PENNSYLVANIA AMERICAN WATER

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VIA eFiling

March 14, 2023

Rosemary Chiavetta, Secretary
Commonwealth of Pennsylvania
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120

Re: Petition for Approval of Pennsylvania-American Water Company's
Wastewater Operation's Long-Term Infrastructure Improvement Plan II
for the Period January 1, 2024 through December 31, 2028
Docket No. P-2023-3038874

Dear Secretary Chiavetta:

On March 8, 2023, Pennsylvania-American Water Company's Wastewater Operations filed a Petition for Approval of its Second Wastewater Long-Term Infrastructure Improvement Plan 2024 through 2028 and attached its Second Wastewater Long-Term Infrastructure Improvement Plan ("Wastewater LTIIP II") to the Petition as Exhibit No. 1.

Enclosed, for filing, is a revised Exhibit No. 1, Wastewater LTIIP II, with the revisions highlighted at Page 32 and on Table 2 at Page 8. The revisions modify the number of Coatesville Wastewater System's force main length from 18,720 LF to the correct number of 130,469 LF.

As evidenced by the Certificate of Service, copies of the enclosed Exhibit No. 1, previously referenced, are being served upon the Bureau of Technical Utility Services, Bureau of Investigation and Enforcement, the Office of Consumer Advocate, the Office of Small Business Advocate, and the parties to Pennsylvania-American Water Company's most recent base rate case. Additionally, an electronic copy in Word®-compatible format is being provided to Erin Laudenslager.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Erin K. Fure

Enclosures

cc: Certificate of Service
E. Laudenslager *(via electronic delivery)*

# PENNSYLVANIA-AMERICAN WATER COMPANY

# 5-YEAR WASTEWATER
# LONG-TERM INFRASTRUCTURE IMPROVEMENT PLAN

March 8, 2023

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## Introduction

In accordance with the requirements of 66 Pa. C.S. §1350 - §1360 and the Public Utility Commission's Final Order for the Implementation of Act 11 of 2012 (Public Meeting of August 2, 2012, Docket No. M-2012-2293611), Pennsylvania-American Water Company (PAWC) is submitting this Wastewater Long-Term Infrastructure Improvement Plan (LTIIP) dated March 8, 2023 for calendar years 2024-2028. This plan replaces PAWC's 2018 Wastewater LTIIP used for the development of a Wastewater Distribution System Improvement Charge, referred to in this report as "Wastewater DSIC" or "DSIC". This revised LTIIP is submitted in support of an expanded Wastewater DSIC mechanism for the 27 current PAWC wastewater systems referenced below.

PAWC is a wholly owned subsidiary of American Water Works Company, Inc. and provides public water and sewer service to residents in Pennsylvania. PAWC owns and operates 27 wastewater systems located in 16 Counties across the Commonwealth and serves approximately 94,909 customer connections (customer count as of 12/31/2022), including several bulk municipal customers.

Provided in Table 1 is a list of all wastewater systems owned and operated by PAWC. The location of each wastewater system is shown in Figure 1. The wastewater system list in this LTIIP is more detailed than the listing in PAWC's wastewater tariff because long-term infrastructure improvement planning is completed by system and the tariff list is grouped by wastewater district. Districts that have multiple wastewater systems include the Fairview, Kane, Lehman Pike, and McKeesport Districts.

*Table 1 - List of PAWC Wastewater Systems*

| Wastewater System Grouped by State Region | | Rate Zone | Areas Served | Number of Customers as of 12/31/22 |
|---|---|---|---|---|
| Central | Fairview North | 1 | York County. Portions of Fairview Township | 1,903 |
| | Fairview South | 1 | York County. Portions of Fairview and Newberry Township | 2,248 |
| | **Foster Twp** | **8** | **Luzerne County. Portions of Foster Township** | **518** |
| | Franklin | 1 | Adams County. Portions of the Townships of Franklin, Hamiltonban, and Highland | 349 |
| | McEwensville | 1 | Northumberland County. McEwensville Borough | 129 |
| | New Cumberland | 2 | Cumberland County. The Borough of New Cumberland | 3,110 |
| | **Turbotville** | **1** | **Northumberland County. Portions of The Borough of Turbotville** | **308** |
| | **York [a]** | **7** | **York County. The City of York and portions of West Manchester Township; and related points of bulk service interconnections with Manchester Township, West Manchester Township, York Township, North York Borough, West York Borough, Springettsbury Township, and Spring Garden Township.** | **13,427** |
| Northeastern | Blue Mountain Lakes | 1 | Monroe County. Portions of the Townships of Smithfield and Stroud | 923 |
| | Lehman Pike [b] | 1 | Monroe County: Portions of Middle Smithfield Township. Pike County: Portions of Lehman Township | 2,798 |
| | Marcel Lake [c] | 1 | Pike County. Portions of Delaware Township | 361 |
| | Pocono | 1 | Monroe County. A portion of Coolbaugh Township | 877 |
| | Scranton [d] | 3 | Lackawanna County. The City of Scranton and the Borough of Dunmore | 29,701 |
| | **Wild Acres [e]** | **1** | **Pike County. Portions of Delaware Township** | 35 |
| Southeastern | Coatesville [f] | 1 and **5** | Chester County. The City of Coatesville, the Borough of Parkesburg and portions of the Borough of South Coatesville and portions of the Townships of Caln, East Fallowfield, Highland, Sadsbury, Valley, West Caln, and West Sadsbury | 10,690 |
| | **Exeter** | **1** | **Berks County. Portions of the Townships of Exeter, Alsace and Lower Alsace (and related points of bulk service interconnection)** | **7,867** |
| | **Royersford** | **9** | **Montgomery County. Royersford Borough and portions of Upper Providence Township** | **1,493** |
| | **Upper Pottsgrove** | **1** | **Montgomery County. Portions of Upper Pottsgrove Township Berks County. A portion of Douglass Township** | **1,546** |

*Table 1 – Continued*

| Wastewater System Grouped by State Region | | Rate Zone | Areas Served | Number of Customers as of 12/31/22 |
|---|---|---|---|---|
| Western | **Butler [g]** | **N/A** | **Butler County. City of Butler, Butler Township, Center Township, portions of East Bulter Borough and Summit, Connoquenessing, Oakland, and Penn Townships.** | **14,792** |
| | Clarion [h] | 1 | Clarion County. Clarion Borough and portions of the Townships of Clarion and Monroe | 2,476 |
| | Claysville | 1 | Washington County. Claysville Borough and portions of the Township of Donegal | 491 |
| | **Kane - Kinzua** | **4** | **McKean County. Kane Borough** | **1,225** |
| | **Kane - Pine St** | **4** | **McKean County. Kane Borough and portions of Wetmore Township.** | **1,145** |
| | Koppel [i] | 1 | Beaver County. Koppel Borough | 360 |
| | McKeesport [j] | 6 | Allegheny County. The City of McKeesport, Port Vue Borough, and the following through bulk municipal connections: Boroughs of White Oak, East McKeesport, Lincoln, Liberty, Versailles, Glassport, and the Townships of North Versailles and Elizabeth | 8,028 |
| | Dravosburg | 6 | Allegheny County. Borough of Dravosburg | 611 |
| | Duquesne | 6 | Allegheny County. The City of Duquesne and a portion of West Mifflin Borough | 1,854 |
| | Paint-Elk | 1 | Clarion County. Shippenville Borough and portions of the Townships of Elk and Paint | 436 |

NOTES: Systems acquired after the 2018 LTIIP are shown in **Bold** font.

**a** Bulk municipal customers include Manchester Township, West Manchester Township, York Township, North York Borough, West York Borough, Springettsbury Township, and Spring Garden Township and are counted as single customers.
**b** Also known as “Saw Creek Estates.”
**c** Also known as “Clean Treatment.”
**d** Number of customers does not include customers in portions of the Boroughs of Taylor, Dickson City, and Moosic served through inter-municipal agreements; bulk municipal customers own and maintain their own wastewater collection systems and are counted as single customers.
**e** Also known as “Delaware.”
**f** Includes the portion of Valley Township in Rate Zone 5 acquired in 2021. Caln, Sadsbury, and West Brandywine Townships are bulk municipal customers counted as single customers.
**g** Purchase of Butler Area Sewer Authority Wastewater System expected to close in Q4 2023 and is included in 2024-2028 LTIIP estimates.
**h** Strattanville Borough is a bulk municipal customer that is counted as a single customer
**i** Big Beaver Borough is a bulk municipal customer that is counted as a single customer.
**j** Customers in the eight surrounding municipalities (Boroughs of White Oak, East McKeesport, Lincoln, Liberty, Versailles, Glassport, and the Townships of North Versailles and Elizabeth) are served through inter-municipal agreements and are counted as single bulk customers.

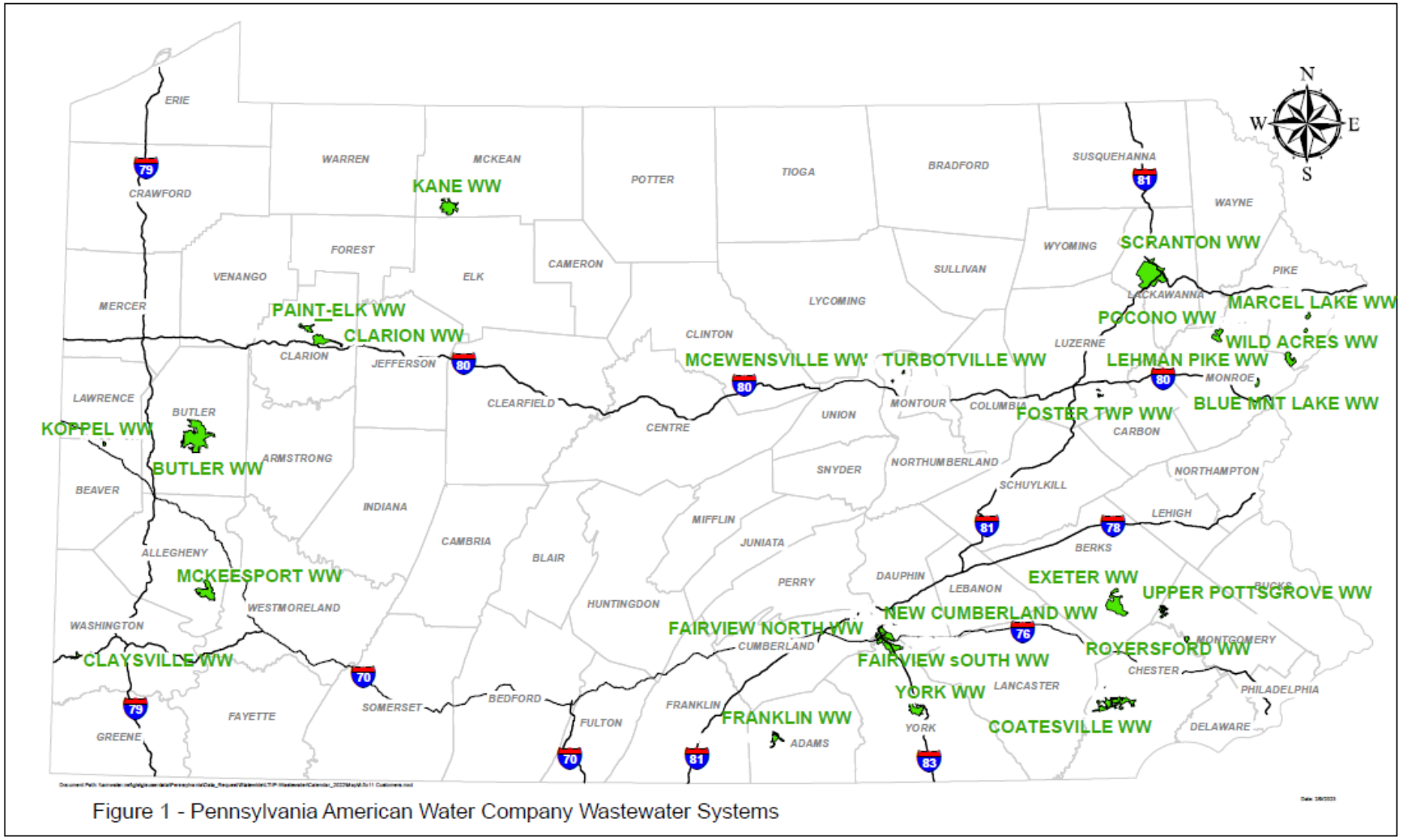


Figure 1 - Pennsylvania American Water Company Wastewater Systems

The condition of the wastewater systems varies, depending on age, material, local conditions and quality of initial design or installation. Some systems require significant capital investment to maintain efficient, safe, and reliable service for existing customers and protection for the environment. PAWC has acquired its wastewater systems from prior ownership in various states of disrepair. Many systems have aging infrastructure and significant inflow and infiltration (I&I) from rainfall runoff and groundwater.

During dry-weather conditions, the impact of I&I varies. Many wastewater collection systems have minimal impact from I&I during dry weather, while other systems experience high I&I even in dry weather conditions. In wet weather conditions, the impact of I&I is amplified. Flow entering a wastewater treatment plant (WWTP) can increase significantly due to the inflow of groundwater, rainfall runoff, and/or snowmelt. This may cause a sanitary sewer overflow (SSOs) or combined sewer overflows (CSOs) to occur if flow exceeds the sewer, lift station, or plant's peak hydraulic capacity. Hydraulically overloaded pipes and manholes can also cause sewer backups into homes and businesses. SSOs, CSOs and sewer backups due to I&I pose a public health risk and may violate many local and federal environmental regulations.

I&I has multiple causes, many of which are related to aging infrastructure. Groundwater infiltration can enter the collection system through cracks in sewer pipes, faulty lateral connections, cracks in manhole walls, or deteriorated pipe joints. Groundwater can also enter the collection system through broken service laterals, root intrusion into a lateral pipe, or cracks in the walls of customer-owned grinder pump pits. Inflow can enter the wastewater collection system in various ways, such as cross connections, uncapped cleanouts, below-grade manhole lids, or roof drains connected directly to the sewer.

The focus of the wastewater LTIIP is to replace or rehabilitate collection system infrastructure based on strategic condition assessment and hydraulic evaluations; reduce I&I levels to address SSO and CSO issues; and to correct deficiencies in certain newly acquired wastewater systems. These types of system improvements will improve system safety and reliability, customer service, and environmental compliance.

I&I has been reduced in several systems since the Wastewater DSIC was implemented. For instance, after significant capital investment in collection system upgrades which occurred over a multiple year timeframe, the Clarion collection system no longer experiences SSO events. Additionally, a complete rebuild of the Marcel Lake gravity collection system resulted in dramatic reduction in I&I.

Accelerated infrastructure replacement and rehabilitation is needed to continue meeting the challenges of PAWC wastewater systems, including systems that have been acquired by PAWC since the last wastewater LTIIP was submitted in 2018. PAWC's wastewater customer base has increased from approximately 65,139 at the time the 2018 LTIIP was filed to the current total of 94,909 customer connections and the anticipated total of 109,701 customer connections with the inclusion of the Butler System before 2024. Many previously acquired systems such as Scranton, McKeesport, Duquesne, and Dravosburg are currently under PA DEP Consent Orders and require continued acceleration of rehabilitation and replacement.

This LTIIP provides a thorough description of the wastewater systems and establishes how PAWC plans to continue to accelerate the rehabilitation, improvement, and replacement of aging wastewater infrastructure (hereinafter referred to as eligible property) within these systems for the five-year period from 2024 to 2028. The LTIIP includes an inventory and

discussion of the types and age of property eligible for wastewater DSIC recovery; schedule for its planned rehabilitation and replacement; location of eligible property; reasonable estimate of the quantity of property to be improved; projected annual expenditures; manner in which replacement or rehabilitation of aging infrastructure will be accelerated; workforce management plan to ensure work is performed in cost-effective, safe and reliable manner; and description of outreach and coordination with other utilities to minimize disruptions to customers.

## Section 1 – Types and Age of Eligible Property

An inventory of all eligible property, as defined in 66 Pa. C.S. §1351 (4), is provided in this Section. PAWC has developed and is applying Geographic Information Systems (GIS) as the spatial component of its Enterprise Asset Management (EAM) Program. Wastewater assets, such as collection mains, manholes, and lift stations are spatially located and attributed with critical information about PAWC systems. GIS data will be updated to include system changes, such as replacement of old pipes or expansion of the wastewater collection system. For some recently acquired systems, there is limited information on the wastewater properties. For each system, all data sources were analyzed, and the best available information was used to quantify the types of eligible property.

PAWC owns the following types of sewer collection systems:

*Gravity* – In a gravity collection system, service laterals from the customer premise connect to a sewer main usually located in an alley or street. For combined systems, catchbasins / inlets convey rainfall runoff directly to the gravity collection system. Eligible property also includes facilities that are unique to combined sewer collection systems, such as CSO regulators, diversion manholes, storage structures, outfalls, and equalization chambers. Sewer mains and interceptor sewer mains (also referred to as “trunk lines”) form a branched network that generally follows street layout and can be accessed through manholes. Service laterals can be accessed through lateral cleanouts. Gravity collection systems either convey sewage directly to a WWTP or to a lift station. In total, the wastewater collection systems are comprised of approximately 94,909 service laterals, 37,056 manholes, and 7,596,953 linear feet (LF) of gravity main which includes combined sewer gravity mains. Gravity main and manhole material generally depends on installation date. Newer mains are polyvinyl chloride (PVC), and older mains are mostly vitrified clay pipe (VCP). Newer manholes are pre-cast or cast in place concrete and older manholes are brick.

*Low Pressure* – In a low-pressure collection system, individual customer sewage collects in a grinder pump and pit installation. Sewage is pumped from the pit through a service lateral into a low-pressure force main. Depending on topography and layout, some low-pressure collection systems include lift stations to boost pressure. A low-pressure force main may contain in-line flow meters, valve vaults, and air and vacuum release chambers. A low-pressure system can convey sewage directly to a WWTP, a lift station, or a manhole in the gravity system. On low pressure systems, the eligible property associated with the service lateral extends from the sewer main to the individual customer’s grinder pump unit. One exception to this exists in the Blue Mountain district where there are 5 company grinder pump and pit installations.

*Force Main* – A force main is a pressurized discharge pipeline from a lift station. A force main pipeline may contain in-line flow meters, valve vaults, and air and vacuum release chambers. Force mains can convey sewage directly to a WWTP or to a manhole in the gravity system. PAWC owns and operates 156 lift stations and approximately 799,144 LF of low pressure and force main. In general, force main material is cast iron for older pipes, ductile iron or PVC for newer pipes.

"Eligible property" is defined in the Pa Code as property that is part of a distribution system and eligible for repair, improvement and replacement of infrastructure under 66 Pa. C.S. §1351, as follows:

4(i) Collection sewers, collecting mains and service laterals, including sewer taps, curb stops, and lateral cleanouts installed as in-kind replacements for customers.

4(ii) Collection mains and valves for gravity and pressure systems and related facilities such as manholes, grinder pumps, air and vacuum release chambers, cleanouts, main line flow meters, valve vaults and lift stations installed as replacements or upgrades for existing facilities that have worn out, are in deteriorated condition or are required to be upgraded by law, regulation or order.

4(iii) Collection main extensions installed to implement solutions to wastewater problems that present a significant health and safety concern for customers currently receiving service from the wastewater utility.

4(iv) Collection main rehabilitation including inflow and infiltration projects.

4(v) Unreimbursed costs related to highway relocation projects where a wastewater utility must relocate its facilities.

4(vi) Other related capitalized costs.

For the purposes of this LTIIP, the term "sewers" refers to sewer mains which convey either sanitary or combined sewage.

Table 2 and Table 3 provide examples of eligible properties for each wastewater system. Table 4 lists pipe length by diameter for each system. Figure 2 and Figure 3 provide a breakdown by material for gravity pipe and pressurized pipe, respectively. Pipe install date breakdown is provided in Figure 4.

*Table 2 - Types and Age of Eligible Property*

| Wastewater System Grouped by State Region | | Gravity Main (LF) | Combined Sewer Gravity Main (LF) | Force Main / Low Pressure Main (LF) | Lift Stations | Manholes | Service Laterals [a] | General System Age |
|---|---|---|---|---|---|---|---|---|
| Central | Fairview North | 165,932 | 0 | 20,563 | 11 | 873 | 1,903 | >1950 |
| | Fairview South | 197,520 | 0 | 12,889 | 6 | 1,057 | 2,248 | >1992 |
| | Foster Twp | 38,684 | 0 | 9,600 | 4 | 205 | 518 | >2011 |
| | Franklin | 56,584 | 0 | 12,423 | 1 | 198 | 349 | >1972 |
| | McEwensville | 12,669 | 0 | 1,242 | 4 | 57 | 129 | >1984 |
| | New Cumberland | 145,413 | 0 | 6,899 | 3 | 613 | 3,110 | >1950 |
| | Turbotville | 21,416 | 0 | 0 | 1 | 90 | 308 | X |
| | York | 541,398 | 0 | 1,666 | 1 | 2,636 | 13,427 | >1910 |
| Northeast | Blue Mountain Lake | 0 | 0 | 67,899 | 6 | 0 | 923 | >1990 |
| | Lehman Pike | 0 | 0 | 266,695 | 13 | 1 | 2,798 | >1980 |
| | Marcel Lake | 30,732 | 0 | 28,597 | 2 | 130 | 361 | >1980 |
| | Pocono | 150,329 | 0 | 99,807 | 2 | 643 | 877 | >1975 |
| | Scranton | 548,947 | 1,189,500 | 12,269 | 7 | 9,445 | 29,701 | >1900 |
| | Wild Acres | 8,767 | 0 | 22,035 | 1 | 30 | 35 | >1980 |
| Southeast | Coatesville | 661,641 | 0 | ~~18,720~~ 130,469 | 24 | 3,208 | 10,690 | >1930s |
| | Exeter | 650,680 | 0 | 13,592 | 6 | 3,110 | 7,867 | >1960 |
| | Royersford | 68,564 | 0 | 4,454 | 2 | 262 | 1,493 | >1960 |
| | Upper Pottsgrove | 105,050 | 0 | 19,815 | 4 | 518 | 1,546 | >1990 |
| West | Butler | 1,412,793 | 0 | 51,622 | 24 | 6,488 | 14,595 est | >1930s |
| | Clarion | 213,588 | 0 | 36,937 | 6 | 1,048 | 2,476 | >1930s |
| | Claysville | 59,243 | 0 | 1,149 | 1 | 342 | 491 | >1983 |
| | Kane - Kinzua | 54,619 | 77,216 | 11,185 | 2 | 388 | 1,225 | >1940 |
| | Kane - Pine St | 64,614 | 95,223 | 22,622 | 6 | 421 | 1,145 | >1940 |
| | Koppel | 27,428 | 0 | 0 | 0 | 122 | 360 | >1920s |
| | McKeesport | 89,288 | 577,822 | 33,725 | 10 | 3,382 | 8,028 | >1900 |
| | Dravosburg | 27,850 | 24,501 | 1,229 | 3 | 267 | 611 | >1900 |
| | Duquesne | 36,520 | 149,109 | 0 | 0 | 1,077 | 1,854 | >1900 |
| | Paint-Elk | 93,318 | 0 | 21,511 | 6 | 445 | 436 | >1960s |

a The entire customer service lateral on a gravity collection system is deemed to be DSIC-eligible property.

*Table 3 – Types of Eligible Property for Combined Sewer Systems*

| System | CSO Structures | Diversion Chambers | Inlets / Catchbasins |
|---|---|---|---|
| Scranton | 79 | 0 | 4,770 |
| McKeesport | 31 | 34 | 1,300 |
| Dravosburg | 0 | 1 | 194 |
| Duquesne | 3 | 4 | 636 |
| Kane - Kinzua | 3 | 0 | 347 |
| Kane - Pine St | 1 | 0 | 313 |

*Table 4a - Pipe Length by Diameter for each Wastewater System – Sanitary Only Gravity Main*

| | | Central | | | | | | | | Northeast | | | | | | Southeast | | | | West | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DIAMETER (in) | Fairview North | Fairview South | Foster Twp | Franklin | McEwensville | New Cumberland | Turbotville | York | Blue Mountain Lake | Lehman Pike | Marcel Lake | Pocono | Scranton | Wild Acres | Coatesville | Exeter | Royersford | Upper Pottsgrove | Butler | Clarion | Claysville | Kane - Kinzua | Kane - Pine St | Koppel | McKeesport | Oravosburg | Duquesne | Paint-Elk | TOTAL |
| Sanitary-Only Gravity Main (LF) | Unknown | | | 10 | 1,345 | 105 | | | 634 | | | | 54 | 4,673 | 8,767 | 272,872 | 15,620 | 1,112 | | 12,370 | 2,931 | | 1,063 | 405 | | 21,828 | 2,469 | 235 | 795 | 347,287 |
| | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| | 4 | | | | | | | 250 | | | | | 1,617 | | | 156 | | | | 4,842 | 170 | | 40 | 247 | | 416 | | | 136 | 7,874 |
| | 5 | | | | | | | | | | | | | 353 | | | | | | 0 | | | | | 3,973 | | | | | 4,325 |
| | 6 | 605 | | | | | 398 | 15,283 | 357 | | | | | 4,062 | | 3,355 | 2,234 | | | 29,741 | 11,207 | | 361 | 1,108 | 867 | 614 | | | 10,644 | 80,838 |
| | 8 | 147,535 | 191,873 | 34,465 | 46,510 | 10,947 | 122,070 | 5,883 | 406,666 | | | 27,205 | 127,309 | 376,382 | | 315,197 | 533,866 | 55,421 | 87,633 | 1,121,377 | 148,040 | 50,091 | 53,155 | 62,854 | 15,322 | 32,869 | 16,755 | 17,993 | 79,504 | 4,086,922 |
| | 9 | | | | | | | | | | | | | 239 | | | | | | 0 | | | | | | | | | | 239 |
| | 10 | 14,320 | 5,647 | 1,963 | 8,729 | 1,617 | 13,501 | | 31,875 | | | | 5,298 | 75,839 | | 13,897 | 21,664 | 931 | 8,638 | 63,742 | 12,170 | 9,152 | | | 1,452 | 2,839 | 5,896 | 2,590 | 274 | 302,034 |
| | 12 | 2,240 | | 2,245 | | | 1,666 | | 23,913 | | | 3,526 | 875 | 33,939 | | 7,791 | 24,607 | 2,338 | 4,478 | 51,364 | 19,404 | | | | 577 | 14,981 | 2,413 | 1,963 | 678 | 199,001 |
| | 14 | | | | | | | | 208 | | | | | | | | 2,247 | | | 0 | | | | | | | | | | 2,455 |
| | 15 | | | | | | 4,325 | | 14,763 | | | | 6,571 | 24,220 | | 22,926 | 1,403 | 8,762 | | 50,490 | 7,891 | | | | 5,112 | 5,157 | 317 | 6,587 | 691 | 159,216 |
| | 16 | | | | | | | | 1,950 | | | | 781 | 74 | | | 3,204 | | | 305 | | | | | | | | | | 6,314 |
| | 18 | | | | | | 2,849 | | 8,797 | | | | 6,522 | 10,063 | | 11,203 | 25,674 | | 4,300 | 22,293 | 6,507 | | | | 125 | 9,926 | | 639 | 556 | 109,453 |
| | 20 | | | | | | | | 1,432 | | | | | 5,361 | | | 5,318 | | | 7,403 | | | | | | 53 | | | | 19,568 |
| | 21 | | | | | | 298 | | 3,156 | | | | | | | | | | | 14,354 | | | | | | | | 235 | | 18,043 |
| | 22 | | | | | | | | 914 | | | | | 225 | | | | | | 0 | | | | | | | | | | 1,140 |
| | 24 | 1,231 | | | | | | | 9,268 | | | | 897 | 3,812 | | 6,692 | 227 | | | 16,190 | 2,298 | | | | | | | 4,604 | 39 | 45,259 |
| | 26 | | | | | | | | | | | | | 304 | | | 1,777 | | | 0 | | | | | | | | | | 2,081 |
| | 27 | | | | | | | | 4,233 | | | | | | | | 7,334 | | | 0 | | | | | | | | | | 11,568 |
| | 30 | | | | | | | | 7,379 | | | | 406 | 1,469 | | 4,848 | 5,503 | | | 1,387 | 1,426 | | | | | 605 | | | | 23,023 |
| | 32 | | | | | | | | | | | | | 428 | | | | | | 0 | | | | | | | | | | 428 |
| | 36 | | | | | | | | 8,609 | | | | | 393 | | 1,031 | | | | 10,345 | 1,543 | | | | | | | | | 21,921 |
| | 42 | | | | | | 306 | | 4,265 | | | | | 183 | | 1,672 | | | | 0 | | | | | | | | 483 | | 6,909 |
| | 48 | | | | | | | | 6,118 | | | | | 562 | | | | | | 6,590 | | | | | | | | 1,129 | | 14,398 |
| | 51 | | | | | | | | | | | | | 322 | | | | | | 0 | | | | | | | | | | 322 |
| | 54 | | | | | | | | 1,876 | | | | | 401 | | | | | | 0 | | | | | | | | | | 2,278 |
| | 60 | | | | | | | | 47 | | | | | | | | | | | 0 | | | | | | | | 62 | | 109 |
| | 72 | | | | | | | | 4,938 | | | | | | | | | | | 0 | | | | | | | | | | 4,938 |
| | 78 | | | | | | | | | | | | | 3,301 | | | | | | 0 | | | | | | | | | | 3,301 |
| | 25 x 41 | | | | | | | | | | | | | 172 | | | | | | 0 | | | | | | | | | | 172 |
| | 31 x 48 | | | | | | | | | | | | | 155 | | | | | | 0 | | | | | | | | | | 155 |
| | 32 x 47 | | | | | | | | | | | | | 168 | | | | | | 0 | | | | | | | | | | 168 |
| | 32 x 48 | | | | | | | | | | | | | 834 | | | | | | 0 | | | | | | | | | | 834 |
| | 32 x 49 | | | | | | | | | | | | | 401 | | | | | | 0 | | | | | | | | | | 401 |
| | 34 x 53 | | | | | | | | | | | | | 557 | | | | | | 0 | | | | | | | | | | 557 |
| | 48 x 53 | | | | | | | | | | | | | 53 | | | | | | 0 | | | | | | | | | | 53 |
| | TOTAL | 165,932 | 197,520 | 38,684 | 56,584 | 12,669 | 145,413 | 21,416 | 541,398 | 0 | 0 | 30,732 | 150,329 | 548,947 | 8,767 | 661,641 | 650,680 | 68,564 | 105,050 | 1,412,793 | 213,588 | 59,243 | 54,619 | 64,614 | 27,428 | 89,288 | 27,850 | 36,520 | 93,318 | 5,483,582 |

*Table 5b - Pipe Length by Diameter for each Wastewater System – Force/Low Pressure Main*

| | | Central | | | | | | | | Northeast | | | | | | Southeast | | | | West | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DIAMETER (in) | Fairview North | Fairview South | Franklin | Foster Twp | McEwensville | New Cumberland | Turbotville | York | Blue Mountain Lake | Lehman Pike | Marcel Lake | Pocono | Scranton | Wild Acres | Coatesville | Exeter | Royersford | Upper Pottsgrove | Butler | Clarion | Claysville | Kane - Kinzua | Kane - Pine St | Koppel | McKeesport | Oravosburg | Duquesne | Paint-Elk | TOTAL |
| Force/Low Pressure Main (LF) | Unknown | | | 34 | | 499 | | | | 29 | 60 | | 838 | 27 | 22035 | 26438 | | | 383 | 18 | 45 | | | | | 597 | | | | 51005 |
| | 1 | | | | | | | | | | 439 | | 343 | | | | | | | | | | | | | | | | | 781 |
| | 1.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1101 | 1101 |
| | 1.5 | 396 | | | | | | | | | | | | | | 355 | | | 3178 | | | | | | | 268 | | | | 4197 |
| | 2 | 2478 | | | 656 | 516 | | | | 19977 | 68255 | | 50000 | | | 11157 | | | 1327 | 2453 | 1177 | | | 3760 | | | | | 893 | 162648 |
| | 2.5 | | | | | | | | | | | | | | | | | | | 1628 | | | | | | | | | 2861 | 4489 |
| | 3 | | | | | 226 | | | | 28876 | 89068 | 754 | 19642 | 391 | | | 385 | | 2328 | | 1415 | 1149 | | 2068 | | | | | 2149 | 148451 |
| | 4 | 1337 | | | 6934 | | 556 | | | 6942 | 62530 | 27842 | 10472 | 1028 | | 36673 | | 351 | | 5377 | 1969 | | 7060 | 16795 | | 136 | | | 4181 | 190183 |
| | 6 | 4444 | | 12388 | | | 1780 | | 1666 | 12076 | 26633 | | 18389 | 7792 | | 27426 | 2732 | 640 | 2644 | 5089 | 29372 | | 3416 | | | | 1228 | | 1910 | 159624 |
| | 8 | 10493 | 12889 | | 2009 | | 4561 | | | | 11511 | | 123 | 60 | | 7438 | 10473 | 3463 | 5726 | 7296 | 1480 | | 709 | | | 124 | | | 8416 | 86771 |
| | 10 | 1315 | | | | | | | | | 5817 | | | 1564 | | 11173 | | | | 5080 | 148 | | | | | | | | | 25096 |
| | 12 | 100 | | | | | | | | | 2383 | | | 1407 | | 9809 | | | 4229 | 8085 | 1332 | | | | | 562 | | | | 27907 |
| | 16 | | | | | | | | | | | | | | | 10214 | | | | 9128 | | | | | | | | | | 19342 |
| | 18 | | | | | | | | | | | | | | | | | | | 1193 | | | | | | 1286 | | | | 2479 |
| | 20 | | | | | | | | | | | | | | | | | | | | | | | | | 9054 | | | | 9054 |
| | 30 | | | | | | | | | | | | | | | | | | | 4580 | | | | | | 7153 | | | | 11733 |
| | 36 | | | | | | | | | | | | | | | | | | | 609 | | | | | | 5417 | | | | 6026 |
| | TOTAL | 20563 | 12889 | 12422 | 9599 | 1241 | 6897 | 0 | 1666 | 67899 | 266695 | 28596 | 99807 | 12269 | 22035 | 130469 | 13590 | 4454 | 19815 | 51622 | 36937 | 1149 | 11185 | 22622 | 0 | 33726 | 1228 | 0 | 21511 | 910887 |

*Table 6c - Pipe Length by Diameter for each Wastewater System – Combined Gravity Main*

| | | Central | | | | | | | | Northeast | | | | | | Southeast | | | | West | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Combined Gravity Main (LF) | DIAMETER (in) | Fairview North | Fairview South | Foster Twp | Franklin | McEwensville | New Cumberland | Turbotville | York | Blue Mountain Lake | Lehman Pike | Marcel Lake | Pocono | Scranton | Wild Acres | Coatesville | Exeter | Royersford | Upper Pottsgrove | Butler | Claysville | Clarion | Kane - Kinzua | Kane - Pine St | Koppel | McKeesport | Dravosburg | Duquesne | Paint-Elk | TOTAL |
| | Unknown | | | | | | | | | | | | | 11,421 | | | | | | | | | 610 | 200 | | 105,487 | 6,088 | | | 123,807 |
| | 2 | | | | | | | | | | | | | | | | | | | | | | 37 | 15 | | | | | | 51 |
| | 4 | | | | | | | | | | | | | 765 | | | | | | | | | 53 | 696 | | | 8 | | | 1,522 |
| | 6 | | | | | | | | | | | | | 14,281 | | | | | | | | | 646 | 890 | | 330 | | 128 | | 16,275 |
| | 8 | | | | | | | | | | | | | 300,450 | | | | | | | | | 33,028 | 41,980 | | 102,907 | 339 | 44,968 | | 523,673 |
| | 10 | | | | | | | | | | | | | 212,269 | | | | | | | | | 8,795 | 16,968 | | 33,581 | 503 | 22,099 | | 294,214 |
| | 12 | | | | | | | | | | | | | 256,340 | | | | | | | | | 21,940 | 25,284 | | 142,670 | 7,987 | 32,925 | | 487,147 |
| | 14 | | | | | | | | | | | | | 624 | | | | | | | | | | | | | | | | 624 |
| | 15 | | | | | | | | | | | | | 101,037 | | | | | | | | | | 2,111 | | 88,794 | 3,063 | 18,004 | | 213,009 |
| | 16 | | | | | | | | | | | | | 1,837 | | | | | | | | | | | | | | 701 | | 2,538 |
| | 18 | | | | | | | | | | | | | 56,470 | | | | | | | | | 131 | 2,348 | | 33,940 | 2,993 | 3,505 | | 99,386 |
| | 20 | | | | | | | | | | | | | 36,496 | | | | | | | | | | | | 7,421 | 893 | 803 | | 45,613 |
| | 21 | | | | | | | | | | | | | 9,976 | | | | | | | | | 4,518 | | | 4,596 | 185 | 62 | | 19,336 |
| | 22 | | | | | | | | | | | | | 1,485 | | | | | | | | | | | | | | 42 | | 1,527 |
| | 24 | | | | | | | | | | | | | 54,192 | | | | | | | | | 1,207 | 1,136 | | 23,434 | 1,923 | 15,352 | | 97,244 |
| | 25 | | | | | | | | | | | | | 471 | | | | | | | | | | | | | | | | 471 |
| | 26 | | | | | | | | | | | | | 605 | | | | | | | | | | | | | | | | 605 |
| | 27 | | | | | | | | | | | | | 3,795 | | | | | | | | | | | | 2,040 | | 200 | | 6,035 |
| | 30 | | | | | | | | | | | | | 43,416 | | | | | | | | | 6,251 | | | 614 | | 3,256 | | 53,537 |
| | 31 | | | | | | | | | | | | | 960 | | | | | | | | | | | | | | | | 960 |
| | 32 | | | | | | | | | | | | | 1,307 | | | | | | | | | | | | | | | | 1,307 |
| | 33 | | | | | | | | | | | | | 1,398 | | | | | | | | | | | | 208 | | | | 1,606 |
| | 34 | | | | | | | | | | | | | 812 | | | | | | | | | | | | | | | | 812 |
| | 36 | | | | | | | | | | | | | 4,821 | | | | | | | | | | 3,594 | | 10,432 | | 419 | | 19,265 |
| | 38 | | | | | | | | | | | | | 459 | | | | | | | | | | | | | | | | 459 |
| | 39 | | | | | | | | | | | | | | | | | | | | | | | | | 1,100 | | | | 1,100 |
| | 40 | | | | | | | | | | | | | 552 | | | | | | | | | | | | | | | | 552 |
| | 42 | | | | | | | | | | | | | 2,423 | | | | | | | | | | | | 8,044 | | 64 | | 10,532 |
| | 44 | | | | | | | | | | | | | 470 | | | | | | | | | | | | | | | | 470 |
| | 48 | | | | | | | | | | | | | 6,406 | | | | | | | | | | | | 3,916 | 34 | 444 | | 10,800 |
| | 50 | | | | | | | | | | | | | 350 | | | | | | | | | | | | | | | | 350 |
| | 52 | | | | | | | | | | | | | 187 | | | | | | | | | | | | | | | | 187 |
| | 54 | | | | | | | | | | | | | 5,728 | | | | | | | | | | | | 52 | | | | 5,780 |
| | 56 | | | | | | | | | | | | | 62 | | | | | | | | | | | | | | | | 62 |
| | 57 | | | | | | | | | | | | | 347 | | | | | | | | | | | | | | | | 347 |
| | 58 | | | | | | | | | | | | | 94 | | | | | | | | | | | | | | | | 94 |
| | 60 | | | | | | | | | | | | | 7,382 | | | | | | | | | | | | 3,743 | 281 | 4,151 | | 15,557 |
| | 63 | | | | | | | | | | | | | 873 | | | | | | | | | | | | | | | | 873 |
| | 66 | | | | | | | | | | | | | 2,057 | | | | | | | | | | | | | | | | 2,057 |
| | 72 | | | | | | | | | | | | | 729 | | | | | | | | | | | | 702 | 204 | 1,813 | | 3,448 |
| | 75 | | | | | | | | | | | | | | | | | | | | | | | | | 2,018 | | | | 2,018 |
| | 78 | | | | | | | | | | | | | 973 | | | | | | | | | | | | | | | | 973 |
| | 80 | | | | | | | | | | | | | | | | | | | | | | | | | 1,482 | | | | 1,482 |
| | 84 | | | | | | | | | | | | | | | | | | | | | | | | | 311 | | 176 | | 487 |
| | 90 | | | | | | | | | | | | | 3,823 | | | | | | | | | | | | | | | | 3,823 |
| | 96 | | | | | | | | | | | | | 50 | | | | | | | | | | | | | | | | 50 |
| | 121 | | | | | | | | | | | | | 28 | | | | | | | | | | | | | | | | 28 |

*Table 7c – Continued*

| | | Central | | | | | | | | Northeast | | | | | | Southeast | | | | West | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DIAMETER (in) | Fairview North | Fairview South | Foster Twp | Franklin | McEwensville | New Cumberland | Turbotville | York | Blue Mountain Lake | Lehman Pike | Marcel Lake | Pocono | Scranton | Wild Acres | Coatesville | Exeter | Royersford | Upper Pottsgrove | Butler | Claysville | Clarion | Kane - Kinzua | Kane - Pine St | Koppel | McKeesport | Oravosburg | Duquesne | Paint-Elk | TOTAL |
| Combined Gravity Main (LF) | 12" x 12" | | | | | | | | | | | | | 7 | | | | | | | | | | | | | | | | 7 |
| | 15.4" x 7.5" | | | | | | | | | | | | | 15 | | | | | | | | | | | | | | | | 15 |
| | 2' x 2'3" | | | | | | | | | | | | | 186 | | | | | | | | | | | | | | | | 186 |
| | 2'10" x 4'3" | | | | | | | | | | | | | 637 | | | | | | | | | | | | | | | | 637 |
| | 2'X2'4" | | | | | | | | | | | | | 31 | | | | | | | | | | | | | | | | 31 |
| | 2 x 3 | | | | | | | | | | | | | 617 | | | | | | | | | | | | | | | | 617 |
| | 20x39 | | | | | | | | | | | | | 187 | | | | | | | | | | | | | | | | 187 |
| | 24"X24" | | | | | | | | | | | | | 39 | | | | | | | | | | | | | | | | 39 |
| | 24"x27" | | | | | | | | | | | | | 670 | | | | | | | | | | | | | | | | 670 |
| | 25x36 | | | | | | | | | | | | | 129 | | | | | | | | | | | | | | | | 129 |
| | 25X40 | | | | | | | | | | | | | 113 | | | | | | | | | | | | | | | | 113 |
| | 26"x36" | | | | | | | | | | | | | 373 | | | | | | | | | | | | | | | | 373 |
| | 26"x38" | | | | | | | | | | | | | 2,260 | | | | | | | | | | | | | | | | 2,260 |
| | 26"x39" | | | | | | | | | | | | | 4,542 | | | | | | | | | | | | | | | | 4,542 |
| | 26"X41" | | | | | | | | | | | | | 1,787 | | | | | | | | | | | | | | | | 1,787 |
| | 27"x37" | | | | | | | | | | | | | 393 | | | | | | | | | | | | | | | | 393 |
| | 28"x42" | | | | | | | | | | | | | 1,181 | | | | | | | | | | | | | | | | 1,181 |
| | 29"x18" | | | | | | | | | | | | | 146 | | | | | | | | | | | | | | | | 146 |
| | 29"x44" | | | | | | | | | | | | | 1,832 | | | | | | | | | | | | | | | | 1,832 |
| | 29x37 | | | | | | | | | | | | | 56 | | | | | | | | | | | | | | | | 56 |
| | 29X56 | | | | | | | | | | | | | 14 | | | | | | | | | | | | | | | | 14 |
| | 3'4"X5'0" | | | | | | | | | | | | | 217 | | | | | | | | | | | | | | | | 217 |
| | 3'9"X2'6" | | | | | | | | | | | | | 681 | | | | | | | | | | | | | | | | 681 |
| | 3'x4' | | | | | | | | | | | | | 708 | | | | | | | | | | | | | | | | 708 |
| | 3'x4'6" | | | | | | | | | | | | | 401 | | | | | | | | | | | | | | | | 401 |
| | 30"x42" | | | | | | | | | | | | | 305 | | | | | | | | | | | | | | | | 305 |
| | 30"x54" | | | | | | | | | | | | | 241 | | | | | | | | | | | | | | | | 241 |
| | 32"x38" | | | | | | | | | | | | | 326 | | | | | | | | | | | | | | | | 326 |
| | 32"x41" | | | | | | | | | | | | | 821 | | | | | | | | | | | | | | | | 821 |
| | 32"x60" | | | | | | | | | | | | | 377 | | | | | | | | | | | | | | | | 377 |
| | 32round | | | | | | | | | | | | | 264 | | | | | | | | | | | | | | | | 264 |
| | 33x41 | | | | | | | | | | | | | 201 | | | | | | | | | | | | | | | | 201 |
| | 33x49 | | | | | | | | | | | | | 194 | | | | | | | | | | | | | | | | 194 |
| | 34"x35" | | | | | | | | | | | | | 204 | | | | | | | | | | | | | | | | 204 |
| | 34"x48" | | | | | | | | | | | | | 216 | | | | | | | | | | | | | | | | 216 |
| | 34"x51" | | | | | | | | | | | | | 1,367 | | | | | | | | | | | | | | | | 1,367 |
| | 36"x24" | | | | | | | | | | | | | 271 | | | | | | | | | | | | | | | | 271 |
| | 36"x36" | | | | | | | | | | | | | 1,488 | | | | | | | | | | | | | | | | 1,488 |
| | 36"x38" | | | | | | | | | | | | | 883 | | | | | | | | | | | | | | | | 883 |
| | 36"X41" | | | | | | | | | | | | | 35 | | | | | | | | | | | | | | | | 35 |
| | 36X46 | | | | | | | | | | | | | 89 | | | | | | | | | | | | | | | | 89 |
| | 37"x57" | | | | | | | | | | | | | 884 | | | | | | | | | | | | | | | | 884 |
| | 38"x44" | | | | | | | | | | | | | 194 | | | | | | | | | | | | | | | | 194 |
| | 38"X57" | | | | | | | | | | | | | 196 | | | | | | | | | | | | | | | | 196 |
| | 38x38 | | | | | | | | | | | | | 53 | | | | | | | | | | | | | | | | 53 |
| | 38x92 | | | | | | | | | | | | | 83 | | | | | | | | | | | | | | | | 83 |
| | 4'8"x7'2" | | | | | | | | | | | | | 2,138 | | | | | | | | | | | | | | | | 2,138 |

*Table 8c – Continued*

| | | Central | | | | | | | | Northeast | | | | | | Southeast | | | | West | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DIAMETER (in) | Fairview North | Fairview South | Foster Twp | Franklin | McEwensville | New Cumberland | Turbotville | York | Blue Mountain Lake | Lehman Pike | Marcel Lake | Pocono | Scranton | Wild Acres | Coatesville | Exeter | Royersford | Upper Pottsgrove | Butler | Claysville | Clarion | Kane - Kinzua | Kane - Pine St | Koppel | McKeesport | Oravosburg | Duquesne | Paint-Elk | TOTAL |
| Combined Gravity Main (LF) | 40"x60" | | | | | | | | | | | | | 800 | | | | | | | | | | | | | | | | 800 |
| | 40"x64" | | | | | | | | | | | | | 858 | | | | | | | | | | | | | | | | 858 |
| | 42"x60" | | | | | | | | | | | | | 560 | | | | | | | | | | | | | | | | 560 |
| | 44"x44" | | | | | | | | | | | | | 297 | | | | | | | | | | | | | | | | 297 |
| | 44"x68" | | | | | | | | | | | | | 573 | | | | | | | | | | | | | | | | 573 |
| | 45"x68" | | | | | | | | | | | | | 218 | | | | | | | | | | | | | | | | 218 |
| | 45X66 | | | | | | | | | | | | | 151 | | | | | | | | | | | | | | | | 151 |
| | 46"x66" | | | | | | | | | | | | | 498 | | | | | | | | | | | | | | | | 498 |
| | 48"x78" | | | | | | | | | | | | | 605 | | | | | | | | | | | | | | | | 605 |
| | 48"x84" | | | | | | | | | | | | | 2,231 | | | | | | | | | | | | | | | | 2,231 |
| | 48"X84"Egg | | | | | | | | | | | | | 924 | | | | | | | | | | | | | | | | 924 |
| | 48X90 | | | | | | | | | | | | | 665 | | | | | | | | | | | | | | | | 665 |
| | 52x53 | | | | | | | | | | | | | 222 | | | | | | | | | | | | | | | | 222 |
| | 56X80 | | | | | | | | | | | | | 241 | | | | | | | | | | | | | | | | 241 |
| | 56x86 | | | | | | | | | | | | | 450 | | | | | | | | | | | | | | | | 450 |
| | 59X64 | | | | | | | | | | | | | 168 | | | | | | | | | | | | | | | | 168 |
| | 6"X5" | | | | | | | | | | | | | 9 | | | | | | | | | | | | | | | | 9 |
| | 60"x72" | | | | | | | | | | | | | 352 | | | | | | | | | | | | | | | | 352 |
| | 62"X95" | | | | | | | | | | | | | 641 | | | | | | | | | | | | | | | | 641 |
| | 66"x99" | | | | | | | | | | | | | 536 | | | | | | | | | | | | | | | | 536 |
| | 7.5"X5" | | | | | | | | | | | | | 15 | | | | | | | | | | | | | | | | 15 |
| | 72"x108" | | | | | | | | | | | | | 1,254 | | | | | | | | | | | | | | | | 1,254 |
| | 78.5"X54" | | | | | | | | | | | | | 536 | | | | | | | | | | | | | | | | 536 |
| | 87" C.B. | | | | | | | | | | | | | 402 | | | | | | | | | | | | | | | | 402 |
| | 9.25"X5" | | | | | | | | | | | | | 24 | | | | | | | | | | | | | | | | 24 |
| | TOTAL | | | | | | | | | | | | | 1,189,500 | | | | | | | | | 77,216 | 95,223 | | 577,822 | 24,501 | 149,109 | | 2,113,371 |

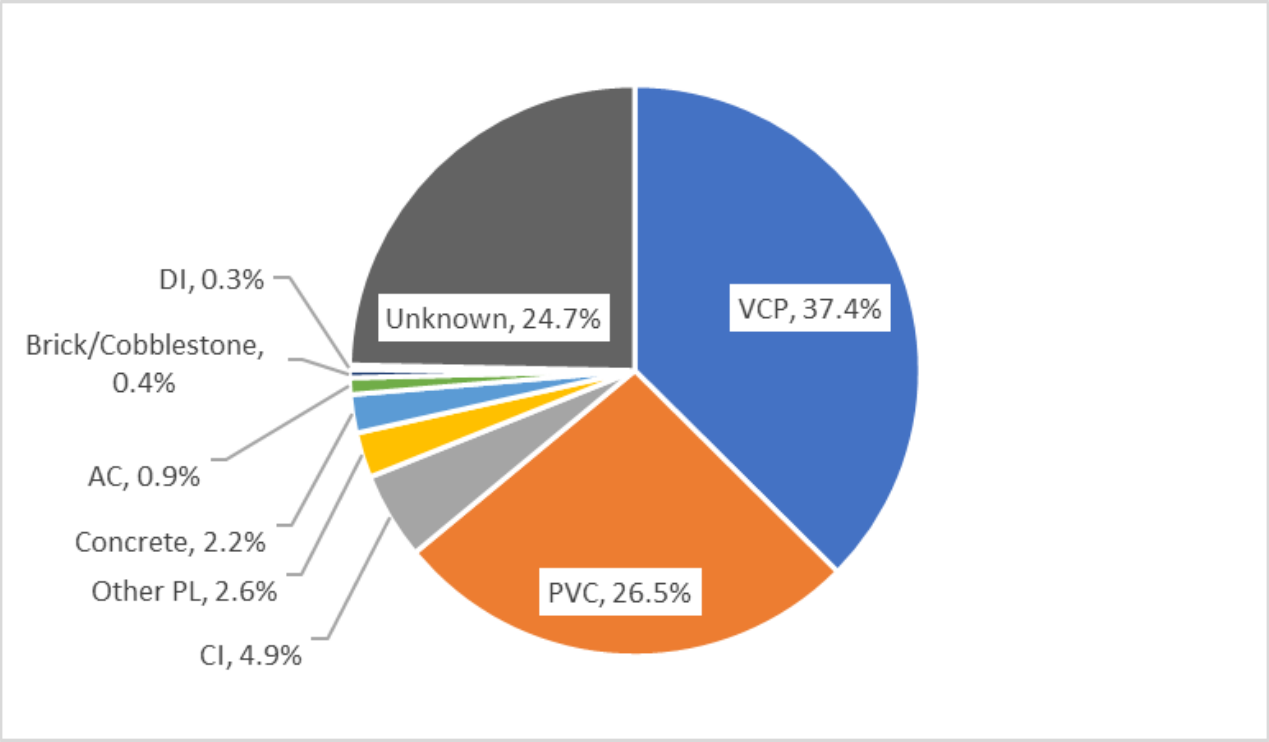


*Figure 1 - Gravity Main Material Breakdown by percentage of total length*

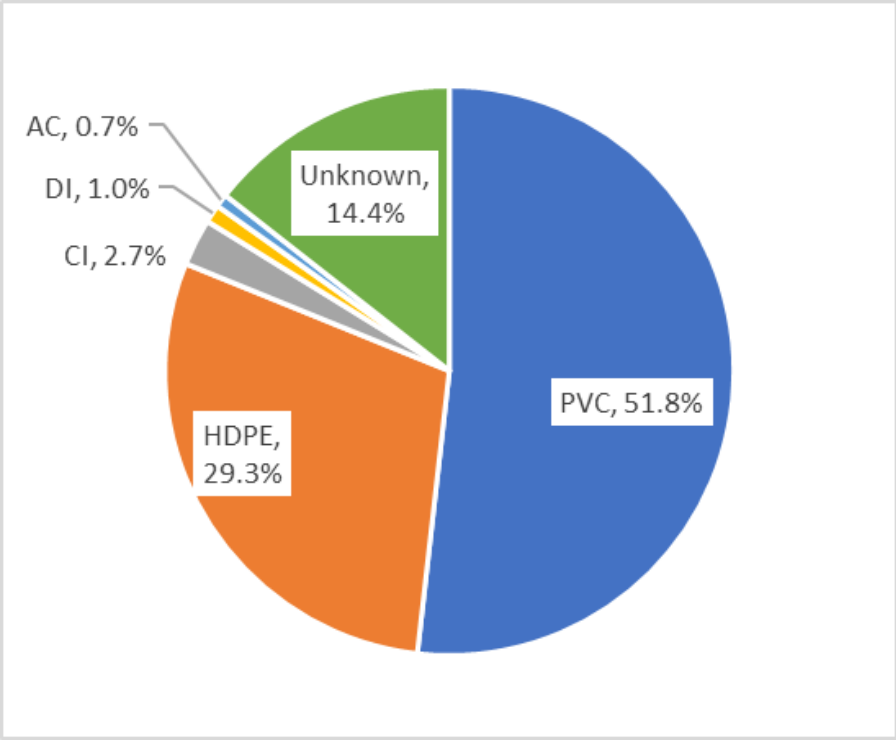


*Figure 2 - Pressurized Main Material Breakdown by percentage of total length.*

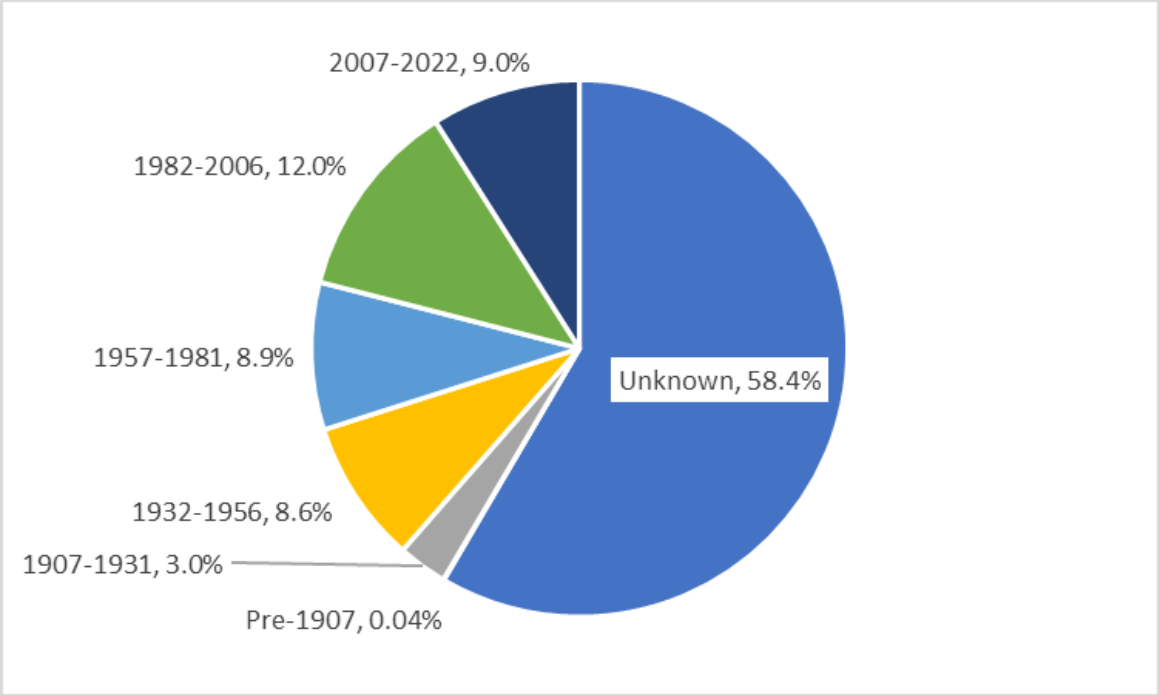


*Figure 3 - Pipe Install Date Breakdown by percentage of total length [unknown percentage due in large part to newer acquisitions]*

## Section 2 – Schedule for Planned Rehabilitation and Replacement of Eligible Property

PAWC recognizes the importance of continuous renewal of aging infrastructure to ensure and maintain adequate, efficient, safe, and reliable service to existing customers. This Section provides an overview of the planning process for replacement of aging wastewater collection system infrastructure. Planning related to collection main extensions due to the increase in the number of customers is not included, except those projects that implement solutions to wastewater problems for existing customers. Planning for WWTP improvements is not included in this Section, as WWTP improvements are not DSIC eligible.

Capital investment programs and projects are needs based and prioritized within a strategic planning process utilizing drivers associated with various asset investment strategies (such as regulatory compliance, reliability, capacity, customer satisfaction, etc.). Within a 5-year strategic capital expenditure plan, PAWC has established longer term funding levels for main replacement and rehabilitation based on program needs. The Company determines an overall investment level based upon the performance of the existing assets and the anticipated remaining life expectancy of the asset, taking into account the impact of investment on customer rates. Ideally, PAWC's spending level for main replacement and rehabilitation should be adequate to keep pace with the anticipated remaining service life of the collection system infrastructure. Expecting pipelines to continue to provide service beyond their useful life generally results in higher levels of service failure, disruptions to customers and potential impacts to the environment.

The first step of the planning process is to conduct a macro-level overview of each wastewater system. GIS tools may be used to help identify and prioritize groups of wastewater properties that are likely candidates for replacement or rehabilitation. GIS tools are not the sole determinant for identifying groups of wastewater assets. Other data that may be applied includes operational knowledge / records, condition of lift stations, number and location of sanitary and/or dry weather sewer overflows, and recorded flows into the WWTP. This system specific information assists in identifying structural and hydraulic deficiencies within each collection system to assess potential vulnerabilities.

Properties may be divided into general categories based on the following:

- Systems that are currently or projected to be hydraulically overloaded as defined by 25 Pa. C.S. §94.1.
- Known problem areas based on operation and maintenance records.
- Sewer collection basins with high I&I.
- Material and age; for example, old vitrified clay pipes and deteriorated brick manholes are potential candidates for replacement / rehabilitation, while lift stations and polyvinyl chloride (PVC) sewers less than 20 years old are less likely to need replacement.

Using these general categories, areas of concern can be identified which may contain properties in need of replacement. The macro-level planning process helps identify groups of assets which are potential candidates, and those groups of assets that are unlikely to need near-term replacement. This allows resources required for micro-level planning to be more efficiently targeted to those areas most likely to contain aging infrastructure in need of rehabilitation or replacement.

The next step in the planning process is to conduct a more detailed, micro-level planning analysis. A comprehensive sewer system evaluation study is conducted, which is a systematic approach to identify specific properties to be rehabilitated or replaced. This study may include:

- Continuous flow monitoring
- Rainfall monitoring
- Hydraulic modeling
- Smoke testing
- Dye testing
- Traditional Closed-circuit TV (CCTV) inspection of mains and service laterals
- Multi-sensor robotic inspection including synchronized laser, sonar, and CCTV for the collection of the system's physical attributes
- Manhole inspection
- Lift station inspection / monitoring
- CSO inlet, outfall, and regulator inspections
- Subbasin analysis / prioritization

During the micro-level planning process, specific properties are identified as candidates for replacement or rehabilitation using a risk-based methodology based on a condition assessment and hydraulic capacity evaluation. Focusing on replacement of aging infrastructure and reduction of I&I, strategic improvements identified in the micro-level planning process can be grouped in the following categories:

*Manhole replacement / rehabilitation* – Work may include frame and cover replacement, internal grouting, lining, or complete replacement. Manhole lining can be used for structural reinforcement, reduction of groundwater infiltration, or protection from corrosive gases. Whether replacement or rehabilitation is best depends on various factors, such as location, structural integrity, and manhole depth. For example, replacement cost may be similar to rehabilitation cost for shallow manholes. In such cases, replacement is likely the best option. For manholes located in areas that are difficult to excavate, lining may be the best option. For each individual project, all factors are considered to select the most prudent and cost-effective method.

*Pipe replacement / rehabilitation* – Work may consist of complete replacement, partial replacement, or trenchless rehabilitation such as cured-in-place pipe lining (CIPP), slip lining,

close-fit pipe lining (fold and form), other pipe coatings/lining systems, pipe bursting, horizontal directional drilling using fused high-density polyethylene (HDPE) pipe or fused PVC pipe. Work could include replacement of air and vacuum release chambers, valves, and flow meters. Pipe replacement and rehabilitation could be part of a relocation project due to highway construction, I&I project, or other project that addresses aging infrastructure. In some cases, projects may include main extensions installed to implement solutions to wastewater problems that present a health and safety concern for existing customers. For low pressure sewers and force mains, which have a shallower installation than gravity mains, replacement is often the best method. For gravity sewers, trenchless rehabilitation is often most cost-effective; however, replacement may be the best option in cases where the pipe is misaligned or has lost its structural integrity. Another option is to combine partial replacement with cured in place liner, such that ground disturbance is minimized to only those sections of pipe in need of replacement. PAWC has embraced trenchless technologies that allow underground infrastructure to be rehabilitated without the need for excavation. In general, trenchless rehabilitation is the preferred method to address aging infrastructure. Collapses or other significant defects that cannot be rehabilitated using trenchless technology on critical pipe segments (e.g., deformation) will be repaired or replaced using open-cut methods. For each individual project, all factors are considered to select the most prudent and cost-effective method.

*Service lateral replacement / rehabilitation* – Work may consist of replacing or rehabilitating company owned gravity or low-pressure sewer laterals, including taps, and cleanouts. A cured-in-place liner is a trenchless alternative that may be best for service laterals that are difficult to excavate. Depending on the condition and number of connections, service lateral replacement may be combined with main line replacement / rehabilitation.

*Lift station replacement / rehabilitation* – Lift stations are evaluated on a case-by-case basis. A scoring system is provided at the end of this Section. Necessary improvements can usually be completed by full or partial rehabilitation. Replacement may be the best option for older and outdated lift stations.

*Combined sewer overflow facility replacement / rehabilitation* – CSO facilities are evaluated on a case-by-case basis. Replacement or rehabilitation of these facilities may include features such as outfall structures, bar screens, piping, valves, or diversion chamber / flow weirs.

Once specific properties are identified as needing replacement or rehabilitation, the final step in the micro-level planning process is prioritization. To better understand and evaluate the complex characteristics of its properties and the various drivers for improvements, PAWC plans to apply a prioritization model to score capital improvement projects which will be funded through the wastewater DSIC program.

The prioritization model for wastewater collection mains will use pipe condition information to assess the system's ability to meet performance measures associated with the following level of service factors. Defining the level of service that is expected from a pipe is dependent on the specific customers that it is serving.

*Level of Service Factors*

- Reliable service (prevent disruptions)
- Customer satisfaction

- Environmental sustainability
- Regulatory compliance
- Public safety

Service reliability, or continuity of operations, is based on factors such as the number of service interruptions (due to pipe failures or operational issues), events impacting critical facilities and the length of time associated with these service interruptions. Customer satisfaction is influenced by events such as sewage back-ups and blockages, odors and overflow discharges. Environmental sustainability and regulatory compliance are primarily determined by the number of dry weather or sanitary sewer overflow events that could impact waterways. Public safety includes events that impact critical facilities, the general public and the utilities' employees.

The list of identified projects will cover multiple wastewater systems and geographical areas across the Commonwealth. Each project may have drivers based on local conditions. What follows below is a standardized condition-based risk assessment prioritization system developed by the National Association of Sewer Service Companies (NASSCO) that can be applied to score and rank projects in different wastewater systems against each other to ensure cost-effective prioritization of capital investment.

In order to cost-effectively prioritize wastewater collection system replacement and rehabilitation projects, PAWC will utilize a risk-based condition assessment approach. To accomplish this prioritization, PAWC will perform a GIS analysis to assign a risk score to each project, where risk is defined as:

*Risk = Likelihood of Failure (LoF) x Consequence of Failure (CoF)*

By establishing "of" standardized definitions and a scoring system for Likelihood of Failure (LoF) and Consequence of Failure (CoF), a risk rating is obtained.

The LoF component represents the probability that the asset will fail based on the asset's physical condition. For linear assets, such as sewer pipelines, this score will be determined by reviewing CCTV or multi-sensor robotic inspections allowing pipes to be coded using the NASSCO's Pipeline Assessment Certification Program (PACP) which is an industry standard for performing condition assessments. Table 5 below lists the PACP grading that is used for LoF scoring.

*Table 9 – PACP Grading for LoF (NASSCO)*

| Grade | Description |
|---|---|
| 5 | Immediate Attention – Defect requires immediate attention |
| 4 | Poor – Severe defects that will become Grade 5 defects within the near future |
| 3 | Fair – Moderate defects that will continue to deteriorate |
| 2 | Good – Defects that have not begun to deteriorate |
| 1 | Excellent – Pipe functional with minor defects |

For pipelines without existing inspection data, desktop assessment using operations and maintenance history (if available), material, and date of construction will be used until condition assessment data is available.

Non-linear assets, such as lift stations, can be classified using the AW Risk Register and High-Risk Asset Management (HRAM) scoring. A typical evaluation would include desktop or field inspection, interviews with operational personnel, or review of design, operation, and maintenance records. The HRAM scale ranges from 1 to 5 for both LoF and CoF, with 1 indicating near new condition and 5 indicating failure has occurred. LoF scores the asset with respect to condition, capacity, performance, and external threats, see Table 6. The highest score across the 4 categories is used for the LoF score.

*Table 10 – HRAM LoF Scoring*

| Physical Condition | Capacity (design capacity) | Performance<br>Level of Service (LOS) | External Threats | Score |
|---|---|---|---|---|
| Excellent: No deterioration, normal maintenance. >80% of useful life remains | Adequate for future needs | Exceeds LOS | Unlikely | 1 |
| Good: minor deterioration, function well, minor maintenance required. 60-80% of useful life remains | Meet current needs | Meets LOS | Less likely | 2 |
| Fair: Moderate deterioration, function partially limited, significant maintenance required. Refurbishment in next 10 years. 40-60% of useful life remains | Meet current needs, but has limitations | Meet LOS with limitations. | Likely | 3 |
| Poor: Severely deteriorated, cannot function well, significant renewal required in next 5 years. 20-40% of useful life remains | Difficult to meet current needs | Difficult to meet LOS | Highly likely | 4 |
| Failing: Cannot function, less than 20% of useful life remains | Cannot meet current needs | Cannot meet current or near-future (within 5 year) LOS | Certain | 5 |

The CoF score presents the direct and indirect impact to the customers and environment if the asset fails. When assigning weighting factors, one should consider how much the parameter contributes to the economic, social and environmental impacts in the event of a failure, commonly referred to as a “triple bottom line” accounting framework:

- Economic impact resulting from the need to conduct an urgent repair: accounts for the relative cost to repair failures (i.e., depth, pipe size, and accessibility) and any fines or other regulatory costs incurred due to a failure.
- Societal impact resulting from the loss of service of the asset: accounts for the number of customers affected by the failure, the type of customers affected (i.e., hospitals, schools, etc.) and the location of the asset.
- Environmental impact resulting from any discharges: accounts for the relative impact to the surrounding environment if a failure leads to a discharge.

CoF may be assigned to a scale from 1 to 6 with 6 being the highest consequence and 1 being the least. An overall CoF score will be calculated as a weighted average of all the individual CoF factors as shown in Table 7. The weighting factors will be 0.25 for each financial and social criterion and 0.50 for environmental criteria. Proposed weightings and ranges presented may be adjusted as the statewide analysis is performed. Weighting factors include diameter, depth, relative network position of pipe, class of road, distance from environmentally sensitive features, and distance between downstream pipe to a service lateral of customer with high importance,

and accessibility for maintenance and inspection. Diameter ranges have been customized to fit small or large wastewater systems. Relative network position is calculated as the sum of relative positions of all pipes discharging to an upstream structure. A larger relative network position would indicate more customers upstream and thus a larger impact of failure. Relative network position requires accurate maps of the system and will be calculated when available. Utilities have a set of customers who are very significant for the well-being of the community. These customers may include hospitals, schools, manufacturing facilities, and emergency services, etc., as determined by the utility. Providing uninterrupted service to these critical facilities is a priority.

Access to manholes and pipes are very important for inspection and repairs. Large construction equipment is sometimes required to repair the failure of a pipe. Response time for a service crew may be significantly higher, if access to the pipe is difficult. The failure of such a pipe may cause significant damage to the environment, as well as private properties, due to delays in response created by difficulties in accessing the failure point. A higher CoF should be assigned to these pipes. This will affect the economic costs, due directly to the difficulty and social costs, if the property needs to be disrupted to gain access.

*Table 11 - Consequence of Failure Scoring (NASSCO)*

| CoF Factor | Description | CoF Score | Criteria |
|---|---|---|---|
| Diameter (inch) – small wastewater systems | < 8” | 1 | Economic, Social |
| | ≥ 8” < 10” | 2 | |
| | ≥ 10” < 15” | 3 | |
| | ≥ 15” < 21” | 4 | |
| | ≥ 21” < 30” | 5 | |
| | ≥ 30” | 6 | |
| Diameter (inch) – large wastewater systems | < 10” | 1 | |
| | ≥ 10” < 15” | 2 | |
| | ≥ 15” < 24” | 3 | |
| | ≥ 24” < 36” | 4 | |
| | ≥ 36” < 60” | 5 | |
| | ≥ 60” | 6 | |
| Depth (ft) | < 6’ | 1 | Economic, Social |
| | ≥ 6’ < 10’ | 2 | |
| | ≥ 10’ < 14’ | 3 | |
| | ≥ 14’ < 18’ | 4 | |
| | ≥ 18’ < 24’ | 5 | |
| | ≥ 24’ | 6 | |
| Relative Network Position of Pipe | ≤ 10 | 1 | Social |
| | 11 – 30 | 2 | |
| | 31 – 70 | 3 | |
| | 71 – 120 | 4 | |
| | 121 – 150 | 5 | |
| | > 150 | 6 | |
| Class of Road | Unpaved Road | 1 | Economic, Social |
| | Minor Local Road | 2 | |

| CoF Factor | Description | CoF Score | Criteria |
|---|---|---|---|
| | Major Local Road | 3 | |
| | Collector Road | 4 | |
| | Arterial / Building / Pool | 5 | |
| | Highway / Waterway / Railroad | 6 | |
| Distance from Environmentally Sensitive Features | ≥ 150 LF | 1 | Environmental |
| | 100 to 150 LF | 2 | |
| | 75 to 100 LF | 3 | |
| | 50 to 75 LF | 4 | |
| | 25 to 50 LF | 5 | |
| | < 25 LF | 6 | |
| Distance between Downstream Pipe to a Service Lateral for Customer with High Importance | ≥ 20,000 LF | 1 | Social |
| | 15,000 to 20,000 LF | 2 | |
| | 10,000 to 15,000 LF | 3 | |
| | 5,000 to 10,000 LF | 4 | |
| | 1,000 to 5,000 LF | 5 | |
| | < 1,000 LF | 6 | |
| Accessibility of Pipe | On Right-of-Way – no traffic control | 1 | Economic, Social |
| | On Right-of-Way – with traffic Control | 2 | |
| | On public land with vehicle access | 3 | |
| | On public land without vehicle access | 4 | |
| | On private land without vehicle access | 5 | |
| | Behind or under built structures and no vehicle access | 6 | |

The scoring system will have flexibility by allowing adjustment in how each criterion is weighted, and accounting for special circumstances which may be difficult to quantify. The prioritization model will serve as a tool that helps PAWC develop a schedule for planned rehabilitation and replacement of eligible property to maintain safe, reliable service to existing customers.

The overall risk associated with a failure event is a function of the LoF event and its consequence. Not all highly probable events need the same attention, since they may not have equally high consequence (impact) to the community.

Increased LoF should result in more aggressive maintenance and repair. Increased CoF should result in increased assessment. This approach provides the basis for an economically efficient, balanced and proactive assessment, maintenance and replacement/rehabilitation program.

Non-linear assets, such as lift stations, CoF can be classified using the AW Risk Register and High-Risk Asset Management (HRAM) scoring similar to LoF scoring. A typical evaluation would include desktop or field inspection, interviews with operational personnel, or review of design, operation, and maintenance records. The HRAM scale ranges from 1 to 5 for CoF, with 1 indicating low consequence and 5 indicating a very high consequence. CoF scores the asset with respect to Social or Customer Impact, including outage times, ease to repair and safety.

Economic Impact to the Company, Customers and/or Community; and Environmental Impacts such as SSOs, CSOs, other releases, and permit compliance. The highest score across the 3 categories is used for the LoF score. Total HRAM score is the product of the LoF and CoF score and ranges from 1 to 25.

This risk-based management approach allows for proactive planning. For example, pipelines serving critical community services, such as hospitals and other critical care facilities, can be proactively assessed and managed to minimize potential service disruptions. To reduce the impact to customers and save on mobilization and demobilization costs, projects can be grouped together by geographic proximity and similar risk rankings. Likewise, pipeline construction work can be coordinated with other roadwork such as road restoration, detours and other utility work. Improvement projects can be better scheduled by area to achieve unit cost savings rather than reactive projects scattered across a system.

In general, preference will be given to those systems with high I&I, and older systems with aging lift stations, brick manholes, and vitrified clay pipe. Some parameters may impact just one of the three triple bottom line categories, while some may have varying degrees of impacts. An example of this would be a sewer line that crosses a waterway. This clearly can impact the environmental aspect of the triple bottom line, considering the likelihood for contamination of the stream. There may also be some social impacts with respect to an interruption in recreational use of the waterway, and economic impacts that result from penalties and fines.

## Section 3 – Location of Eligible Property

The number of eligible property for each wastewater system can be found in Tables 2 and 3. Tables 4a, 4b, and 4c provide the size and length of pressure and gravity sewers for each wastewater system.

PAWC is regularly conducting inspection of gravity pipelines in its various wastewater collection systems as well as baseline surveys for newly acquired systems. The majority of gravity pipelines in recently acquired wastewater systems have either old CCTV inspection records or no inspection records. These systems are generally scheduled for inspection to collect condition assessment data allowing each gravity pipe to be assigned a NASSCO score. In addition, pipe and manhole attribute data is collected to improve GIS records and hydraulic model accuracy. The inspection captures GPS data, including the coordinates of service laterals flowing into the gravity system, which improves PAWC's ability to respond to PA One-Call and service requests.

The strategic approach for all gravity collection systems is to utilize a condition-based assessment, hydraulic capacity information, and GIS-based system attributes to prioritize accelerated replacement or rehabilitation work based on a triple bottom line risk assessment methodology using industry standard LoF and CoF factors.

### Central Pennsylvania

Fairview North

The Fairview North wastewater system is located in York County and provides wastewater collection and treatment service to approximately 1,903 mostly residential customers. The collection system serves portions of Fairview Township. PAWC purchased the assets of the Fairview North system in 2015.

The Fairview North collection system consists of approximately 165,932 LF of gravity main, ranging in diameter from 6-inch to 12-inch; and approximately 20,563 LF of force main, ranging in diameter from 1.5-inch to 12-inch. The collection system was originally installed around 1950. The system includes 11 lift stations. The approximately 873 manholes are brick or concrete. The system includes VCP, asbestos cement (AC), and PVC gravity mains. Force main material includes ductile iron, AC, and PVC.

The Fairview North system includes one WWTP with a permitted annual average daily flow of 1.206 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0081868. The 2021 annual average daily flow into the plant was 0.314 MGD, and the ratio of 3 consecutive month maximum to annual average was 1.21.

Fairview North has been evaluated and the majority of Class 4 and 5 failures have been remediated through lining or replacement. The Company does not anticipate significant rehabilitation costs in the coming years; however, a study is on-going to define where sewer capacity needs to be addressed.

Fairview South

The Fairview South wastewater system is located in York County and provides wastewater collection and treatment service to approximately 2,248 mostly residential customers. The collection system serves portions of Fairview Township. PAWC purchased the assets of the Fairview South system in 2015.

The Fairview South collection system consists of approximately 197,520 LF of PVC gravity main, ranging in diameter from 8-inch to 10-inch; and approximately 12,889 LF of 8-inch PVC force main. The collection system was originally installed around 1992. The system includes 6 lift stations. The approximately 1,057 manholes are concrete.

The Fairview South system includes one WWTP with a permitted annual average daily flow of 0.94 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0082589. The 2021 annual average daily flow into the plant was 0.600 MGD, and the ratio of 3 consecutive month maximum to annual average was 1.19. During wet weather events, the system can experience flows up to three times the annual average.

Based on system age and observed wet weather flows, the collection is assumed to be in relatively good condition. However, some I&I rehabilitation projects are anticipated over the 5-year planning horizon. Wet weather flows in the subbasins that flow to the Fisher pump station, Lakeside pump station, and the Fairmont pump station appear to be more significant than other areas in the system and will be a focus of the investigative and rehabilitation work.

Foster Township

The Foster Township wastewater system is located in Luzerne County and provides wastewater collection/conveyance service to portions of Foster Township. The system consists of approximately 518 mostly residential customers. PAWC purchased the assets of the Foster Twp system in 2022.

The Foster Twp collection system consists of approximately 38,684 LF of mostly PVC gravity main, ranging in diameter from 8-inch to 12-inch, and 9,600 LF of PVC force main, ranging in diameter from 2-inch to 8-inch. The system also contains approximately 204 concrete manholes and 4 lift stations.

Wastewater system evaluation is on-going and targeted improvements are anticipated based on the results. The system is approximately 12 years old and significant investment is not anticipated.

Franklin

The Franklin wastewater system is located in Adams County and provides wastewater collection and treatment service to portions of the Townships of Franklin, Hamiltonban, and Highland. The system consists of approximately 349 mostly residential customers. PAWC purchased the assets of the Franklin system in 2013 and neighboring Hamiltonban system in 2014. Hamiltonban was interconnected with the Franklin system in 2016.

The Franklin collection system consists of approximately 56,584 LF of mostly PVC and some VCP gravity main, ranging in diameter from 8-inch to 10-inch, and 12,889 LF of 6-inch PVC force main. Most of the collection system was installed in 2004 or later; the Hamiltonban portion was originally constructed around 1972. Most of the approximately 198 manholes are concrete.

Included in the above footages of gravity main is a stand-alone area known as the “sand mound,” which serves 14 homes and was installed in 2004. The sand mound area consists of 6-inch PVC gravity mains that discharge into two 1,500 gallon septic tanks with an 1,800 gallon final settling tank, a lift station, and a 10,000 square-foot elevated sand mound. At this time, there are no plans to connect the sand mound area to the Franklin collection system.

The system contains one WWTP with a permitted annual average daily flow of 0.2 MGD, which is the basis for the plant’s hydraulic capacity. The plant is operated under NPDES permit PA-00248088. The 2021 annual average daily flow into the plant was 0.0834 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.22. There is one lift station that was installed in 2016 to deliver flows from Hamiltonban to the Franklin WWTP. The WWTP is not expected to be hydraulically or organically overloaded in the next five years.

Rehabilitation projects focused on lining the older Hamiltonban subbasin that consists of VCP and was impacted by I&I during wet weather events. Much of this area was lined using UV CIPP liners and additional work is not anticipated. For the newer areas within the Franklin subbasin, PAWC plans to complete repairs and rehabilitation projects on an as-needed basis.

McEwensville

The McEwensville wastewater system is located in Northumberland County and provides wastewater collection and treatment service to approximately 129 mostly residential customers. The collection system serves McEwensville Borough. PAWC purchased the assets of the McEwensville system in 2015.

The McEwensville collection system consists of approximately 12,669 LF of 8-inch and 10-inch PVC gravity main, and 1,242 LF of 2-inch to 3-inch PVC force main. The collection system was originally constructed in 1984. The approximately 57 manholes are concrete.

The system contains one WWTP with a permitted annual average daily flow of 0.045 MGD, which is the basis for the plant’s hydraulic capacity. The plant is operated under NPDES permit PA-0111414. The 2021 annual average daily flow into the plant was 0.019 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.11. The system includes 4 lift stations.

PAWC plans to rehabilitate or replace all lift stations located in the collection system, including the lift station at the headworks of the WWTP. In addition, PAWC plans to complete targeted rehabilitation work in the collection system.

New Cumberland

The New Cumberland wastewater system is located in Cumberland County and currently provides wastewater collection and treatment service to approximately 3,066 mostly residential and commercial customers in New Cumberland Borough. PAWC purchased the assets of the New Cumberland system in 2016.

The collection system consists of approximately 144,692 LF of gravity, mostly VCP and some PVC ranging in diameter from 6-inch to 42-inch diameter; and approximately 6,898 LF of force main, 4-inch to 8-inch diameter. The collection system includes 3 lift stations. The collection system was originally constructed around 1950. Most of the gravity collection system consists of vitrified clay pipe with concrete manholes.

The New Cumberland system includes one WWTP with a permitted annual average daily flow of 1.25 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0026654. The 2021 annual average daily flow into the plant was 0.522 MGD, and the ratio of 3 consecutive month maximum to annual average was 1.56.

Collection system investigations included multi-sensor CCTV investigation. Lining projects to address NASSCO Class 4 and 5 defects are on-going. It is anticipated that this work will continue through the 5-year outlook.

Turbotville

The Turbotville wastewater system is located in Northumberland County and provides wastewater collection and treatment service to approximately 308 residential and commercial customers. The collection system serves Turbotville Borough. PAWC purchased the assets of the Turbotville system in 2019.

The Turbotville collection system consists of approximately 21,416 LF of 6-inch and 8-inch PE sliplined VCP gravity main. The approximately 90 manholes are concrete.

The system contains one WWTP with a permitted annual average daily flow of 0.136 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0028100. The 2021 annual average daily flow into the plant was 0.110 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.80.

PAWC has inspected and rehabilitated or replaced Class 4 and 5 rated sewer main in the collection system. The majority of sewer has previously been slip lined with PE pipe, but I&I is still higher than typical systems. A new WWTP is in-service with the ability to handle the wet weather flows and additional sewer work will be conducted as needed.

York

The York wastewater system is located in York County and currently provides wastewater collection and treatment service to approximately 13,427 residential, commercial, industrial, institutional, and bulk customers in the City of York and 7 neighboring municipalities. These municipalities include Manchester Township, West Manchester Township, York Township, North York Borough, West York Borough, Springettsbury Township, and Spring Garden Township. Flow from Springettsbury Township includes flows from five additional municipalities including Dallastown Borough, Red Lion Borough, Windsor Township, Windsor Borough, and Yoe Borough. PAWC purchased the assets of the York system in 2020.

The collection system consists of approximately 541,398 LF of gravity, mostly VCP with some RCP, DI, and Plastic ranging in diameter from 6-inch to 72-inch diameter; and approximately 1,660 LF of 6-inch PVC force main. The collection system includes 1 lift station and dates back to the early 1900s.

The York system includes one WWTP with a permitted annual average daily flow of 26.0 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0026263. The 2021 annual average daily flow into the plant was 10.264 MGD, and the ratio of 3 consecutive month maximum to annual average was 1.31.

## Northeastern Pennsylvania

### Blue Mountain Lake

The Blue Mountain Lake (BML) wastewater system is located in Monroe County and currently provides wastewater collection and treatment service to approximately 923 mostly residential customers in portions of Stroud and Smithfield Townships. PAWC purchased the assets of the BML system in 2005.

The BML collection system consists of about 67,899 LF of low-pressure sewer main, and does not contain any gravity or force main. The low-pressure main was installed in 1990 or later, and consists of PVC main ranging in diameter from 2-inch to 6-inch. The system includes 6 lift stations.

The system contains one WWTP with a permitted annual average daily flow of 0.183 MGD. The plant is operated under NPDES permit PA-0062464. The 2021 annual average daily flow into the plant was 0.120 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.02. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years. The collection system is in relatively good condition and experiences little to no I&I.

PAWC plans to continue to assess the condition of the system, and complete targeted rehabilitation work as needed. BML lift stations will be continuously evaluated, which may result in improvement or replacement projects for the purpose of increasing reliability of service.

### Lehman Pike

The Lehman Pike (LP) wastewater system serves portions of Middle Smithfield Township in Monroe County, and portions of Lehman Township in Pike County. LP provides wastewater collection and treatment service to approximately 2,798 mostly residential customers, mostly in Pike County. PAWC purchased the assets of the LP system in 2002.

The LP collection system consists of approximately 266,695 LF of low pressure main, and does not contain any gravity or force main. The low-pressure main was installed in 1980 or later, and consists of PVC main ranging in diameter from 1-inch to 10-inch. Each customer owns and maintains their own grinder pump and pit installation. The system includes 13 lift stations.

One of the lift stations owned by PAWC is located at an aerated equalization basin, which receives flow from the Timothy Lakes Campground. The Campground maintains its own collection system.

The LP system contains one WWTP with an NPDES permitted discharge of 0.75 MGD. The plant is operated under NPDES permit PA-0060640. The WWTP has an average day design flow capacity of 0.532 MGD. The 2021 annual average daily flow into the plant was 0.245 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.09. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

The LP collection system is in relatively good condition and experiences low I&I. Since the acquisition in 2002, PAWC has completed rehabilitation and replacement work at most of the lift stations. PAWC plans to continue to assess the overall condition of the system, and complete targeted rehabilitation and improvement work as needed.

Marcel Lake

The Marcel Lake (ML) wastewater system is located in Pike County and provides wastewater collection and treatment service to approximately 361 mostly residential customers in the Marcel Lake Estates development in Delaware Township. In 2013, PAWC purchased the assets of the Marcel Lake system from the Clean Treatment Sewage Company.

The system contains one WWTP with a permitted annual average daily flow of 0.100 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0060313. The 2021 average daily flow into the plant was 0.0423 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.17. The WWTP is not currently nor expected to be organically overloaded in the next five years.

The original gravity collection system was shown to be in very poor condition with inadequate design and failing pipes. The original gravity system was replaced and flows to the WWTP are now half of what they were.

In its current state, the Marcel Lake collection system consists of approximately 30,732 LF of 8-inch and 12-inch PVC gravity main, and approximately 28,597 LF of PVC low pressure main, ranging in diameter from 3-inch to 4-inch. The gravity system installed in 2018 includes three submersible lift stations whereas the previous layout design required 10 lift stations. The gravity collection area includes approximately 130 manholes. The low-pressure system was originally installed in the 1980s or later.

PAWC plans to continue to assess the overall condition of the system, and complete targeted rehabilitation and improvement work as needed.

Pocono

The Pocono wastewater system is located in Monroe County and provides wastewater collection and treatment service to approximately 877 mostly residential customers in the Pocono Country Place residential development within Coolbaugh Township. PAWC purchased the assets of the PCP system in 1995.

The Pocono collection system consists of approximately 150,329 LF of gravity main, ranging in diameter from 4-inch to 30-inch; 99,805 LF of low pressure main, ranging in diameter from 1-inch to 8-inch, about 5,400 LF of which is 4-inch and 6-inch diameter force main. The collection system was installed in 1975 or later. The system includes 2 lift stations. The force mains are ductile iron; the majority of low-pressure and gravity mains are PVC; and the approximately 877 manholes are concrete.

The system contains one WWTP with a permitted annual average daily flow of 1.256 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0060097. The 2017 annual average daily flow into the plant was 0.715 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.37. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

PAWC plans to continue to assess the overall condition of the system, and complete targeted rehabilitation and improvement work to address the continued I&I issues in Pocono.

Scranton

The Scranton combined sewer system (formerly Scranton Sewer Authority) is located in Lackawanna County and provides sanitary and combined sewage collection and treatment service to approximately 29,701 customers, comprised of residential, commercial, industrial customers, and other / institutional / bulk customers. The collection system services the City of Scranton and Borough of Dunmore. PAWC's Scranton Wastewater System also provides conveyance and treatment of wastewater from portions of the adjacent Boroughs of Taylor, Dickson City, and Moosic through inter-municipal agreements with the Lower Lackawanna Valley Sanitary Authority (LLVSA) and the Lackawanna River Basin Sewer Authority (LRBSA). PAWC purchased the assets of Scranton Sewer Authority in 2016.

The Scranton Sewer Authority entered into a Consent Decree with the Environmental Protection Agency (EPA) and the PaDEP on January 31, 2013. The Consent Decree was amended with the approval of the District Court to substitute PAWC as the successor to the Scranton Sewer Authority effective as of the date of closing on the Company's acquisition from the Scranton Authority, which was December 29, 2016. Scranton Sewer Authority adopted a Long Term Control Plan (LTCP), that was approved by the PaDEP and EPA, for the purpose of reducing combined sewer overflows into the Lackawanna River and its tributaries from the Scranton Wastewater System service area in accordance with the requirements of the Clean Water Act. Under the amended Consent Decree, PAWC is required to implement the approved LTCP.

The LTCP was adopted in 2012. The goal of the LTCP is to attain water quality standards within the receiving streams of the Scranton Wastewater System's seventy-eight (78) CSO facilities. A variety of measures were evaluated to control the frequency and duration of the CSO events. With the use of hydraulic modeling, the primary control measures selected include in-line and off-line storage systems, strategic sewer separation, CSO regulator adjustments, and interceptor capacity improvements. Due to the large number of CSO facilities in the system, and the associated number of identified control projects, the LTCP will be implemented over a twenty-five (25) year period. Using a ranking system, which took into account the "triple bottom line" (financial, social, and environmental) attributes of each project, the LTCP CSO control projects were ranked and then divided into five implementation phases, with higher ranking projects generally placed in the earlier phases. The LTCP has a final completion date of December 1, 2037, with a current total estimated cost of approximately $140M.

The Scranton wastewater collection system consists of approximately 1,738,447 LF (329 miles) of gravity collection main ranging in diameter from 4-inch to 108-inch, approximately 68 percent (225 miles) of which is combined sewer. The collection/conveyance system includes 12,269 LF of force main ranging in diameter from 3-inch to 12-inch inch. The 9,445 manholes are mostly brick with some concrete. Most of the collection system consists of 8-inch to 24-inch vitrified clay, reinforced concrete, and PVC pipe that is about 50 to 60 years old. Some pipes are over 100 years old. The system includes 7 lift stations.

Combined sewage is conveyed to CSO regulator chambers prior to connecting with an interceptor sewer. Under high wet-weather flow conditions that exceed the capacities of downstream facilities, the CSO regulators direct combined sewage to the receiving streams. Including the WWTP bypass, the Scranton collection system contains 78 permitted CSO discharge points: seventy (70) CSO regulator structures / outfalls, four (4) diversion manholes, and four (4) pumping station overflow outlets.

The main interceptor sewer for the Scranton system runs parallel to the Lackawanna River, which generally flows through the middle of Scranton City. The main interceptor is approximately 5.8 miles in length, starting as a 24-inch diameter pipe at the upstream end of the system at the Leggetts Creek CSO Regulator and increasing to a 78-inch diameter pipe at the headworks to the Scranton WWTP. The 78-inch diameter portion of the main interceptor has a peak flow capacity of about 110 MGD compared to the existing peak capacity of the Scranton WWTP of 39 MGD. The main interceptor averages about 30 feet deep at its downstream end and crosses the Lackawanna River at three locations.

The Scranton system includes one WWTP with annual average daily flow hydraulic capacity of 25 MGD. Improvements were completed to comply with the PaDEP / EPA Combined Sewer Overflow Long Term Control Plan and NPDES permit in order to upgrade the BNR process to treat up to 46 MGD with 14 MGD biological nutrient reduction bypass flow, for a peak flow of 60 MGD. The plant discharges to the Lackawanna River under NPDES permit PA-0026492A-1. The 2021 annual average daily flow into the plant was 12.866 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.12. The WWTP is not in a current hydraulic or organic overload condition, nor is it projected to be within the next five years.

Preventative maintenance activities are continually performed by PAWC staff to optimize the operation of the collection system and to minimize the occurrences of blockages. The strategy for accelerated replacement and rehabilitation of aging infrastructure in the collection system will be a targeted, multi-year process. PAWC plans to use an approach that includes consent order compliance, long-term control plan and nine minimum control measures to address combined sewer overflows; and CCTV inspection of mains and laterals, multi-sensor robotic inspection, and hydraulic model development for the main replacement and rehabilitation program.

Using continuous information from PAWC collection system staff, including CCTV inspection results and multi-sensor robotic inspection of the system, PAWC plans to address areas of high concern as they are identified. The system will continue to be inspected with the goal of accelerating asset renewal and rehabilitation.

The 7 lift stations are in good condition and are cleaned / maintained on a regular basis by PAWC staff. Three have been upgraded within the past seven years.

Wild Acres

The Wild Acres wastewater system is located in Pike County and currently provides wastewater collection and treatment service to approximately 35 residential customers in portions pf Delaware Township. PAWC purchased the assets of the Wild Acres system in 2021.

The Wild Acres collection system consists of about 8,767 LF of gravity sewer and approximately 22,035 LF of low pressure sewer main. The system was installed in 1980s or later.

The system contains one WWTP without a surface discharge. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years. The collection system is in relatively good condition and experiences little I&I. PAWC plans to continue to assess the condition of the system, and complete targeted rehabilitation work as needed.

## Southeastern Pennsylvania

### Coatesville

The Coatesville wastewater system is located in Chester County and provides wastewater collection and treatment service to approximately 10,690 customers, comprised of residential, commercial, industrial, and other / institutional customers, and 2 bulk municipal customers. The collection system serves the City of Coatesville, the Borough of Parkesburg and portions of the Borough of South Coatesville and portions of the Townships of Caln, East Fallowfield, Highland, Sadsbury, Valley, West Caln, and West Sadsbury. The system includes the following bulk municipal customers: Caln and West Brandywine Townships. PAWC purchased the assets of the Coatesville system in 2001, the assets of the Sadsbury system in 2019 and the assets of the Valley Twp System in 2021.

The Coatesville collection system consists of approximately 661,641 LF of gravity main, ranging in diameter from 4-inch to 42-inch; and approximately ~~18,720~~ 130,469 LF of force main, ranging in diameter from 2-inch to 12-inch. The collection system was installed in the 1930s or later. The system includes 24 lift stations. The approximately 3,208 manholes are brick or concrete. The system includes VCP, PVC, and ductile iron gravity main. Force main material includes ductile iron and PVC.

The system contains one WWTP with a permitted annual average daily flow of 7.0 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0026859. The 2021 annual average daily flow into the plant was 3.294 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.15. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

Since the 2001 acquisition, PAWC has maintained a regular program of monitoring collection system conditions. An aggressive I&I abatement program has been implemented to minimize extraneous flows into the system. The collection system is divided into ten subbasins, from which additional subbasins are identified and prioritized for the I&I monitoring and abatement program. Trenchless technologies, such as cured-in-place liners, have been an important tool to complete the rehabilitation work in a cost effective, safe and reliable manner. Work has continued in the high priority subbasins since the mid 1990's.

The general strategy to maintain an accelerated pace of replacement and rehabilitation of eligible property is to inspect portions of the collection system each year, and use the inspection results to identify projects to be completed the following year. The entire collection system was inspected in 2005, and a hydraulic model was developed. Some new additions to the system have not been inspected. The original inspection was completed over 13 years ago; therefore, some areas in critical subbasins have been re-inspected in recent years. PAWC plans to continue inspections in order to maintain an accelerated I&I abatement program and continue to assess the condition of the system.

### Exeter

The Exeter wastewater system is located in Berks County and provides wastewater collection and treatment service to approximately 7,867 residential, commercial, industrial, and other / institutional customers. The collection system serves portions of the Township of Exeter and

portions of Upper Providence Township. PAWC purchased the assets of the Exeter system in 2019.

The Exeter collection system consists of approximately 650,680 LF of mostly VCP and PVC gravity main, ranging in diameter from 8-inch to 30-inch, and 19,815 LF of PVC force main, ranging in diameter from 3-inch to 8-inch. The system also contains approximately 3,110 concrete manholes and 6 lift stations.

The system contains one WWTP with a permitted annual average daily flow of 7.100 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0026972. The 2021 annual average daily flow into the plant was 3.516 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.26.

PAWC has inspected the collection system and plans on targeted rehabilitation or replacement of Class 4 and 5 defects over the next 5-years. This includes replacement of the Schuylkill River Interceptor in 4 Phases starting after or with completion of a capacity upgrade to the plant influent pump station.

Royersford

The Royersford wastewater system is located in Montgomery County and provides wastewater collection and treatment service to approximately 1,493 residential and commercial customers in Royersford Borough and portions of Upper Providence Township. PAWC purchased the assets of the Royersford system in 2021.,

The Royersford collection system consists of approximately 105,050 LF of mostly VCP and PVC gravity main, ranging in diameter from 8-inch to 18-inch, and 19,815 LF of PVC force main, ranging in diameter from 2-inch to 8-inch. The system also contains approximately 518 concrete manholes and 4 lift stations.

The system contains one WWTP with a permitted annual average daily flow of 1.00 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0021512. The 2021 annual average daily flow into the plant was 0.262 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.52.

Wastewater system evaluation is on-going and targeted improvements are anticipated based on the results.

Upper Pottsgrove

The Upper Pottsgrove wastewater system is located in Montgomery and Berks Counties and provides wastewater collection/conveyance service to portions of Upper Pottsgrove Township and Douglass Township. The system consists of approximately 1,546 mostly residential or commercial customers. PAWC purchased the assets of the Upper Pottsgrove system in 2022.

The Upper Pottsgrove collection system consists of approximately 105,050 LF of mostly VCP and PVC gravity main, ranging in diameter from 8-inch to 18-inch, and 19,815 LF of PVC force main, ranging in diameter from 2-inch to 8-inch. The system also contains approximately 518 concrete manholes and 4 lift stations. There are 6 metering points that meter flow leaving Upper Pottsgrove.

Wastewater system evaluation is on-going and targeted improvements are anticipated based on the results.

## Western Pennsylvania

### Butler

The Butler wastewater system is located in Butler County and provides wastewater collection and treatment service to approximately 14,792 residential, commercial, industrial, and mixed / institutional customers. The collection system serves the City of Butler, Butler Township, Center Township, portions of East Butler Borough and Summit, Connoquenessing, and Oakland Townships. PAWC is under agreement to purchase the assets of the Butler system and anticipates closing the transaction in Q4 2023.

The Butler collection system consists of approximately 1,412,793 LF of gravity main and approximately 51,622 LF of force main. The collection system was installed in the 1930s or later. The system includes 24 lift stations and approximately 6,488 brick and concrete manholes.

The system contains one WWTP with a permitted annual average daily flow of 10.0 MGD, which is the basis for the plant's hydraulic capacity and a maximum flow rate of 25.0 MGD. The plant is operated under NPDES permit PA-0026697. The 2021 annual average daily flow into the plant was 5.698 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.12.

In 2019, the Butler Area Sewer Authority voluntarily entered into another CAP to address similar issues in two sewer sheds located in the outlying portions of their system. This CAP will entail improvements to six (6) pumping stations totaling approximately $16 million. Design and permitting are underway, and construction is scheduled to occur from 2024 to 2026.

### Clarion

The Clarion wastewater system is located in Clarion County and provides wastewater collection and treatment service to approximately 2,476 residential, commercial, industrial, and mixed / institutional customers. The collection system serves Clarion Borough, and portions of Monroe Township, Clarion Townships, and Strattanville Borough. Strattanville Borough is a bulk municipal customer that owns and maintains its own wastewater collection system. PAWC purchased the assets of the Clarion system in 2008.

The Clarion collection system consists of approximately 213,588 LF of gravity main, ranging in diameter from 4-inch to 36-inch; and approximately 36,937 LF of force main, ranging in diameter from 2-inch to 10-inch. The collection system was installed in the 1930s or later. The system includes 6 lift stations. Most of the approximately 1,048 manholes are brick, and the remaining ones are concrete. Most of the gravity collection mains are clay, and the remaining ones are PVC. Force mains are PVC, ductile iron, and HDPE. A recently installed 6-inch HDPE force main, which serves the Clarion-Limestone School District, accounts for most of the force main length in the Clarion system.

The system contains one WWTP with a permitted annual average daily flow of 2.9 MGD. The plant hydraulic capacity was increased in 2015 after WWTP improvements were completed. The

plant is operated under NPDES permit PA-0029491. The 2021 annual average daily flow into the plant was 1.033 MGD, and the ratio of the 3 consecutive month maximum to annual average flow was 1.13. System improvements were completed, which include wet weather storage basins at the Liberty Lift Station and the WWTP. Prior to completion of system improvements, during excessive wet weather, bypasses would occur at the WWTP and SSOs would occur at the WWTP and within the collection system. In 2017, the system experienced no SSOs. The WWTP is not currently nor projected to be hydraulically or organically overloaded in the next five years.

Since the 2008 acquisition, PAWC has implemented an aggressive I&I abatement program to correct defects in priority subbasins of the collection system that were potential sources of I&I. Work has included main line, manhole, and lateral rehabilitation, as well as upgrades to lift stations. Trenchless technologies, including cured-in-place liners and pipe-bursting, have been an important tool to complete the rehabilitation work in a cost-effective, safe and reliable manner.

I&I remains an issue in high priority subbasins in the collection system as well as several other subbasins, which will need to be addressed to prevent future hydraulic overload conditions. PAWC plans to maintain an accelerated I&I abatement program has inspected the entire collection system. The basins that flow to the Liberty Lift Station will be targeted over the next several years due to significant I&I within the basins. Pipe segments consisting of VCP pipe with known I&I issues and root infiltration will be replaced or rehabilitated. Other work will target NASSCO rated 4 and 5 sewer defects.

Claysville

The Claysville wastewater system is located in Washington County and currently provides wastewater collection and treatment service to approximately 491 mostly residential customers in the Borough of Claysville and portions of Donegal Township. PAWC purchased the assets of the Claysville system in 2008.

The Claysville collection system consists of approximately 59,243 LF of gravity main, 8-inch and 10-inch diameter; and approximately 1,149 LF of 3-inch force main. The majority of the collection system was installed in 1983, with two small extensions installed since that time. All mains are PVC, and all of the approximately 342 manholes are concrete. The system includes one lift station which serves the I-70 highway rest stop along with a few residential connections.

The system contains one WWTP with a permitted annual average daily flow of 0.16 MGD, which is the basis for the plant's hydraulic capacity. The plant is operated under NPDES permit PA-0093165. The 2021 annual average daily flow into the plant was 0.0821 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.20. The WWTP is not currently nor projected to be hydraulically or organically overloaded in the next five years.

A sewer system evaluation study was conducted in 2008. Based on the results of this study, it was determined that the collection system is in relatively good condition. Some defective areas were identified and corrective actions were completed. After corrective actions, the collection system remains affected by I&I. In 2015, a wet weather storage tank was constructed at the WWTP to minimize sanitary sewer overflows due to I&I. PAWC plans to re-inspect the entire collection system. PAWC plans to assess the condition of the system, and complete selected / limited rehabilitation work as needed based on findings of the investigative work.

Kane – Kinzua

The Kane - Kinzua combined sewer system is located in McKean County and provides sanitary and combined sewage collection and treatment service to approximately 1,225 mostly residential customers. The collection system serves a portion of Kane Borough. PAWC purchased the assets of the Kane wastewater systems in 2020.

The Kane - Kinzua collection system consists of approximately 131,835 LF of gravity main, ranging in diameter from 8-inch to 30-inch. Approximately 59 percent of the gravity main is combined sewer. There are 2 pumping stations and approximately 11,185 force mains in the Kane - Kinzua collection system. The collection system was installed in the 1940s or later. Most of the approximately 388 manholes are brick or concrete. Most of the gravity collection mains are vitrified clay pipe with some PVC and RCP.

The system contains one WWTP with a permitted annual average daily flow of 1.5 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0023175. The 2021 annual average daily flow into the plant was 0.512 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.14. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

The strategy for accelerated rehabilitation and replacement of existing infrastructure in the Kane - Kinzua collection system will be similar to Kane – Pine St. The entire collection system will be inspected with multi-sensor robotics with condition and data attributes collected for use in developing a prioritized list of projects for rehabilitation or replacement of aging infrastructure. PAWC plans to initially address immediate concerns and known areas of deficiency, followed by accelerated asset renewal / replacement based on inspection results.

Kane – Pine St

The Kane – Pine St combined sewer system is located in McKean County and provides sanitary and combined sewage collection and treatment service to approximately 1,145 mostly residential customers. The collection system serves a portion of Kane Borough and portions of Wetmore Township. PAWC purchased the assets of the Kane wastewater systems in 2020.

The Kane – Pine St collection system consists of approximately 159,837 LF of gravity main, ranging in diameter from 8-inch to 36-inch. Approximately 60 percent of the gravity main is combined sewer. There are 6 pumping stations and approximately 11,185 force mains in the Kane – Pine St collection system. The collection system was installed in the 1940s or later. Most of the approximately 421 manholes are brick or concrete. Most of the gravity collection mains are vitrified clay pipe with some PVC and PE.

The system contains one WWTP with a permitted annual average daily flow of 1.5 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0023167. The 2021 annual average daily flow into the plant was 0.588 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.12. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

The strategy for accelerated rehabilitation and replacement of existing infrastructure in the Kane – Pine St collection system will be similar to Kane-Kinzua. The entire collection system will be inspected with multi-sensor robotics with condition and data attributes collected for use in developing a prioritized list of projects for rehabilitation or replacement of aging infrastructure.

PAWC plans to initially address immediate concerns and known areas of deficiency, followed by accelerated asset renewal / replacement based on inspection results.

Koppel

The Koppel wastewater system is located in Beaver County and provides wastewater collection and treatment service to approximately 360 mostly residential customers in Koppel Borough. PAWC purchased the assets of the Koppel system in 2013.

The Koppel system consists of approximately 27,428 LF of gravity main, ranging in diameter from 4-inch to 15-inch. The system was installed in the 1920s or later. Most of the gravity main is vitrified clay, with some PVC. The approximately 122 manholes are composed of brick. There are no lift stations or force mains in the Koppel collection system.

The system contains one WWTP with a permitted annual average daily flow of 0.24 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0023434. The 2021 annual average daily flow into the plant was 0.150 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.23. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

In recent years a full inspection and remediation or replacement of Koppel's sewers was conducted. PAAW does not expect much additional work in the next 5 years.

McKeesport

The McKeesport combined sewer system is located in Allegheny County and provides wastewater and combined sewage collection and treatment service to approximately 8,028 mostly residential customers and commercial with some other / institutional customers. The collection system does not directly serve any industrial customers. The McKeesport collection system and regional WWTP also supply customers in eight surrounding municipalities through inter-municipal agreements, which include the Boroughs of White Oak, East McKeesport, Lincoln, Liberty, Versailles, Glassport, and the Townships of North Versailles and Elizabeth. PAWC purchased the assets of the McKeesport system in 2017.

The McKeesport collection system consists of approximately 667,110 LF of gravity main, ranging in diameter from 4-inch to 112-inch. Approximately 87 percent of gravity main is combined sewer. The McKeesport collection system includes approximately 33,725 LF of force main, ranging in diameter from 8-inch to 36-inch. The collection system was installed in the 1900 or later. The interceptor lines were installed in the 1950s or early 1960s to intercept flow that was going into the river and direct flow to the WWTP. The McKeesport collection system includes 9 lift stations. Most of the approximately 3,382 manholes are brick. Most of the gravity collection mains are vitrified clay pipe. Force main materials include cast iron and PVC. The system includes 4 diversion chambers / manholes and 26 combined sewer overflow outfalls.

The McKeesport system contains one WWTP with a permitted annual average daily flow of 13.0 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0026913. The 2021 annual average daily flow into the plant was 10.408 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.13. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

PAWC uses a holistic approach to address sewer work and I&I that includes consent order compliance, long-term control plan and nine minimum control measures to address combined sewer overflows, flow monitoring, lateral inspection and GPS surveying, hydraulic model development, and CCTV inspection. Using continuous information from PAWC collection staff, and information from multi-sensor robotic inspections, PAWC addresses immediate concerns and known areas of deficiency, followed by accelerated asset renewal / replacement based on future inspection results.

In order to comply with the PaDEP & the US EPA requirements, a LTCP was prepared by McKeesport. The conclusion of the study determined that several capital projects were to be constructed to comply with regulatory wet weather flow policies. These projects were completed prior to acquisition by PAWC. PAWC is presently monitoring flows to verify the completed projects have met the goal of the LTCP.

Dravosburg

The Dravosburg combined sewer system is located in Allegheny County and provides sanitary and combined sewage collection and treatment service to approximately 611 mostly residential customers. The collection system serves the Borough of Dravosburg. PAWC purchased the assets of the Dravosburg system in 2017.

The Dravosburg collection system consists of approximately 52,351 LF of gravity main, ranging in diameter from 8-inch to 72-inch. Approximately 47 percent of the gravity main is combined sewer. The Dravosburg collection system includes approximately 1,229 LF of 6-inch force main. The collection system was installed in the 1900s or later. The system includes one lift station and one CSO outfall. Most of the approximately 267 manholes are brick. Most of the gravity collection mains are vitrified clay pipe.

The system contains one WWTP with a permitted annual average daily flow of 0.48 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0028401. The 2021 annual average daily flow into the plant was 0.201 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.43. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

The strategy for accelerated rehabilitation and replacement of existing infrastructure in the Dravosburg collection system will be similar to other recently acquired combined sewer systems such as McKeesport. The entire collection system will be inspected with multi-sensor robotics with condition and data attributes collected for use in developing a prioritized list of projects for rehabilitation or replacement of aging infrastructure. PAWC plans to initially address immediate concerns and known areas of deficiency, followed by accelerated asset renewal / replacement based on future inspection results.

Duquesne

The Duquesne combined sewer system is located in Allegheny County and provides sanitary and combined sewage collection and treatment service to approximately 1,854 mostly residential customers. The collection system serves the City of Duquesne and approximately 17 residential customers in West Mifflin Borough. PAWC purchased the assets of the Duquesne system in 2017.

The Duquesne collection system consists of approximately 185,630 LF of gravity main, ranging in diameter from 8-inch to 80-inch. Approximately 80 percent of the gravity main is combined sewer. There are no pumping stations or force mains in the Duquesne collection system. The Duquesne system includes four CSO structures. The collection system was installed in the 1900s or later. Most of the approximately 1,077 manholes are brick. Most of the gravity collection mains are vitrified clay pipe.

The system contains one WWTP with a permitted annual average daily flow of 2.0 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0026981. The 2021 annual average daily flow into the plant was 0.626 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.24. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

The strategy for accelerated rehabilitation and replacement of existing infrastructure in the Duquesne collection system will be similar to Dravosburg. The entire collection system will be inspected with multi-sensor robotics with condition and data attributes collected for use in developing a prioritized list of projects for rehabilitation or replacement of aging infrastructure. PAWC plans to initially address immediate concerns and known areas of deficiency, followed by accelerated asset renewal / replacement based on future inspection results.

Paint-Elk

The Paint-Elk wastewater system is located in Clarion County and provides wastewater collection and treatment service to approximately 436 mainly residential customers. The collection system serves Shippenville Borough and portions of the Townships of Elk and Paint. PAWC purchased the assets of the Paint-Elk system in 2014 and acquired the Shippenville Borough system in 2015.

The Paint-Elk collection system consists of approximately 93,318 LF of gravity main, ranging in diameter from 4-inch to 18-inch; and approximately 21,511 LF of force main, ranging in diameter from 1.25-inch to 8-inch. The collection system was installed in the 1960s or later. The system includes 5 lift stations. Most of the approximately 445 manholes are concrete. The majority of the gravity collection mains are PVC. Force main material includes PVC and HDPE. A lift station and sewer main extension was completed in 2017 to interconnect the Shippenville system to the Paint-Elk system. The Shippenville system is now a basin within the Paint-Elk system.

The system contains one WWTP with a permitted annual average daily flow of 0.6 MGD, which is the basis for the plant's hydraulic capacity. It is operated under NPDES permit PA-0034924. The 2021 annual average daily flow into the plant was 0.237 MGD, and the ratio of 3 consecutive month maximum to annual average flow was 1.10. The WWTP is not currently nor expected to be hydraulically or organically overloaded in the next five years.

Some of the lift stations are in good overall condition but major improvements are needed for many of the stations. The collection system is in good overall condition, however there are several areas of the system that need to be addressed. The entire system has been inspected. Several projects have been identified within the priority basins that will include improvements to the existing VCP pipe.

## Section 4 – Estimate of the Quantity of Property to Be Improved

The estimated quantities of property to be improved are listed in Table 8 below. To compile these estimates, the best available information was used regarding the infrastructure needs for each wastewater system. Actual quantities and scheduling may change depending on the outcome of sewer system evaluation or other planning studies, as described in Section 2 of this LTIIP.

*Table 12 – Projected Wastewater DSIC Eligible Properties to Be Replaced / Rehabilitated for 2024 to 2028*

| Year | Gravity/Pressure Pipe (LF) | Manholes (ea.) | Service Laterals (ea.) | Lift Stations (ea.) |
|---|---|---|---|---|
| 2024 | 83,375 | 278 | 834 | 1 |
| 2025 | 66,890 | 223 | 669 | 2 |
| 2026 | 76,668 | 256 | 767 | 4 |
| 2027 | 74,800 | 250 | 748 | 2 |
| 2028 | 87,847 | 240 | 720 | 2 |

## Section 5 – Projected Annual Expenditures

The projected annual expenditures for 2024 to 2028 are listed in Table 9 below. These estimates are based on the quantities listed in Table 8 and recent, competitively bid prices in Pennsylvania. Non-regulatory wastewater DSIC investments are expenditures that exclude regulatory driven costs such as projects associated with a consent order agreement (CO) or a connection management plan (CMP).

*Table 13 - Projected Annual Wastewater DSIC Expenditures 2024 to 2028 (in millions)*

| Year | Total Investment |
|---|---|
| 2024 | $49.44M |
| 2025 | $38.45M |
| 2026 | $65.50M |
| 2027 | $53.70M |
| 2028 | $57.62M |

Some quantities may change depending on the results of sewer system evaluation and engineering studies. Costs may vary depending on whether a replacement or rehabilitation method was selected during the final design. For example, competitive bid prices for gravity replacement varied with depth of pipe and diameter, so an average depth and diameter was assumed to generate a projected cost. Annual expenditures may be subject to periodic fluctuation due to larger wastewater upgrades associated with regulatory compliance; therefore, these are listed separately. For all projects, the most prudent and cost-effective method will be selected. In addition, PAWC uses competitive bidding to ensure all major capital projects are completed in a cost-effective manner.

## Section 6 – Acceleration of Infrastructure Replacement / Renewal

PAWC has continuously invested in its wastewater infrastructure to maintain safe, reliable service to its customers. As shown in Table 10 below, from 2019 to 2023 PAWC spent an average of $30.54 million annually on wastewater DSIC eligible infrastructure improvements (regulatory driven projects shown separately). From 2024 to 2028, PAWC proposes to increase non-regulatory wastewater DSIC eligible spending to almost $53 million annually in order to continue making necessary improvements.

*Table 14 - Historic Annual Wastewater DSIC Expenditures (in millions)*

| Year | Annual DSIC Expenditures |
|---|---|
| 2019 | $32.58M |
| 2020 | $27.65M |
| 2021 | $25.59M |
| 2022 | $26.20M |
| 2023 [a] | $40.68M |

[a] Current Projection

## Section 7 – Workforce Management Plan

To ensure system reliability and public safety, all wastewater DSIC eligible projects will be constructed by qualified contractors or PAWC staff. For some wastewater systems, PAWC staff complete investigative work, spot repairs, or lift station repairs which may be DSIC eligible work. Typically, DSIC eligible projects are bundled together for competitive bidding to prequalified contractors to achieve economies of scale.

PAWC utilizes a pre-qualification process to ensure all contractors are qualified to perform work in a cost-effective, safe, and reliable manner. PAWC utilizes a third-party entity to monitor contractor safety performance. The contractor prequalification process helps PAWC certify and centralize contractor data, perform pre-project screening, and contractor pre-qualification. This allows PAWC to more effectively manage its risk and contractors' performance. During the pre-

qualification screening process, contractors are required to submit pertinent documentation, such as:

- Safety: company policy, designated safety inspector, OSHA lost workdays and recordable incidents, OSHA violations
- Worker's Compensation Experience Ratings (Experience Modifier)
- Staffing information
- Annual value of work and percentage of work relevant to bid project.
- Work experience schedule
- Bonding capacity
- Liability Insurance coverage
- References

All construction projects performed by independent contractors are properly inspected. PAWC employees are actively engaged in the direct supervision of project inspections. The project close-out process includes a punch-list to ensure all work is completed according to contract documents.

## Section 8 – Outreach and Coordination with Other Utilities

The acceleration of aging infrastructure proposed in this LTIIP will lead to disruptions as work is performed in the right of ways of the roadways and streets across the PAWC service area. Local municipalities and other utilities / agencies may be planning paving projects or underground infrastructure replacement projects located in the same right-of-way as PAWC wastewater infrastructure. PAWC recognizes that coordination with other utilities minimizes disruption and ensures that infrastructure replacement is efficient and cost effective. Therefore, PAWC plans to take the following steps to reach out to customers about disturbances, and to coordinate with other utilities and the Pennsylvania Department of Transportation (PennDOT) located within the PAWC service area:

- Utilize Pennsylvania's One-Call system for "design notifications."
- Maintain open communication with local municipalities to stay informed about planned utility and paving projects.
- Maintain communication with PennDOT Utility Administrators and review the "letting" schedule.
- Maintain communication / working relationships with other utilities operating in our service area.

- Where applicable and cost-effective, use trenchless technologies to minimize roadway disturbance.
- Prior to working within a community, issue door-to-door notifications, press releases, and / or information letters to notify those customers / community associations affected by the work.
- PAWC has launched its “CodeRED” system, which delivers high-speed notifications to customers when water emergencies occur. Customers enrolling in CodeRED can be contacted quickly by text, email, telephone, and the CodeRED mobile app depending on their personal preferences. CodeRED rapidly contacts large numbers of customers about emergency situations, which include boil water advisories, main breaks, water conservation requirements and other major events impacting water service. The system will also be used for non-urgent notification, such as planned service outages, local hydrant flushing, low-pressure events and major traffic impacts.
- Leverage areas where PAWC owns both sewer and water lines to replace both simultaneously as appropriate.

**BEFORE THE**
**PENNSYLVANIA PUBLIC UTILITY COMMISSION**

| | | |
|---|---|---|
| PETITION FOR APPROVAL OF PENNSYLVANIA-AMERICAN WATER COMPANY'S WASTEWATER OPERATION'S LONG-TERM INFRASTRUCTURE IMPROVEMENT PLAN II FOR THE PERIOD JANUARY 1, 2024 THROUGH DECEMBER 31, 2028 | : | DOCKET NO. P-2023-3038874 |

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served a true copy of **revised Exhibit No. 1, Wastewater LTIIP II**, upon the parties listed below, in the manner specified below, in accordance with the requirements of 52 Pa. Code § 1.54.

**VIA ELECTRONIC MAIL**

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