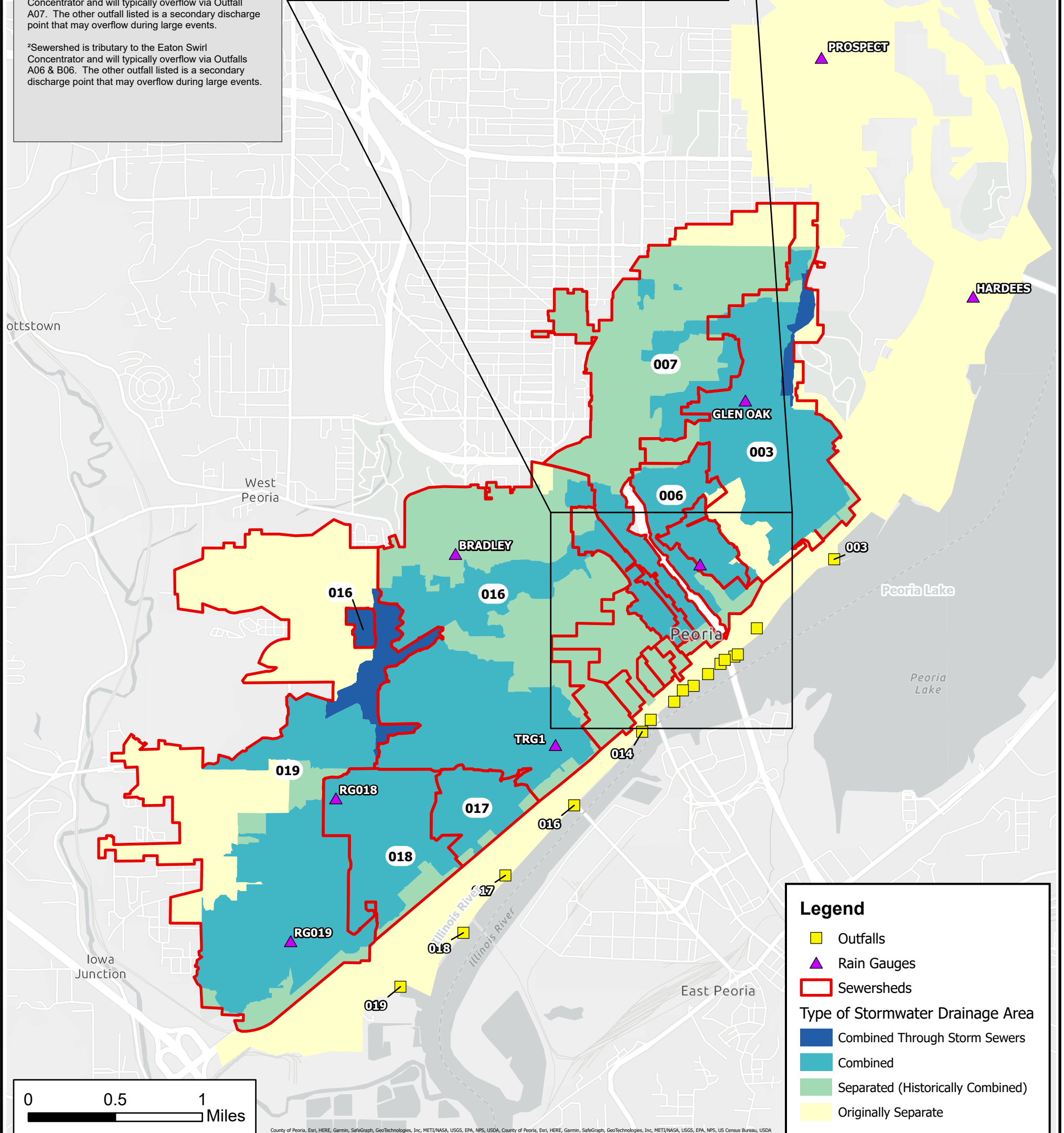
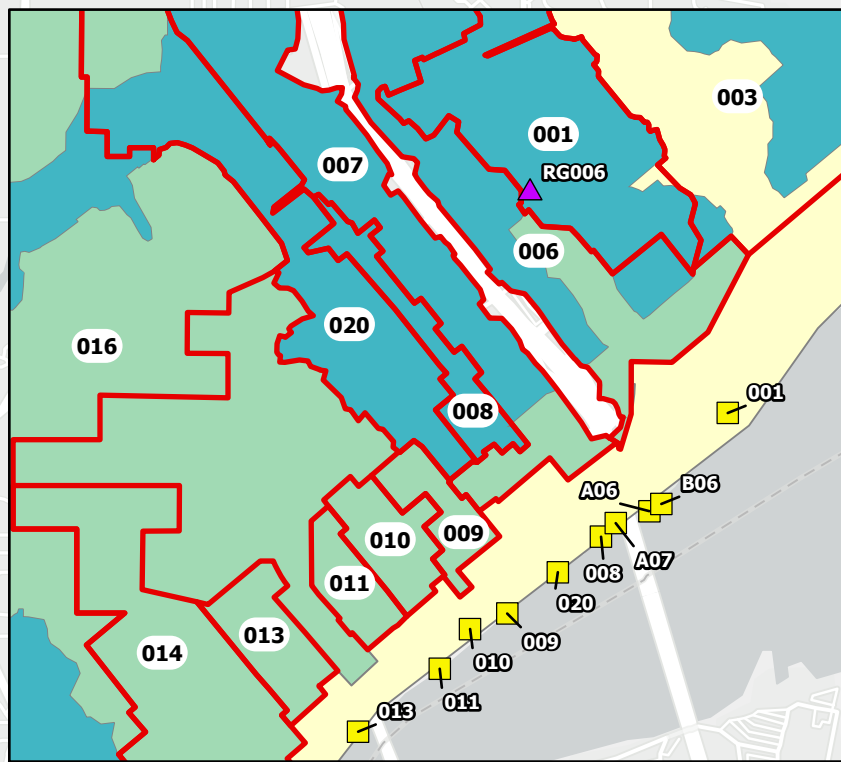
Figure 16 | Photo of Prospect Rain Gauge Location

APPENDIX A

CSO Outfall, Rain Gauge, and Sewershed Locations

- 019 Darst Street: Outfall 019
- 018 Sanger Street: Outfall 018
- 017 South Street: Outfall 017
- 016 Cedar Street: Outfall 016
- 014 State Street: Outfall 014
- 013 Walnut Street: Outfall 013
- 011 Harrison Street: Outfall 011
- 010 Liberty Street: Outfall 010
- 009 Fulton Street: Outfall 009
- 020 Main Street¹: Outfalls 020 & A07
- 008 Hamilton Street¹: Outfalls 008 & A07
- 007 Fayette Street: Outfall A07
- 006 Eaton Street: Outfalls A06 & B06
- 001 Green Street²: Outfalls 001, A06 & B06
- 003 Spring Caroline: Outfall 003

²Sewershed is tributary to the Eaton Swirl Concentrator and will typically overflow via Outfalls A06 & B06. The other outfall listed is a secondary discharge point that may overflow during large events.



County of Peoria, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, County of Peoria, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

- Outfalls
- Rain Gauges
- Sewersheds

Type of Stormwater Drainage Area

- Combined Through Storm Sewers
- Combined
- Separated (Historically Combined)
- Originally Separate

APPENDIX B

Year 1 CSO Control
Project Pre-Construction
Infiltration Test Results

ID	Test Date	Location	Soil Type	Depth of Test (ft)	Infiltration Rate (in/hr)	Test Method	Notes
I-01	6/10/2021	Laveille & Madison	Sandy Brown clay/sand	5.42	3.3	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 2 - 4.5 in/hr
I-02	6/10/2021	Madison & Caroline	Coarse brown sand	5	46.4	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 43 - 51 in/hr
I-03	6/10/2021	Madison & Mary	Silty clay	5.5	0.16	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.096 - 0.32 in/hr
I-04	6/10/2021	Monroe & Mary	Silty clay low permeability	5.25	0.24	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.047 - 0.588 in/hr, low permeability
I-05	6/10/2021	Caroline & Monroe	Medium brown sand	5	10.4	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 6.67 - 13.3 in/hr, high permeability
I-06	6/14/2021	Caroline between Perry & Monroe	Medium brown sand	5	7.4	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 5.4 - 12.6 in/hr, moderate permeability
I-07	6/10/2021	Monroe & Laveille	Coarse/medium sands w/some fines	5	7.2	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 5.2 - 7.2 in/hr
I-08	6/11/2021	Perry & Caroline	Medium sand	5	15.2	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 14 - 16 in/hr
I-09	6/11/2021	Perry & Mary	Silty clay	5	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Based on observed soil texture (silty clay) found at 5 ft, that was consistent with low permeability (<0.2 inch/hr); site anticipated to be unsuitable and infiltration test not conducted
I-10	6/11/2021	Perry & Mary	Auger refusal	N/A	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Auger refusal at 14 inches at 4 locations
I-11	6/11/2021	Glendale & Mary	Silty clay	5.5	1.3	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.82 - 1.85 in/hr
I-12	6/11/2021	Glendale & Caroline	Medium sand some fines	5.17	2	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration rage 1.8 - 2.1 in/hr, moved to front of 1419 Glendale to avoid raised corner
I-13	6/11/2021	Jefferson & Laveille	Medium-coarse sand some fines	5.33	1.2	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.5 - 1.9 in/hr, fines appear to decrease below 4 ft
I-14	6/15/2021	Caroline between Jefferson & Monroe	Coarse/medium sands w/some fines	5	12.6	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 10 - 16 in/hr
I-15	6/11/2021	Jefferson & Mary	Dry coarse/medium sand	2	14.7	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 9.8 - 20.5 in/hr, high permeability
I-16	6/14/2021	Madison & Mary	Coarse sand and fines	5.17	15.1	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 9.1 - 30 in/hr, high permeability
I-17	6/14/2021	Mary between Monroe & Madison	Coarse brown sand & some silt	5	9.5	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 4.4 - 14.9 in/hr, high permeability
I-18	6/14/2021	Caroline between Monroe & Madison	Coarse sand some gravel	5	129	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 101 - 175 in/hr, high permeability
I-19	6/15/2021	Laveille between Monroe & Madison	Silty clay medium sand	5.33	0.24	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.185 - 0.303 in/hr, low permeability
I-20	6/15/2021	Laveille & Monroe	Silty clay with fine sand	5.25	1.03	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.4 - 2.25 in/hr, low permeability
I-21	6/15/2021	Monroe between Caroline & Mary	Medium sand with fines	5.42	0.16	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.01 - 0.45 in/hr, permeability lower than expected from soil texture
I-22	6/15/2021	Monroe between Mary & Cornhill	Medium brown sand	4.5	49	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 26 - 64 in/hr, high permeability

ID	Test Date	Location	Soil Type	Depth of Test (ft)	Infiltration Rate (in/hr)	Test Method	Notes
I-23	6/16/2021	Mary between Monroe & Perry	Sandy silt and clay	5.08	0.25	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.1 - 0.7 in/hr, low permeability expected
I-24	6/16/2021	Mary between Glendale & Perry	Auger refusal rocks/debris	N/A	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Not completed due to gravel/debris resulting in auger refusal at 12". An attempt to move I-24 about 50 ft NW toward Glendale was also met with refusal at 32" with construction debris, although at the point of refusal, some coarse sand with silts.
I-25	6/16/2021	Caroline between Perry & Glendale	Silty clay some veins of fine sand	4.83	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Based on observed soil texture (silty clay) found at 5 ft, that was consistent with low permeability (<0.2 inch/hr); site anticipated to be unsuitable and infiltration test not conducted.
I-26	6/16/2021	Caroline between Adams & Jefferson	Coarse sand/pea gravel	3.17	76	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 11 - 137 in/hr, very high permeability
I-27	6/17/2021	Adams & Mary	Coarse sand	4.5	88	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 66 - 136 in/hr, very high permeability
I-29	6/17/2021	Alley between Mary & Caroline	Coarse sand	5.5	3.15	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 2.9 - 3.7 in/hr, moderate permeability
I-28	6/17/2021	center of Jefferson, Caroline, Monroe, & Mary	Coarse sand w/silts and clay	5.5	0.67	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.49 - 0.92 in/hr, moderate to low permeability expected
I-34	6/18/2021	Madison between Laveille & Spring	Medium sand	5	12.85	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 10 - 16 in/hr
I-32	6/18/2021	Perry between Caroline & Mary	Silty clay	5.17	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Based on observed soil texture (silty clay) found at 5 ft, that was consistent with low permeability (<0.2 inch/hr); site anticipated to be unsuitable and infiltration test not conducted.
I-33	6/18/2021	Glendale between Caroline & Mary	Silty clay with medium sand	5	1.02	Guelph Permeameter or Compact Constant Head Permeameter	Infiltration range 0.84 - 1.24 in/hr, low to moderate permeability expected.
I-30	6/17/2021	Madison between Caroline & Mary	Silty clay	5.33	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Based on observed soil texture (silty clay) found at 5 ft, that was consistent with low permeability (<0.2 inch/hr); site anticipated to be unsuitable and infiltration test not conducted.
I-31	6/18/2021	Monroe between Caroline & Mary	Silty clay	5.5	N/A	Guelph Permeameter or Compact Constant Head Permeameter	Low permeability
B-1	5/27/2021	center of Jefferson, Caroline, Monroe, & Mary	Brown to dark brown clayey sand with gravel	6	0.1	Lab Permeameter	
B-4	5/27/2021	Jefferson & Laveille	Dark brown clayey sand	6	0.35	Lab Permeameter	
B-2	5/27/2021	Caroline between Adams & Jefferson	Brown and rust brown clayey sand with gravel	6	0.002	Lab Permeameter	
B-5	5/27/2021	Caroline & Jefferson	Brown and dark brown clayey sand	6	0.01	Lab Permeameter	
B-6	5/27/2021	Jefferson & Mary	Dark brown poorly graded sand with silt and gravel	6	0.00018	Lab Permeameter	Depth to sand 5 ft
B-3	5/18/2021	Adams & Mary	Brown poorly graded sand	6	2452	Lab Permeameter	Depth to sand 0 ft
B-7	5/27/2021	Laveille & Madison	Brown clayey sand	6	0.001	Lab Permeameter	
B-8	5/18/2021	Madison & Caroline	Brown silty sand	6	9	Lab Permeameter	

ID	Test Date	Location	Soil Type	Depth of Test (ft)	Infiltration Rate (in/hr)	Test Method	Notes
B-9	5/27/2021	Madison & Mary	Dark brown clayey sand	6	0.007	Lab Permeameter	Depth to sand >10 ft
B-10	5/27/2021	Laveille between Monroe & Madison	Very dark brown clayey sand	6	0.003	Lab Permeameter	
B-11	5/18/2021	Monroe & Laveille	Brown poorly graded sand	6	2225	Lab Permeameter	
B-12	5/18/2021	Caroline & Monroe	Brown poorly graded sand with silt	6	3146	Lab Permeameter	
B-13	5/27/2021	Monroe & Mary	Very dark brown clayey sand	6	0.012	Lab Permeameter	Depth to sand 0 ft
B-14	5/27/2021	Caroline between Perry & Monroe	Dark brown sandy lean clay	6	0.002	Lab Permeameter	Depth to sand >10 ft
B-15	5/18/2021	Mary between Monroe & Perry	Grayish brown poorly graded soil	6	444	Lab Permeameter	Depth to sand 0 ft
B-17	5/18/2021	Perry & Caroline	Brown poorly graded sand with clay	6	449	Lab Permeameter	Depth to sand 2-5 ft
B-18	5/27/2021	Perry & Mary	Brown lean clay	6	0.0001	Lab Permeameter	Depth to sand >10 ft
B-19	5/27/2021	Mary between Glendale & Perry	Rust brown and brown sandy lean clay	6	0.001	Lab Permeameter	Depth to sand >10 ft
B-16	5/18/2021	Perry & Laveille	Brown poorly graded sand	6	1417	Lab Permeameter	
B-20	5/27/2021	Glendale & Caroline	Dark brown clayey gravel with sand	6	0.001	Lab Permeameter	Depth to sand >10 ft
B-21	5/27/2021	Glendale & Mary	Brown and rust brown lean clay with sand	6	0.00008	Lab Permeameter	Depth to sand >10 ft

APPENDIX C

Year 1 CSO Control
Project Post-Construction
Infiltration Tests Results

Asset ID	Asset Type	GI Project	Design Native Soil Infiltration Rate (in/hr)	Design Surface Infiltration Rate (in/hr)	Completed By	Test Date	Test Reason	Test Method	Test Layer	Test Type	Test Units	Test Rate	Rate Comparison	Exceeding Design Rate?	Follow Up
Y1_PP-24	Paver Blocks	Year 1	4	25	EJC	8/28/2023	Post-Construction	ASTM C1781 for Permeable Pavers	Surface	infiltration	in/hr	1277	51.1	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-27	Paver Blocks	Year 1	8	25	EJC	8/28/2023	Post-Construction	ASTM C1781 for Permeable Pavers	Surface	infiltration	in/hr	1387	55.5	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-7	Paver Blocks	Year 1	8	25	EJC	9/26/2023	Post-Construction	Hydrant Test	Surface	infiltration	in/hr	468	18.72	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-9	Paver Blocks	Year 1	2	25	EJC	9/26/2023	Post-Construction	Hydrant Test	Surface	infiltration	in/hr	401	16.04	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-17	Paver Blocks	Year 1	8	25	EJC	9/27/2023	Post-Construction	Hydrant Test	Surface	infiltration	in/hr	317	12.67	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-18	Paver Blocks	Year 1	8	25	EJC	9/27/2023	Post-Construction	Hydrant Test	Surface	infiltration	in/hr	599	23.96	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-20	Paver Blocks	Year 1	8	25	EJC	9/26/2023	Post-Construction	Hydrant Test	Surface	infiltration	in/hr	244	9.76	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-7	Paver Blocks	Year 1	8	25	EJC	9/26/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	>9.5	>1.18	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-9	Paver Blocks	Year 1	2	25	EJC	9/26/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	12.4	6.2	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-17	Paver Blocks	Year 1	8	25	EJC	9/27/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	13.3	1.67	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-18	Paver Blocks	Year 1	8	25	EJC	9/27/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	13.6	1.7	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-20	Paver Blocks	Year 1	8	25	EJC	9/26/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	>8.4	>1.05	Yes	Continue following O&M and Performance Testing Plan
Y1_PP-10	Inlet to Piping to Storm Chamber to Subsurface Storage	Year 1	2	25	EJC	7/21/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	N/A ¹	Unknown	Unknown	Perform corrective action and re-test
Y1_PP-14	Inlet to Piping to Storm Chamber to Subsurface Storage	Year 1	6	25	EJC	7/21/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	N/A ¹	Unknown	Unknown	Perform corrective action and re-test
Y1_PP-15	Inlet to Piping to Storm Chamber to Subsurface Storage	Year 1	6	25	EJC	7/21/2023	Post-Construction	Hydrant Test	Native Soil Interface	infiltration	in/hr	N/A ¹	Unknown	Unknown	Perform corrective action and re-test

¹ The subsurface infiltration rate was not evaluated due to a flow restriction in the system, preventing flow from stormwater bump-outs from getting into the subsurface storage below permeable pavers.