RFP 2024-382 SEWER REHABILITATION ENGINEERING SERVICES

Report previously prepared in support of various funding applications. Consultants are encouraged to develop their own approach.

# Collection System Rehabilitation Evaluation Report

Oneida County Department of Water Quality & Water Pollution Control

16 June 2022


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# 1. Executive Summary

In 2007, the New York State Department of Environmental Conservation (NYSDEC) and Oneida County, NY (County) entered a Consent Order (No. R620060823-67) to address sanitary sewer overflows (SSO) at the Sauquoit Creek Pump Station (SCPS). Since that time, the County has engaged in collection system rehabilitation and construction projects for water pollution control plant (WPCP) improvements. Specific to the collection system, the rehabilitation construction contracts were undertaken to reduce the amount of inflow and infiltration (I/I) entering the system due to defects in interceptor sewers, mainline sewers, lateral connections, and manhole structures.

The work to date has resulted in a significant and sustained decrease in SSO volume at the SCPS. Even with historic rainfall events, the SSO volumes remain significantly lower than in the past. However, even though the volume of SSO has been reduced, I/I in the collection system continues to persist and a supplementary phase of collection system rehabilitation is warranted to further reduce I/I.

The purpose of this report is to support the need for a supplementary phase of collection system rehabilitation and to identify the costs associated with the necessary collection system rehabilitation. A supplementary phase is recommended to progress in a build-and-measure fashion starting with the highest priority I/I reduction projects. The total project cost estimate for this work is $26 million.

Three approaches were considered to mitigate I/I impacts at the SCPS and WPCP: (1) storage; (2) new treatment works; and (3) sewer rehabilitation. At this point in the County's SSO mitigation efforts, continued sewer rehabilitation is the only feasible alternative to reduce wet weather flow received at the SCPS and the WPCP. The construction costs for storage and new treatments works are more than $60 million and $100 million, respectively, making these approaches unfeasible compared to the $21 million estimated construction cost of the sewer rehabilitation. In addition to monetary considerations, maintaining the existing infrastructure is simply a more sustainable approach as opposed to building new infrastructure. The County's philosophy is that if the I/I can be removed at its source, it should be removed instead of being conveyed and treated using valuable resources.

# 2. Project Background and History

The Oneida County Sewer District (District) is administered through the Oneida County Department of Water Quality and Water Pollution Control (WQ&WPC), which is responsible for the operation and management of the District's facilities and personnel. District facilities include 45 miles of interceptor sewers, the Sauquoit Creek and Barnes Avenue Pumping Stations, and the WPCP. The District services 15 municipalities including the City of Utica. The WPCP was constructed in 1968 as a regional wastewater treatment facility and treats wastewater from the City of Utica, 14 municipalities, and the Oneida County Business Park. Wastewater from the City of Utica is combined sewage, whereas wastewater from regions outside the City includes only sanitary sewage.

In 2007, the NYSDEC and Oneida County entered into a Consent Order (No. R620060823-67) due to SSO at the SCPS. The original Consent Order required mitigation of the SSO by October 21, 2014. Through cooperative discussions with the NYSDEC, the Consent Order has been modified twice, and now the SSO must be mitigated by December 31, 2022. The last modification was executed by the NYSDEC on November 24, 2021.

The County began the SSO mitigation work by developing a Plan of Study in 2008 which was finalized in 2010. For the purpose of mitigating the SSO at the SCPS, the study considered I/I reduction in the collection system as well as increased capacity at the County's pump stations and WPCP to treat I/I.

Since 2010, the County has engaged in collection system rehabilitation and WPCP improvement construction projects. Specific to the collection system, rehabilitation construction contracts were undertaken to reduce the amount of I/I entering the system due to defects in interceptor sewers, mainline sewers, lateral connections, and manhole structures. Work under these sewer rehabilitation contracts has typically included a mix of cured-in-place pipe (CIPP) lining, pipe joint and lateral grouting, open cut repairs, spot repairs, manhole repairs/replacement, and supplemental CCTV inspections.

The rehabilitation construction work has and will continue to be completed throughout the entire District, including the major sewer basins, namely, Sauquoit Creek, Starch Factory, and North of Utica. The City of Utica is completing work in their combined sewage systems independently but in a coordinated manner with the County.

# 2.1 Site Information

Oneida County is located in the central region of New York State and encompasses an area of 1,258 square miles.

The Oneida County Department of WQ&WPC is responsible for administering the operations of the Oneida County Sewer District, which services a population of approximately 110,000 and covers an area of approximately 170 square miles.

There are 15 municipalities plus the County of Oneida in the District. These include the City of Utica; the Villages of New York Mills, Yorkville, Whitesboro, Oriskany, New Hartford, Clayville, and Holland Patent; the Towns of Whitestown, New Hartford, Paris, Marcy, Deerfield, Frankfort, and Schuyler; and the Oneida County Business Park (and former airport) whose sanitary sewers are owned directly by the County. Refer to Figure 2.1.

## 2.1.1 Geologic Conditions

According to the United States Department of Agriculture (USDA) National Resources Conservation Services (NRCS) Oneida County is underlain primarily by sedimentary rocks that are of Paleozoic age. Specifically, in the proposed work areas, the natural soils are formed mainly of alluvial and outwash deposits derived from the rocks upstream; the soils consists of well drained to poorly drained bottom land that are subject to flooding. The predominant soil type is "Urban Land", which consists of areas where at least 50 percent of the land surface is covered with impervious material or buildings, and the soils are disturbed and augmented.

This supplementary phase of collection system rehabilitation work will be entirely trenchless or replacement of existing sewers in existing trenches or previously already disturbed and altered soils. If needed, future soil investigations will be completed during design.

## 2.1.2 Environmental Resources and Floodplain Considerations

The highest priority sewer basins that are recommended for sewer rehabilitation are located adjacent to the Mohawk River, a Class C waterbody. Based on a review of the NYSDEC Environmental Resource Mapper, portions of the work areas are near regulated freshwater wetlands and other classified waterbodies; however no significant areas of environmental concern were found at the proposed project site. The work will be completed in the vicinity important environmental resources, but based on previous collection system rehabilitation activities in these areas, these rehabilitation efforts would likely not impact the proposed project in this report.

Only a small portion of the work areas are in flood hazard areas as defined by the Federal Emergency Management Agency (FEMA). No work areas are in a regulatory floodway, but some areas are within the 100-year flood and 500-year flood zones. The existing sewers to be rehabilitated have experienced these types of floods in the past. Special precautions will be made during construction to avoid damage from flooding during active construction.

As reported in Section 5.2.2, as typical of collection system rehabilitation, this will be a Type II Action with none to minimal negative environmental impacts.

### 2.1.3 Potential Environmental Justice Areas

The NYSDEC's Geospatial Information System (GIS) tools were used to identify the Potential Environmental Justice Areas (PEJA) in the WPCP service area, and the resulting map is provided on Figure 2.2. While the Oneida County WPCP is not located directly in a PEJA, there are several PEJAs located in the WPCP service area, including the City of Utica, Town of Whitesboro and Village of New York Mills. The PEJA recognizes populations that meet or exceed certain statistical criteria related to percentage minority population and percentage of households with incomes below the federal poverty level. The proposed UV project would have a direct beneficial impact to the PEJAs within Oneida County by improving the water quality in the Mohawk River.

According to the US Census Bureau, the Oneida County has a median household income (MHI) of $59,113 (2020 dollars based on the American Community Survey 5-Year Estimates, 2016-2020), compared to the New York State average MHI of $71,117 (2020) and the United States MHI of $64,994 (2020 dollars). The US Census Bureau lists that 12.4 percent of Oneida County lives in poverty compared to the national average of 11.4 percent.

The NYSEFC has issued guidelines on hardship financing eligibility based on municipal, project and environmental justice criteria. The NYSEFC established criteria that the municipal population must be less than 300,000, and the MHI of a municipality must be less than 80 percent of the regionally adjusted MHI of $68,486 for the upstate region ($54,789) or the MHI be between 80 to 100 percent of the regionally adjusted MHI with a poverty level that is greater than the 2019 state-wide poverty of 10.4 percent, to be eligible for hardship financing. While the MHI for Oneida County ($59,113) is greater than 80 percent of the regionally adjusted MHI ($54,789), it does satisfy the alternate criteria of MHI being between 80 to 100 percent of the regionally adjusted MHI and the poverty of 12.4 percent is greater than the state-wide poverty of 10.4 percent. Oneida County's population of 230,274 (2021 estimate) is also below the 300,000-person threshold. Therefore, Oneida County may qualify for hardship financing for this project.

## 2.2 Ownership and Service Area

On behalf of the District, Oneida County holds the NYSDEC-issued SPDES Permit. The member municipalities own and operate the collection systems within their own boundaries, and although not bound directly by the terms and conditions of the County's SPDES Permit, their discharges to the District's system are regulated by the County's Sewer Use Ordinance. Each municipality within the District owns and operates their own collection system. The village-owned systems tend to be the oldest within the SCPS sewer basin, whereas the town-owned systems are generally of newer construction.

The District owns and operates the WPCP, the SCPS, the Barnes Avenue Pumping Station, and 45 miles of interceptor sewers ranging in size from 12 to 66 inches in diameter connecting the member municipalities to the SCPS and/or the WPCP.

The District's collection system is comprised of 12 interceptor sewers, five of which are tributary to the SCPS. These interceptors are Sauquoit Creek Interceptor, Mud Creek Interceptor, Harts Hill Interceptor, Whitesboro-Oriskany-Airport Interceptor, and Yorkville Interceptor. The remaining interceptor sewers are directly tributary to the WPCP and include Starch Factory Creek Interceptor, North Utica Interceptor, Mohawk River Interceptor, Marcy Interceptor, Deerfield East Interceptor, Deerfield West Interceptor, and Realls Creek Interceptor. All of the interceptor sewers were constructed between 1968 and 1979.

While the District's service area does not cover all of Oneida County, the historical populations of the County were examined to provide the general population trends. Table 2.1 presents the historical US Census populations since 2020. The US Census data show a declining trend in population within Oneida County over the past 21 years, with an overall decrease of 2.2 percent since 2000.

***Table 2.1 Oneida County Historical Population***

| Year | Population | Source |
|---|---|---|
| 2000 | 235,469 | US Census |
| 2010 | 234,878 | US Census |
| 2020 | 232,125 | US Census |
| 2021 | 230,274 | US Census (estimate) |

# 2.3 Existing Facilities and Present Condition

## 2.3.1 Collection System Infrastructure

The District's sanitary sewers are constructed primarily of reinforced concrete pipe with precast concrete manholes and are generally in good condition. The municipal collection systems are constructed from a variety of materials and have a wide range of ages and conditions. The County performed a Sewer System Evaluation Survey (SSES) throughout the District during the period from 2008 to 2010.

Based on the findings, rehabilitation construction contracts were undertaken to reduce the amount of I/I entering the system due to defects in the interceptor sewers, mainline sewers, lateral connections, and manhole structures. Work under these sewer rehabilitation contracts typically included a mix of CIPP lining, pipe joint and lateral grouting, open cut repairs, spot repairs, manhole repairs/replacement, and supplemental CCTV inspections. Information related to the sewer rehabilitation contracts is presented in Table 2.2.

*Table 2.2 Summary of Completed Sewer Rehabilitation Projects*

| Contract No.* | Title of Contract | Project Location / Description | CWSRF Project No. | Miles of Rehabilitation | Current Contract Amount | Contractor | Contract Status |
|---|---|---|---|---|---|---|---|
| 2 | Sanitary Sewer Manhole Rehabilitation - Phase 2 | District-wide: Rehabilitation of approximately 1,278 sanitary sewer manholes. | C6-6070-08-00 | 47 | $1,529,131.73 | Green Mountain Pipeline Services | Complete |
| 3 | Sanitary Sewer Mainline Rehabilitation - Phase 1 | Villages of New York Mills, Oriskany, New Hartford, Whitesboro, and Yorkville; Towns of New Hartford and Whitestown | C6-6070-08-00 | 13 | $1,916,428.54 | Insituform | Complete |
| 4 | Sewer Separation - Clinton/Henderson Street, NY Mills | NY Mills: Storm/Sanitary sewer separation. | C6-6070-08-00 | 2 | $155,007.51 | JJ Lane Construction | Complete |
| 5 | Sewer Repairs and Rehabilitation | Villages of Whitesboro, New Hartford, Yorkville, New York Mills: Storm/Sanitary sewer repairs and rehabilitation; manhole replacement and UV-CIPP lining. | C6-6070-08-00 | 1 | $411,841.66 | Central Paving | Complete |
| 6 | Sanitary Sewer Mainline Rehabilitation - Phase 2 | Villages of New Hartford and Clayville; Towns of New Hartford and Paris; City of Utica | C6-6070-08-00 | 15 | $2,086,525.00 | Green Mountain Pipeline Services | Complete |
| 7 | Sanitary Sewer Mainline Rehabilitation - Phase 3 | Towns of New Hartford and Whitestown: Glenhaven area (HHI-1 and WHN-31), the area west of the Whitesboro Parkway School and south of Clinton Street area (WHN-33), and Kellogg Road area (NHD-18) | C6-6070-08-00 | 13 | $2,060,644.00 | Green Mountain Pipeline Services | Complete |

| Contract No.* | Title of Contract | Project Location / Description | CWSRF Project No. | Miles of Rehabilitation | Current Contract Amount | Contractor | Contract Status |
|---|---|---|---|---|---|---|---|
| 8 | Sanitary Sewer Mainline Rehabilitation - Phase 4 | Town of New Hartford: Paris Road area (NHD-23) | C6-6070-08-00 | 14 | $1,143,410.78 | National Water Main Cleaning Co. | Complete |
| 10 | Sanitary Sewer Mainline Rehabilitation - Phase 5 | Town of Whitestown and Village of Whitesboro: Area west of Henderson St., north of Mud Creek, south of Clinton St. and east of Clinton Rd; and areas of V. of Whitesboro that have not been previously rehabbed. | C6-6070-08-10 | 17 | $3,429,370.00 | Green Mountain Pipeline Services | Complete |
| 11 | Sanitary Sewer Mainline Rehabilitation - Phase 6 | Town of New Hartford/Hamlet of Washington Mills: Chapman Rd, Higby Rd., and Mohawk St. as well as side streets in Town of New Hartford (NHD-20). | C6-6070-08-10 | 7 | $632,029.26 | National Water Main Cleaning Co. | Complete |
| 12[3] | Sewer Rehabilitation Project | Village of Yorkville: Areas of the Village not previously rehabbed (YKV-1). | C6-6071-02-00 | 11 | $3,420,966.19 | National Water Main Cleaning Co. | Base Project Complete |
| 13 | Sanitary Sewer Mainline Rehabilitation - Phase 8 | Town of New Hartford: Residential subdivisions along Routes 12B and Merritt Place, situated south of Route 5B and Seneca Turnpike, and north of Sherrill Brook Park (NHD-6). | C6-6070-08-10 | 5 | $802,838.50 | National Water Main Cleaning Co. | Complete |
| 14 | Sanitary Sewer Mainline Rehabilitation - Phase 9 | Town of New Hartford: Commercial district along Seneca Turnpike surrounding Sangertown Square Shopping Mall, south to a residential area situated between Seneca Turnpike and | C6-6070-08-10 | 7 | $995,407.25 | National Water Main Cleaning Co. | Complete |

| Contract No.* | Title of Contract | Project Location / Description | CWSRF Project No. | Miles of Rehabilitation | Current Contract Amount | Contractor | Contract Status |
|---|---|---|---|---|---|---|---|
| | | Clinton Rd., and a small residential area south of Clinton Rd. along Merritt Place (NHD-9). | | | | | |
| 16 | Sanitary Sewer Mainline Rehabilitation - Phase 10 | Town of Whitestown: Residential area along Westmoreland Rd. and West St., south of the NYS Thruway, and north of Clinton Rd. (WHN-34, WHN-35, WHN-12 & WHN-36). | C6-6070-08-10 | 3 | $386,042.00 | National Water Main Cleaning Co. | Complete |
| 17 | Sewer Rehabilitation Project - Phase 11 | Village of Yorkville Flow data, mapping, and SSES (smoke testing/CCTV) results were assessed to determine location(s) most appropriate for continued sewer system rehabilitation. Both sanitary and storm sewers will be lined. House laterals will be lined. Bid documents are nearly complete and anticipate project to be bid in 2nd Quarter 2022. | C6-6070-08-10 | <1 | $600,000.00 | TBD | Tentative Bid Date - 2nd Quarter 2022 |

The sewer collection system for each of the municipalities can be divided into unique sewer basins with common discharge points to the interceptor sewers. Each of the municipalities has one or more sewer basins that connect into the District interceptor sewers. For example, the Village of New York Mills has three connection points to the District interceptor sewers and therefore can be divided into three unique sewer basins. Figure 2.3 shows the sewer basins for each member municipality which in total make up the SCPS Basin.

As their names imply, some of the interceptor sewers are constructed parallel to creeks or rivers in order to efficiently convey flow to the SCPS or WPCP. The majority of the manholes are located in off-road sewer easements and/or rights-of-way, as opposed to within or adjacent to roadways. Many of the more remote off-road easements/rights-of-ways require tree and overgrowth removal to facilitate improved accessibility for regular inspections as well as preventive and corrective manhole and pipeline maintenance. This issue is being addressed as part of the long-term maintenance recommendations of the SSO Mitigation Plan for both the District and municipal sewer systems.

The County's Engineering Team continues to review available data and looks for additional sewer rehabilitation opportunities. A new contract (Contract 17) is being developed to address sewer rehabilitation in the Village of Yorkville; construction is anticipated to begin in 2022-23. The District and the municipalities plan to continue their work together to remove I/I from the collection systems.

### 2.3.2 History of Damage due to Storm/Flood

On October 31, 2019, an intense rainfall event caused widespread flooding in the Mohawk Valley. The rain gauge at the WPCP recorded 3.75 inches of rain, with a peak intensity of over 3 inches per hour. Damages occurred at the WPCP, sections of the Sauquoit Creek Interceptor Sewer and Force Main along Sauquoit Creek, and the SCPS.

The flood event was particularly intense within the Sauquoit Creek drainage basin with extensive flooding along Sauquoit Creek that resulted in stream bank failures. Sections of the Sauquoit Creek Interceptor Sewer were damaged, which included stream bank failures that resulted in pipe exposures within the creek that caused debris and creek water to enter the sewer. The damages incurred at various locations and the current status of repairs are presented in Table 2.3. The County continues to coordinate with FEMA regarding the disaster recovery assistance program. Total cost of repairs to the remaining interceptor sewers and force main are expected to cost between $500,000 and $700,000.

***Table 2.3 FEMA Damage Project Summary***

| Project Number | FEMA Damage Number | Title | Cost | Status |
|---|---|---|---|---|
| 133024 | 366892 | Sewer exposure repair (New Hartford Park, Washington Mills) | $96,054 | Work Completed 11/01/2021 |
| | 366893 | Sewer exposure repair (Oneida St., Washington Mills - behind Salvatore's bakery) | $51,000 | Pending FEMA review/approval |
| | 366894 | Sewer exposure (Victoria Drive, Utica) | $149,100 | Pending FEMA review/approval |
| | 366895 | Manhole Exposure (New Hartford Street, New York Mills) | $37,680 | Pending FEMA review/approval |
| 135064 | 374275 | Sewer Line Encasement Undermining (Mud Creek) | $53,287 | Pending FEMA 406 HMP Completion |
| 133005 | n/a | Sewer line repair with stream bed restoration and bank armament | $392,312 | Work Completed 12/01/2021 |

| Project Number | FEMA Damage Number | Title | Cost | Status |
|---|---|---|---|---|
| 133021 | n/a | Pump Station/Access Road Repairs | $199,720 | Work Completed 06/20/2021 |
| 158181 | n/a | Pump Station - Emergency Work | $140,134 | Work Completed 06/20/2021 |
| 145808 | n/a | Oneida County DWQ Management Costs | | Pending Formulation Completion |
| 135067 | n/a | Nail Creek Force Main | $23,000 | Pending FEMA review/approval |
| 135066 | 374278 | Creek Stabilization and Associated Damages (near Pietryka Park) | $130,225 | Pending Final FEMA Review/approval |
| 135061 | n/a | App-Cert Pump Station - Damaged Electrical Equipment | $29,400 | Work Completed 12/30/2022 |

## 2.4 Definition of the Problem

The collection system rehabilitation work has notably reduced the SSO volume. As presented in Figure 2.4, there was a significant and sustained decrease in SSO volume immediately following the completion of the rehabilitation construction contracts in 2014. Even with historic rainfall events, the SSO volumes remain significantly lower than in the past. However, even though the SSO volume has been reduced, I/I in the collection system continues to persist. Therefore, a supplementary phase of collection system rehabilitation is warranted to further reduce I/I.

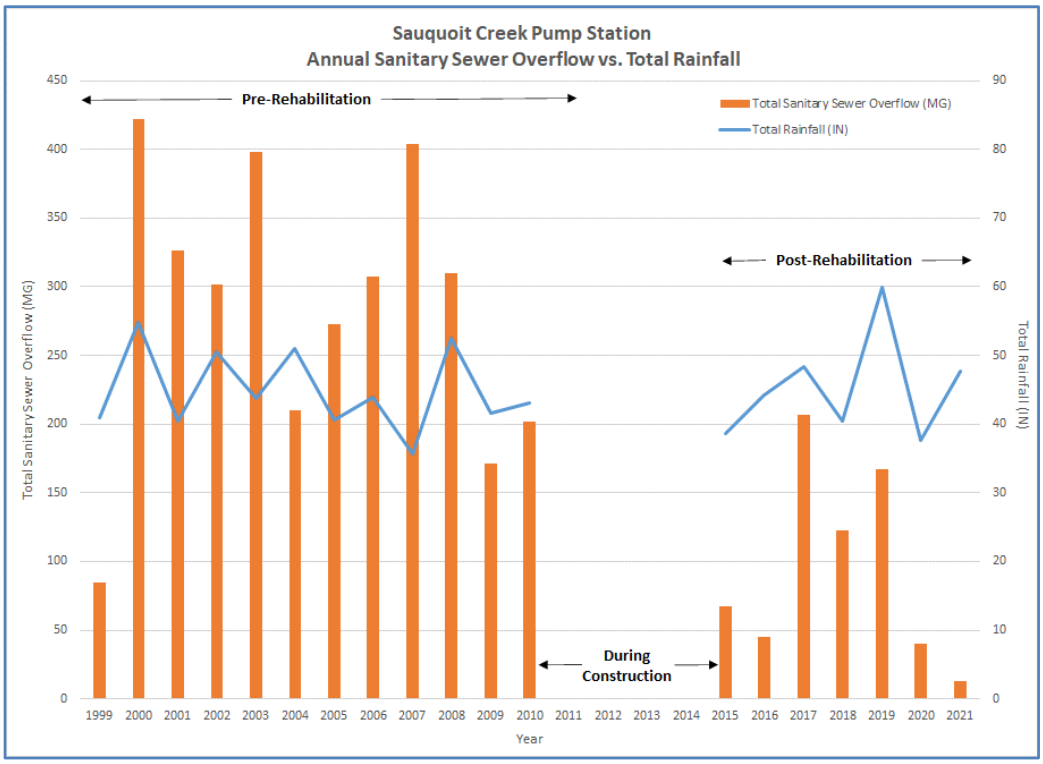



*Figure 2.4 Annual Overflow Volume at Sauquoit Creek Pump Station vs. Total Rainfall*

For the past decade, the County has continually measured the I/I in the collection system using flow meters. The flow meters in the Town of New Hartford, Village of New Hartford, Village of Yorkville, as well as New York Mills, Oriskany, and Whitesboro, show notable increases in flow in response to the storm events. The flow meter data is used to calculate rainfall-derived infiltration and inflow (RDII). RDII has been measured in units of gallons per linear foot of sewer per inch of rainfall (gallons/LF/inch) for major wet weather events over the last 10 years. A general rule of thumb is that the threshold for severe RDII is a net RDII greater than 15 gallons/LF/inch. The net RDII values for many of the areas in the aforementioned municipalities were above this threshold for the major storm events, suggesting potential severe RDII in these areas and further supporting the additional sewer investigations being conducted in these areas.

Based on the findings of the RDII analysis, Table 2.4 presents the areas tributary to the WPCP which are deemed to have excessive I/I. It is recommended these areas be the subject of a supplementary phase of collection system rehabilitation.

*Table 2.4 District Sewer Basins with High Inflow and Infiltration*

| Sewer Basin Name | Flow Meter Name | Length (feet) | Net RDII (gallons/LF/inch) |
|---|---|---|---|
| City of Utica-Proctor Park | ONEIDA_205 | 41,980 | 45 |
| City of Utica-South Park | ONEIDA_31223 | 33,299 | 36 |
| Town of Deerfield-1 | Oneida_DFD1 | 15,574 | 18 |
| Town of Deerfield-2 | Oneida_DFD2 | 47,017 | 15 |
| Town of Deerfield-3 | Oneida_DFD3 (1) | 34,577 | 10 |
| Town of New Hartford-Oneida Street | Oneida_NHD22 | 57,479 | 19 |
| Town of New Hartford- Chenango Street | Oneida_NHD23 | 74,255 | 18 |
| Town of New Hartford- New Hartford Street | Oneida_NHD24 | 34,200 | 15 |
| Village of New York Mills-Commercial Drive | Oneida_NYM3B | 27,395 | 21 |
| Village of Oriskany-South | Oneida_OKY1A (1) | 12,946 | 10 |
| Village of Oriskany- North | Oneida_OKY1B | 22,096 | 20 |
| Village of New Hartford | Oneida_VNHD1 (2) | 46,012 | 21 |
| Village of Whitesboro-Redfield Avenue | Oneida_WBO1 (1) | 64,665 | 10 |
| Village of Whitesboro-Linwood Place A | Oneida_WBO2A | 26,427 | 26 |
| Village of Whitesboro-Linwood Place B | Oneida_WBO2B (1) | 26,529 | 13 |
| Village of Whitesboro-Pleasant Street | Oneida_WBO3 (1) | 1,978 | 17 |
| Village of Yorkville-East | Oneida_YKV1A (2) | 50,475 | 32 |
| Village of Yorkville-North East | Oneida_YKV1B (2) | 2,325 | 15 |
| Village of Yorkville-West | Oneida_YKV2 (2) | 23,130 | 17 |

(1) No excessive I/I present, but contiguous with areas with excessive I/I. Therefore, it is recommended to perform SSES work and needed collection system rehabilitation work.
(2) SSES or construction work already in progress.

As detailed in the following paragraphs, the project is needed to reduce wet weather flow received at the SCPS and the WPCP, protect property and public and environmental health from the impacts of I/I, improve aging infrastructure, and promote smart economic development.

## 2.5 Financial Status

Annual revenues for the District are derived from sewer billing charges based on metered or unmetered water consumption. In addition to funding the operation of the wastewater system, these charges also go toward the construction of Consent Order related system upgrades. The 2022 District sewer billing charges include $6.77 per 1,000 gallons of water usage. Additionally, customers in the Sauquoit Creek tributary basin, except the Village of Whitesboro are assessed an additional surcharge rate of $1.05 per 1,000 gallons of water usage to pay for capital expenditures and system repairs associated with the Consent Order. Customers residing in the Village of Whitesboro are assessed an additional surcharge rate of $2.30 per 1,000 gallons of water usage for the same expenditures and repairs. In addition to the District sewer charges, each tributary community establishes their own sewer rates since the communities own and operated their own sewer collection systems.

According to the 2022 adopted budget for the Oneida County Department of Water Quality and Water Pollution Control (WQ&WPC), the total budget is $12,889,512, which includes administrative, sanitary sewers, sewage treatment and industrial program appropriations. The County has a number of bonds that were issued to fund capital projects, and the annual debt service for the 2022 budget is $11,299,496. Recent capital projects include several construction contracts for upgrades at the WPCP, Sauquoit Creek Pump Station/forcemain, and sanitary sewer collection system improvements that are either completed or near completion, which were part of the Consent Order compliance program. This project, will be charged back to to the respective municipalities the same way that the Sauquoit Creek Basin has the $1.05 surcharge.

# 3. Alternatives Analysis

At this point in the County's SSO mitigation efforts, continued sewer rehabilitation is the only feasible alternative to reduce wet weather flow received at the SCPS and the WPCP. In general, there are three approaches which could be used by the District to reduce wet weather flow impacts at the SCPS and WPCP: (1) storage; (2) new treatment works (in addition to the current WPCP expansion); and (3) sewer rehabilitation.

For the first approach, if land were available at either the SCPS or the WPCP, an estimated 15 million gallons of storage would be required. This facility size was based on storing the volume of back-to-back two-year return frequency storm events. The volume was estimated from actual SSO volume and rainfall records measured at the SCPS during a two-year return frequency storm that had a duration of almost two days. Using a rule of thumb cost estimate of $4 per gallon of storage, the construction cost for this approach would be on the order of magnitude of $60 million.

The treatment works at the WPCP are currently being expanded from 55 million gallons per day (mgd) to 111 mgd. Given the current expansion project at the WPCP, there is no land or configuration available on which to further expand the capacity for this persistent I/I. Therefore, new treatment works would be required in addition to the current WPCP expansion. If land were available, an estimated treatment capacity of 18 mgd would be required. This facility size was based on excess flow rates measured at both the SCPS and WPCP during five-year return frequency storm events. The flow rates were estimated from actual flow and rainfall records measured at the SCPS and the WPCP. Using a rule of thumb cost estimate of $5 million per mgd treated, the construction cost for this approach would be on the order of magnitude of $100 million.

Throughout the entire District, there is approximately 380 miles of sewer pipe and 10,000 manholes. Using a rule of thumb cost estimate of $80 per foot of pipe and $2,000 per manhole for rehabilitation, about 50 percent of the sewer pipes and manholes throughout the entire District could be rehabilitated for the same order of magnitude cost of storage and new treatment works. As presented in the following section, only a select set of sewer basins warrants further sewer rehabilitation, representing less than 25 percent of the total sewer pipe and manholes throughout the entire District. The alternative analysis for sewer rehabilitation will consider flow metering, sewer system investigation, and sewer rehabilitation as presented in the following section. This should be considered as a supplementary phase of collection system rehabilitation that the County began over a decade ago.

In addition to the monetary considerations for continuing the sewer rehabilitation approach, the District believes the more sustainable approach is to maintain the existing infrastructure versus building new infrastructure. Simply, if the I/I can be removed at its source, then it should be removed instead of being conveyed and treated, using up valuable resources.

# 3.1 Alternative 1: Continued Sewer Rehabilitation

The supplementary phase of collection system rehabilitation work will entail SSES work and collection system rehabilitation construction. The SSES work may include manhole inspections, television inspection of sewers, smoke testing and dye testing, and flow monitoring. The collection system rehabilitation construction may include a mix of CIPP lining, pipe joint and lateral grouting, open cut repairs, spot repairs; and manhole repairs/replacement. This supplementary phase of collection system rehabilitation work will be conducted on the highest priority sewer basins, which were identified in Section 2.4 and Table 2.4.

## 3.1.1 Historical Flow Data

The County worked closely with the Dormitory Authority of the State of New York (DASNY) to secure the $950,000 Economic Development Assistance Program (EDAP) funding allocation to support the extensive flow monitoring program proposed by the County and approved by NYSDEC on August 24, 2012. The EDAP funds were ultimately made available by DASNY to the County in March 2014. Procurement of the flow monitoring equipment was advertised on June 9, 2014, and a contract was awarded on September 10, 2014 to ADS Environmental Services, LLC (ADS). ADS completed installation of 63 flow meters and five rain gauges in 2015. Forty-four meters were installed in the SCPS drainage basin and 14 meters were installed throughout the North Utica drainage basin. Two meters were installed to monitor flow to the County's Barnes Avenue Pump Station and three are used to monitor flow in the City of Utica's combined sewers to aid in hydraulic model calibration and confirmation. Three new flow meters were installed within the collection system tributary to the Starch Factory Interceptor (outside of the SCPS basin) in December 2019. Currently, 66 flow meters are installed under the County's flow monitoring program. In 2022, the County and their consultants plan to review and discuss the current flow meter locations and consider redeploying some flow meters to more strategic locations.

Flow metering data from ADS are available to the County and its consultant team for evaluating the impacts of sanitary sewer and manhole rehabilitation on the amount of I/I entering the sanitary sewer system. Raw flow monitoring data, consisting of 5-minute measurements of depth and velocity, is routinely analyzed to identify dry and wet weather days, define "typical" rain events for both summer and winter seasons, and analyze the rain event's effect on the flow in the sanitary sewer. This forms the basis of evaluating the quantity of RDII in large datasets. Each year, a report is created that provides a summary of the previous year's flow monitoring data. A summary of the 2021 data follows, and a more detailed report from ADS can be found in Appendix A.

Based on the RDII analysis and as presented in Section 2.4 and Table 2.4, there are certain drainage basins tributary to the WPCP which are deemed to have excessive I/I. It is recommended these areas be subject of a supplementary phase of collection system rehabilitation.

### 3.1.1.1 2021 Starch Factory Drainage Basin Flow Data Summary

The flow meters in the Starch Factory drainage basin have been consistently collecting flow data since their installation in 2019. Their purpose is to isolate portions of the Starch Factory drainage basin so that areas of excess I/I can be identified. The data collected by these flow meters continues to be reviewed and analyzed. That said, preliminary results provided in the report by ADS (Appendix A) indicates that the sewershed tributary to meter "Oneida_205", located within Proctor Park, appears to be proportionally contributing the most RDII in the Starch Factory Interceptor area. The City of Utica previously advised the County of its plans to conduct its own additional flow monitoring in the Starch Factory drainage basin in 2022. Additionally, the County and the City of Utica held a meeting with ADS in the fourth quarter of 2021 to review and discuss the current flow meter locations, and consideration is being given to redeploying some flow meters to more strategic locations.

## 3.1.2 Sewer System Investigation

Sewer system investigations, including manhole inspections, smoke testing, dye tracing, and closed circuit television (CCTV) inspections, will be performed as part of this supplementary phase of collection system rehabilitation work.

### 3.1.2.1 Manhole Inspections

Manhole inspections will be performed during this investigation phase. Inspections will be based on standards and procedures from the National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program. Observations regarding structural defects and I/I sources will be made. Custom software will be used in the field to collect manhole data and produce a comprehensive, GIS-derived database of inspection records that can be used to determine potential I/I sources and rehabilitate the manholes in the future.

### 3.1.2.2 Smoke Testing

All of the known sewers in the subject sewer basins will be smoke tested during this supplemental phase to identify potential inflow sources. Smoke testing involves blowing non-toxic smoke into the sewer mains and observing and documenting where the smoke exits the system. Depending on specific circumstances, the observed smoke can indicate the locations of broken pipes, cleanouts, area drains, or catch basins where stormwater inflow may enter the sanitary sewer collection system. Testing may indicate inflow sources, and in some circumstances, infiltration sources. Dye tracing locations can be recommended based on the smoke testing observations.

### 3.1.2.3 Dye Tracing

Locations such as public catch basins (drainage inlets) and private area drains where smoke is observed can be dye traced. This can be completed by dropping dye into a suspect location (i.e., a catch basin that smoked) and flushing it into the system with large amounts of water. Observations can then be made downstream in the sanitary sewer system to document whether the tested location was connected directly to the sanitary system. If dye is observed in the sanitary system, it will be confirmed and documented that there was a direct connection allowing inflow into the sanitary sewer system. This testing will be performed after the smoke testing has been performed at locations of potential inflow identified.

### 3.1.2.4 Closed Circuit Television Inspections

The CCTV inspection program for this phase of SSES will be performed using the NASSCO Pipe Assessment and Certification Program (PACP). The CCTV inspections will search for structural defects and possible sources of I/I in the sewer system by internal camera inspection of the sanitary sewer mainlines. During CCTV inspections, a CCTV camera with the capability to light, pan, and tilt will be utilized to investigate various defects and/or sources of I/I along the mainlines as the camera physically passes through the sewer mains. A NASSCO trained technician will operate the camera, observe the defects, and identify the defects and their severity. The operator will enter this data into a database that can be searched for defect type and severity. When the database is finalized, the engineering team can query the database and locate the most severe defects that warrant sewer system rehabilitation.

### 3.1.2.5 Micro-Basin Flow Monitoring

Micro-basin flow monitoring entails monitoring sewer flows in small reaches of sewers. For example, monitors are installed every 1,000 feet across a sewer system. All the monitors in the sewer system are employed simultaneously. With simultaneous readings, comparison of upstream and downstream monitors can yield specific sewer reaches that have high I/I. The monitors can record wastewater levels from 0 to 100 percent pipe

diameter during dry day periods and wet weather events and then convert those changes in level to volumetric differences in flow through the use of algorithms in an analysis software program. The high-resolution data (every 1,000 feet) allows the algorithm to pinpoint the faulty infrastructure contributing the majority of I/I. The results will be used to identify specific sections of pipes that require further inspection to find the source of I/I.

## 3.1.3 Sewer System Rehabilitation

### 3.1.3.1 Rehabilitation Methods

During the investigation of the sewer system, multiple measurements and observations will be documented. Included in the data collection effort will be pipe material, size, depth, infiltration type, defect type, and severity and locations of infiltration and defects. The inspection data will be analyzed and the most appropriate rehabilitation method(s) selected.

In general, there are four options for rehabilitating a sewer mainline: (1) excavate and replace; (2) manhole-to-manhole rehabilitation (pipe lining); (3) open-cut spot repair; and (4) trenchless spot repair. Excavation and replacement and open-cut spot repairs are disruptive, take more time, and are more costly than trenchless alternatives. However, there are some defects, such as a collapsed pipe, that preclude the use of trenchless rehabilitation alternatives. Excavation and replacement and open-cut spot repairs will be suggested when trenchless alternatives are not suitable. There may be some instances when an open-cut repair is needed to repair a collapsed pipe segment, but a manhole-to-manhole liner is then recommended to rehabilitate the other pipe defects.

When trenchless rehabilitation alternatives are selected, infiltration defects will be repaired using injection grout methods to stop active infiltration. After active infiltration has ceased, other rehabilitation methods will be used to restore structural and functional integrity to the sewer pipes. The additional rehabilitation methods used will depend on the existing defects and the sewer pipe construction materials as summarized below.

Manhole-to-manhole rehabilitation will be accomplished by CIPP lining; while trenchless spot repairs will consist of pressure testing and grouting as well as inserting pipe sleeves where cracks, fractures, and broken pipes exist. Break-in lateral connections will be rehabilitated using both grouting and liners. The following types of lining and spot repair work are anticipated based on past work throughout the District:

1. Pressure testing and grouting.
2. CIPP installations.
3. CIPP sleeve installations.
4. Root removal.
5. Lateral lining.
6. Lateral connection repairs.
7. Manhole grouting and lining.

As stated above, the severity of the observed defects will influence the approach used to compare sewer pipe rehabilitation/replacement alternatives. It is important to note that the recommended approach will be based on sewer rehabilitation being the preferred alternative, and sewer replacement used when needed or in the rare occurrence when it is more cost effective. Life cycle cost analyses for rehabilitation versus replacement have been completed by others (Killips, John; Gamble, Chad WEF 2013), and it has been shown that the costs for each are similar. Therefore, sewer rehabilitation will be recommended unless structural defects warrant replacement. If a pipe is in such poor condition that it is beyond rehabilitation, replacement would be necessary. However, for the reasons stated above, where manhole-to-manhole rehabilitation or spot repairs are able to be completed, that will be the preferred method of rehabilitation.

An analysis based on the types and quantities of defects observed will be performed to determine the most cost-effective rehabilitation technique. Generally, if a sewer pipe section is found to be structurally unsound, the sewer pipe will be replaced. For structurally sound pipes, spot repairs will always be considered first, but if the quantity of spot repairs reaches a significant threshold, full length (manhole-to-manhole) CIPP linings will be installed. For example, a full-length CIPP liner will be recommended when the total cost for completing the spot repair(s) exceeds 50 percent of the cost for a full-length CIPP liner. This criterion emphasizes life cycle cost

considerations; even though the spot repairs are less costly today, the full-length liner has a much longer life expectancy and therefore a lower life cycle cost. As stated above, certain defects such as a collapsed pipe can only be repaired using an open-cut spot repair. But if the cost of a full-length CIPP liner is 50 percent more than the spot repairs of the remaining defects, a full-length liner will be recommended. Using the database described in Section 3.1.2.4 allows for easy and accurate review of each pipe section; therefore, each sewer pipe will be evaluated on a case-by-case basis to determine which method is most feasible and cost effective.

Regardless of the ultimate rehabilitation method chosen (spot repair or manhole-to-manhole), most sewer pipes will need to undergo some common form of rehabilitation. Common rehabilitation techniques include root control, grinding of protruding lateral service connections, service lateral rehabilitation near the host pipe, and repair of collapsed pipes. Root intrusion will be removed via mechanical cutting and chemical root control. It is recommended that active and break-in service connections receive lateral rehabilitation. Once these common rehabilitation techniques have been implemented, the other defects may be rehabilitated using localized grouting, pipe sleeves, or CIPP lining.

Based on past work in throughout the District the vast majority of the sewer defects are expected to be within the sanitary sewer system. However, there may be cases where there are cross connections between the sanitary sewer system and stormwater system or defects in the stormwater system causing I/I issues. These cross connections and stormwater system defects will be addressed on a case-by-case basis as part of this project.

### 3.1.3.2 Comprehensive Sewer Basin Approach

Historically, I/I projects typically rehabilitate only visually observed I/I sources. Unfortunately, this historical approach does not address groundwater migration. If only the visually observed sources are repaired, groundwater then often migrates to the nearest undetected defect, resulting in little, if any, benefit to the sewer system. Therefore, repairing only the visually observed leaks (and not all potential leaks) may not maximize peak flow reduction as the groundwater migrates to the next weakest spot in the sewer system. To find the next source, follow-up inspections become necessary.

Alternatively, the recommended approach to sewer rehabilitation for this project is to inspect and rehabilitate the entire sewer system in the highest priority sewer basins including all pipe, manholes, and lateral connections. Projects that address I/I with this type of comprehensive sewer basin approach versus individual sewer sections or manholes are more successful in reducing peak flow and provide better long-term results. By addressing I/I sources on a comprehensive basis, as compared to individual observed defects, post-rehabilitation sewer flows become easier to assess.

The mitigation of I/I will take several years to complete owing to the widespread nature of the sewer basins and I/I sources throughout the District's collection system. Therefore, the recommended I/I reduction program includes a progressive implementation approach to ensure a technically feasible and cost-effective solution to reduce I/I.

I/I reduction projects and a comprehensive sewer rehabilitation approach are both recommended to reduce I/I in the District's collection system. It is further recommended that this work be completed by implementing a build-and-measure program. For this program, phases of work will be identified and completed, and subsequent studies undertaken to measure I/I reduction. By implementing a build-and-measure program, the success of the work can be monitored as it is being completed and adjustments made to the program to optimize I/I reduction per dollar spent. Further, at some point, there will be diminishing returns on the rehabilitation investment and a decision will be made regarding the scope of future rehabilitation projects.

In consultation with the District, it was decided that this supplementary phase of collection system rehabilitation work will progress in a build-and-measure fashion starting with the highest priority I/I reduction projects, such as rehabilitation of the collection systems in the sewer basins identified in Section 2.4 and Table 2.4. The cost estimates and schedule for the first phase of work are provided below.

### 3.1.4 Alternative 1 Opinion of Probable Capital Costs

Using price information from past work in the County and other collection system rehabilitation work throughout New York State, it is estimated the total cost to complete the County's supplementary phase of collection system rehabilitation work is $26 million. Table 3.1 provides current unit pricing for SSES work and collection system rehabilitation construction.

*Table 3.1 Sanitary Sewer Pipe Rehabilitation Unit Cost Estimate*

| Rehabilitation Description | Unit | Cost Per Unit | Cost Per Unit by Pipe Diameter | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 6 | 8 | 10 | 12 | 15 | 18 |
| Manhole inspection | Each | $150 | | | | | | |
| Smoke testing | Feet | $1 | | | | | | |
| Dye tracing | Each | $300 | | | | | | |
| CCTV | Feet | | $3 | $3 | $3 | $3 | $4 | $4 |
| Micro-basin metering | Feet | $1.5 | | | | | | |
| CIPP short liner-point repair (1) | Each | | $3,000 | $3,450 | $3,900 | $4,500 | $5,700 | $6,000 |
| Joint grouting (1,2) | Each | | $25 | $27 | $29 | $31 | $37 | $39 |
| Lateral liner (top hat) (3) | Each | | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 |
| Lateral grouting (1,2) | Each | | $600 | $600 | $600 | $600 | $700 | $700 |
| CIPP full length liner (2,4) | Feet | | $50 | $50 | $53 | $71 | $94 | $118 |
| Open cut point repair (0'-6' depth) (4) | Each | | $8,000 | $9,000 | $9,000 | $12,000 | $15,000 | $16,000 |
| Open cut point repair (6'-12' depth) (4) | Each | | $14,400 | $16,200 | $16,200 | $21,600 | $27,000 | $29,000 |
| Open cut point repair (12'-16' depth) (4) | Each | | $17,600 | $19,800 | $19,800 | $26,400 | $33,000 | $36,000 |
| Open cut point repair (+16' depth) (4) | Each | | $20,800 | $23,400 | $23,400 | $31,200 | $39,000 | $42,000 |
| Full length replacement (0'-6' depth) (5) | Feet | | $250 | $250 | $250 | $280 | $300 | $320 |
| Full length replacement (6'-12' depth) (5) | Feet | | $313 | $313 | $313 | $350 | $375 | $395 |
| Full length replacement (12'-16' depth) (5) | Feet | | $375 | $375 | $375 | $420 | $450 | $475 |
| Full length replacement (+16' depth) (5) | Feet | | $475 | $475 | $475 | $532 | $570 | $590 |
| Lateral rehabilitation | Each | $2,000 | | | | | | |
| Manhole rehabilitation | Each | $2,000 | | | | | | |

(1) Source: National Water Main Cleaning Company Budget Prices.
(2) Source: City of Port Chester Bids (2016).
(3) Source: Engineer's estimate.
(4) Source: City of New Rochelle Bids (2017).
(5) Source: Rockland County Bids (2015).

Notes:

- Open cut point repair cost is based on 15-foot length.
- Open-cut replacement cost based on complete pipe replacement (approximately 200 feet)
- Open-cut replacement and open-cut point repair costs based on non-NYSDOT roads.
- Trench replacement only; no milling and pavement of road.

Table 3.2 presents the SSES cost estimate, the collection system rehabilitation construction estimate and the total cost estimate.

*Table 3.2 Engineer's Opinion of Probable Cost*

| Basin | Basin ID | Length (feet) | Number of Manholes | Cost of SSES | Cost of Sewer System Rehabilitation |
|---|---|---|---|---|---|
| City of Utica-Proctor Park | ONEIDA_205 | 41,980 | 140 | $250,000 | $1,189,000 |
| City of Utica-South Park | ONEIDA_31223 | 33,299 | 111 | $200,000 | $943,000 |
| Town of Deerfield-1 | Oneida_DFD1 | 15,574 | 52 | $100,000 | $441,000 |
| Town of Deerfield-2 | Oneida_DFD2 | 47,017 | 157 | $280,000 | $1,332,000 |
| Town of Deerfield-3 | Oneida_DFD3 | 34,577 | 115 | $210,000 | $980,000 |
| Town of New Hartford-Oneida Street | Oneida_NHD22 | 57,479 | 192 | $350,000 | $1,629,000 |
| Town of New Hartford-Chenango Street | Oneida_NHD23 | 74,255 | 248 | $450,000 | $2,104,000 |
| Town of New Hartford-New Hartford Street | Oneida_NHD24 | 34,200 | 114 | $210,000 | $969,000 |
| Village of New York Mills-Commercial Drive | Oneida_NYM3B | 27,395 | 91 | $170,000 | $777,000 |
| Village of Oriskany-South | Oneida_OKY1A | 12,946 | 43 | $80,000 | $367,000 |
| Village of Oriskany-North | Oneida_OKY1B | 22,096 | 74 | $130,000 | $626,000 |
| Village of New Hartford | Oneida_VNHD1 | 46,012 | 153 | $50,000 | $1,304,000 |
| Village of Whitesboro-Redfield Avenue | Oneida_WBO1 | 64,665 | 216 | $390,000 | $1,832,000 |
| Village of Whitesboro-Linwood Place A | Oneida_WBO2 A | 26,427 | 88 | $160,000 | $749,000 |
| Village of Whitesboro-Linwood Place B | Oneida_WBO2 B | 26,529 | 88 | $160,000 | $751,000 |
| Village of Whitesboro-Pleasant Street | Oneida_WBO3 | 1,978 | 7 | $10,000 | $56,000 |
| Village of Yorkville-East | Oneida_YKV1A | 50,475 | 168 | $0 (1) | $1,430,000 |
| Village of Yorkville-North East | Oneida_YKV1B | 2,325 | 8 | $0 (1) | $66,000 |
| Village of Yorkville-West | Oneida_YKV2 | 23,130 | 77 | $0 (1) | $0 (1) |
| | **Subtotals** | | | $3,200,000 | $17,600,000 |
| | Construction Total | | | | $20,800,000 |
| | Engineering/Legal/Financial | | | | $2,000,000 |
| | Contingency | | | | $3,200,000 |
| | **PROJECT TOTAL** | | | | **$26,000,000** |

(1) Work completed or in progress.

### 3.1.5 Alternative 1 Estimated O&M Costs

The County and municipalities each have their own sewer operation and maintenance budgets used for both proactive and reactive work. This supplementary phase of collection system rehabilitation represents an asset renewal of aging infrastructure, which in turn will lessen future maintenance cost and reduce reactive work in the system associated with system defects and I/I-related issues.

### 3.1.6 Non-Monetary Factors

Advantages and disadvantages of this collection system rehabilitation work are presented below.

#### 3.1.6.1 Advantages

The advantages of the collection system rehabilitation work are (1) aging assets would be renewed instead of building new infrastructure; and (2) it is less distributive to the community.

#### 3.1.6.2 Disadvantages

The disadvantage of the collection system rehabilitation work is that it may take several years using a build-and-measure approach to mitigate wet weather flows at SCPS and WPCP.

## 3.2 Green Infrastructure Alternatives

Green infrastructure uses plants, soil, pervious surfaces, or stormwater harvesting to decrease the volume and rate of runoff to a discharge point. Effective green infrastructure, such as bioretention, requires permeable soils (not generally present throughout the District) and active vegetation to sequester rainfall so that it does not enter the sanitary sewer system. The municipalities currently use a mix of storm sewers and ditches to convey rainwater to receiving waters. While the storm sewers seem to effectively sequester rainfall, increasing the rate of soil infiltration using green infrastructure will likely move flow into the sanitary sewer. This means that green infrastructure designed to increase infiltration is not anticipated to help remove inflow from the sewer. The detached single-family home configuration in throughout the District means that each street already has a significant amount of grass and trees along the road. These capture a significant amount of rainwater. This means that a green infrastructure project will not likely reduce I/I unless a project can be implemented that will move runoff away from the sewer. In addition, green infrastructure practices that collect runoff from structures (e.g., green roofs, rain barrels, cisterns, or stormwater planters) would need to be applied to each single-family home to have an impact on the overall discharge.

From the perspective of sanitary sewer operations, it is preferable to control surface runoff so that it is directed away from the sanitary sewers. Such potential green infrastructure projects would likely take the form of swales, constructed wetlands, or detention ponds and require significant regrading to capture stormwater in a location that is not near sanitary sewers. The municipalities would have to acquire land to do this and changing grading to point towards a detention area will be a considerable expense. In addition, the highest priority basins within the District contains very little available vacant land. Because of these reasons, The Green Infrastructure was determined to be infeasible for the Village and removed from further consideration.

# 4. Summary and Comparison of Alternatives

Three approaches were considered to mitigate I/I impacts at the SCPS and WPCP: (1) storage; (2) new treatment works; and (3) sewer rehabilitation. At this point in the County's SSO mitigation efforts, continued sewer rehabilitation is the only feasible alternative to reduce wet weather flow received at the SCPS and the WPCP. The construction costs for storage and new treatments works are more than $60 million and $100 million, respectively, making these approaches unfeasible compared to the $21 million estimated construction cost of sewer rehabilitation. In addition to monetary considerations, maintaining the existing infrastructure is simply a more sustainable approach as opposed to building new infrastructure. The County's philosophy is that if the I/I can be removed at its source, it should be removed instead of being conveyed and treated using valuable resources.

# 5. Recommended Alternative

The recommended alternative is to continue the County's collection system rehabilitation work in a supplementary phase(s) of work. It is further recommended that the sewer rehabilitation project inspect and rehabilitate the entire sewer system in the highest priority sewer basins including all pipe, manholes, and lateral connections. Projects that address I/I with this type of comprehensive sewer basin approach versus individual sewer sections or manholes are more successful in reducing peak flow and provide better long-term results. The work should also be completed by implementing a build-and-measure program. For this program, phases of work will be identified and completed and subsequent studies undertaken to measure I/I reduction. By implementing a build-and-measure program, the success of the work can be monitored as it is being completed and adjustments made to the program to optimize I/I reduction per dollar spent.

This supplementary phase of collection system rehabilitation work will progress in a build-and-measure fashion starting with the highest priority I/I reduction projects, such as rehabilitation of the collection systems in the sewer basins identified in Section 2.4 and Table 2.4. The total project cost estimate for this supplementary phase of collection system rehabilitation work is $26 million.

## 5.1 Proposed Schedule

As this is a supplemental phase of sewer rehabilitation, work will continue through the rest of the year 2022. It is anticipated that financing and or grant funding will be approved by April 1, 2023, thus the project scheduled was developed accordingly.

***Table 5.1 Proposed Project Schedule***

| Project Milestone | Date |
|---|---|
| Continued Collection Investigations | 2022-2023 |
| EFC Project Approval | 4/1/2023 |
| Continued Collection Investigations | 2023 |
| Plans & Specifications for Bidding | 10/1/2023 |
| Advertise Bid | 12/1/2023 |
| Start Construction | 4/1/2024 |
| End Construction | 12/31/2025 |

## 5.2 Next Steps

### 5.2.1 Descriptions of Community Engagement

Since 2013, the County has made a significant effort toward community outreach initiatives. The goal of the outreach has been public education on the importance of the SSO mitigation program and the benefit of the capital upgrades in the collection system, at the SCPS, and at the WPCP. Community Engagement has included:

- Development of the “Operation Ripple Effect” initiative to educate the community on the overall program, and benefits of disconnecting stormwater sources from the collection system. http://rippleeffectocsd.org
- Radio and television advertisements
- Interviews of key personnel (County Executive, Commissioner, etc.) by local print and radio media
- Rain barrel construction community events
- Educational events in local elementary schools
- Regular Steering Committee meetings with DPW supervisors, highway superintendents, etc. in the communities that operate collection systems tributary to the OCSD interceptor network.

The community engagement program will continue through the construction of the upgrades described in this Engineering Report.

### 5.2.2 SEQR Review

A preliminary SEQRA review based on past collection system rehabilitation projects and past SEQRA review by the County confirms the continuations of collection system rehabilitation will have no significant adverse impacts on the environment, and the County will likely identify this as Type II Action with regard to proposed improvements and modifications to collection systems throughout the District.

### 5.2.3 Procurement Method

These collection system rehabilitation work will be procured by a traditional design-bid-build process. Once the final design is completed, and plans approved by the NYSEFC and NYSDEC, the Contract Documents will be issued for public bidding. The Contractor(s) will be chosen on the basis of the lowest responsible base bid.

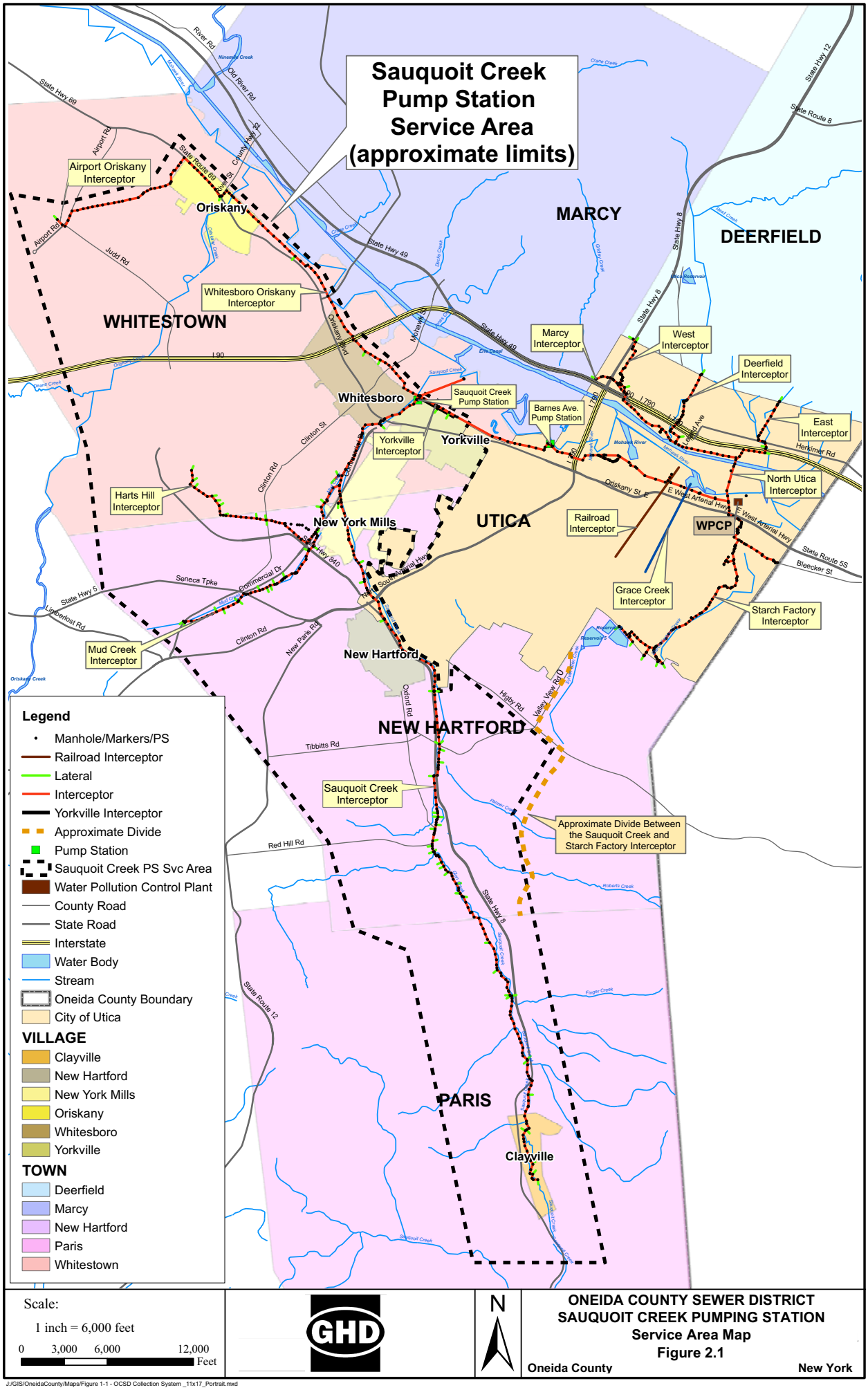
### 5.2.4 Smart Growth Assessment

As required by the NYSEFC, the County has prepared the Smart Growth Assessment Form for this project. The completed form can be found in Appendix B.

### 5.2.5 Engineering Report Certification

As required by the NYSEFC, the County has prepared the Engineering Report Certification for this project. The completed form can be found in Appendix C.

# Figures


Sauquoit Creek Pump Station Service Area (approximate limits)
Airport Oriskany Interceptor
Oriskany
Whitesboro Oriskany Interceptor
WHITESTOWN
MARCY
DEERFIELD
Marcy Interceptor
West Interceptor
Deerfield Interceptor
East Interceptor
Whitesboro
Sauquoit Creek Pump Station
Barnes Ave. Pump Station
Yorkville Interceptor
Yorkville
Harts Hill Interceptor
New York Mills
UTICA
Railroad Interceptor
WPCP
North Utica Interceptor
Grace Creek Interceptor
Starch Factory Interceptor
Mud Creek Interceptor
New Hartford
NEW HARTFORD
Sauquoit Creek Interceptor
Approximate Divide Between the Sauquoit Creek and Starch Factory Interceptor
PARIS
Clayville
Legend
Manhole/Markers/PS
Railroad Interceptor
Lateral
Interceptor
Yorkville Interceptor
Approximate Divide
Pump Station
Sauquoit Creek PS Svc Area
Water Pollution Control Plant
County Road
State Road
Interstate
Water Body
Stream
Oneida County Boundary
City of Utica
VILLAGE
Clayville
New Hartford
New York Mills
Oriskany
Whitesboro
Yorkville
TOWN
Deerfield
Marcy
New Hartford
Paris
Whitestown
Scale:
1 inch = 6,000 feet
0 3,000 6,000 12,000
Feet
GHD
N
ONEIDA COUNTY SEWER DISTRICT
SAUQUOIT CREEK PUMPING STATION
Service Area Map
Figure 2.1
Oneida County
New York
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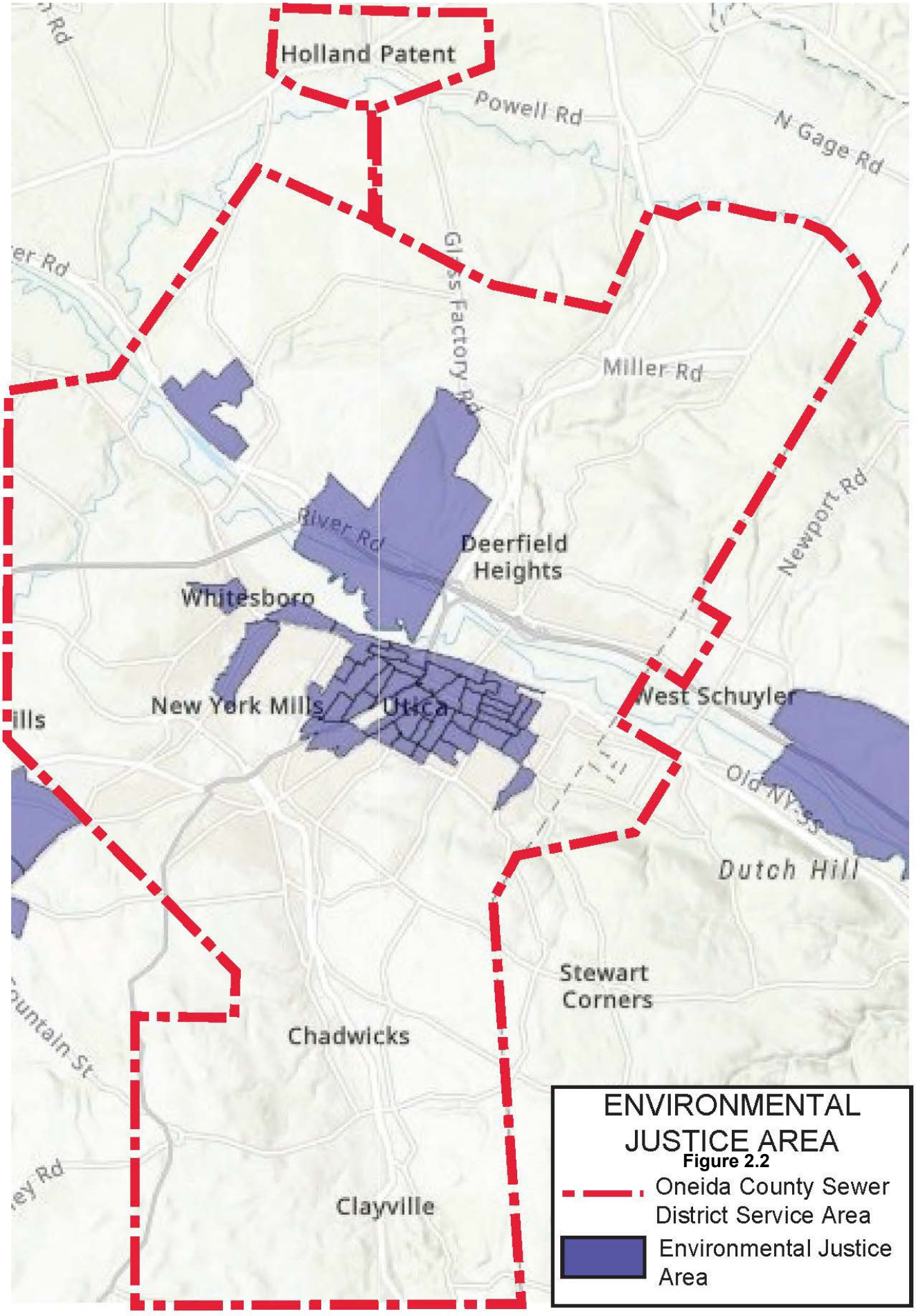
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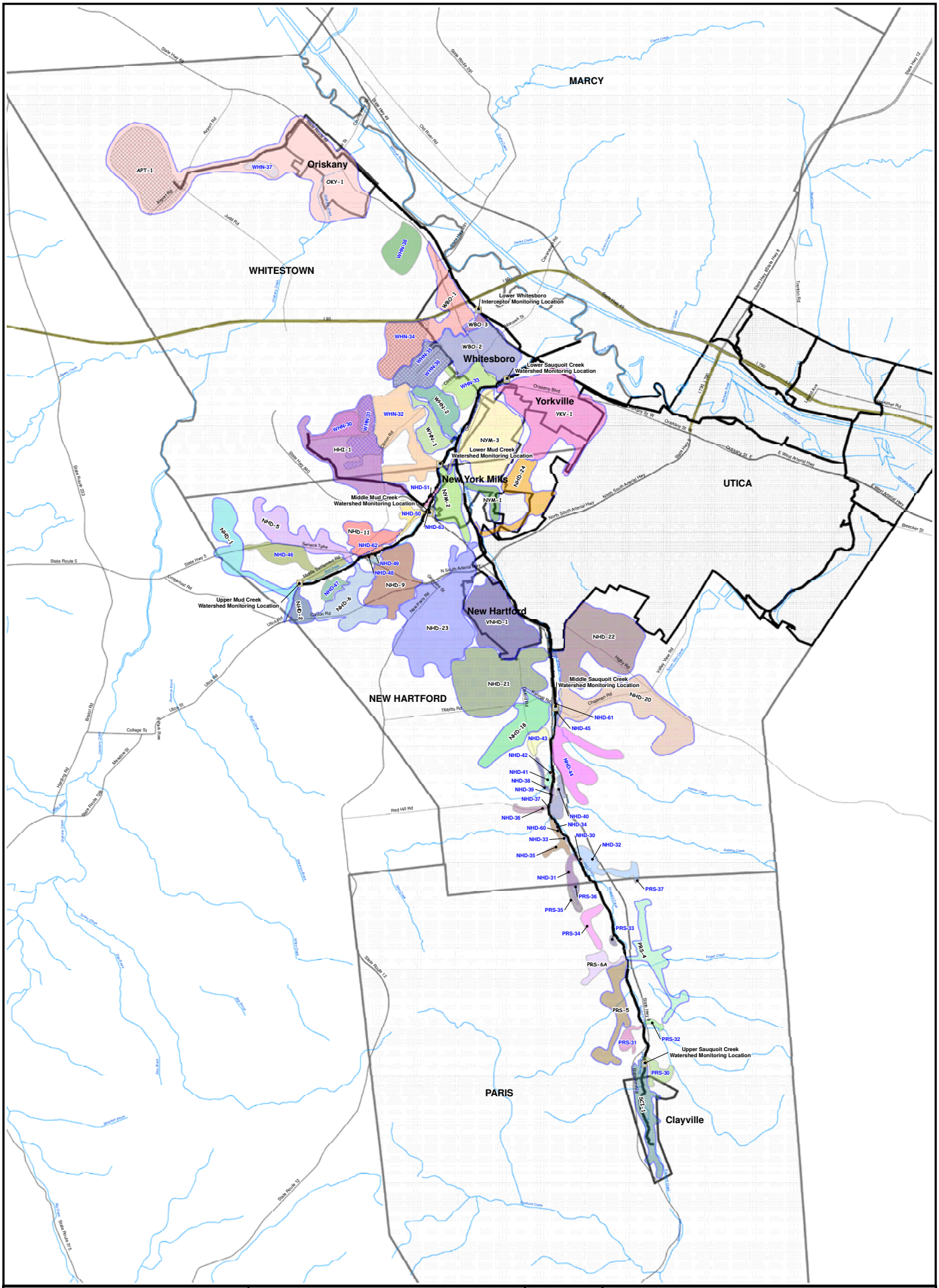
N Gage Rd
Glass Factory Rd
Miller Rd
River Rd
Deerfield Heights
Whitesboro
New York Mills
Utica
West Schuyler
Newport Rd
Old NY-5S
Dutch Hill
Stewart Corners
Chadwicks
Clayville
ENVIRONMENTAL JUSTICE AREA
Figure 2.2
Oneida County Sewer District Service Area
Environmental Justice Area




Scale:

0 0.5 1 2 Miles

GHD

N

**ONEIDA COUNTY SEWER DISTRICT**
**SAUQUOIT CREEK PUMPING STATION**
**Municipal Sewer Basins**
**Figure 2-3**

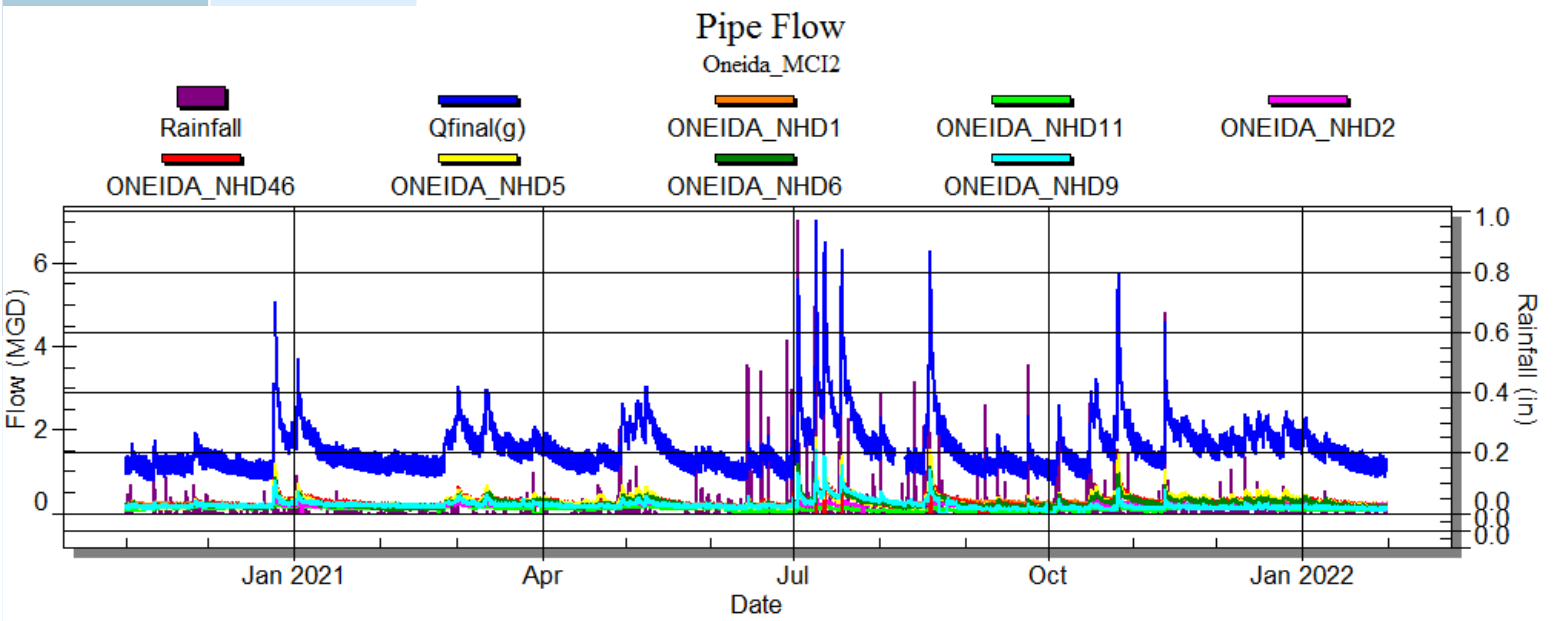
Oneida County New York

# Appendices

# Appendix A

## ADS Flow Monitory Data Report

# Oneida County Annual Report
# RDII Analysis
21 April 2022



# Table of Contents

# 1. – Overview

The objectives of this report are to review the historical flow data from the County's metering and rain gauge networks for calendar year 2021. The report will look at:

1. Hydrographs from three groups of specified meters of interest for storms of July 8, August 17-21, October 24-26, and November 12.
2. Meters in the Starch Factory Interceptor for the same four storms
3. Seasonal values in Average Dry Day Flow (ADDF) and Base Infiltration (BI)
4. Trends in Gross RDII Volume and Peak Flows
5. Severity of RDII in individual meter basins.

The graphics in this report are intended to provide summary level information.

Figure 1 on the next page is a schematic layout of the metering network as it was during the last year.

FIGURE 1.

# Oneida County, NY 2021 (28 Feb 22) Flow Monitoring Study Schematic

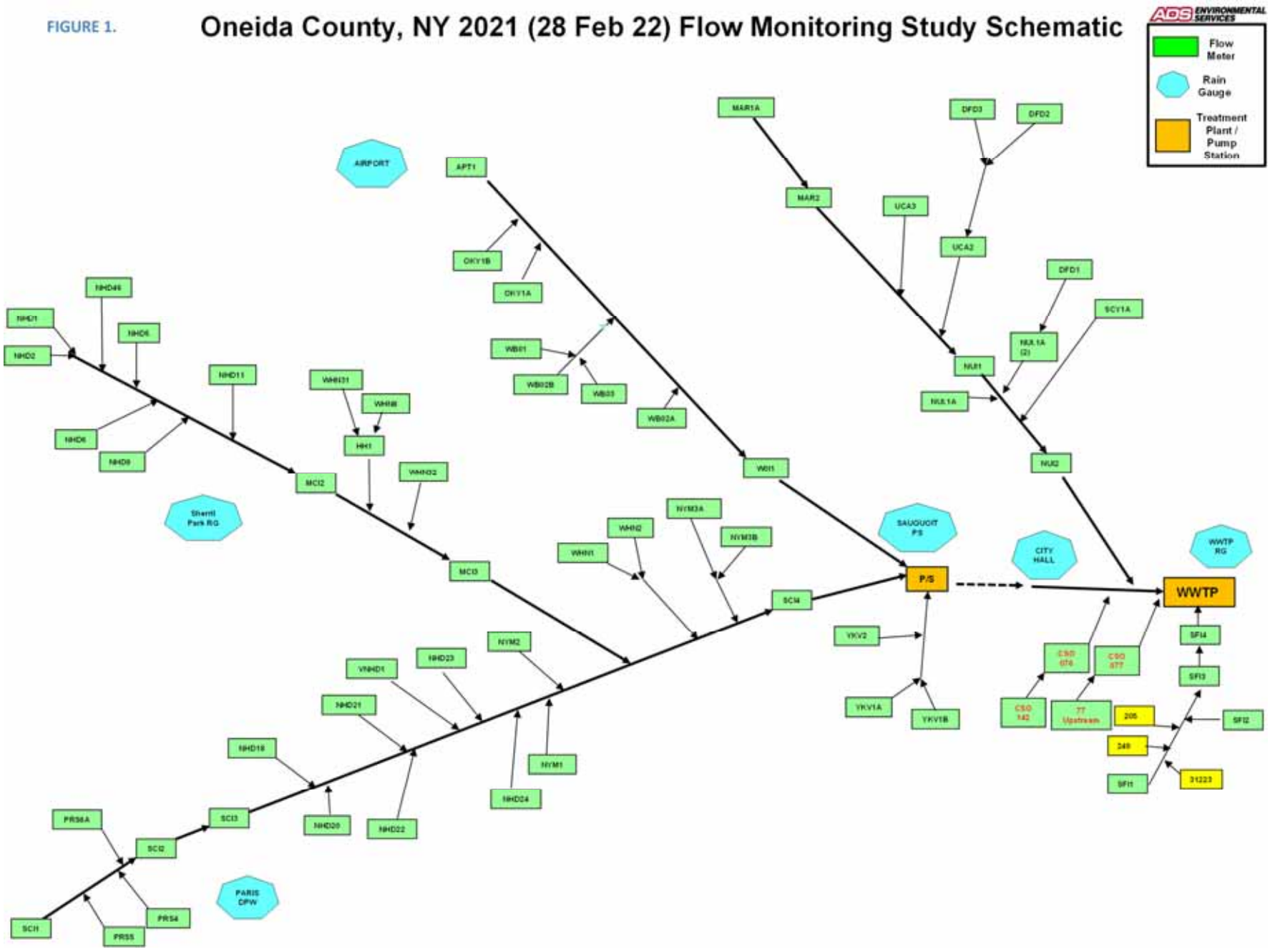


Table 1 lists the sizes of each of the metered sewersheds in Acres and linear feet of sewer. These values are used to 'normalize' RDII volumes to provide an apples-to-apples comparison. A series of 9's indicates the value is unknown. These values have been provided to ADS.

**Table 1 Basin sizes in Acres and Linear Feet of sewer.**

| Basin | Area | Length |
|---|---|---|
| ONEIDA_205 | 99 | 41,980 |
| ONEIDA_249 | 99 | 2,650 |
| ONEIDA_31223 | 99 | 33,299 |
| Oneida_APT1 | 532 | 26,391 |
| Oneida_DFD1 | 123 | 15,574 |
| Oneida_DFD2 | 344 | 47,017 |
| Oneida_DFD3 | 228 | 34,577 |
| Oneida_HHI1 | 216 | 35,910 |
| Oneida_MAR1A | 5,082 | 429,838 |
| Oneida_MAR2 | 232 | 40,894 |
| Oneida_MCI2 | 244 | 32,223 |
| Oneida_MCI3 | 90 | 7,090 |
| Oneida_NHD1 | 225 | 30,579 |
| Oneida_NHD11 | 106 | 14,198 |
| Oneida_NHD18 | 344 | 34,903 |
| Oneida_NHD2 | 61 | 5,250 |
| Oneida_NHD20 | 426 | 37,856 |
| Oneida_NHD21 | 394 | 45,742 |
| Oneida_NHD22 | 532 | 57,479 |
| Oneida_NHD23 | 701 | 74,255 |
| Oneida_NHD24 | 330 | 34,200 |
| Oneida_NHD46 | 254 | 17,714 |
| Oneida_NHD5 | 294 | 30,229 |
| Oneida_NHD6 | 237 | 26,097 |
| Oneida_NHD9 | 241 | 31,169 |
| Oneida_NUI1 | 24 | 9,011 |
| Oneida_NUI1A | 99 | 9,999 |
| Oneida_NUI2 | 1,070 | 122,183 |
| Oneida_NYM1 | 62 | 5,808 |
| Oneida_NYM2 | 162 | 19,741 |
| Oneida_NYM3A | 212 | 23,789 |
| Oneida_NYM3B | 263 | 27,395 |
| Oneida_OKY1A | 105 | 12,946 |
| Oneida_OKY1B | 126 | 22,096 |
| Oneida_PRS4 | 193 | 23,423 |

| Basin | Area | Length |
|---|---|---|
| Oneida_PRS5 | 138 | 16,953 |
| Oneida_PRS6A | 122 | 13,369 |
| Oneida_SCI1 | 92 | 19,791 |
| Oneida_SCI2 | 172 | 39,878 |
| Oneida_SCI3 | 575 | 75,360 |
| Oneida_SCI4 | 138 | 53,220 |
| Oneida_SCY1A | 129 | 19,503 |
| Oneida_SFI1 | 767 | 81,909 |
| Oneida_SFI2 | 142 | 8,115 |
| Oneida_SFI3 | 9,999 | 99,999 |
| Oneida_UCA2 | 231 | 33,284 |
| Oneida_UCA3 | 177 | 13,964 |
| Oneida_VNHD1 | 405 | 46,012 |
| Oneida_WBO1 | 504 | 64,665 |
| Oneida_WBO2A | 145 | 26,427 |
| Oneida_WBO2B | 176 | 26,529 |
| Oneida_WBO3 | 32 | 1,978 |
| Oneida_WHN1 | 116 | 15,156 |
| Oneida_WHN2 | 117 | 15,592 |
| Oneida_WHN31 | 148 | 16,758 |
| Oneida_WHN32 | 360 | 37,125 |
| Oneida_WHN8 | 53 | 6,724 |
| Oneida_WOI1 | 147 | 54,242 |
| Oneida_YKV1A | 292 | 50,475 |
| Oneida_YKV1B | 12 | 2,325 |
| Oneida_YKV2 | 173 | 23,130 |
| Private_348G | 9,999 | 99,999 |
| Utica_5351 | 9,999 | 99,999 |

## 2. – Hydrographs from Meters of Interest for Four Storms

It has been requested to view hydrographs from the three sets of meters listed in Table 2 for storms of July 8, August 17-21, October 24-26, and November 12.

Table 2 Three sets of meters for viewing hydrographs.

| Set 1: | Set 2 | Set 3 |
|---|---|---|
| NHD5 | VNHD1 | NYM3 |
| NHD18 | YKV1A | OKY1A |
| NHD20 | YKV2 | WBO1 |
| NHD21 | | WBO2A |
| NHD22 | | |
| NHD23 | | |
| NHD24 | | |

The hydrographs for these three sets of meters are included in following nine figures. The four storms for the three sets of meters are grouped into 3 hydrographs for each group.

Figure 2A Set 1 July 9

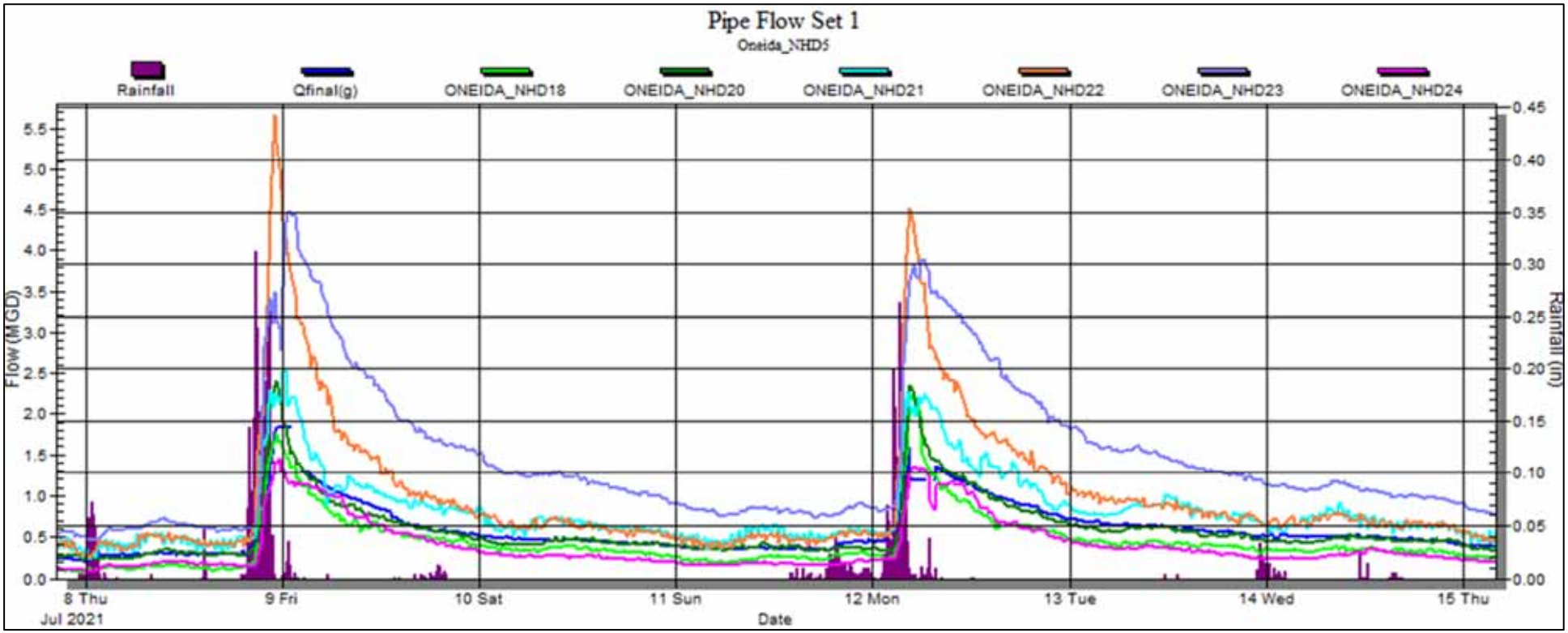


Figure 2B Set 1 August 18

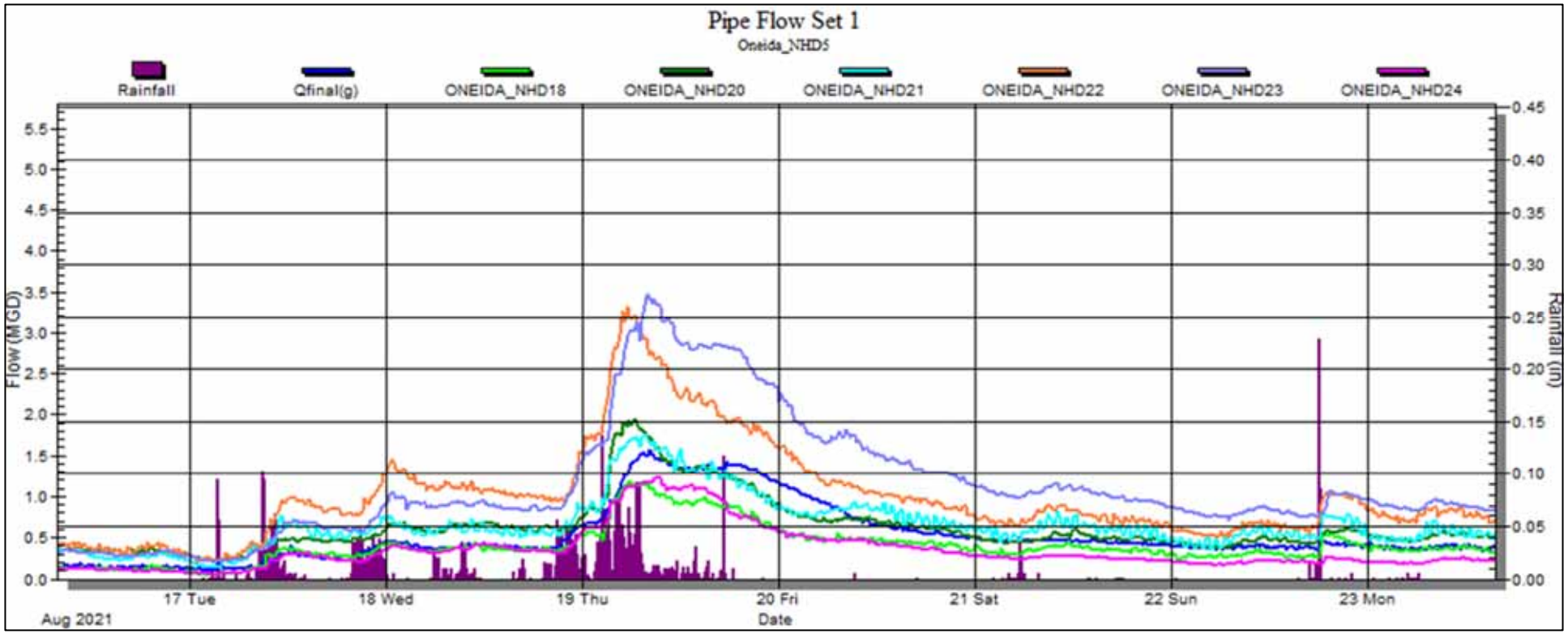


Figure 2C Set 1 October 26 and November 12

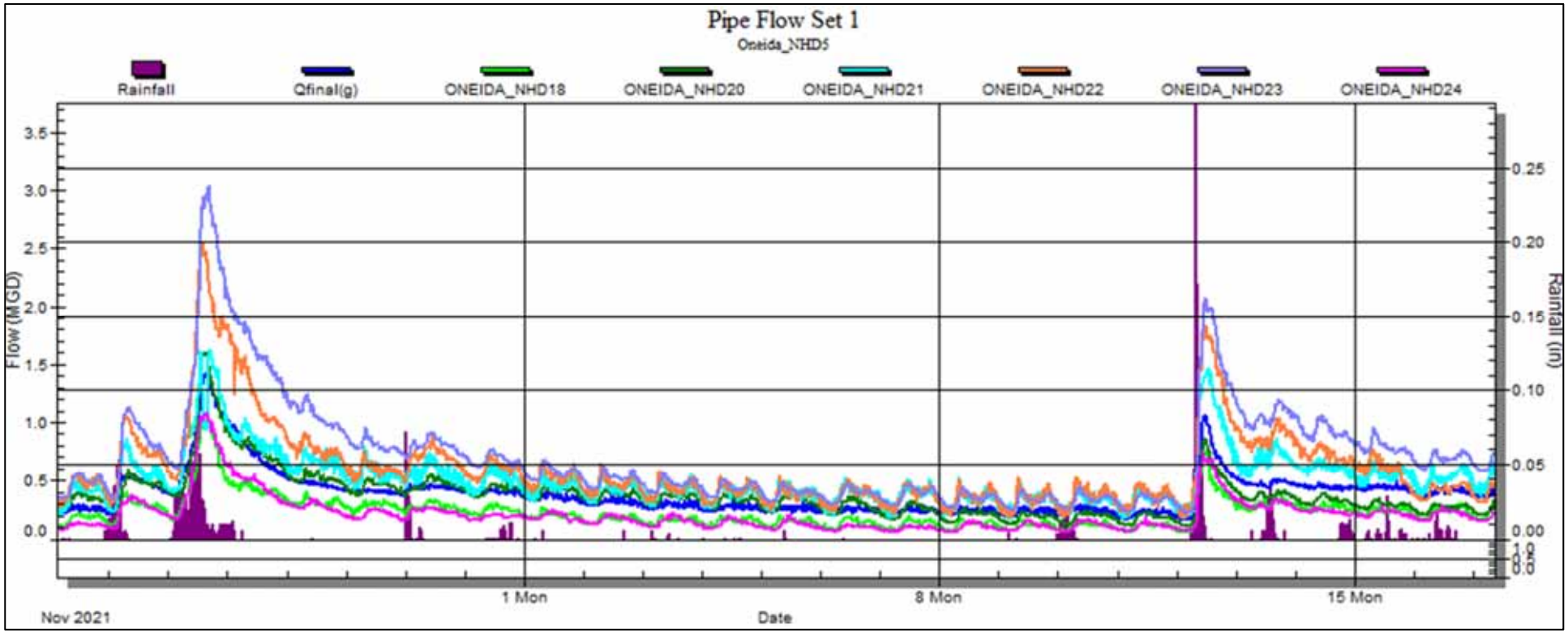


Figure 3A Set 2

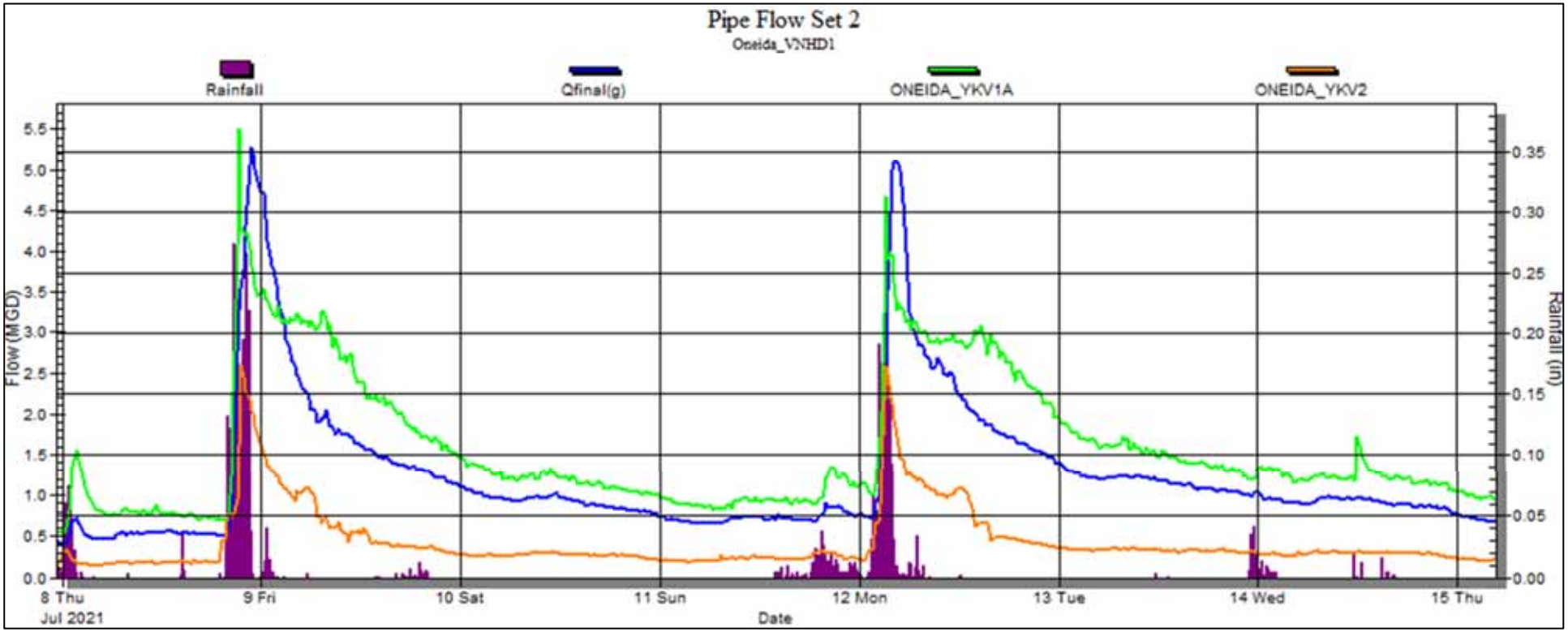


Figure 3B Set 2

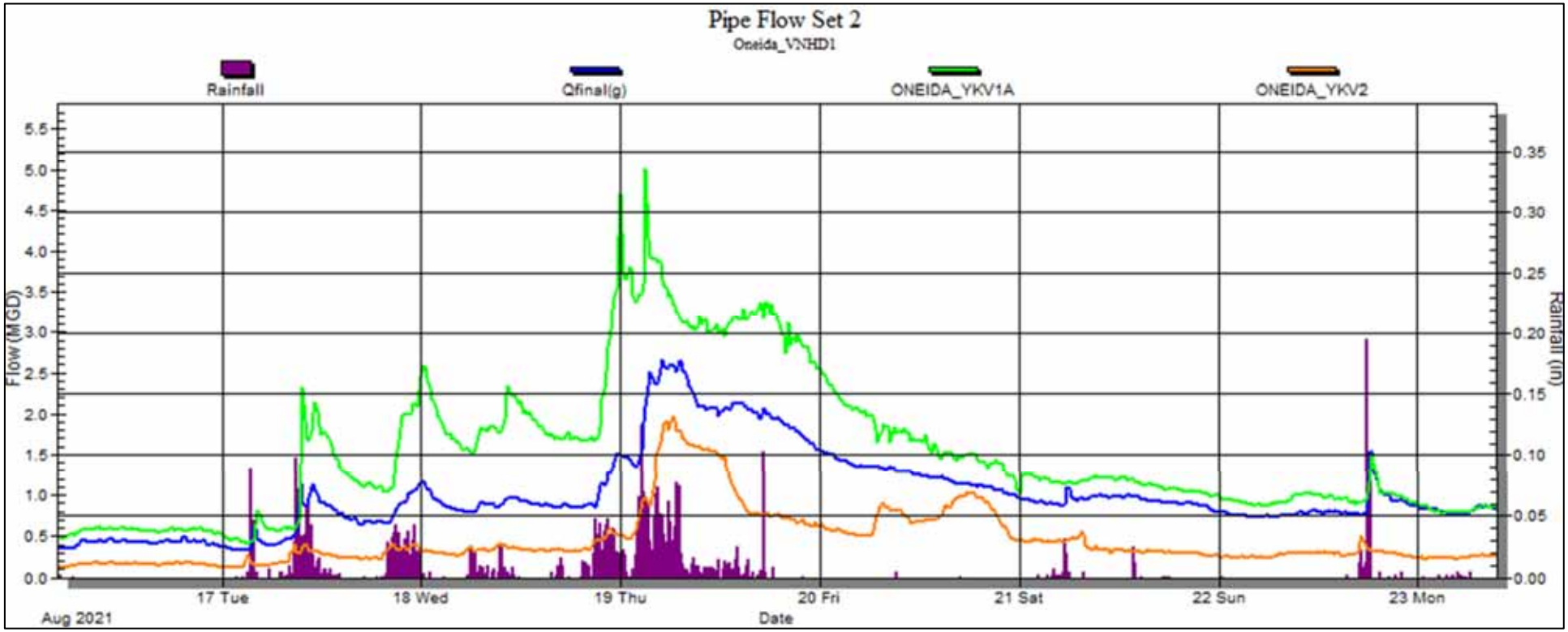


Figure 3C Set 2

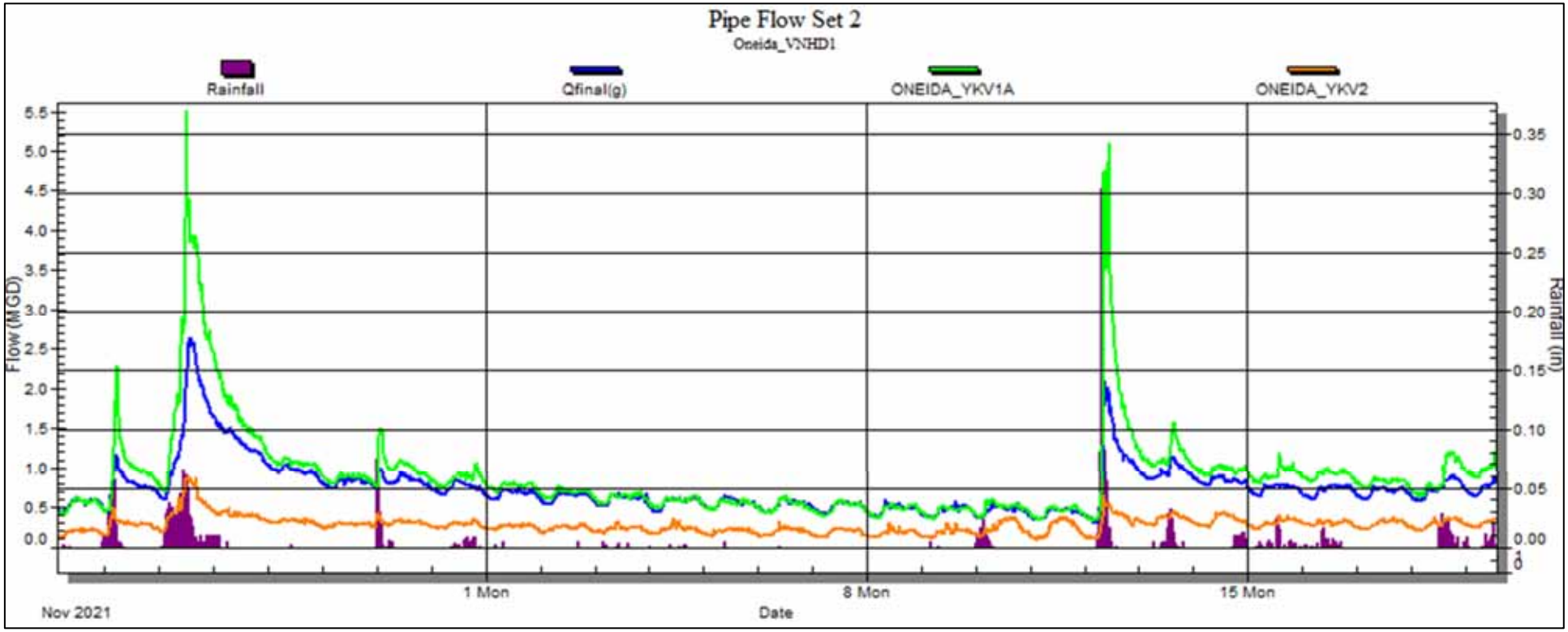


Figure 4A Set 3

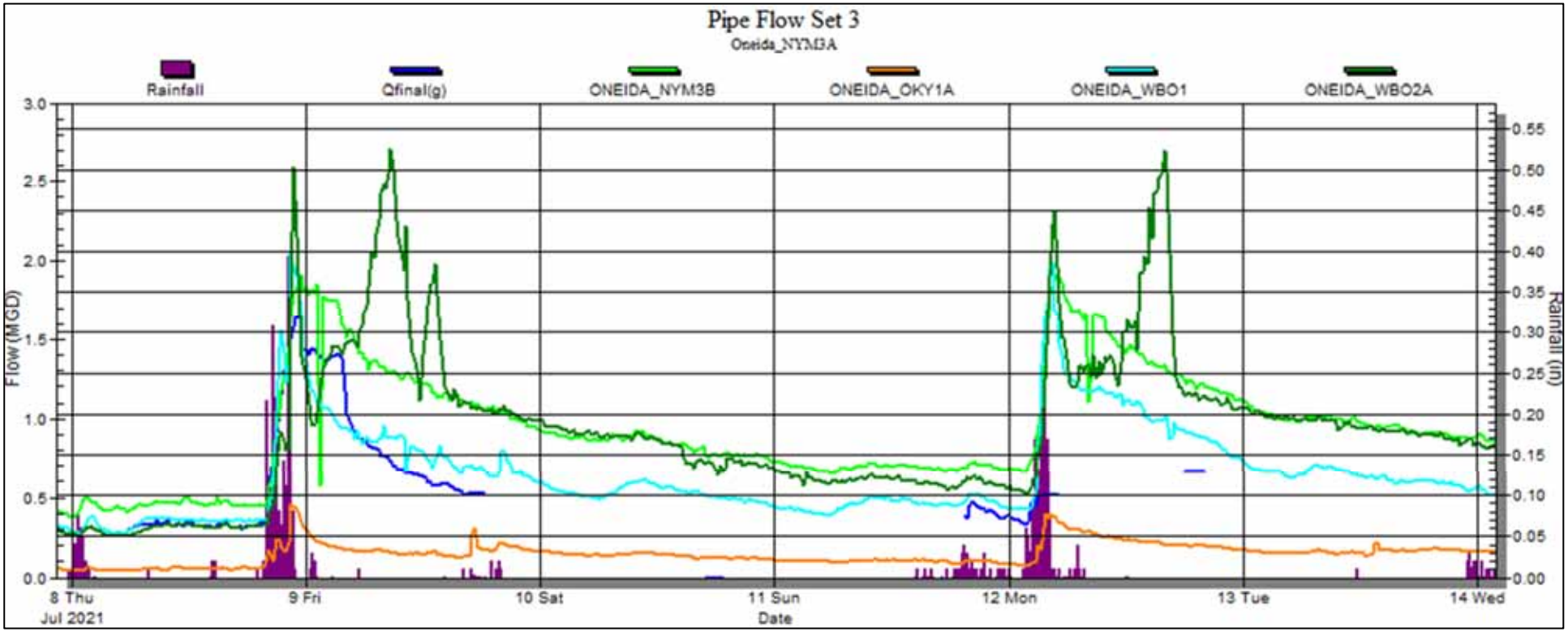


Figure 4B Set 3

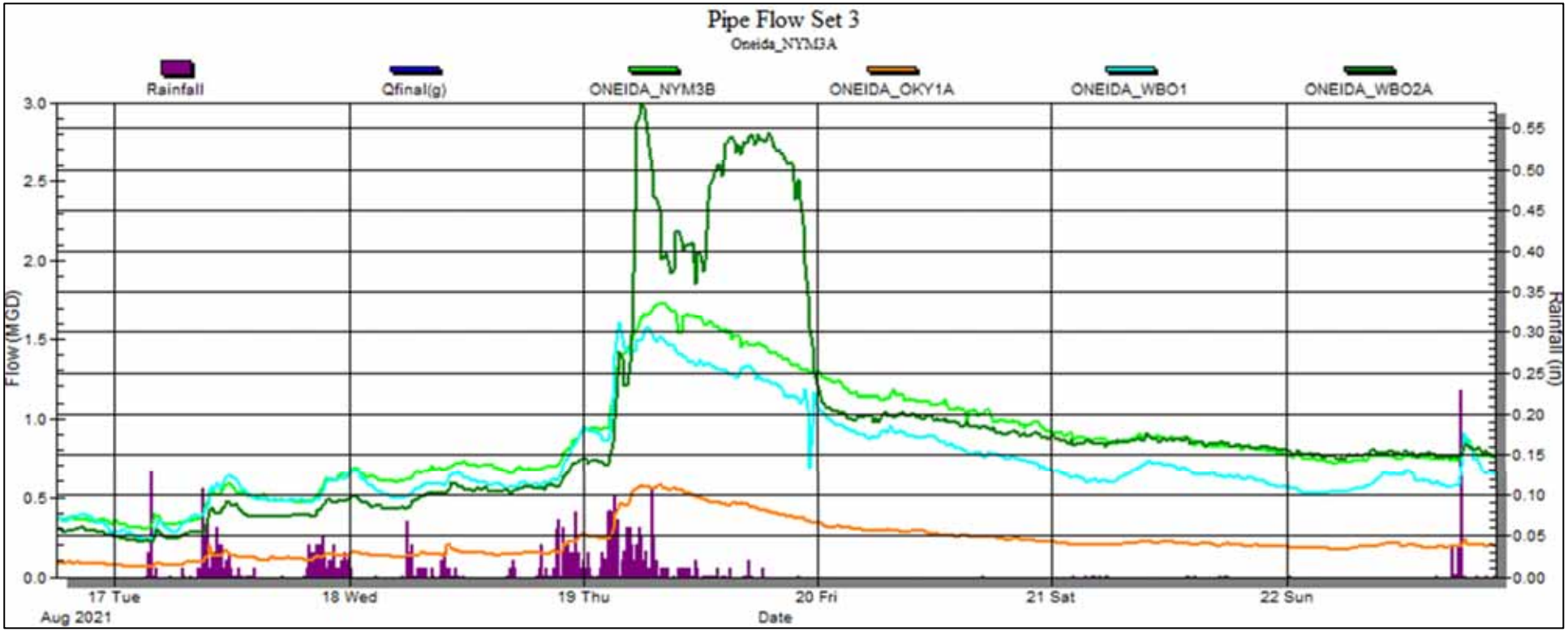
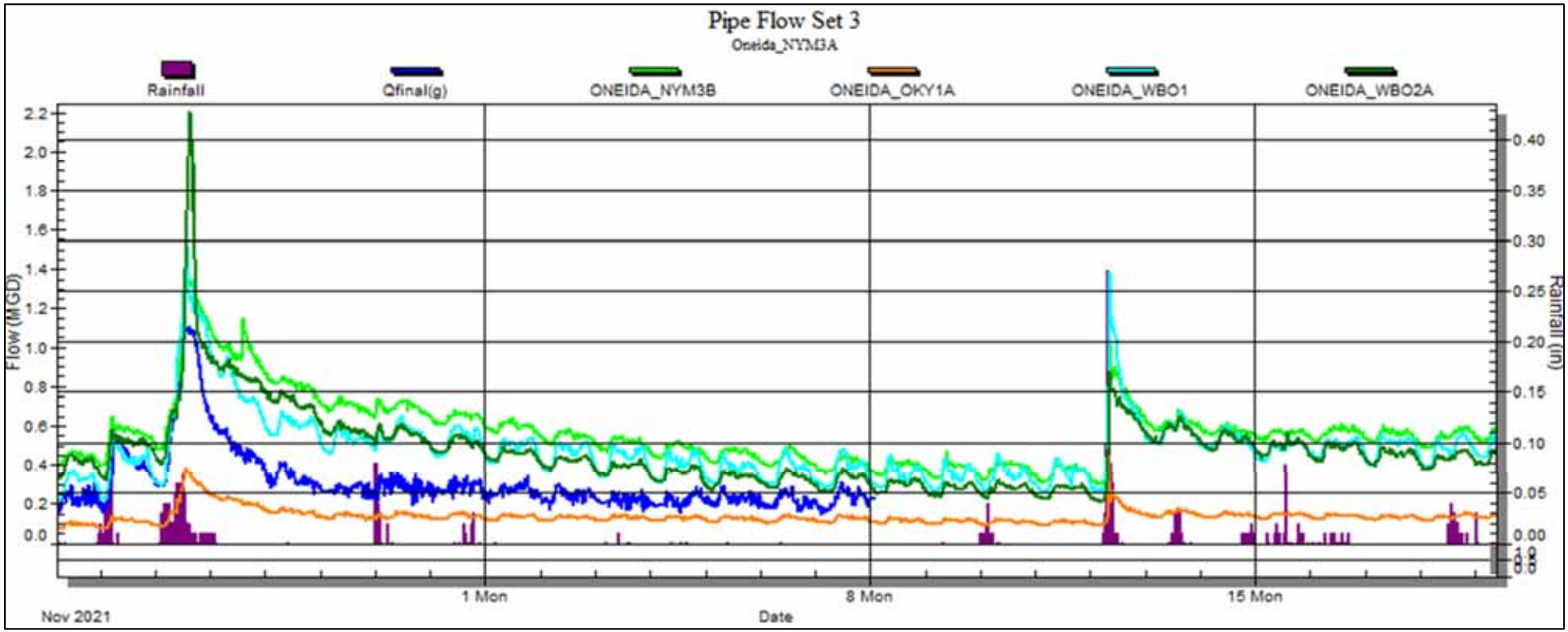


Figure 4C Set 3



## 2A Starch Factory Interceptor Hydrographs

The following three figures show the hydrographs from the four selected storms.

Figure 5A Starch Factory Interceptor

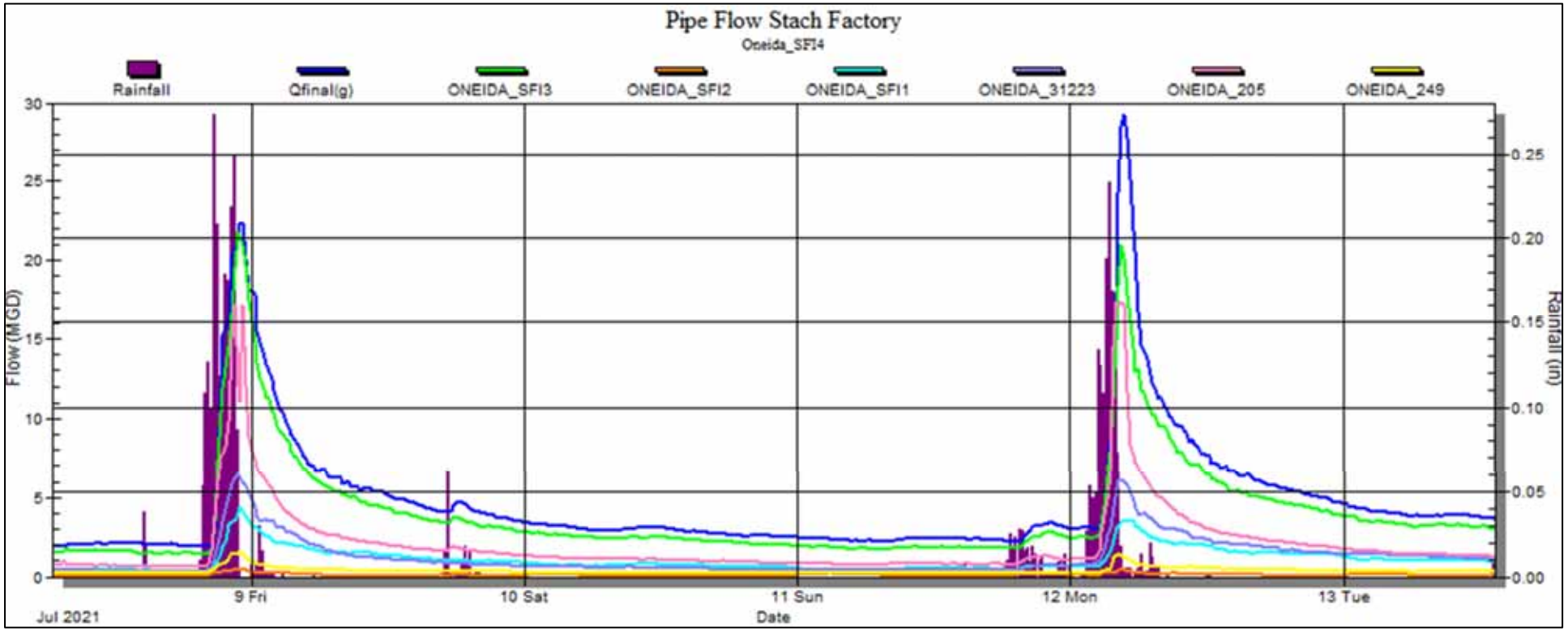


Figure 5B Starch Factory Interceptor

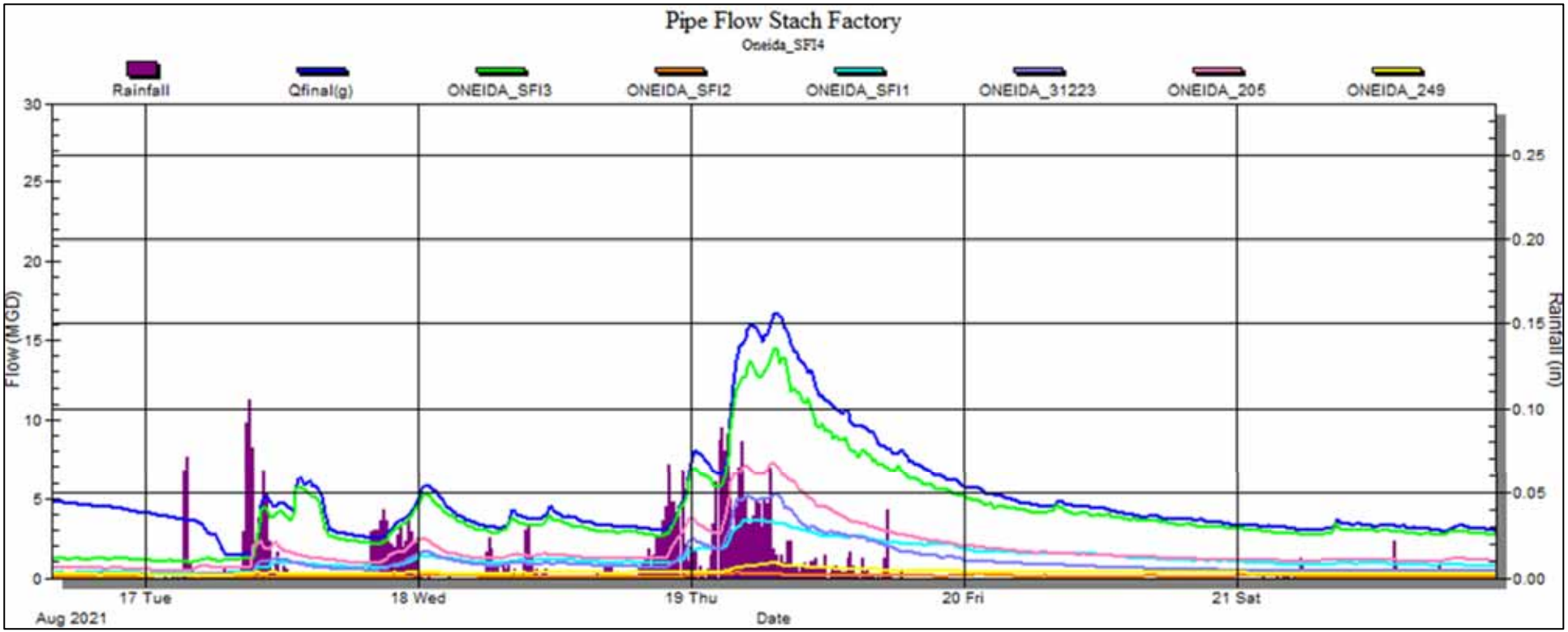
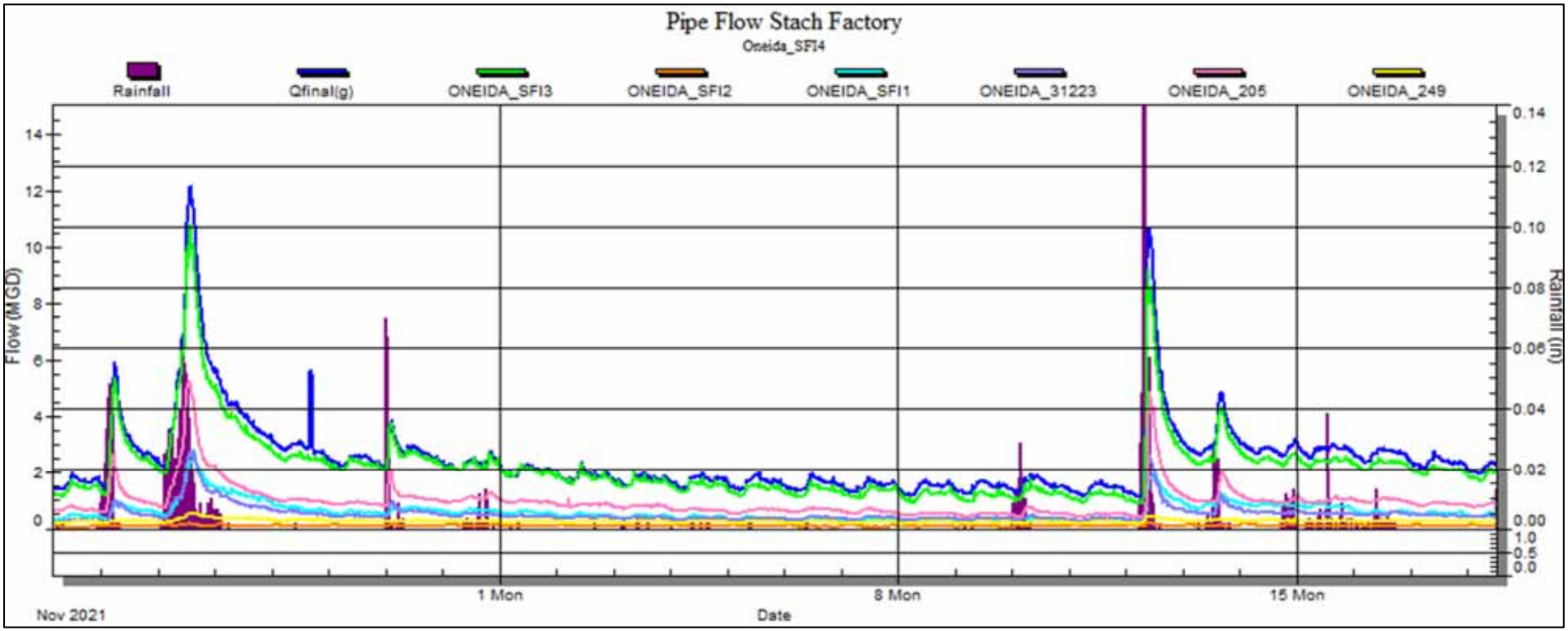


Figure 5C Starch Factory Interceptor



## 3. - Rainfall

Table 3 lists the rainfall recorded at each gauge from November of 2020.

**Table 3 Rainfall totals since November 2020.**

| Storm | RG_Airport | RG_Cityhall | RG_ParisDPW | RG_SauquoitPS | RG_Sherillpark | RG_WWTP |
|---|---|---|---|---|---|---|
| 11/2/2020 | 0.35 | 0.41 | 0.37 | 0.41 | 0.28 | 0.37 |
| 11/11/2020 | 0.9 | 0.71 | 0.69 | 0.79 | 0.66 | 0.88 |
| 11/22/2020 | 0.3 | 0.26 | 0.57 | 0.31 | 0.33 | 0.33 |
| 11/25/2020 | 0.62 | 0.69 | 0.47 | 0.73 | 0.63 | 0.66 |
| 12/24/2020 | 1.5 | 1.22 | 1.72 | 1.5 | 1.57 | 1.39 |
| 1/2/2021 | 0.8 | 0.64 | 0 | 0.98 | 0.58 | 0.73 |
| 3/28/2021 | 0.47 | 0.62 | 0.68 | 0.54 | 0.6 | 0.62 |
| 4/20/2021 | 0.48 | 0.52 | 0.69 | 0.69 | 0.83 | 0.52 |
| 4/29/2021 | 1.03 | 1.04 | 1.03 | 0 | 0.95 | 1.01 |
| 5/2/2021 | 0.88 | 0.73 | 0.63 | 0 | 0.56 | 0.83 |
| 5/4/2021 | 0.75 | 0.55 | 0.57 | 0 | 0.59 | 0.64 |
| 5/8/2021 | 0.92 | 0.82 | 0.89 | 0 | 0.86 | 0.8 |
| 5/26/2021 | 0.38 | 0.62 | 0.29 | 0 | 0.42 | 0.52 |
| 5/28/2021 | 0.63 | 0.45 | 0.6 | 0 | 0.54 | 0.53 |
| 6/2/2021 | 0.61 | 0.24 | 0.89 | 0.3 | 0.31 | 0.25 |
| 6/14/2021 | 1.14 | 1.27 | 0.88 | 1.61 | 1.83 | 1.64 |
| 6/19/2021 | 0 | 1.07 | 0.59 | 1.35 | 0.92 | 0.8 |
| 7/1/2021 | 0.42 | 0.49 | 1.49 | 0.61 | 3.02 | 0.88 |
| 7/8/2021 | 1.61 | 2.64 | 1.45 | 2.36 | 2.55 | 3 |
| 7/11/2021 | 1.24 | 1.9 | 1.58 | 1.79 | 2.01 | 2.22 |
| 7/17/2021 | 1.88 | 2.55 | 1.53 | 2.25 | 1.99 | 2.68 |
| 7/29/2021 | 0.6 | 0.54 | 0.28 | 0.73 | 0.32 | 0.83 |
| 8/1/2021 | 1.02 | 0.72 | 0.98 | 0.59 | 1.03 | 0.66 |
| 8/13/2021 | 0.31 | 1.28 | 0.47 | 1.64 | 1.08 | 1.8 |
| 8/17/2021 | 4.64 | 2.85 | 3.45 | 3.39 | 4.15 | 3.22 |
| 9/8/2021 | 0.63 | 0.6 | 0.63 | 0.53 | 0.53 | 0.61 |
| 9/12/2021 | 1.06 | 0.81 | 1.01 | 0.79 | 0.99 | 0.82 |
| 9/15/2021 | 0.44 | 0.44 | 0.59 | 0.33 | 0.36 | 0.41 |
| 9/23/2021 | 1.52 | 0.47 | 0.78 | 0.78 | 0.96 | 0.64 |
| 10/3/2021 | 2.03 | 1.3 | 1.35 | 1.74 | 1.62 | 1.83 |
| 10/15/2021 | 2.34 | 1.69 | 2.28 | 2 | 2.09 | 1.67 |
| 10/24/2021 | 2.24 | 1.7 | 2.25 | 2.12 | 2.21 | 1.85 |

| Storm | RG_Airport | RG_Cityhall | RG_ParisDPW | RG_SauquoitPS | RG_Sherillpark | RG_WWTP |
|---|---|---|---|---|---|---|
| 11/12/2021 | 1.69 | 1.6 | 1.74 | 1.74 | 1.93 | 1.61 |
| 12/2/2021 | 0.53 | 0.37 | 0.47 | 0.59 | 0.38 | 0.39 |
| 12/6/2021 | 0.54 | 0.44 | 0.52 | 0.51 | 0.4 | 0.42 |
| 12/11/2021 | 0.5 | 0.52 | 0.47 | 0.54 | 0.48 | 0.56 |
| 12/15/2021 | 0.74 | 0.49 | 0.57 | 0.69 | 0.57 | 0.53 |
| 12/25/2021 | 0.62 | 0.53 | 0.64 | 0.46 | 0.6 | 0.63 |

Table 4 on the following page lists the maximum return frequency and corresponding duration for all storm from November 2020.

**Table 4 Maximum Return Frequency for storms since November 2020.**

| Storm | RG_Airport | RG_Cityhall | RG_ParisDPW | RG_SauquoitPS | RG_Sherillpark | RG_WWTP |
|---|---|---|---|---|---|---|
| 11/2/2020 | 0.8-mo;3-hr;0.3-in | 0.9-mo;3-hr;0.3-in | 0.9-mo;1-hr;0.2-in | 1.0-mo;3-hr;0.4-in | 0.6-mo;6-hr;0.3-in | 0.8-mo;3-hr;0.3-in |
| 11/11/2020 | 1.8-mo;6-hr;0.8-in | 1.4-mo;6-hr;0.6-in | 1.5-mo;6-hr;0.6-in | 1.6-mo;6-hr;0.7-in | 1.3-mo;6-hr;0.6-in | 1.9-mo;1-hr;0.4-in |
| 11/22/2020 | 0.6-mo;6-hr;0.2-in | 0.5-mo;6-hr;0.2-in | 1.0-mo;6-hr;0.4-in | 0.6-mo;6-hr;0.3-in | 0.6-mo;6-hr;0.2-in | 0.6-mo;12-hr;0.3-in |
| 11/25/2020 | 0.9-mo;12-hr;0.5-in | 1.0-mo;24-hr;0.6-in | 0.7-mo;12-hr;0.4-in | 1.1-mo;24-hr;0.7-in | 0.9-mo;24-hr;0.6-in | 1.0-mo;24-hr;0.6-in |
| 12/24/2020 | 3.2-mo;24-hr;1.5-in | 1.9-mo;24-hr;1.2-in | 4.6-mo;24-hr;1.7-in | 3.0-mo;24-hr;1.5-in | 3.4-mo;24-hr;1.5-in | 2.5-mo;24-hr;1.3-in |
| 1/2/2021 | 1.6-mo;6-hr;0.7-in | 1.2-mo;6-hr;0.5-in | 0.0-mo;15-min;0.0-in | 1.7-mo;12-hr;0.9-in | 1.0-mo;12-hr;0.6-in | 1.4-mo;6-hr;0.6-in |
| 3/28/2021 | 1.0-mo;2-hr;0.3-in | 1.0-mo;1-hr;0.2-in | 1.1-mo;2-hr;0.4-in | 0.5-mo;2-hr;0.2-in | 1.0-mo;15-min;0.2-in | 1.2-mo;1-hr;0.3-in |
| 4/20/2021 | 0.8-mo;12-hr;0.4-in | 0.7-mo;12-hr;0.4-in | 1.0-mo;48-hr;0.7-in | 1.4-mo;6-hr;0.6-in | 1.2-mo;48-hr;0.8-in | 0.8-mo;12-hr;0.4-in |
| 4/29/2021 | 1.6-mo;24-hr;1.0-in | 1.6-mo;24-hr;1.0-in | 1.5-mo;6-hr;0.7-in | 0.0-mo;15-min;0.0-in | 1.5-mo;24-hr;0.9-in | 1.6-mo;24-hr;1.0-in |
| 5/2/2021 | 1.2-mo;6-hr;0.5-in | 1.2-mo;6-hr;0.5-in | 0.9-mo;6-hr;0.4-in | 0.0-mo;15-min;0.0-in | 0.9-mo;6-hr;0.4-in | 1.3-mo;6-hr;0.6-in |
| 5/4/2021 | 1.4-mo;6-hr;0.6-in | 1.0-mo;1-hr;0.2-in | 0.8-mo;24-hr;0.5-in | 0.0-mo;15-min;0.0-in | 0.9-mo;6-hr;0.4-in | 1.1-mo;6-hr;0.5-in |
| 5/8/2021 | 1.2-mo;48-hr;0.9-in | 1.1-mo;12-hr;0.6-in | 1.2-mo;12-hr;0.7-in | 0.0-mo;15-min;0.0-in | 1.2-mo;48-hr;0.8-in | 1.0-mo;48-hr;0.7-in |
| 5/26/2021 | 0.9-mo;15-min;0.1-in | 1.5-mo;15-min;0.2-in | 1.0-mo;1-hr;0.2-in | 0.0-mo;15-min;0.0-in | 1.0-mo;1-hr;0.2-in | 1.5-mo;1-hr;0.3-in |
| 5/28/2021 | 1.1-mo;12-hr;0.6-in | 0.8-mo;12-hr;0.4-in | 1.0-mo;12-hr;0.5-in | 0.0-mo;15-min;0.0-in | 1.0-mo;12-hr;0.5-in | 0.9-mo;12-hr;0.5-in |
| 6/2/2021 | 1.6-mo;15-min;0.3-in | 0.3-mo;48-hr;0.2-in | 1.9-mo;15-min;0.3-in | 0.5-mo;24-hr;0.3-in | 0.5-mo;30-min;0.1-in | 0.3-mo;48-hr;0.2-in |
| 6/14/2021 | 1.3-yr;1-hr;0.9-in | 2.1-mo;1-hr;0.4-in | 1.6-mo;15-min;0.2-in | 2.4-yr;1-hr;1.1-in | 2.7-yr;15-min;0.7-in | 3.3-mo;30-min;0.4-in |
| 6/19/2021 | 0.0-mo;15-min;0.0-in | 8.2-mo;1-hr;0.7-in | 1.9-mo;15-min;0.3-in | 3.3-yr;30-min;1.0-in | 6.9-mo;30-min;0.6-in | 3.3-mo;1-hr;0.5-in |
| 7/2/2021 | 0.7-mo;12-hr;0.4-in | 0.9-mo;12-hr;0.5-in | 3.0-mo;30-min;0.4-in | 1.7-mo;15-min;0.3-in | 11.3-yr;1-hr;1.6-in | 2.4-mo;1-hr;0.5-in |
| 7/8/2021 | 6.7-mo;3-hr;1.1-in | 12.7-yr;3-hr;2.5-in | 1.0-yr;3-hr;1.3-in | 6.5-yr;3-hr;2.2-in | 10.6-yr;3-hr;2.4-in | 14.5-yr;3-hr;2.5-in |
| 7/11/2021 | 2.8-mo;3-hr;0.8-in | 2.0-yr;2-hr;1.4-in | 6.5-mo;2-hr;0.9-in | 1.1-yr;3-hr;1.4-in | 1.9-yr;2-hr;1.4-in | 3.4-yr;2-hr;1.6-in |
| 7/17/2021 | 5.1-mo;24-hr;1.7-in | 1.4-yr;1-hr;0.9-in | 2.7-mo;48-hr;1.5-in | 1.9-yr;1-hr;1.0-in | 5.7-mo;24-hr;1.8-in | 1.2-yr;24-hr;2.5-in |
| 7/29/2021 | 1.1-mo;6-hr;0.5-in | 1.0-mo;1-hr;0.2-in | 0.6-mo;6-hr;0.3-in | 1.3-mo;6-hr;0.6-in | 0.6-mo;6-hr;0.2-in | 2.8-mo;15-min;0.4-in |
| 8/1/2021 | 4.9-mo;15-min;0.4-in | 1.8-mo;3-hr;0.7-in | 1.8-mo;30-min;0.3-in | 1.5-mo;2-hr;0.5-in | 4.6-mo;1-hr;0.6-in | 1.7-mo;3-hr;0.6-in |
| 8/13/2021 | 1.2-mo;30-min;0.2-in | 11.1-mo;1-hr;0.8-in | 1.2-mo;15-min;0.2-in | 7.0-yr;1-hr;1.5-in | 2.3-yr;15-min;0.7-in | 1.3-yr;6-hr;1.6-in |
| 8/17/2021 | 4.8-yr;48-hr;4.0-in | 8.8-mo;48-hr;2.5-in | 1.2-yr;48-hr;2.8-in | 1.6-yr;48-hr;3.0-in | 2.5-yr;72-hr;4.0-in | 1.3-yr;48-hr;2.9-in |
| 9/8/2021 | 3.8-mo;1-hr;0.5-in | 2.6-mo;1-hr;0.5-in | 1.9-mo;1-hr;0.4-in | 1.8-mo;1-hr;0.4-in | 1.8-mo;1-hr;0.4-in | 2.5-mo;1-hr;0.5-in |
| 9/12/2021 | 3.7-mo;1-hr;0.5-in | 1.6-mo;6-hr;0.7-in | 1.9-mo;6-hr;0.8-in | 1.7-mo;1-hr;0.4-in | 2.5-mo;1-hr;0.5-in | 1.6-mo;6-hr;0.7-in |
| 9/15/2021 | 0.8-mo;12-hr;0.4-in | 1.0-mo;15-min;0.1-in | 1.4-mo;15-min;0.2-in | 0.8-mo;2-hr;0.2-in | 0.8-mo;2-hr;0.2-in | 0.9-mo;6-hr;0.4-in |
| 9/23/2021 | 3.4-yr;1-hr;1.2-in | 1.0-mo;6-hr;0.4-in | 2.0-mo;1-hr;0.4-in | 3.8-mo;1-hr;0.5-in | 7.5-mo;1-hr;0.7-in | 1.4-mo;6-hr;0.6-in |
| 10/3/2021 | 5.0-mo;48-hr;2.0-in | 1.8-mo;48-hr;1.3-in | 1.9-mo;48-hr;1.3-in | 3.5-mo;48-hr;1.7-in | 3.1-mo;48-hr;1.6-in | 3.8-mo;48-hr;1.8-in |
| 10/15/2021 | 4.8-mo;48-hr;2.0-in | 2.0-mo;72-hr;1.7-in | 4.4-mo;72-hr;2.3-in | 3.2-mo;72-hr;2.0-in | 3.5-mo;72-hr;2.1-in | 2.0-mo;72-hr;1.6-in |
| 10/24/2021 | 5.9-mo;48-hr;2.1-in | 3.4-mo;48-hr;1.7-in | 5.9-mo;48-hr;2.1-in | 5.4-mo;48-hr;2.1-in | 5.7-mo;48-hr;2.1-in | 3.9-mo;48-hr;1.8-in |
| 11/12/2021 | 5.1-mo;6-hr;1.2-in | 4.8-mo;6-hr;1.2-in | 5.8-mo;6-hr;1.3-in | 6.9-mo;6-hr;1.3-in | 1.0-yr;6-hr;1.5-in | 4.8-mo;6-hr;1.2-in |
| 12/2/2021 | 0.8-mo;24-hr;0.5-in | 0.6-mo;24-hr;0.4-in | 0.7-mo;24-hr;0.5-in | 0.9-mo;24-hr;0.6-in | 0.6-mo;24-hr;0.4-in | 0.6-mo;24-hr;0.4-in |
| 12/6/2021 | 1.2-mo;6-hr;0.5-in | 0.8-mo;6-hr;0.3-in | 1.1-mo;6-hr;0.5-in | 0.9-mo;6-hr;0.4-in | 0.9-mo;6-hr;0.4-in | 0.7-mo;6-hr;0.3-in |
| 12/11/2021 | 0.9-mo;6-hr;0.4-in | 0.9-mo;2-hr;0.3-in | 0.8-mo;2-hr;0.3-in | 1.0-mo;1-hr;0.2-in | 0.9-mo;2-hr;0.3-in | 0.9-mo;2-hr;0.3-in |
| 12/15/2021 | 1.3-mo;12-hr;0.7-in | 0.9-mo;12-hr;0.5-in | 1.0-mo;12-hr;0.5-in | 1.2-mo;12-hr;0.7-in | 0.9-mo;12-hr;0.5-in | 0.9-mo;12-hr;0.5-in |
| 12/25/2021 | 1.6-mo;15-min;0.3-in | 1.5-mo;15-min;0.2-in | 1.0-mo;24-hr;0.6-in | 0.8-mo;1-hr;0.2-in | 1.1-mo;12-hr;0.6-in | 1.3-mo;1-hr;0.3-in |

## 4. - ADDF and Base Infiltration System Wide

Figure 6 shows the Average Dry Day Flow (NetAvg), Wastewater Production (NetWW) and Base Infiltration (NetBI) values for the summer of 2021. These values are normalized by the length of sewer in each basin and the values are in GPD/LF. The wastewater production value of 5 GPD/LF is the upper limit of wastewater production that we would expect from single family residential areas. Low density housing can as low at 1 GPD/LF. High density housing such as multi-story apartments and commercial areas can be up to 10 GPD/LF. Many of these sites exhibit base infiltration values higher than the wastewater. The very high value for Oneida_249 appears to be due to private sewer that are not included in the basin size tally. High values for SFI4 are due to the 'very tight' subtraction from the upstream meter.

**Figure 6 Base Infiltration for Summer 2021.**

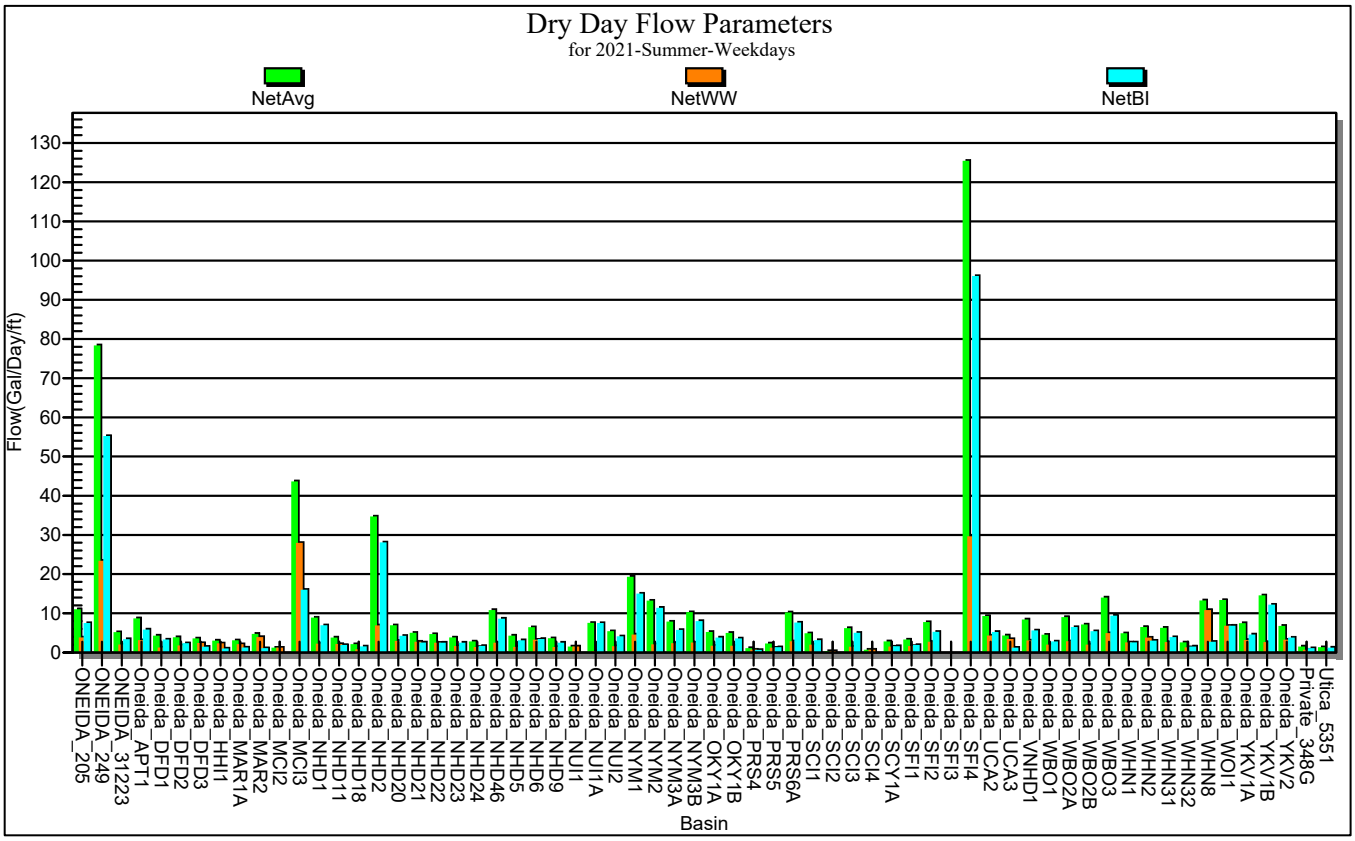


**Table 5 Ranked List of sewersheds from Figure 6 with Net Base Infiltration Values greater that 5 GPD/LF**

| | Net Base Infiltration in GPD/LF | | |
|---|---|---|---|
| Meter | NetAvg | NetWW | NetBI |
| Oneida_SFI4 | 125.172 | 29.381 | 95.791 |
| ONEIDA_249 | 78.074 | 23.124 | 54.95 |
| Oneida_NHD2 | 34.44 | 6.641 | 27.799 |
| Oneida_MCI3 | 43.38 | 27.667 | 15.713 |
| Oneida_NYM1 | 19.044 | 4.31 | 14.734 |
| Oneida_YKV1B | 14.277 | 2.364 | 11.913 |
| Oneida_NYM2 | 12.949 | 1.82 | 11.129 |
| Oneida_WBO3 | 13.747 | 4.648 | 9.099 |
| Oneida_NHD46 | 10.566 | 2.204 | 8.362 |
| Oneida_NYM3B | 9.99 | 2.256 | 7.734 |
| Oneida_PRS6A | 9.938 | 2.584 | 7.353 |
| Oneida_NUI1A | 7.288 | 0.06 | 7.228 |
| ONEIDA_205 | 10.777 | 3.557 | 7.22 |
| Oneida_NHD1 | 8.616 | 1.955 | 6.66 |
| Oneida_WOI1 | 13.09 | 6.531 | 6.558 |
| Oneida_WBO2A | 8.771 | 2.583 | 6.188 |
| Oneida_APT1 | 8.441 | 2.853 | 5.588 |
| Oneida_NYM3A | 7.581 | 2.103 | 5.478 |
| Oneida_VNHD1 | 8.137 | 2.796 | 5.342 |
| Oneida_WBO2B | 6.86 | 1.705 | 5.155 |
| Oneida_SFI2 | 7.473 | 2.48 | 4.994 |

## 5. - RDII System Wide

Figure 7 shows the Gross Peak RDII flow rate for 5 of the largest storms.

**Figure 7 Peak RDII flow rate recorded at each meter for 5 of the largest storms during the study period.**

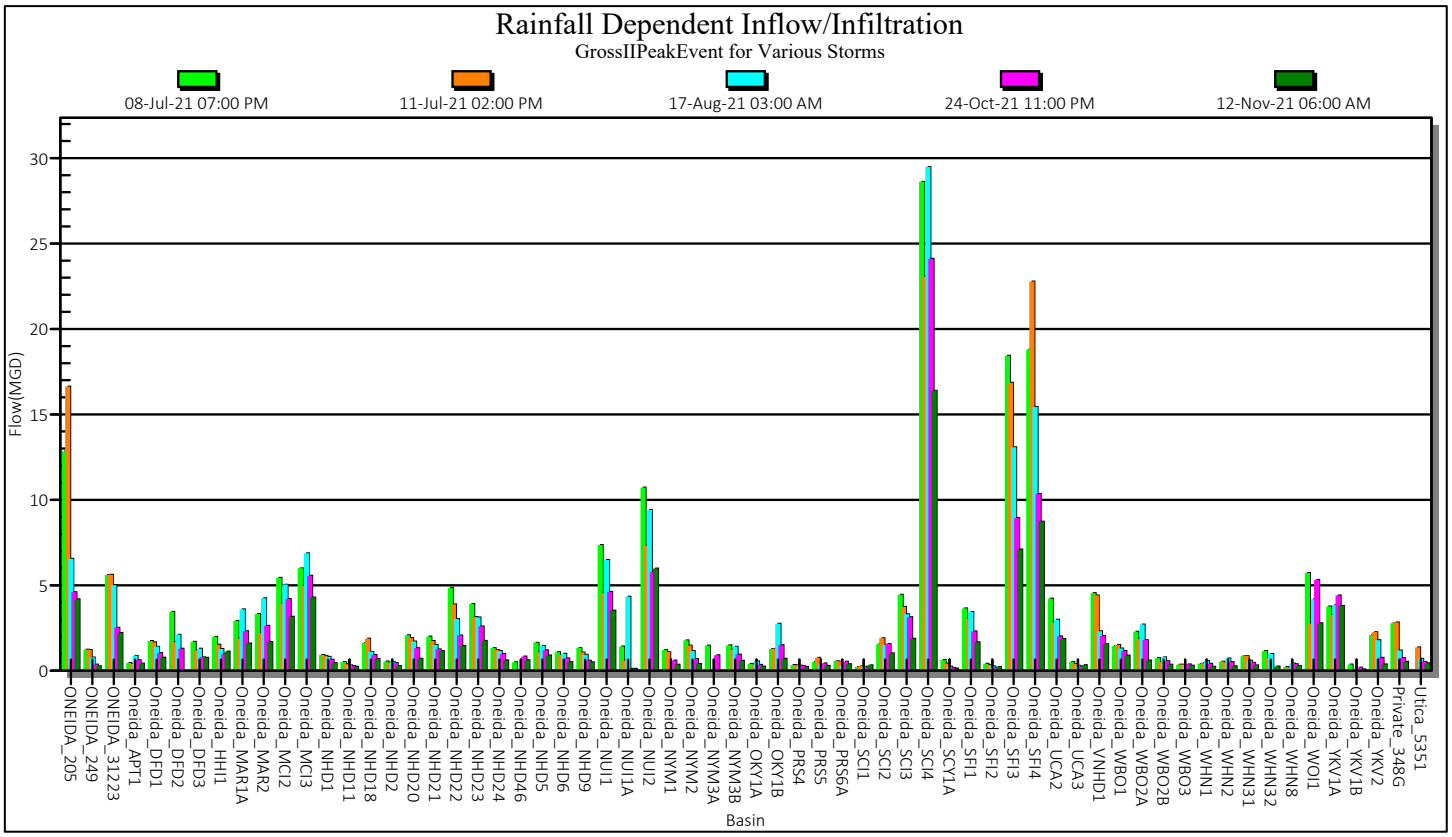


Figure 8 plots the Net RDII generated per linear foot of sewer per inch of rainfall (Gallons/LF/Inch). Although there is not a formal threshold for the definition of 'severe' RDII, a rule of thumb is that the threshold is 15 – 20 gal/LF/inch. Often the lower threshold is applied in the summertime and the upper limit is applied in the wintertime.

**Figure 8 Net RDII expressed in Gallons/LF of sewer/Inch of rainfall. A general rule of thumb is that values greater than 15 are severe.**

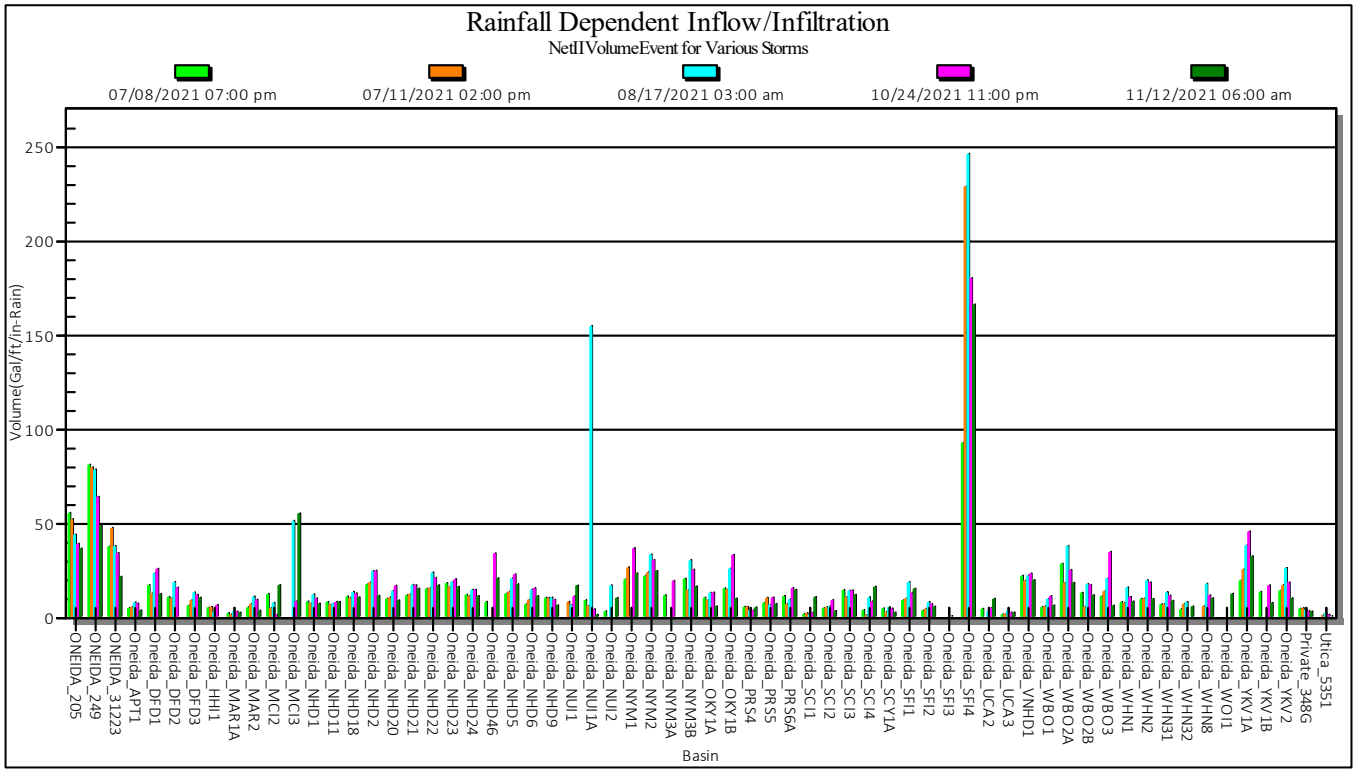


Table 6 is a ranked list of the sewersheds in Figures 7 and 8 with RDII severity exceeding 15 Gallons/LS/Inch of rainfall. These were the five largest storms observed during this period.

**Table 6 Ranked List of sewersheds from Figure 7 and Figure 8 with RDII severity greater that 15 Gal/LF/Inch of rain.**

| | RDII Volume in Million Gallons | | | | | | RDII Severity in Gal/LF/In of rain | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Storm | 7/8/21 | 7/11/21 | 8/17/21 | 10/24/21 | 11/12/21 | | 7/8/21 | 7/11/21 | 8/17/21 | 10/24/21 | 11/12/21 |
| Oneida_SFI4 | 0.636 | 1.238 | 2.691 | 1.122 | 0.862 | | 92.7 | 228.8 | 246.2 | 180.1 | 166.1 |
| ONEIDA_249 | 0.321 | 0.336 | 0.72 | 0.38 | 0.224 | | 81.0 | 79.7 | 78.5 | 64.0 | 48.6 |
| ONEIDA_205 | 3.486 | 3.481 | 6.381 | 3.672 | 2.667 | | 55.5 | 52.1 | 43.9 | 39.1 | 36.5 |
| ONEIDA_31223 | 1.878 | 2.517 | 4.359 | 2.54 | 1.251 | | 37.7 | 47.5 | 37.8 | 34.1 | 21.6 |
| Oneida_WBO2A | 1.719 | 0.84 | 3.513 | 1.413 | 0.839 | | 28.4 | 18.3 | 37.9 | 25.1 | 18.3 |
| Oneida_NYM2 | 1.071 | 0.864 | 2.099 | 1.175 | 0.82 | | 22.1 | 23.9 | 33.3 | 30.4 | 24.7 |
| Oneida_VNHD1 | 2.309 | 1.663 | 3.852 | 2.342 | 1.663 | | 22.1 | 19.5 | 22.2 | 23.3 | 19.7 |
| Oneida_NYM3B | 1.324 | 0.708 | 2.803 | 1.465 | 0.778 | | 20.5 | 14.4 | 30.2 | 25.3 | 16.4 |
| Oneida_NYM1 | 0.289 | 0.281 | n/a | 0.417 | 0.228 | | 20.2 | 26.5 | n/a | 36.7 | 23.4 |
| Oneida_YKV1A | 2.377 | 2.319 | 6.365 | 4.696 | 2.806 | | 19.6 | 25.4 | 38.3 | 45.6 | 32.5 |
| Oneida_NHD23 | 2.717 | 2.169 | 5.315 | 3.338 | 2.198 | | 18.2 | 16.3 | 18.9 | 20.2 | 16.2 |
| Oneida_NHD2 | 0.223 | 0.184 | 0.502 | 0.282 | 0.111 | | 17.6 | 18.6 | 24.5 | 24.7 | 11.5 |
| Oneida_DFD1 | 0.718 | 0.393 | 1.159 | 0.759 | 0.317 | | 17.1 | 12.6 | 23.4 | 25.8 | 12.4 |
| Oneida_OKY1B | 0.558 | 0.411 | 2.623 | 1.633 | 0.37 | | 15.4 | 14.7 | 25.9 | 33.1 | 9.9 |
| Oneida_NHD22 | 1.894 | 1.58 | 4.235 | 2.324 | 1.622 | | 15.2 | 15.5 | 23.7 | 21.0 | 17.0 |
| Oneida_SCI3 | 1.627 | 1.281 | 3.701 | 2.415 | 1.572 | | 14.5 | 10.7 | 14.2 | 14.3 | 12.0 |
| Oneida_YKV2 | 0.792 | 0.715 | 1.996 | 0.873 | 0.399 | | 14.2 | 17.1 | 26.2 | 18.5 | 10.1 |
| Oneida_YKV1B | 0.076 | n/a | n/a | 0.08 | 0.031 | | 13.6 | n/a | n/a | 17.0 | 7.7 |
| Oneida_WBO2B | 0.789 | 0.26 | 1.642 | 0.976 | 0.54 | | 13.0 | 5.6 | 17.7 | 17.3 | 11.8 |
| Oneida_NHD5 | 0.918 | 0.777 | 2.431 | 1.502 | 0.981 | | 12.5 | 13.7 | 20.6 | 22.8 | 17.6 |
| Oneida_MCI2 | 0.928 | 0.437 | 1.577 | 0.098 | 1.013 | | 12.4 | 4.8 | 7.8 | 1.4 | 17.1 |
| Oneida_NHD24 | 0.78 | 0.651 | 1.713 | 1.087 | 0.668 | | 11.9 | 11.3 | 14.6 | 14.6 | 11.2 |
| Oneida_NYM3A | 0.66 | n/a | n/a | 0.978 | n/a | | 11.8 | n/a | n/a | 19.4 | n/a |
| Oneida_NHD21 | 1.104 | 0.978 | 2.488 | 1.534 | 1.165 | | 11.8 | 12.3 | 17.2 | 17.0 | 15.2 |
| Oneida_WBO3 | 0.051 | 0.048 | 0.143 | 0.146 | 0.021 | | 11.3 | 13.9 | 20.7 | 34.7 | 6.2 |
| Oneida_PRS6A | 0.223 | 0.15 | 0.44 | 0.465 | 0.339 | | 11.2 | 7.1 | 9.5 | 15.5 | 14.6 |
| Oneida_NHD18 | 0.91 | 0.698 | 1.776 | 0.947 | 0.677 | | 11.0 | 10.5 | 13.5 | 12.8 | 10.6 |
| Oneida_DFD2 | 1.353 | 0.935 | 2.758 | 1.387 | n/a | | 10.8 | 10.1 | 18.6 | 15.7 | n/a |
| Oneida_NHD9 | 0.805 | 0.606 | 1.197 | 0.603 | 0.359 | | 10.4 | 10.3 | 10.4 | 9.3 | 6.4 |
| Oneida_OKY1A | 0.221 | 0.149 | 0.772 | 0.38 | 0.127 | | 10.4 | 9.1 | 13.0 | 13.2 | 5.8 |
| Oneida_NHD20 | 0.862 | 0.752 | 1.945 | 1.335 | 0.614 | | 9.9 | 10.6 | 14.1 | 16.9 | 9.0 |
| Oneida_WHN2 | 0.361 | 0.279 | 1.041 | 0.612 | 0.265 | | 9.8 | 10.0 | 19.7 | 18.6 | 9.8 |
| Oneida_SFI1 | 1.777 | 1.595 | 5.082 | 2.141 | 2.074 | | 9.1 | 10.0 | 18.7 | 13.0 | 15.2 |
| Oneida_NUI1A | 0.189 | 0.097 | 5.983 | 0.092 | 0.024 | | 9.1 | 6.2 | 154.7 | 4.3 | 1.4 |
| Oneida_NHD1 | 0.543 | 0.379 | 1.481 | 0.675 | 0.395 | | 8.4 | 7.4 | 12.1 | 10.1 | 7.3 |
| Oneida_NHD46 | 0.356 | n/a | n/a | 1.311 | 0.677 | | 8.3 | n/a | n/a | 34.0 | 20.7 |

Figure 9 lists the Capture Coefficient or the percent of the rainfall entering the sewer as RDII for each sewershed. A general rule of thumb is that values greater than 5% fall into the marginal category and values greater that 7% to 10% fall into the severe category. Very high values are indicative that basin sizes are not correctly known.

**Figure 9 Capture Coefficient for 5 of the largest response storms.**

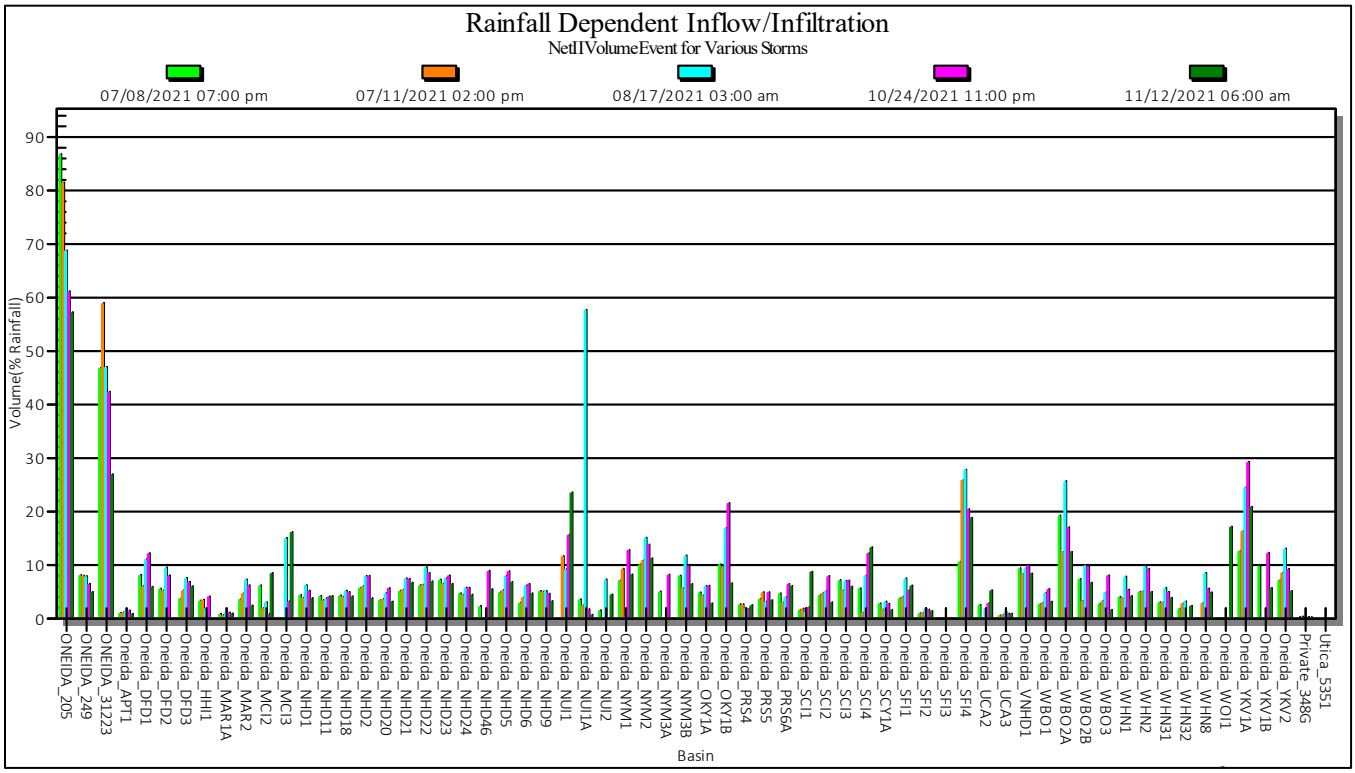


Table 7 is a ranked list of the sewersheds in Figure 9 with Capture Coefficients exceeding 10%. These were the five largest storms observed during this period.

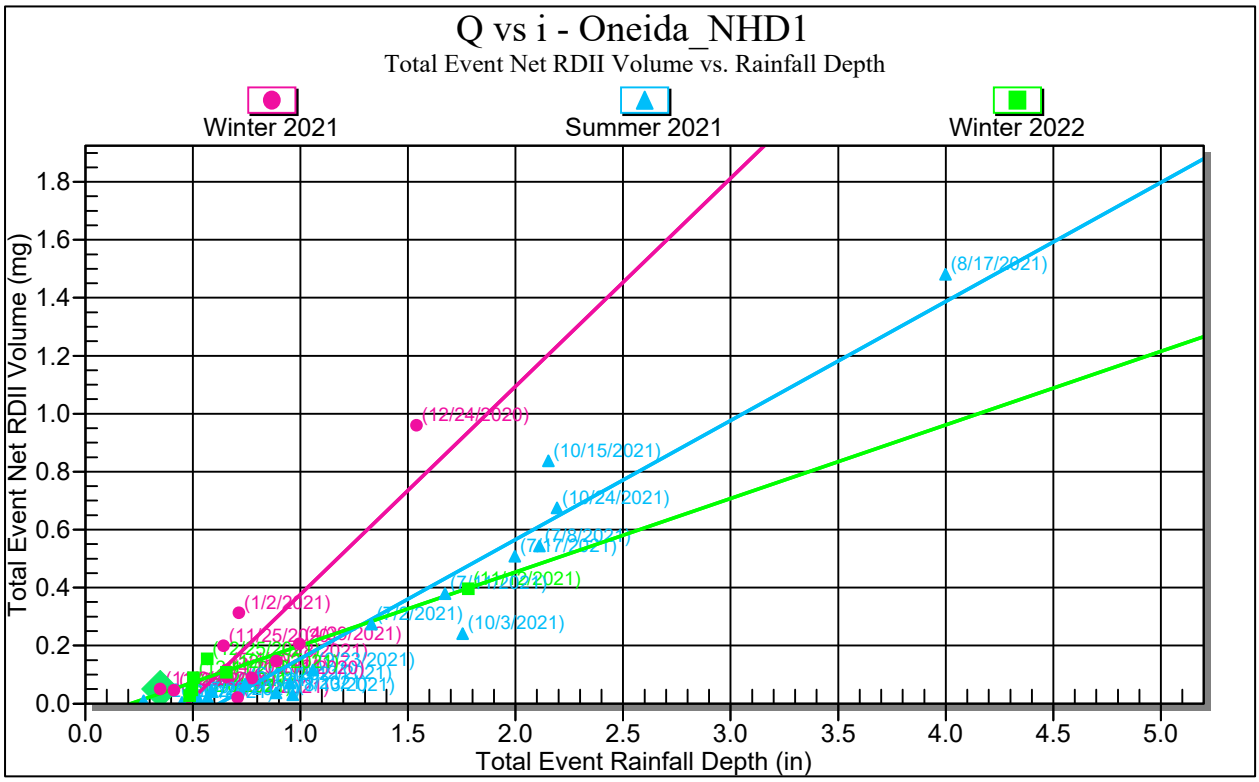
**Table 7 Ranked List of Sewersheds in Figure 9 with Capture Coefficient greater than 10%.**

| | RDII as Capture Coefficient -( % Rainfall as RDII) | | | | |
|---|---|---|---|---|---|
| Storm | 7/8/21 | 7/11/21 | 8/17/21 | 10/24/21 | 11/12/21 |
| ONEIDA_205 | 86.6 | 81.3 | 68.6 | 61.0 | 57.1 |
| ONEIDA_31223 | 46.7 | 58.8 | 46.9 | 42.2 | 26.8 |
| Oneida_WBO2A | 19.1 | 12.3 | 25.5 | 16.9 | 12.3 |
| Oneida_YKV1A | 12.5 | 16.2 | 24.4 | 29.1 | 20.7 |
| Oneida_SFI4 | 10.4 | 25.7 | 27.7 | 20.2 | 18.7 |
| Oneida_OKY1B | 10.0 | 9.5 | 16.7 | 21.4 | 6.4 |
| Oneida_NYM2 | 9.9 | 10.7 | 15.0 | 13.7 | 11.1 |
| Oneida_YKV1B | 9.7 | n/a | n/a | 12.1 | 5.5 |
| Oneida_VNHD1 | 9.2 | 8.1 | 9.3 | 9.7 | 8.3 |
| ONEIDA_249 | 8.0 | 7.9 | 7.7 | 6.3 | 4.8 |
| Oneida_DFD1 | 8.0 | 5.9 | 10.9 | 12.0 | 5.8 |
| Oneida_NYM3B | 7.9 | 5.5 | 11.6 | 9.7 | 6.3 |
| Oneida_WBO2B | 7.2 | 3.1 | 9.8 | 9.6 | 6.5 |
| Oneida_NHD23 | 7.1 | 6.4 | 7.4 | 7.9 | 6.3 |
| Oneida_SCI3 | 7.0 | 5.2 | 6.9 | 6.9 | 5.8 |
| Oneida_YKV2 | 7.0 | 8.4 | 12.9 | 9.1 | 5.0 |
| Oneida_NYM1 | 7.0 | 9.1 | n/a | 12.6 | 8.1 |
| Oneida_NHD22 | 6.0 | 6.2 | 9.4 | 8.4 | 6.8 |
| Oneida_MCI2 | 6.0 | 1.8 | 2.9 | 0.7 | 8.3 |
| Oneida_NHD2 | 5.6 | 5.9 | 7.8 | 7.8 | 3.6 |
| Oneida_SCI4 | 5.5 | 1.0 | 7.9 | 12.0 | 13.1 |

## 6. – Q vs i Plots

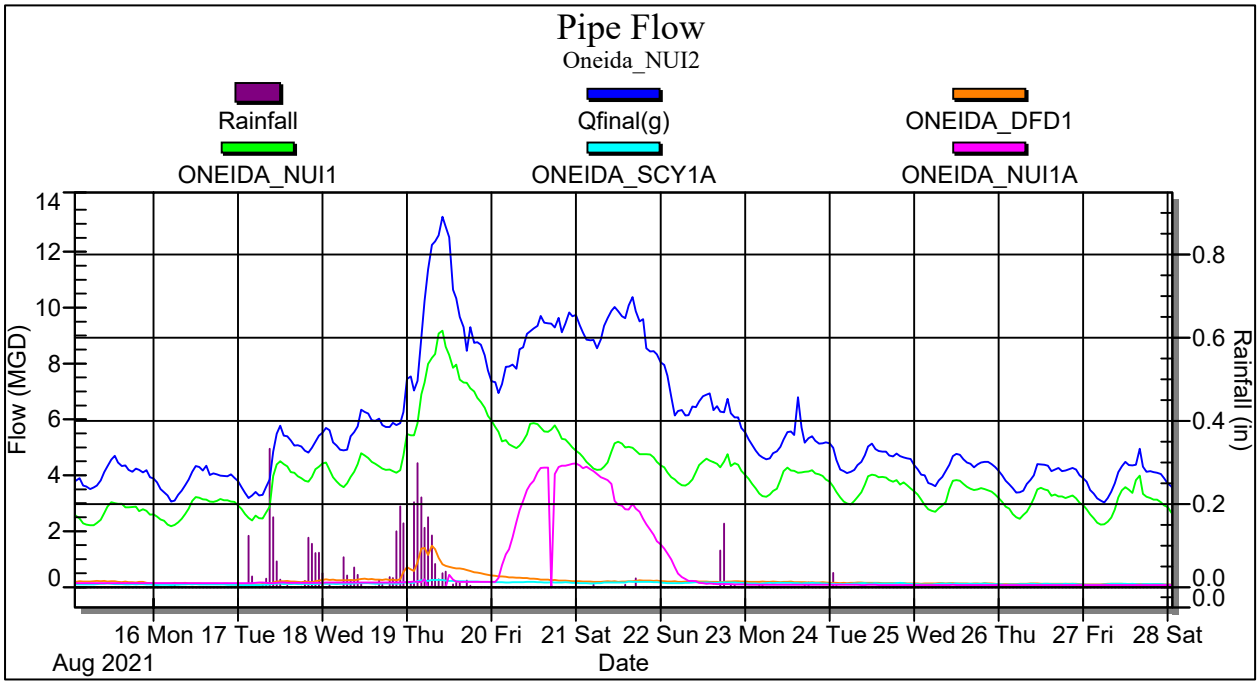
Figure 10 is a Q vs i plot for NHD1 and the behavior of the entire systems is similar to this plot. The Christmas storm that began on 24 December 2020 is an outlier when compared to all other winter storms. Storms that include a snow melt appear this way on a Q vs i plot; the RDII volume is unusually high for the measured rainfall. But the weather records don't indicate that there was snow on the ground in December. If snow melt has a part to play in a winter storm, that storm normally is removed from these plots.

**Figure 10 Q vs i plot reveals that the Christmas 2020 storm is an outlier.**



## 7. Possible River Intrusion

We have spotted what appears to be possible river intrusion upstream of meter Oneida_NUI1A. Figure 11 shows all meters immediately upstream of Oneida_NUI2 and both meters show the classic pattern of river intrusion, a flow response well after the rainfall. The rainfall was the early morning hours of 19 August, and the response begins the early morning hours of 20 August. As a general rule, the longer the delay for the intrusion response, the larger the watershed of the water way. A small roadside ditch or creek may overtop a defective manhole cone within minutes or an hour after the storm, but it may take a full day for a larger river reach an elevation to overtop a defective manhole top.



# Appendix B

## Smart Growth Assessment Form

NEW YORK STATE OF OPPORTUNITY. | Department of Health | Environmental Facilities Corporation

# Smart Growth Assessment Form

This form should be completed by an authorized representative of the applicant, preferably the project engineer or other design professional.[1]

## Section 1 – General Applicant and Project Information

Applicant: Oneida County  Project No.: N/A

Project Name: District Wide Sewer Rehabilitation

Is project construction complete? ☐ Yes, date:  ☑ No

Please provide a brief project summary in plain language including the location of the area the project serves:

The purpose of this project is to complete a supplementary phase of collection system rehabilitation to reduce inflow and infiltration throughout the Oneida County Sewer District. A supplementary phase is recommended to progress in a build-and-measure fashion starting with the highest priority I/I reduction projects. The total project cost estimate for this work is $26 million.

## Section 2 – Screening Questions

### A. Prior Approvals

1. Has the project been previously approved for Environmental Facilities Corporation (EFC) financial assistance? ☐ Yes ☑ No
2. If yes to A(1), what is the project number(s) for the prior approval(s)? Project No.:
3. If yes to A(1), is the scope of the previously-approved project substantially the same as the current project? ☐ Yes ☐ No

**If your responses to A(1) and A(3) are both yes, please proceed to Section 5, Signature.**

### B. New or Expanded Infrastructure

1. Does the project involve the construction or reconstruction of new or expanded infrastructure? ☐ Yes ☑ No

Examples of new or expanded infrastructure include, but are not limited to:

(i) The addition of new wastewater collection/new water mains or a new wastewater treatment system/water treatment plant where none existed previously;

(ii) An increase of the State Pollutant Discharge Elimination System (SPDES) permitted flow capacity for an existing wastewater treatment system; and OR

[1] If project construction is complete and the project was not previously financed through EFC, an authorized municipal representative may complete and sign this assessment.

(iii) An increase of the permitted water withdrawal or the permitted flow capacity for the water treatment system such that a Department of Environmental Conservation (DEC) water withdrawal permit will need to be obtained or modified, or result in the Department of Health (DOH) approving an increase in the capacity of the water treatment plant.

**If your response to B(1) is no, please proceed to Section 5, Signature.**

## Section 3 –Smart Growth Criteria

Your project must be consistent will all relevant Smart Growth criteria. For each question below please provide a response and explanation.

1. Does the project use, maintain, or improve existing infrastructure?
   ☐ Yes ☐ No

   Explain your response:

2. Is the project located in a (1) municipal center, (2) area adjacent to a municipal center, or (3) area designated as a future municipal center, as such terms are defined herein (please select one response)?

   ☐ Yes, my project is located in a municipal center, which is an area of concentrated and mixed land uses that serves as a center for various activities, including but not limited to: central business districts, main streets, downtown areas, brownfield opportunity areas (see *www.dos.ny.gov* for more information), downtown areas of local waterfront revitalization program areas (see *www.dos.ny.gov* for more information), areas of transit-oriented development, environmental justice areas (see *www.dec.ny.gov/public/899.html* for more information), and hardship areas (projects that primarily serve census tracts or block numbering areas with a poverty rate of at least twenty percent according to the latest census data).

   ☐ Yes, my project is located in an area adjacent to a municipal center which has clearly defined borders, is designated for concentrated development in the future in a municipal or regional comprehensive plan, and exhibits strong land use, transportation, infrastructure, and economic connections to an existing municipal center.

   ☐ Yes, my project is located in an area designated as a future municipal center in a municipal or comprehensive plan and is appropriately zoned in a municipal zoning ordinance

   ☐ No, my project is not located in a (1) municipal center, (2) area adjacent to a municipal center, or (3) area designated as a future municipal center.

   Explain your response and reference any applicable plans:

3. Is the project located in a developed area or an area designated for concentrated infill development in a municipally-approved comprehensive land use plan, local waterfront revitalization plan, and/or brownfield opportunity area plan?

   ☐Yes ☐No

   Explain your response and reference any applicable plans:

4. Does the project protect, preserve, and enhance the State's resources, including surface and groundwater, agricultural land, forests, air quality, recreation and open space, scenic areas, and significant historic and archaeological resources?

   ☐Yes ☐No

   Explain your response:

5. Does the project foster mixed land uses and compact development, downtown revitalization, brownfield redevelopment, the enhancement of beauty in public spaces, the diversity and affordability of housing in proximity to places of employment, recreation and commercial development, and the integration of all income and age groups?

   ☐Yes ☐No

   Explain your response:

6. Does the project provide mobility through transportation choices including improved public transportation and reduced automobile dependency?

   ☐Yes ☐No ☐N/A

   Explain your response:

7. Does the project involve coordination between State and local government, intermunicipal planning, or regional planning?

   ☐Yes ☐No

   Explain your response and reference any applicable plans:

8. Does the project involve community-based planning and collaboration?

   ☐Yes ☐No

   Explain your response and reference any applicable plans:

9. Does the project support predictability in building and land use codes?

   ☐Yes ☐No ☐N/A

   Explain your response:

10. Does the project promote sustainability by adopting measures such as green infrastructure techniques, decentralized infrastructure techniques, or energy efficiency measures?

    ☐Yes ☐No

    Explain your response and reference any applicable plans:

11. Does the project mitigate future physical climate risk due to sea-level rise, storm surges, and/or flooding, based on available data predicting the likelihood of future extreme weather events, including hazard risk analysis data, if applicable?

    ☐Yes ☐No

    Explain your response and reference any applicable plans:

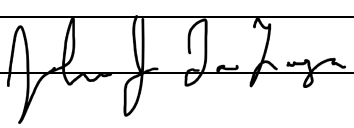
## Section 4 – Miscellaneous

1. Is the project expressly required by a court or administrative consent order? ☐ Yes ☐ No

   If yes, and you have not previously provided the applicable order to EFC/DOH, please submit it with this form.

## Section 5 – Signature

By signing below, you agree that you are authorized to act on behalf of the applicant and that the information contained in this Smart Growth Assessment is true, correct and complete to the best of your knowledge and belief.

| | |
|---|---|
| Applicant: Oneida County | Phone Number: 315.687.3936 |
| Name and Title of Signatory: GHD Consulting Services Inc. - John LaGorga, PE, BCEE - Project Director | |
| Signature:  | Date: 6/16/2022 |

# Appendix C

## Engineering Report Certification

## Engineering Report Certification

To Be Provided by the Professional Engineer Preparing the Report

During the preparation of this Engineering Report, I have studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is being sought from the New York State Clean Water State Revolving Fund. In my professional opinion, I have recommended for selection, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of constructing the project or activity, the cost of operating and maintaining the project or activity over the life of the project or activity, and the cost of replacing the project and activity.

**Title of Engineering Report: Oneida County Collection System Rehabilitation Evaluation**

**Date of Report: June 16, 2022**

**Professional Engineer's Name: John J. LaGorga, PE, BCEE**

**Signature:**

**Date: June 16, 2022**

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