Allegheny County
Sanitary Authority

Financial Statements and
Required Supplementary and
Supplementary Information

Years Ended December 31, 2020 and 2019
with Independent Auditor's Report

ALLEGHENY COUNTY SANITARY AUTHORITY

YEARS ENDED DECEMBER 31, 2020 AND 2019

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MaherDuessel

Independent Auditor's Report

Board of Directors
Allegheny County
Sanitary Authority

We have audited the accompanying financial statements of the business-type activities and aggregate remaining fund information of Allegheny County Sanitary Authority (Authority), as of and for the years ended December 31, 2020 and 2019, and the related notes to the financial statements, as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the business-type activities and the aggregate remaining fund information of the Authority as of December 31, 2020 and 2019, and the respective changes in financial position and, where applicable, cash flows thereof for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, the pension plans' schedules, and other post-employment benefits schedules on pages i through xiii, pages 42 through 45, and page 46, respectively, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audits were conducted for the purpose of forming opinions on the financial statements as a whole. The schedules of investments and other assets are presented for purposes of additional analysis and are not a required part of the financial statements.

The schedules of investments and other assets are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated, in all material respects, in relation to the financial statements as a whole.

Maher Duessel

Pittsburgh, Pennsylvania
March 24, 2021

MANAGEMENT'S DISCUSSION AND ANALYSIS

AUDIT ASSURANCE

The unmodified (i.e., clean) opinion of our independent auditors, Maher Duessel, Certified Public Accountants, is included in this report. You will note that the Allegheny County Sanitary Authority (Authority) has included for 2020 this Management's Discussion and Analysis section, which is in compliance with Statement No. 34 of the Governmental Accounting Standards Board.

FINANCIAL HIGHLIGHTS

Allegheny County (County) is located in Southwestern Pennsylvania and encompasses approximately 730 square miles of land. Founded in 1788, the County is the second most populated county in Pennsylvania with over 1.2 million residents. Roughly 25% of the County's residents live within the City of Pittsburgh. The Allegheny and Monongahela Rivers flow through the County to form the Ohio River in downtown Pittsburgh.

Economy

The County is the location of nine Fortune 500 corporate headquarters. The County's 2020 Fortune 500 companies include: U.S. Steel (247), PNC Financial Services Group (151), PPG Industries (209), Kraft Heinz (114), Alcoa (302), Howmet Aerospace (226), Wesco International, Inc. (379), Dick's Sporting Goods (362), and Westinghouse Air Brake (388). The County has experienced substantial growth in areas such as technology, tourism, and health care. The County is also a strong supporter of its manufacturing industries and has traditionally been one of the major industrial centers of the world with its access to major fields of coal and shipping access to 8,000 miles of navigable rivers. The Port of Pittsburgh is the second largest inland port in the nation. There is annual benefit to the region of over $800 million for the shipping and receiving of 32 million tons of cargo.

The County has undergone an economic transformation spanning more than three decades with a shift from the manufacturing industry to the service and trade industries. Specifically, the focus industries have been healthcare and life sciences, advanced manufacturing, energy, information and communication technology, and financial and business services. This shift is attributed to the continuing diversification of the employment base.

The region's health services sector employs over 140,000 people and is a robust network that is cultivating lifesaving technologies, regenerative medicine, and pharmaceuticals. The University of Pittsburgh Medical Center is a multi-billion-dollar global healthcare enterprise and is the region's top employer, with more than 53,000 employees. Highmark Inc., UnitedHealth Care, Allegheny Health Network, and Mercy Health System are also part of this sector.

Top manufacturers such as ACUTRONIC, Alcoa, Covestro, Calgon Carbon, Drager Safety, Eaton Corp, HJ Heinz, Howmet Aerospace, PPG Industries, RTI International Metals, and U.S. Steel are either headquartered or have a presence in the greater County region. Smaller precision tooling and machining companies meet global demands for custom components.

The County and surrounding region has become a national leader in energy technology, innovation, and supply chain related to production, distribution, and efficient usage. The area is home to more than 800 companies in the global energy market, including Alpha Natural Resources, Aquatech, Chevron, Columbia Gas of PA, CONSOL Energy Inc., EQT, FirstEnergy Corp., Peoples National Gas, Range Resources, and Westinghouse.

Nearly 1,500 technology firms, including Google, Duolingo, Ansys, Apple, IBM, Uber, and Ariba, have a presence within the County and employ some 26,000 people. A tech-savvy talent pipeline flowing from many area colleges and universities, and a robust network of organizations supporting financial innovation, are helping the region's knowledge-based economy to thrive.

Global financial institutions with headquarters or major business units within the County include PNC Financial Services Group, The Bank of New York Mellon, Citizens Bank, Dollar Bank, Federated Hermes, First Commonwealth Bank, Huntington National Bank, S&T Bank, TriState Capital, and First Niagara.

Two global law firms, K&L Gates and Reed Smith, are based in the City of Pittsburgh, as is Buchanan, Ingersoll & Rooney, and Jones Day – Pittsburgh as well as major insurance companies, including Highmark, UnitedHealthcare, and Cigna.

Adding to the County's diverse labor and business climate, some of the most prestigious health, educational, and cultural institutions in the country are located here. The County's colleges and universities include Carnegie Mellon University, Carlow University, Chatham University, Community College of Allegheny County, Duquesne University, La Roche College, Penn State University, Point Park University, Robert Morris University, the Art Institute of Pittsburgh, and the University of Pittsburgh. The County is also home to various junior and technical colleges.

Uber has a tech center in Pittsburgh and a testing facility on 42 acres within the City of Pittsburgh. Also located in Pittsburgh is the recently formed American Robotics Manufacturing Institute. Amazon has expanded its footprint in the Pittsburgh region. UPMC, the region's largest healthcare provider, announced its plan to spend $2 billion to build three new specialty hospitals, with the first set to open in 2020.

The Port Authority of Allegheny County (Port Authority) serves the metropolitan area by operating over 740 buses, over 80 light rail vehicles, and the Monongahela incline. The Port Authority also owns the Duquesne Incline, which it leases to the nonprofit Society for the Preservation of the Duquesne Heights Incline. The Port Authority is the largest operator of mass transit services in Western Pennsylvania and is among the nation's top 20 largest public transportation systems. The Port Authority's 2,600 employees serve approximately 200,000 riders, with a total of nearly 64 million passengers annually.

Pittsburgh International Airport (PIA), which offers more than 414 flights per day to 74 destinations on 17 airlines, is recognized for its state-of-the-art terminals and an Airmall for the approximately 9 million travelers that pass through PIA each year.

In 2019, non-manufacturing industries accounted for over 90% of the Pittsburgh MSA employment base. The loss of once-dominant, heavy water-use manufacturing such as steel and food processing has had a negative impact on the Authority's residential users. Decline in regional manufacturing over the past two decades has shifted a significant portion of the Authority's cost burden to residential users who have declined as well over the past decade. This decline in consumption base, combined with outside regulatory emphasis on reducing overflows, will have a dramatic impact on rates for years to come.

Additionally, during 2020 the impact of the restrictions imposed by the State of Pennsylvania in response to the coronavirus disease 2019 (COVID-19) on commercial industries such as retail, entertainment, and restaurants and bars amongst many others, had a direct impact on commercial consumption. This decrease in commercial consumption was partially offset by an increase in residential consumption as much of the local workforce was able to work from their residences and limited travel.

- Billed flow for 2020 of 19,222,682 tgal (thousands of gallons) decreased by 391,934 tgal. Commercial consumption decreased in 2020 by 895,554 tgal, which was largely offset by an increase in residential consumption of 503,620. This swing in consumption is directly related to COVID-19 and the unprecedented advisories and restrictions placed not only on this community but the world as a whole.

- In 2020, the Authority treated 69,580,700 tgal, of which 19,222,682 tgal was billed. Stated differently, the Authority billed for 27.63% of the water it treated. During 2019, the Authority treated 76,348,300 tgal, for which it billed 19,614,615 tgal, or 25.69% of what was treated was actually billed to customers. The difference between what is treated vs. that which is billed is attributed to direct inflow of storm water from combined sewer communities served and groundwater infiltration into the system from old and deteriorating sewer lines throughout the service area. 2020 estimated annual precipitation was 39.33 inches, which was significantly less than the 2019 estimated annual precipitation of 52.46 inches.

- The Authority maintained compliance with all debt covenants required by the governing Trust Indentures.

- Debt Service Coverage, when allowing for available revenue funds on hand at the beginning of the year was 4.49, which greatly exceeded the 1.10 Trust Requirements. In addition, stand-alone coverage without consideration to beginning balances was 1.81, which exceeded the required 1.00 Trust Requirement.

- On November 16, 2017, the Board of Directors (Board) adopted multi-year rate structure increasing customer service charges 7.5 percent for in 2018, 7 percent in 2019, 7 percent in 2020, and 7 percent in 2021.

REQUIRED FINANCIAL STATEMENTS

The financial statements of the Authority report information on the Authority's use of accounting methods that are similar to those used by private sector companies. These statements offer short-term and long-term financial information about its activities.

The Statement of Net Position includes all of the Authority's assets, deferred outflows of resources, liabilities, and deferred inflows of resources and provides information about the nature and amounts of investments in resources (assets) and obligations to Authority creditors (liabilities). The Statement of Net Position also provides the basis for computing rate of return, evaluating the capital structure of the Authority, and assessing the liquidity and financial flexibility of the Authority.

All of the current year's revenue and expenses are accounted for in the Statement of Revenues, Expenses, and Changes in Net Position. This statement measures the success of the Authority's operations over the past year and can be used to determine whether the Authority has successfully recovered all its costs through its sewage disposal rates and other fees. As required under the Authority's Trust Indenture, the Consulting Engineer, Hatch, has reviewed the rate structure and agrees that a 7 percent rate increase in 2021 is necessary to meet requirements of the Trust Indenture and financial obligations imposed under the federal consent decree rate model structure.

The third required financial statement is its Statement of Cash Flows. The primary purpose of this statement is to provide information about the Authority's cash receipts and cash payments during the reporting period. The statement reports cash receipts, cash payments, and net changes in cash resulting from operations, investing, and financing activities, and the change in cash during the reporting period.

Also included as part of the financial statements are statements related specifically to the Authority's two defined benefit plans: the Statement of Plan Net Position – Pension Trust Funds and the Statement of Changes in Plan Net Position – Pension Trust Funds. These pension plans are described in detail in the notes to the financial statements.

The notes to the financial statements provide required disclosures and other information that are essential to a full understanding of material data provided in the statements. The notes present information about the Authority's accounting policies, significant account balances and activities, material risks, obligations, commitments, contingencies, and subsequent events, if any.

SUMMARY OF ORGANIZATION AND BUSINESS

The Allegheny County Sanitary Authority was incorporated in May 1945 under the Commonwealth of Pennsylvania Municipality Authorities Act of 1945. Plant operations began on April 30, 1959. The Authority serves as the exclusive agency for the collection, transportation, and treatment of wastewater for the city of Pittsburgh and 82 neighboring municipalities. The Authority charges users for processing of wastewater at a flat rate per thousand gallons. Additional charges are levied for septage (solid waste removed from septic tanks) and industrial waste discharges into the system.

In addition to the main treatment site located on the City of Pittsburgh's Northside, the Authority operates and maintains over 85 miles of interceptor sewers, and seven pumping or ejector stations throughout the service area. The Authority's service area covers over 310 square miles and includes portions of Washington and Westmoreland Counties in addition to the County.

The Authority's Articles of Incorporation (Articles), as amended, provide that the Authority's Board shall consist of seven members serving staggered five-year terms. Pursuant to the Articles, three members of the Board are appointed by the County, three are appointed by the City of Pittsburgh, and one is jointly appointed by the County and the City of Pittsburgh. The day-to-day operation of the Authority is the responsibility of the Executive Director, who is appointed by the Board to carry out its policies.

FINANCIAL ANALYSIS

The following comparative condensed financial statements and other selected information provides key financial data and indicators for management, monitoring and planning.

Condensed Statements of Net Position (Balance Sheet)
(In Millions of Dollars)

	2020	2019	$ Change	% Change
Current assets	$280.56	$242.48	$38.08	15.70%
Restricted/designated assets	272.81	235.49	37.32	15.85%
Prepaid bond costs	5.82	6.59	-0.77	-11.68%
Plant and equipment, net	643.50	629.10	14.40	2.29%
Net pension asset	0.00	0.00	0.00	0.00%
Total Assets	1,202.69	1,113.66	89.03	7.99%
Deferred Outflows of Resources	34.59	42.81	-8.22	-19.20%
Current liabilities	47.78	46.74	1.04	2.23%
Long-term liabilities	759.63	741.84	17.79	2.40%
Total Liabilities	807.41	788.58	18.83	2.39%
Deferred Inflow of Resources	28.30	11.25	17.05	151.56%
Net Position	$401.57	$356.64	$44.93	12.60%

Condensed Statements of Net Position (Balance Sheet)
(In Millions of Dollars)

	2019	2018	$ Change	% Change
Current assets	$242.48	$206.99	$35.49	17.15%
Restricted/designated assets	235.49	251.85	-16.36	-6.50%
Prepaid bond costs	6.59	7.19	-0.60	-8.34%
Plant and equipment, net	629.10	622.34	6.76	1.09%
Net pension asset	0.00	2.71	-2.71	0.00%
Total Assets	1,113.66	1,091.08	22.58	2.07%
Deferred Outflows of Resources	42.81	25.64	17.17	66.97%
Current liabilities	46.74	45.02	1.72	3.82%
Long-term liabilities	741.84	753.21	-11.37	-1.51%
Total Liabilities	788.58	798.23	-9.65	-1.21%
Deferred Inflow of Resources	11.25	12.39	-1.14	-9.20%
Net Position	$356.64	$306.10	$50.54	16.51%

Condensed Statements of Revenues, Expenses
And Changes in Net Position
(In Millions of Dollars)

	2020	2019	$ Change	% Change
Operating revenues	$186.80	$180.24	$6.56	3.64%
Non-operating revenue	2.00	8.97	-6.97	-77.70%
Total revenues	188.80	189.21	-0.41	-0.22%
Operating expenses	84.28	82.08	2.20	2.68%
Non-operating expenses	37.22	33.82	3.40	10.05%
Depreciation	22.37	22.77	-0.40	-1.76%
Total expenses	143.87	138.67	5.20	3.75%
Net income (loss)	44.93	50.54	-5.61	-11.10%
Net Position, Beginning of Year	356.64	306.10	50.54	16.51%
Net Position, End of Year	$401.57	$356.64	$44.93	12.60%

Condensed Statements of Revenues, Expenses
And Changes in Net Position
(In Millions of Dollars)

	2019	2018	$ Change	% Change
Operating revenues	$180.24	$169.72	$10.52	6.20%
Non-operating revenue	8.97	3.13	5.84	186.58%
Total revenues	189.21	172.85	16.36	9.46%
Operating expenses	82.08	78.63	3.45	4.39%
Non-operating expenses	33.82	22.22	11.60	52.21%
Depreciation	22.77	23.07	-0.30	-1.30%
Total expenses	138.67	123.92	14.75	11.90%
Net income (loss)	50.54	48.93	1.61	3.29%
Net Position, Beginning of Year	306.10	257.17	48.93	19.03%
Net Position, End of Year	$356.64	$306.10	$50.54	16.51%

OTHER SELECTED INFORMATION

Selected Data:	2020	2019		Difference	%Change
Authorized employees	526	518		8	1.54%
Actual employees at year-end	425	427		-2	-0.47%
Wastewater treated (billons of gallons)	69,581	76,348		-6,767	-8.86%
Wastewater billed (billions of gallons)	19,223	19,615		-392	-2.00%
Percentage of billed/treated wastewater	27.63%	25.69%		1.94%	7.53%
Rates:					
Charge per 1,000 gallons of water consumption	$8.50	$7.94		$0.56	7.05%
Account service charge per bill rendered	$17.86	$16.69		$1.17	7.01%
Average customer bill:					
Per year	$479.44	$447.88	*	31.56	7.05%
Per quarter	119.86	111.97	*	7.89	7.05%
Per month	39.95	37.32	*	2.63	7.05%

* Based on 12,000 Gallons per quarter

GENERAL TRENDS AND SIGNIFICANT EVENTS

On September 19, 2019, the United States lodged with the Courts a Proposed Modified Consent Decree. On October 2, 2019, the Modified Consent Decree was published in the Federal Register for a 60-day public comment period. The Federal Government accepted comments from October 2, 2019 to December 2, 2019. The Federal Government considered each comment and responded to the public comments (39 written pages) and presented the response to the U.S. District Court.

After the courts reviewed the public comments, the Modified Consent Decree did not change, and as a result, the Modified Consent Decree was entered into the Courts on May 14, 2020. In consideration with the public comments and government responses, the agencies and the courts indicated that the Modified Consent Decree is fair, adequate, reasonable, and consistent with the purpose of the Clean Water Act and the Clean Streams Law.

The Proposed Modified Consent Decree would replace the consent decree that the Court entered on January 24, 2008. The Proposed Modified Consent Decree: (1) approves the Wet Weather Plan that the Authority was required to develop pursuant to the 2008 Consent Decree; (2) extends the time frame in which the Authority must implement the Wet Weather Plan; and (3) allows the Authority to propose future amendments to the Wet Weather Plan, which might include replacing some proposed control technologies with "green infrastructure" controls.

Appendix Z to the Amended Consent Decree summarizes the major components of the new Clean Water Plan.

Summary of Appendix Z

The Authority will complete an Interim Wet Weather Plan (IWWP) by December 31, 2036. Because many uncertainties remain regarding the most optimal mix of the Authority and municipal green and grey infrastructure control measures, an adaptive management framework is necessary to provide for expeditious and affordable program implementation. This framework will provide opportunities to evaluate and integrate green infrastructure and other flow management practices, while prioritizing the regionalization of inter-municipal trunk sewers and key grey infrastructure projects where most cost-effective.

Because the identification of specific flow management project commitments requires on-going coordination with customer municipalities, the IWWP is premised on a phased implementation framework that supports early implementation of green projects, demonstration of effectiveness, and the substitution or reduction of grey infrastructure where flow management measures can be shown to provide equivalent system-wide overflow reduction performance. Accordingly, the framework includes adaptive management milestones where new information can be used to propose modifications to the projects and interim implementation schedules identified herein.

The IWWP is divided into three phases designed to support the adaptive management framework.

Phase 1 projects include highly effective treatment plant expansion projects, preliminary planning projects that will inform adaptive Phase 2 and 3 projects, and existing infrastructure inspection and rehabilitation. Additional detail is as follows:

- **Regional Flow Optimization Strategy and Preliminary Planning.**

  The Authority will work jointly with its customer municipalities to assess the effectiveness of green infrastructure, stream inflow removal, inflow/infiltration reduction, and existing system asset management through preliminary planning and demonstration projects. The resulting regional flow optimization strategy will identify flow management measures to be adaptively incorporated into Phases 2 and 3 and establish the basis of design for Phase 2 and Phase 3 tunnel projects, including any appropriate downsizing. The preliminary basis of design report will include refined tunnel and consolidation sewer construction schedules.

- **Woods Run Wastewater Treatment Plant Expansion.**

  The Authority will expand wet weather treatment capacity of the plant from 250 mgd to 480 mgd and wet weather headworks and disinfection capacity to 600 mgd. It is anticipated that these facilities will be complete and in operation between January 1, 2024 through December 30, 2025.

- **Existing Infrastructure Inspection/Rehabilitation.**

  The Authority will continue its operation and maintenance practices for existing infrastructure, including establishing re-inspection and priority rehabilitation schedules.

Phase 2 projects include high priority conveyance and treatment system improvements that are dependent on Phase 1 preliminary planning to proceed. Depending on the findings of Phase I, these projects include:

- A wet weather pumping station,
- Expanded primary treatment,
- The Ohio River tunnel segment, including crossings to the existing Chartiers Creek and Saw Mill Run interceptor systems, and
- Cost-effective optimization of the Authority's existing tunnel network.

Phase 3 projects represent adaptive projects that may be influenced and modified based on the outcome of Phase 1 and Phase 2 evaluations and demonstration projects.

The IWWP currently includes an estimated $1.8 billion (in 2010 dollars) in identified Authority projects. It is expected that the Regional Flow Optimization Strategy, the regionalization of Intermunicipal Trunk Sewers and Associated Facilities, Municipal Source Reduction Studies, and Municipal Source Reduction Agreements will identify additional Authority and municipal projects. The established adaptive management framework includes provisions for revising the IWWP to incorporate these enhancements. However, the Authority will remain committed to close coordination with its customer municipalities in updating regional financial capability analyses so that proposed IWWP revisions do not result in a regional residential indicator greater than 2% of the median household income.

Regionalization

The Authority has committed to make a good faith effort to take responsibility of at least 200 miles of existing Intermunicipal Trunk Sewers and Associated Facilities by January 31, 2020, including responsibility for controlling associated overflows transferred to the Authority.

Green Infrastructure

The Authority has committed $200 million towards this strategy, including support for municipal flow reduction partnerships. The Authority's Green Revitalization of Our Waterways Program (GROW) has awarded over $44.8 million so far in grants to our member municipalities dedicated to green infrastructure.

Clean Water Assistance Program

Recognizing that increasing rates will have a negative impact on our service areas most vulnerable ratepayers, the Authority implemented a customer assistance program in 2017. Qualified homeowners who meet family income limits set by the federal government will receive approximately the first 4,000 gallons of quarterly consumption free. In 2020, this resulted in approximately 2,300 Authority customers receiving an annual credit of $136.

For 2021, the quarterly assistance payment was increased to $35 per quarter, or an annual credit of $140. The program is being administered by the nationally recognized Dollar Energy Fund. The Authority expects participation in the program to grow as rates continue to increase in order to fund compliance with the consent decree.

FINANCIAL CONDITION

The Authority continued to achieve outstanding financial results in 2020 improving upon already solid debt service coverage ratios and days cash on hand. Debt service coverage increased to 181.15 percent in 2020 surpassing last year's coverage of 180.66 percent. When considering beginning cash balances available after reserving 25 percent, the Authority achieved a record 448.76 percent debt service coverage in 2020. In their May 2019 issue of OUTLOOK, Moody's Investor Services highlighted the Authority's strong liquidity position by noting its achievement of 684 days cash on hand in 2018. Liquidity improved even further in 2019 with days cash on hand increasing to 780 days, and again in 2020 with days cash on hand of 907 days.

RESULTS OF OPERATIONS

Operating Revenue:

Operating revenues of $186,799,875 increased 3.6 percent over 2019, reflecting a 7 percent increase in customer rates implemented at the beginning of the year offset by a small decline in overall consumption. Overall billed consumption declined by 392,000 tgals for the year compared to 2019. Commercial consumption declined by 896,000 tgals due largely to the impact of commercial venues being reduced by restrictions implemented as a result of COVID-19. The decrease in commercial consumption was offset by an increase in residential consumption of 504,000 tgal. The increase in residential consumption was also impacted by COVID-19, as more time was spent in local residences and also the drier summer months that facilitated increased water usage.

All of the Authority's operating revenue was derived from customer billing for sewage treatment service, the Authority receives no subsidies. The Authority, the City of Pittsburgh, and 82 other municipalities in and around Allegheny County have entered into agreements (Standard Municipal Agreements) under which the Authority is designated (within its service area) the exclusive agent of the respective municipality to furnish sewage treatment and disposal service. Each municipality contracting with the Authority is given two options with respect to billing, "Direct" or "Lump-sum." With the Direct method of billing, accounts not paid within 60 days become the responsibility of the community; thus, the Authority insures no bad debt. Under the Direct method, Authority bills and collects for its services directly from the individual customer. Under the Lump-sum method, consumption for the entire community is compiled and billed to the municipality, which in turn bills its own residents. All but three municipalities utilize this method of billing in order to attach fees for local sewer infrastructure maintenance. Under both scenarios, the Authority is guaranteed full payment for services.

Operating Expenses:

Operating expenses in 2020 of $84.28 million were $2.20 million higher than 2019 operating expenses of $82.08 million. Outside Interceptor cleaning contracts added to the cost of maintaining the collection system. Also contributing to administrative cost increases were support for the federal Consent Decree. Some operating expenses that had been anticipated in 2020 had to be delayed due to COVID-19, but are planned to occur in 2021.

Depreciation and Non-operating Expenses:

Depreciation expense decreased slightly by $397,587 as a result of a number of original plant construction assets from the late 1950 and early 1960 fully depreciating during 2020. During 2020 the Authority recognized a $4.6 million loss on disposal of fixed assets related to a building that stored plant chemicals that had to be demolished for plant expansion purposes.

Non-operating expenses also reflect changes to pension funding calculated under GASB Statement No. 68 and the 2018 implementation of GASB Statement No. 75 related to Other Post-Employment Benefits. Calculations with regard to both GASB Statement Nos. 68 and 75 are prepared by the Authority's Actuary. In addition, GASB Statement No. 89 implemented in 2019 resulted in the elimination of the capitalization of interest expense on capital projects. The result was an increase in recognized interest revenues and bond interest expense that would have been shown net and capitalized as part of capital assets under construction.

Non-operating Revenues:

Interest earnings on the Authority's revenue and non-restricted capital facilities funds decreased by over $6.9 million as interest rates declined significantly on money market and treasury holdings.

Litigation Contingency:

As noted above, the Authority has finalized an agreement with U.S. EPA, Pennsylvania DEP, and the Allegheny County Health Department (Agencies) regarding wet weather overloads in the sanitary sewer system. The agreement called for the payment of civil penalties in the amount of $400,000 to each of the three noted agencies. As of January 8, 2009, all of the above-noted agencies have been paid.

Additional penalties may be incurred if the Authority fails to meet specific project deadlines as detailed in the agreement.

Debt:

At year-end, the Authority had $767.24 million in long- and short-term debt.

During 2020, the Authority issued $153,995,000 in Sewer Revenue Bonds to current refund the existing Series 2010 Sewer Revenue Bonds and to provide additional funds for the Capital Improvement Program. The Authority recognized a cash flow savings of almost $39 million on the refunding. Additionally, during 2018, the Authority issued $157,230,000 in Sewer Revenue Bonds to fund the Capital Improvement Program.

More detailed information about the Authority's long-term debt is presented in the notes to the financial statements.

FINAL COMMENTS

In announcing the filing of the Modified Consent Decree on September 19, 2019, Executive Director Arletta Scott Williams publically noted her pleasure at the positive results achieved over the course of negotiations with the Agencies. "We heard the public's input on the first plan, especially when it came to the price tag associated with making these required changes to our system. Being able to reduce the cost to ratepayers, extending the timetable to 2036 and having the ability to adapt the plan to include new advances in stormwater management are all key to reaching our goal of reducing overflows."

Recognizing that increasing rates to fund the Consent Decree will have a negative financial impact on many households in our service area, the Authority implemented a customer assistance program in 2017 providing, in effect, the first 4000 gallons of consumption per quarter free. In 2018, the Authority increased the quarterly assistance payment from $30 to $32, and again increased the quarterly assistance payment to $34 in 2020. The Authority has announced that for 2021, the quarterly assistance payment will increase to $35.

You have the opportunity to become an informed participant in this program. Become familiar with the Consent Decree by reviewing it on-line at *www.alcosan.org* or by contacting our Public Relations Department for a copy.

CONTACTING THE AUTHORITY'S FINANCIAL MANAGER

This financial report is designed to provide our citizens, customers, and creditors with a general overview of the Authority's finances and to demonstrate the Authority's accountability for the money it receives. If you have any questions about this report or need additional financial information, contact the Allegheny County Sanitary Authority's Director of Finance and Administration at 3300 Preble Avenue, Pittsburgh, PA 15233.

ALLEGHENY COUNTY SANITARY AUTHORITY

STATEMENTS OF NET POSITION

DECEMBER 31, 2020 AND 2019

Assets and Deferred Outflows of Resources

	2020	2019
Assets:		
Current assets:		
Cash and cash equivalents	$ 209,431,473	$ 175,476,686
Accounts receivable:		
Billed sewer revenue	20,446,710	16,702,983
Unbilled sewer revenue	44,044,901	43,666,409
Other	4,734	30,225
Other current assets	6,634,434	6,604,244
Total current assets	280,562,252	242,480,547
Restricted/designated assets:		
Cash and cash equivalents	272,815,362	150,150,904
Investments	-	84,963,478
Accrued interest receivable	-	375,444
Total restricted/designated assets	272,815,362	235,489,826
Prepaid bond costs	5,815,062	6,591,319
Nondepreciable capital assets:		
Land	5,344,896	5,344,896
Construction in progress	94,302,298	81,287,241
Total nondepreciable capital assets	99,647,194	86,632,137
Depreciable capital assets - at cost, net of accumulated depreciation	543,854,942	542,465,808
Total	643,502,136	629,097,945
Total Assets	1,202,694,812	1,113,659,637
Deferred Outflows of Resources:		
Related to pensions	27,581,534	35,676,281
Other post-retirement benefits	1,758,333	853,236
Refunding adjustment	5,247,763	6,278,101
Total Deferred Outflows of Resources	34,587,630	42,807,618
Total Assets and Deferred Outflows of Resources	$ 1,237,282,442	$ 1,156,467,255

Liabilities, Deferred Inflows of Resources, and Net Position

	2020	2019
Liabilities:		
Current liabilities:		
Accounts payable	$ 6,092,972	$ 7,349,003
Accrued liabilities:		
Compensated absences	5,950,167	4,994,678
Salaries and wages	1,985,019	1,751,181
Accrued interest on bonds	2,592,551	2,638,762
Reserve for litigation	2,371,900	2,371,900
Pretreatment advance payments	2,600	1,850
Current maturities of sewer revenue bonds	28,785,000	27,635,000
Total current liabilities	47,780,209	46,742,374
Long-term liabilities:		
Other post-employment benefits	13,901,968	12,087,137
Net pension liability	7,266,922	28,684,748
Sewer revenue bonds - less current maturities	670,495,000	650,300,000
Unamortized bond premium	67,960,993	50,763,732
Net long-term debt	738,455,993	701,063,732
Total long-term liabilities	759,624,883	741,835,617
Total Liabilities	807,405,092	788,577,991
Deferred Inflows of Resources:		
Related to pensions	25,133,372	9,341,236
Other post-retirement benefits	3,169,749	1,904,424
Total Deferred Inflows of Resources	28,303,121	11,245,660
Net Position:		
Net investment in capital assets	154,324,268	142,167,140
Unrestricted	247,249,961	214,476,464
Total Net Position	401,574,229	356,643,604
Total Liabilities, Deferred Inflows of Resources, and Net Position	$ 1,237,282,442	$ 1,156,467,255

The notes to financial statements are an integral part of this statement.

ALLEGHENY COUNTY SANITARY AUTHORITY

STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

YEARS ENDED DECEMBER 31, 2020 AND 2019

	2020	2019
Operating Revenues	$ 186,799,875	$ 180,238,305
Operating Expenses:		
Treatment	50,981,608	49,805,868
Intercepting sewer systems	8,771,952	8,753,813
Upper Allegheny system	307,944	298,412
Administrative and engineering	15,682,596	15,962,845
Billing and collecting	4,461,391	3,572,073
Management information systems	4,071,959	3,690,385
Total operating expenses before depreciation	84,277,450	82,083,396
Operating Income Before Depreciation	102,522,425	98,154,909
Depreciation	22,374,952	22,772,539
Operating Income	80,147,473	75,382,370
Non-operating Revenues (Expenses):		
Interest income	2,002,687	8,966,272
Interest expense on bonds	(27,485,399)	(28,261,390)
Amortization of prepaid bond costs	(516,597)	(596,640)
Loss on capital assets retired	(4,573,423)	-
Change in value of pension related items	(2,469,057)	(4,177,854)
Change in value of OPEB related items	(2,175,059)	(774,061)
Total non-operating revenues (expenses)	(35,216,848)	(24,843,673)
Change in Net Position	44,930,625	50,538,697
Net Position:		
Beginning of year	356,643,604	306,104,907
End of year	$ 401,574,229	$ 356,643,604

The notes to financial statements are an integral part of this statement.

ALLEGHENY COUNTY SANITARY AUTHORITY

STATEMENTS OF CASH FLOWS

YEARS ENDED DECEMBER 31, 2020 AND 2019

	2020	2019
Cash Flows From Operating Activities:		
Cash received from customers	$ 182,703,894	$ 177,773,236
Cash paid to suppliers	(27,189,566)	(26,631,933)
Cash paid to employees	(56,940,161)	(54,565,812)
Net cash provided by (used in) operating activities	98,574,167	96,575,491
Cash Flows From Capital and Related Financing Activities:		
Interest paid on bonds	(31,791,811)	(32,663,041)
Principal paid on bonds	(27,635,000)	(26,630,000)
Proceeds from debt issues	153,995,000	-
Bond premium	25,034,803	-
Payments to refund bonds	(107,606,188)	-
Prepaid bond costs	(1,423,616)	-
Acquisition and construction of capital assets	(40,886,542)	(29,438,817)
Net cash provided by (used in) capital and related financing activities	(30,313,354)	(88,731,858)
Cash Flows From Investing Activities:		
Proceeds from sale and maturities of investment securities	85,722,220	87,401,292
Interest earnings	2,636,212	4,454,725
Net cash provided by (used in) investing activities	88,358,432	91,856,017
Increase (Decrease) in Cash and Cash Equivalents	156,619,245	99,699,650
Cash and Cash Equivalents:		
Beginning of year, including $150,150,904 and $83,445,720, respectively, in restricted/designated accounts	325,627,590	225,927,940
End of year, including $272,815,362 and $150,150,904, respectively, in restricted/designated accounts	$ 482,246,835	$ 325,627,590
Noncash Capital and Related Financing Activities:		
Property, plant, and equipment additions reflected in accounts payable	$ 3,165,967	$2,532,565
Reconciliation of Operating Income to Net Cash Provided by (Used in) Operating Activities:		
Operating income	$ 80,147,473	$ 75,382,370
Adjustments to reconcile operating income to net cash provided by (used in) operating activities:		
Depreciation	22,374,952	22,772,539
Change in operating assets and liabilities:		
Accounts receivable	(4,096,728)	(2,442,545)
Other current assets	(30,190)	(47,970)
Accounts payable	(1,011,417)	256,775
Accrued liabilities	1,189,327	676,847
Pretreatment advance payments	750	(22,525)
Net adjustments	18,426,694	21,193,121
Net cash provided by (used in) operating activities	$ 98,574,167	$ 96,575,491

The notes to financial statements are an integral part of this statement.

ALLEGHENY COUNTY SANITARY AUTHORITY

STATEMENTS OF PLAN NET POSITION
PENSION TRUST FUNDS

DECEMBER 31, 2020 AND 2109

	2020	2019
Assets		
Dividends and interest receivable	$ 497,672	$ 482,310
Cash and cash equivalents	909,804	-
Investments at fair value:		
U.S. government securities	28,936,590	28,482,022
Corporate bonds	31,589,449	23,603,932
Equity securities	133,689,506	123,105,389
Municipal bonds	601,227	575,722
Foreign bonds	1,547,617	1,669,170
Mortgages	2,940,269	3,791,923
ETFs	9,815,510	5,864,867
Mutual funds	1,427,539	730,503
Asset backed securities	1,601,347	1,758,661
Noncorporate bonds	2,368,750	2,954,879
Total investments at fair value	214,517,804	192,537,068
Total Assets	$ 215,925,280	$ 193,019,378
Liabilities and Net Position		
Liabilities:		
Other payables	$ -	$ 598,209
Net Position:		
Net position restricted for pension benefits	215,925,280	192,421,169
Total Liabilities and Net Position	$ 215,925,280	$ 193,019,378

ALLEGHENY COUNTY SANITARY AUTHORITY

STATEMENTS OF CHANGES IN PLAN NET POSITION
PENSION TRUST FUNDS

YEARS ENDED DECEMBER 31, 2020 AND 2019

	2020	2019
Additions:		
Contributions:		
Employer	$ 6,932,261	$ 5,357,378
Employee	585,144	527,193
Total contributions	7,517,405	5,884,571
Investment income:		
Net appreciation (depreciation) in fair value of investments	18,356,963	23,541,491
Interest and dividends	4,240,645	4,180,098
Total investment income	22,597,608	27,721,589
Other income	2,734,733	4,896,644
Total additions	32,849,746	38,502,804
Deductions:		
Benefits	8,774,093	8,199,124
Distribution expenses	143,775	132,425
Administrative expense	427,767	504,747
Total deductions	9,345,635	8,836,296
Change in Plan Net Position	23,504,111	29,666,508
Net Position:		
Beginning of year	192,421,169	162,754,661
End of year	$ 215,925,280	$ 192,421,169

1. Organization

The Allegheny County Sanitary Authority (Authority) was incorporated in May 1945 under the Commonwealth of Pennsylvania Municipality Authorities Act of 1945. The Authority serves as the exclusive agency for the collection, transportation, and treatment of wastewater for the City of Pittsburgh and 82 neighboring municipalities. The Authority charges users for processing of wastewater at applicable rates. Additional charges are levied for septage (solid waste removed from septic tanks) and industrial waste discharges into the system.

In evaluating the Authority as a primary government in accordance with Governmental Accounting Standards Board (GASB) guidance, management has addressed all potential component units. The criteria used by the Authority to evaluate possible inclusion of related entities within its reporting entity are financial accountability and the nature and significance of the relationship.

Upon review of the criteria above, the Authority determined that there were no potential component units that met the criteria for inclusion in the reporting entity.

The Authority operates as a stand-alone entity governed by a Board of Directors appointed by the City of Pittsburgh and County of Allegheny. Neither the City of Pittsburgh nor the County of Allegheny appoints a voting majority of the Authority's Board of Directors.

2. Summary of Significant Accounting Policies

Measurement Focus

The Authority uses "income determination" as its measurement focus. Accordingly, all assets, liabilities, deferred inflows, and deferred outflows are included on the balance sheet and net position reflects the economic net worth of the Authority. The operating statement reflects the change in total economic net worth for the period, presented through revenues and expenses of the Authority.

Fiduciary Funds

Fiduciary funds are used to account for assets held in a trustee capacity. The Authority reports the following fiduciary funds:

The *Pension Trust Funds* are used to account for employee retirement systems.

- The Management Pension Fund accounts for assets of the Authority management employees' retirement pension plan.

- The Union Pension Fund accounts for assets of the Authority union employees' retirement pension plan.

Basis of Accounting

The financial statements of the Authority for the years ended December 31, 2020 and 2019 have been prepared on the accrual basis of accounting. Under the accrual basis of accounting, revenues are recognized when earned and expenses are recognized when incurred.

Cash and Cash Equivalents

For purposes of the statements of cash flows, the Authority considers all highly liquid investments with a maturity of three months or less when purchased to be cash and cash equivalents.

Investments

Investments are recorded at fair value at December 31, 2020 and 2019.

The Authority categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs.

Accounts Receivable

Accounts receivable consist of amounts due from customers, lump-sum billings to municipalities (which in turn bill customers individually), and estimated unbilled services since the previous billing.

Under the terms of the respective servicing agreements, each local municipality is responsible for the payment to the Authority and subsequent collection of individual customer billings outstanding over 60 days. Accordingly, an allowance for doubtful accounts is currently not considered necessary by management.

Prepaid Bond Costs

Certain prepaid bond issue and surety bond costs are deferred and amortized over the life of the related outstanding bonds. The original amortization periods are as follows:

Description	Amortization Period
2010 Bonds	30 years
2011 Bonds	9 years
2013 Bonds	31 years
2015 Bonds	30 years
2016 Bonds	21 years
2018 Bonds	30 years
2020 Bonds	30 years

Refunding Adjustment

In accordance with GASB pronouncements, the excess of the reacquisition price over the net carrying amount of debt refunded with proceeds from Series 2020, Series 2016, Series 2015, and Series 2010 Bonds were recorded as refunding adjustments. The refunding adjustments are being amortized using the effective interest method over the originally scheduled life of the defeased issues, which extend to 2051, 2037, 2045, and 2040, respectively. The unamortized balances are reflected as deferred outflows of resources.

Capital Assets

Capital assets are recorded at cost which includes, when appropriate, interest cost incurred on qualifying assets during the construction period.

Depreciation of capital assets is provided for on the straight-line method based on the estimated useful lives of the various classes of assets. Maintenance and repairs are charged to expense as incurred. Estimated useful lives of major classes of assets are as follows:

Land improvements	40 years
Buildings and improvements	50 years
Utility plant in service	60 years
Machinery and equipment	3-20 years

The cost of the study for a potential capital project is capitalized in construction in progress. Upon commencement of the related capital project, the cost of the study is allocated to the project. Upon the Authority's final determination that a project is not viable, the cost of the study is expensed.

Deferred Outflows and Inflows of Resources

In addition to assets and liabilities, the statement of net position will sometimes report separate sections for deferred outflows and deferred inflows of resources. Deferred outflows of resources represent a consumption of net position that applies to a future period while deferred inflows of resources represents an acquisition of net position that applies to future periods.

Compensated Absences

Vested or accumulated vacation and sickness leave are recorded as a liability and expensed as the benefits accrue to employees.

Pension Plans

Substantially all full-time employees of the Authority are enrolled in one of two single-employer defined benefit pension plans. For purposes of measuring the net pension liability, deferred outflows of resources related to pensions, and pension expense, information about the fiduciary net position of the pension plans, as well as additions to and deductions from the pension plan fiduciary net position have been determined using the economic resources measurement focus and accrual basis of accounting. Employer contributions are recognized when due and the employer has a legal requirement to provide the contributions. Investments are reported at fair value.

Post-retirement Benefits

The Authority provides certain health insurance benefits to retirees. The costs of these benefits are recognized in accordance with accounting principles generally accepted in the United States of America and are funded when paid.

Deferred Compensation Plan

The Authority offers its employees a deferred compensation plan (plan) created in accordance with Internal Revenue Code Section 457. The plan, available to all employees, permits them to defer a portion of their salaries until future years. Participation in the plan is optional. The deferred compensation is not available to the employee until termination, retirement, death, or unforeseeable emergency. At December 31, 2020 and 2019, all amounts of compensation deferred under the plan, all property and rights purchased with those amounts, and all income attributable to those amounts, are held in trust solely for the benefit of the participants. Investments are managed by the plan's trustee under several investment options selected by the participant. Under applicable GASB pronouncements, the plan is not required to be included in the Authority's financial statements.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Management makes significant estimates regarding the amount of unbilled accounts receivable, estimated useful lives of assets, depreciation, reserves for accrued litigation, actuarial valuations of the pension plans and other post-employment benefits liabilities, and environmental contingencies.

Pending Pronouncements

GASB has issued statements that will become effective in future years, including 87 (Leases), 91 (Conduit Debt Obligations), 92 (Omnibus 2020), 93 (Interbank Offered Rates), 94 (Public-Private and Public-Public Partnerships), 96 (Information Technology Arrangements), and 97 (Deferred Compensation Plans). Management has not yet determined the impact of these statements on the financial statements.

3. Revenue Bonds

On October 1, 2010, the Authority issued $121,660,000 of Sewer Revenue Bonds Series of 2010, called the 2010 Bonds. The proceeds of the 2010 Bonds were used to provide funds for the financing of a portion of the Authority's capital budget for 2011 through 2013, current refunding of the 1997 bonds, current refunding of the 2000 bonds, payment of a PennVest loan, and funding capitalized interest.

The 2010 Bonds were issued at a bond premium of $5,113,802, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2010 Bonds bear interest at rates ranging from 1.50% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2010 bonds were refunded as part of the issuance of the 2020 Bonds.

On October 1, 2011, the Authority issued $92,250,000 of Sewer Revenue Bonds Refunding Series of 2011, called the 2011 Bonds. The proceeds of the bonds were used to currently refund all of the Authority's outstanding Sewer Revenue Bonds Refunding Series of 2001.

The 2011 Bonds were issued at a premium of $12,066,763, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2011 Bonds bear interest at rates ranging from 1.50% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2011 Bonds were repaid in full during the year ended December 31, 2019.

On December 19, 2013, the Authority issued $64,755,000 of Sewer Revenue Bonds Series of 2013, called the 2013 Bonds. The proceeds of the 2013 Bonds were used to provide additional funding for the Authority's capital projects in 2014 and 2015.

The 2013 Bonds were issued at a bond premium of $2,711,736, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2013 Bonds bear interest at rates ranging from 3.50% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2013 Bonds, which have a final maturity date of December 1, 2044, are subject to redemption prior to maturity. At December 31, 2020 and 2019, the 2013 Bonds payable consisted of $64,755,000.

On September 3, 2015, the Authority issued $265,270,000 of Sewer Revenue Bonds Series of 2015, called the 2015 Bonds. The proceeds of the bonds were used to currently refund all of the Authority's outstanding Sewer Revenue Bonds Refunding Series of 2005 and to provide additional funding for the Authority's capital projects.

The 2015 Bonds were issued at a premium of $36,708,408, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2015 Bonds bear interest at rates ranging from 2.00% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2015 Bonds, which have a final maturity date of December 1, 2045, are subject to redemption prior to maturity. At December 31, 2020 and 2019, the 2015 Bonds payable consisted of $218,845,000 and $246,300,000, respectively.

On September 8, 2016, the Authority issued $106,205,000 of Sewer Revenue Bonds Refunding Series of 2016, called the 2016 Bonds. The proceeds of the bonds were used to advance refund all of the Authority's outstanding Sewer Revenue Bonds Refunding Series of 2007 and to provide additional funding for the Authority's capital projects. The defeased bonds were repaid in full during 2017.

The 2016 Bonds were issued at a premium of $13,012,378, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2016 Bonds bear interest at rates ranging from 0.90% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2016 Bonds, which have a final maturity date of December 1, 2037, are subject to redemption prior to maturity. At December 31, 2020 and 2019, the 2016 Bonds payable consisted of $104,455,000.

On September 6, 2018, the Authority issued $157,230,000 of Sewer Revenue Bonds Series of 2018, called the 2018 Bonds. The proceeds of the bonds were to finance a portion of the Authority's capital budget for the years 2018 to 2020.

The 2018 Bonds were issued at a premium of $12,092,896, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2018 Bonds bear interest at rates ranging from 3.25% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2018 Bonds, which have a final maturity date of June 1, 2048, are subject to redemption prior to maturity. At December 31, 2020 and 2019, the 2018 Bonds payable consisted of $157,230,000.

On October 1, 2020, the Authority issued $153,995,000 of Sewer Revenue Bonds Series of 2020, called the 2020 Bonds. The proceeds of the bonds were used to advance refund all of the Authority's outstanding Sewer Revenue Bonds Series of 2010 and to provide additional funding for the Authority's capital projects. The refunded Series 2010 bonds were paid in full in 2020.

The 2020 Bonds were issued at a premium of $25,034,803, which is being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

The 2020 Bonds bear interest at rates ranging from 2.13% to 5.00%. Interest is payable in semiannual installments on June 1 and December 1 until maturity. The 2020 Bonds, which have a final maturity date of June 1, 2050, are subject to redemption prior to maturity. At December 31, 2020, the 2020 Bonds payable consisted of $153,995,000.

This refunding resulted in an economic gain to the Authority of approximately $32.6 million and a decrease to the debt service payments of approximately $38.8 million. In connection with the 2020 debt refunding, the Authority recorded deferred refunding adjustments of approximately $110,000, which are being amortized as an adjustment to interest expense over the life of the bonds, using the effective interest method.

A summary of long-term debt is as follows for the years ended December 31, 2020 and 2019, respectively:

	Balance 1/1/2020	Accretions/ New Issue	Retired	Balance 12/31/2020	Unamortized Premium	Bonds Payable, net	Current Portion
2010 Series	$ 105,195,000	$ -	$ (105,195,000)	$ -	$ -	$ -	$ -
2013 Series	64,755,000	-	-	64,755,000	1,802,902	66,557,902	-
2015 Series	246,300,000	-	(27,455,000)	218,845,000	20,959,097	239,804,097	28,785,000
2016 Series	104,455,000	-	-	104,455,000	9,652,968	114,107,968	-
2018 Series	157,230,000	-	-	157,230,000	10,794,959	168,024,959	-
2020 Series	-	153,995,000	-	153,995,000	24,751,067	178,746,067	-
Total	$ 677,935,000	$ 153,995,000	$ (132,650,000)	$ 699,280,000	$ 67,960,993	$ 767,240,993	$ 28,785,000

	Balance 1/1/2019	Accretions/ New Issue	Retired	Balance 12/31/2019	Unamortized Premium	Bonds Payable, net	Current Portion
2010 Series	$ 105,415,000	$ -	$ (220,000)	$ 105,195,000	$ 3,104,226	$ 108,299,226	$ 180,000
2011 Series	23,010,000	-	(23,010,000)	-	-	-	-
2013 Series	64,755,000	-	-	64,755,000	1,933,670	66,688,670	-
2015 Series	249,450,000	-	(3,150,000)	246,300,000	23,904,336	270,204,336	27,455,000
2016 Series	104,705,000	-	(250,000)	104,455,000	10,446,099	114,901,099	-
2018 Series	157,230,000	-	-	157,230,000	11,375,401	168,605,401	-
Total	$ 704,565,000	$ -	$ (26,630,000)	$ 677,935,000	$ 50,763,732	$ 728,698,732	$ 27,635,000

The 2013, 2015, 2016, 2018, and 2020 Bonds are collateralized by the net revenues of the Authority, by Surety Bonds, in lieu of cash, as required by the trustee and all amounts held in the Revenue Fund and all amounts held by the trustees.

Schedule of Required Debt Service

In accordance with the provisions of the Trust Indentures for the bonds payable, the Authority has established categories of accounts (current, special, and debt service) with certain assets, principally short-term investments, restricted for specific purposes. Each account category is further segregated into specific accounts referred to as funds. All revenues are required by the Trust Indentures to be deposited in a Revenue Fund. These Trust Indentures also require that rates be sufficient to pay current expenses of the Authority, 110% of the debt service requirements for the current fiscal year, and all amounts owed to the Bond Issuer under the terms of the Financial Guaranty Agreement. Current expenses are defined, generally, as the costs of operating and maintaining the sewer system as determined under accounting principles generally accepted in the United States of America, except for depreciation and interest expense.

Funds created as a result of the governing Trust Indentures and by Board of Directors' resolutions are summarized as follows:

	2020	2019
Current account:		
Revenue Fund	$ 209,431,473	$ 175,476,686
Special accounts:		
Capital Facilities Fund	$ 81,936,033	$ 78,136,787
Construction Fund - 2018	120,873,880	157,337,837
Construction Fund - 2020	69,999,530	-
	$ 272,809,443	$ 235,474,624
Debt service accounts:		
Debt Service Fund	$ 5,919	$ 15,202

Maturities of all outstanding bonds of the Authority, in the aggregate, are as follows:

	Principal	Interest	Total Debt Service
2021	$ 28,785,000	$ 31,110,606	$ 59,895,606
2022	31,255,000	29,661,281	60,916,281
2023	32,830,000	28,124,956	60,954,956
2024	31,490,000	26,450,981	57,940,981
2025	30,975,000	24,968,856	55,943,856
2026-2030	128,770,000	103,688,538	232,458,538
2031-2035	120,485,000	76,328,813	196,813,813
2036-2040	137,395,000	50,456,209	187,851,209
2041-2045	106,955,000	24,179,525	131,134,525
2046-2050	50,340,000	3,738,400	54,078,400
Total	$ 699,280,000	$ 398,708,165	$ 1,097,988,165

The total debt service schedule in Note 14 represents the total debt service requirements (principal, interest, and sinking fund requirements) of the Authority's bond issuances, by issue and in the aggregate.

4. Interest Cost

Interest cost, including amortization of refunding adjustments, bond discounts/premiums, and prepaid bond costs, for the years ended December 31, 2020 and 2019 were as follows:

	2020	2019
2010 Bonds	$ 3,847,532	$ 5,135,326
2011 Bonds	-	588,142
2013 Bonds	3,149,935	3,149,935
2015 Bonds	9,606,809	9,808,789
2016 Bonds	3,640,978	3,642,744
2018 Bonds	6,533,094	6,533,094
2020 Bonds	1,223,648	-
	$ 28,001,996	$ 28,858,030

5. Deposits and Investments with Financial Institutions

The investment and deposit policy of the Authority funds is governed by the Trust Indentures and the Municipal Authority Act. In accordance with these regulations, the Authority is authorized to invest in obligations of the U.S. Treasury, agencies and instrumentalities; certificates of deposits, time deposits or deposits in savings accounts, fully insured or collateralized; commercial paper of the highest rating; bonds or notes issued by the Commonwealth of Pennsylvania, political subdivision, or related school district; repurchase agreements; money market mutual funds; and investment agreements with any bank or insurance company. Throughout the years ended December 31, 2020 and 2019, the Authority invested in authorized investments that consisted of U.S. government obligations, short-term commercial paper, money market mutual funds, an external investment pool, and guaranteed investment contracts. There were no deposit or investment transactions during 2020 and 2019 that were in violation of either state statutes or the policies of the Authority. The Authority does not have a formal investment policy which addresses custodial credit risk, interest rate risk, credit risk, or concentration of credit risk. The Authority can withdraw funds from the external investment pools without limitations or fees.

GASB requires disclosures related to the following deposit and investment risks: credit risk (including custodial credit risk and concentrations of credit risk), interest rate risk, and foreign currency risk. The following is a description of the Authority's deposit and investment risks:

Custodial Credit Risk - Custodial credit risk is the risk that in the event of a bank failure, the Authority's deposits may not be returned to it. As of December 31, 2020, $25,580,631 of the Authority's bank balance of $26,017,875 was exposed to custodial credit risk, which is collateralized in accordance with Act 72 of the Pennsylvania state legislature, which requires the institution to pool collateral for all governmental deposits and have the collateral held by an approved custodian in the institution's name. These deposits have carrying amounts of $28,296,819 as of December 31, 2020. As of December 31, 2019, $20,824,223 of the Authority's bank balance of $21,257,698 was exposed to custodial credit risk, which is collateralized in accordance with Act 72 of the Pennsylvania state legislature, which requires the institution to pool collateral for all governmental deposits and have the collateral held by an approved custodian in the institution's name. These deposits have carrying amounts of $20,907,643 as of December 31, 2019.

Included in cash and cash equivalents on the statements of net position are short-term investments in money markets and PA INVEST.

At December 31, 2020, the Authority held the following investment balances:

	Carrying Value	Maturity in Years Less Than 1 Year	1-5 Years
U.S. Government Agencies	$ -	$ -	$ -
Money Market Funds	451,748,312	451,748,891	-
PA INVEST	2,201,704	2,201,704	-
Total	$ 453,950,016	$ 453,950,595	$ -

At December 31, 2019, the Authority held the following investment balances:

	Carrying Value	Maturity in Years Less Than 1 Year	1-5 Years
U.S. Government Agencies	$ 84,963,478	$ 84,963,478	$ -
Money Market Funds	302,533,615	302,533,615	-
PA INVEST	2,186,332	2,186,332	-
Total	$ 389,683,425	$ 389,683,425	$ -

The carrying value of the Authority's investments is the same as their fair value amount. Money markets are valued using quoted market prices (Level 1 inputs). The fair values of U.S. government agency securities are priced using the spread above the risk-free yield curve. As the yields for the risk-free yield curve and the spreads for these securities are observable market inputs, the fair values of U.S. government agency securities are included in the Level 2 fair value hierarchy.

The Authority's investments in the external investment pool (INVEST) is the same as the value of the pool shares and is reported at amortized cost which approximates market. All investments in an external investment pool that is not SEC registered are subject to oversight by the Commonwealth. The Authority can withdraw funds from INVEST without limitations or fees.

Interest Rate Risk – Interest rate risk is the risk that changes in interest rates will adversely affect the fair market value of the Authority's investments.

Credit Risk – Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation. As of December 31, 2020 and 2019, the Authority's investment in the state investment pool (INVEST) was rated AAA by Standard & Poor's. 100% of the Authority's investments in money market funds are rated AAA by Standard & Poor's and AAA by Moody's.

Concentration of Credit Risk – Concentration of credit risk is the risk of loss attributed to the magnitude of a government's investments in a single issuer. As of December 31, 2020 and 2019, the Authority did not have a high concentration of investments in any one issuer.

Pension Trust Funds

The pension trust funds are used to account for assets held by the Authority in a trustee capacity for future payment of retirement benefits to employees or former employees.

The pension trust funds' investments in money markets, equity, and fixed-income funds, and guaranteed interest accounts are not exposed to custodial credit risk because they are not evidenced by securities that exist in physical or book-entry form. Investments in common stock are not subject to the disclosure requirements of GASB Statement No. 40.

The following is a description of the pension trust funds' investment risks:

Credit risk. The risk that an issuer or other counterparty to an investment will not fulfill its obligations is called credit risk. As of December 31, 2020 and 2019, the pension trust funds' investments in fixed income investments for the Management Plan and Union Plan were rated as follows:

Fiduciary Fund		
Bond ratings	2020 Market Value	2019 Market Value
Moody's Aaa	$ 33,988,279	$ 34,319,748
Moody's Aa1	723,232	769,049
Moody's Aa2	999,509	776,391
Moody's A1	2,392,849	2,393,441
Other	31,481,380	24,577,680
Total	$ 69,585,249	$ 62,836,309

The remaining mutual funds, stocks, mortgages, common/collective trusts, and ETFs were not rated by nationally recognized statistical rating organizations.

Interest Rate Risk. Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of the pension trust funds' investments. The pension trust funds do not have a formal investment policy that limits investment maturities as a means of managing its exposure to fair value losses arising from increasing interest rates. The following table shows investment maturities in years for pension trust fund investments with maturities:

		Investment Maturities (In Years) from December 31, 2020				
Investment Type	Fair Value	Less than 1 Year	1-5 Years	6-10 Years	11-15 Years	16 or more Years
Corporate and utility bonds	$ 31,589,449	$ 1,122,759	$ 9,526,514	$ 11,985,027	$ 3,748,499	$ 5,206,650
US treasury and agency	28,936,590	573,057	15,012,759	4,004,366	1,763,862	7,582,546
Municipal	601,227	-	239,109	303,741	58,377	-
Mortgages & Asset Backed Securities	4,541,616	1,014,383	2,813,064	691,538	-	22,631
Foreign Bonds	1,547,617	-	1,216,560	264,297	-	66,760
Noncorporate Bonds	2,368,750	191,771	1,431,764	655,808	89,407	-
Total securities with maturities	$ 69,585,249	$ 2,901,970	$ 30,239,770	$ 17,904,777	$ 5,660,145	$ 12,878,587

		Investment Maturities (In Years) from December 31, 2019				
Investment Type	Fair Value	Less than 1 Year	1-5 Years	6-10 Years	11-15 Years	16 or more Years
Corporate and utility bonds	$ 23,603,932	$ 663,053	$ 10,702,073	$ 7,892,682	$ 1,757,679	$ 2,588,445
US treasury and agency	28,482,022	1,387,721	10,775,168	4,860,793	1,597,009	9,861,331
Municipal	575,722	-	230,074	291,408	54,240	-
Mortgages & Asset Backed Securities	5,550,584	527,006	4,794,385	201,602	-	27,591
Foreign Bonds	1,669,170	-	1,409,227	199,401	-	60,542
Noncorporate Bonds	2,954,879	473,319	1,958,214	523,346	-	-
Total securities with maturities	$ 62,836,309	$ 3,051,099	$ 29,869,141	$ 13,969,232	$ 3,408,928	$ 12,537,909

Financial instruments potentially expose the pension trust funds to various risks such as concentrations of credit risk and market risks. Concentration of credit risk for investments in marketable securities is mitigated by the overall diversification of managed investment portfolios. Due to the level of risk associated with certain investments, it is at least reasonably possible that changes in values of investments will occur in the near term and that such change could materially affect the amount reported on the combined statement of fiduciary net position.

The composition of the pension trust funds is noted below, along with the fair value measurements as of December 31, 2020 and 2019, respectively:

Investments by Fair Value Level:	December 31, 2020	December 31, 2019
Fixed Income:		
US Treasury Bonds	$ 9,656,105	$ 10,382,437
US Agency Bonds	19,280,485	18,099,585
Asset Backed Securities	1,601,347	1,758,661
Corporate Bonds	29,424,062	21,769,670
Utility Bonds	2,165,387	1,834,262
Municipal Bonds	601,227	575,722
Foreign Bonds	1,547,617	1,669,170
Noncorporate Bonds	2,368,750	2,954,879
Mortgages and mortgaged backed securities	2,940,269	3,791,923
ETFs - Fixed Income	1,196,556	-
Total Fixed Income	70,781,805	62,836,309
Equities:		
Mutual Funds	1,427,539	730,503
Common Stocks:		
Capital Goods	4,478,132	3,860,612
Industrials	2,512,561	2,518,014
Consumer Discretionary	4,087,424	4,079,307
Consumer Staples	3,095,454	3,447,758
Commercial & Professional Services	700,372	-
Energy	3,056,446	5,916,198
Food, Bev, Tobacco, & Personal Products	6,615,774	4,876,668
Financials	11,152,804	10,978,442
Materials	3,048,883	1,592,385
Transportation	2,677,448	4,452,072
Retail	10,037,097	9,487,249
Pharm/Biotech	7,471,849	15,458,181
Insurance	3,654,194	2,458,541
Information Technology	22,754,824	21,260,183
Software & Services	14,311,836	12,316,880
Media	10,512,613	5,559,296
Real Estate	3,769,444	3,304,533
Utilities	3,615,520	4,050,995
Health Care	10,923,691	4,679,908
Telecommunications	5,213,140	2,808,167
ETFs - Growth	8,618,954	5,864,867
Total Equities	143,735,999	129,700,759
Total investments by fair value level	$ 214,517,804	$ 192,537,068

US Treasury bonds, asset backed securities, utility bonds, noncorporate bonds, mutual funds, preferred stock, common stock, and exchange traded funds are valued using quoted marked prices (Level 1 inputs). Corporate, municipal, and foreign bonds as well as mortgages are valued using a matrix pricing model (Level 2 inputs). The fair values of U.S. government agency securities are priced using the spread above the risk-free yield curve. As the yields for the risk-free yield curve and the spreads for these securities are observable market inputs, the fair values of U.S. government agency securities are included in the Level 2 fair value hierarchy.

6. Capital Assets

A summary of capital assets is as follows:

	2020	2019
Nondepreciable assets:		
Land	$ 5,344,896	$ 5,344,896
Construction in progress	94,302,298	81,287,241
Total nondepreciable assets	99,647,194	86,632,137
Depreciable assets:		
Land improvements	4,805,250	4,805,250
Buildings and improvements	466,753,712	467,618,174
Utility plant in service	256,379,473	256,546,851
Machinery and equipment	340,138,570	338,657,202
Clean Water Program	17,603,803	-
GROW Program	4,812,861	2,189,927
Total depreciable assets	1,090,493,669	1,069,817,404
Less: accumulated depreciation	546,638,727	527,351,596
Net depreciable assets	543,854,942	542,465,808
Total capital assets	$ 643,502,136	$ 629,097,945

The Authority has spent $94,302,298 and $81,287,241 for construction in progress as of December 31, 2020 and 2019, respectively, with estimated remaining total expansion costs of approximately $761,630,176, which are anticipated to occur over the next five years. These expansion costs are primarily attributable to activities required by the Consent Decree further discussed in Note 10.

7. Pension Plans

General Information About the Pension Plans. The Authority has two single-employer defined benefit pension plans covering substantially all full-time employees: the Management Employees Plan (Management Plan) and the Union Employees Plan (Union Plan). The Union Plan is a contributory plan including all members of the utility workers' collective bargaining unit and the Management Plan is a contributory plan available to all Authority employees not participating in the Union Plan. The Authority's pension plans, the Management Employees Plan and Union Employees Plan (Plans), are governed by independent boards composed primarily of participants in the Plans, and the Authority does not directly participate in the management of the Plans.

Management and Union Plans - Summary of Significant Accounting Policies

Financial information is presented on the accrual basis of accounting. Employer contributions to the Plans are recognized when earned. Benefits and refunds are recognized when incurred, in accordance with the terms of each Plan.

Each Plans asset are reported at fair value. Neither Plan had any investment transactions with related parties during the year.

Statements of Plan Net Position – Management and Union Plans

COMBINING STATEMENT OF PLAN NET POSITION
PENSION TRUST FUNDS

YEAR ENDED DECEMBER 31,

	Management 2020	Management 2019	Union 2020	Union 2019
Assets				
Dividends and interest receivable	$ 147,870	$ 165,480	$ 349,802	$ 316,830
Cash and cash equivalents	-	-	909,804	-
Investments at fair value:				
U.S. government securities	10,656,447	12,916,458	18,280,142	15,565,564
Corporate bonds	9,256,193	6,777,935	22,333,257	16,825,997
Equity securities	30,215,290	26,051,710	103,474,216	97,053,679
Municipal bonds	239,109	230,074	362,118	345,648
Foreign bonds	-	-	1,547,617	1,669,170
Mortgages	22,631	27,591	2,917,638	3,764,332
ETFs	9,815,510	5,864,867	-	-
Mutual funds	1,427,539	730,503	-	-
Asset backed securities	-	-	1,601,347	1,758,661
Noncorporate bonds	-	-	2,368,750	2,954,879
Total investments at fair value	61,632,719	52,599,138	152,885,085	139,937,930
Total Assets	$ 61,780,589	$ 52,764,618	$ 154,144,691	$ 140,254,760
Liabilities and Net Position				
Liabilities:				
Other payables	$ -	$ -	$ -	$ 598,209
Net Position:				
Net position restricted for pension benefits	61,780,589	52,764,618	154,144,691	139,656,551
Total Liabilities and Net Position	$ 61,780,589	$ 52,764,618	$ 154,144,691	$ 140,254,760

Statements of Changes in Plan Net Position – Management and Union Plans

COMBINING STATEMENT OF CHANGES IN PLAN NET POSITION
PENSION TRUST FUNDS

YEAR ENDED DECEMBER 31,

	Management 2020	Management 2019	Union 2020	Union 2019
Additions:				
Contributions:				
Employer	$ 2,822,303	$ 2,376,191	$ 4,109,958	$ 2,981,187
Employee	314,238	303,018	270,906	224,175
Total contributions	3,136,541	2,679,209	4,380,864	3,205,362
Investment income:				
Net appreciation (depreciation) in fair value of investments	7,159,549	8,563,244	11,197,414	14,978,247
Interest and dividends	1,186,424	1,140,200	3,054,221	3,039,898
Total investment income	8,345,973	9,703,444	14,251,635	18,018,145
Other income	2,542	31,235	2,732,191	4,865,409
Total additions	11,485,056	12,413,888	21,364,690	26,088,916
Deductions:				
Benefits	2,280,017	2,254,417	6,494,076	5,944,707
Distribution expenses	143,775	132,425	-	-
Administrative expense	45,293	45,715	382,474	459,032
Total deductions	2,469,085	2,432,557	6,876,550	6,403,739
Change in Plan Net Position	9,015,971	9,981,331	14,488,140	19,685,177
Net Position:				
Beginning of year	52,764,618	42,783,287	139,656,551	119,971,374
End of year	$ 61,780,589	$ 52,764,618	$ 154,144,691	$ 139,656,551

Plan Benefits

Normal Retirement. Under each of the plans, employees' eligibility for normal benefits begins at age 65, at which time the individual is entitled to an annual retirement benefit, payable monthly for life. For the Management Plan, this benefit is equal to 2.5% of the first $4,200 of average compensation for each year of Credited Service, plus 2.5% of 3-year compensation in excess of $4,200 for each year of Contributory Service (for participant contributing at the rate of 3% of compensation) and 2.0% of 5-year average compensation in excess of $4,200 for each year of Contributory Service (for participant contributing at the rate of 1.25% of compensation in excess of $4,200). If a participant transfers from the Union Plan, the normal retirement benefit is based on all years of employment with the Authority and is offset by the Union Plan benefit. In addition, the portion of the benefit for those contributing 1.25% of compensation in excess of $4,200 will be determined using 2.50% of 3-year average compensation in excess of $4,200 for any Union years of Contributory Service. For the Union Plan, this benefit is equal to 2.5% of the first $4,200 of average compensation for each year of credited service plus 2.5% of average compensation in excess of $4,200 for each year of Contributory Service. The benefit above is limited to 100% of average compensation. For both plans, in no event will a participant's benefit exceed the limits set forth in Section 415(b) of the Internal Revenue Code.

Early Retirement. Early retirement is available to all participants who have reached the age of 55 and have at least 10 years of service for the Management plan, and 55 and have at least 15 years of service for the Union plan. For the Management Plan, a participant who is contributing 3% of compensation may retire at age 60 with 10 years of service with no early retirement reduction. If such participant elects to retire prior to age 60, benefits will be reduced by one-half of 1% for each month prior to age 60 in which retirement occurs. For a participant who elected to contribute 1.25% of compensation in excess of $4,200, the monthly benefit will be reduced by one-half of 1% for each month prior to Normal Retirement Date (that is, prior to age 65). For the Union Plan, If the participant has attained age 60 with 25 years of Credited Service and is actively employed immediately prior to retirement, the benefit is unreduced. Otherwise, the benefit is reduced actuarially if it commences prior to age 62 or by 5% per year if it commences between age 62 and Normal Retirement Date.

Late Retirement. In both plans, for those retiring after age 65, the benefit is the greater of (1) the actuarial equivalent of the benefit that would have been payable at the Normal Retirement Date and (2) the benefit based on service and earnings as of the actual retirement date.

Disability Retirement. For both plans, disability retirement is available upon evidence of total and permanent disability and after 10 years of Credit Service. The disability benefit is based on average compensation and service at the time of disability. The disability benefit is limited to the amount which, when added to worker's compensation, equals 100% of base pay. The disability benefit is payable immediately, with no reduction for commencement before Normal Retirement Date.

Termination Benefits. For both plans, a participant is fully vested in his accrued benefit after 15 years of Credited Service or upon attainment of Normal Retirement age. Partial vesting occurs after 5 years of Credited Service, in accordance with the following schedule:

Credited Service	Vested Percentage	Credited Service	Vested Percentage
Less than 5 years	0%	10 years	50%
5 years	25%	11 years	60%
6 years	30%	12 years	70%
7 years	35%	13 years	80%
8 years	40%	14 years	90%
9 years	45%	15 or more years	100%

The vested accrued benefit will be payable in full at Normal Retirement Date. Reduced payment can begin as early as age 55 if the participant had 15 years (Union Plan) or 10 years (Management Plan) of Credited Service upon termination of employment. For the Union Plan, the benefit reduction for early commencement is the same as the reduction described for Early Retirement. For the Management Plan, the benefit reduction for early commencement is one-half of 1% for each month prior to normal retirement date, and a participant who satisfies the eligibility requirements for Early Retirement upon termination of employment is deemed to be fully vested. Employee contribution balances are always 100% vested. A participant who terminates employment with less than five years of Credited Service will be entitled to the return of his contributions with interest. A participant who terminates employment with partial vesting may elect a return of his contributions with interest. Such participant will have a residual benefit equal to the vested percentage of his accrued benefit based on Credited Service only (that is, the portion of the benefit based on the first $4,200 of compensation). A participant who withdrew contributions upon termination of employment and who is reemployed by the Authority will have the opportunity to repay his withdrawn contributions, with interest, for the purpose of restoring previously earned Contributory Service.

Pre-Retirement Spouse's Benefit. Upon the death of an active participant before retirement but after five years of Credited Service, the surviving spouse will receive 100% of the accrued benefit, determined without regard to the participant’s vested percentage. If the spouse is under age 50, the 100% is reduced by 0.5% for each year and a fraction under age 50. For deaths occurring prior to January 1, 2004 (Union Plan) or 2006 (Management Plan), the surviving spouse received 100% of the vested accrued benefit. Upon the death of a terminated vested participant prior to the commencement of any benefits, the beneficiary shall receive an amount equal to the participant's personal contributions, if any, plus interest at the rate of 3% per year.

Post-Retirement Medical Benefit Payment. For the Management Plan, when a retired participant who was contributing at the rate of 3% attains age 65, such retired participant will receive an additional monthly benefit equal to two times the Medicare Part B premium in effect at that time, payable for the remainder of the participant’s life.

Post-Retirement Lump Sum Death Benefit. For the Management Plan, participants retiring under either the Normal or Early Retirement provisions who were contributing at the rate of 3% will be eligible for a post-retirement death benefit of $2,000. Such benefit will be paid to the designated beneficiary.

Employees Covered by Benefit Terms. As of the most recent actuarial valuations, the following employees were covered by the benefit terms:

	Management	Union	Total
Inactive plan members or beneficiaries currently receiving benefits	74	186	260
Inactive plan members entitled to but not yet receiving benefits	21	33	54
Active plan members	134	294	428
Total plan members	229	513	742

Contributions. Participants in the Management Plan contribute 3.0% and participants in the Union Plan contribute 1.25% of earnings to their respective plans. The Authority’s contributions to the plans are based on actuarially determined rates.

Net Pension Liability (Asset). The Authority's net pension liability (asset) for 2019 and 2020 was measured as of December 31, 2018 and 2019, respectively. The total pension liability used to calculate the net pension liability (asset) was determined by actuarial valuations as of those respective measurement dates.

Actuarial Assumptions. The total pension liability in the December 31, 2019 and 2018 actuarial valuations were determined using the following actuarial assumptions, applied to all periods included in the measurement:

Actuarial cost method	Entry age normal
Actuarial assumptions:	
Investment rate of return	7.00%
Underlying inflation rate	2.30%
Salary projection	4.00%

For both plans - Base mortality tables are applied to participant categories as follows:

- Active participants and terminated participants with deferred benefits: PubG-2010(A) Employee Table
- Non-disabled participants in payment status: PubG-2010(A) Retiree Table
- Disabled participants: PubNS-2010 Disabled Retiree Table
- Surviving beneficiaries: Pub-2010(A) Contingent Survivor Table

For the January 1, 2020 valuation, fully-generational mortality improvement for all participant categories is projected under Scale MP-2019. For the January 1, 2019 valuation, fully-generational mortality improvement for all participant categories was projected under Scale MP-2018. The MP scale is updated annually by the Society of Actuaries. Annual updates to the MP scale will be applied to each future actuarial valuation. The MP scale update is treated as an actuarial experience gain or loss, rather than as an assumption change.

Actuarial assumptions used in the respective valuations were based on actuarial experience studies for the period January 1, 2018 to December 31, 2018 and January 1, 2019 to December 31, 2019.

Long-Term Expected Rate of Return. The long-term expected rate of return on plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The following were the asset allocation policy and best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation:

	Management Plan		Union Plan	
Asset Class	Target Allocation	Long-Term Expected Real Rate of Return	Target Allocation	Long-Term Expected Real Rate of Return
US equity	70.0%	4.37%	70.0%	4.37%
Fixed income	30.0%	1.00%	30.0%	1.00%
	100.0%		100.0%	

Discount Rate. The discount rate used to measure the total pension liability was 7.00%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and that the Authority's contributions will be made based on the actuarially determined contribution. Based on those assumptions, the fiduciary net position of each plan was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Concentrations – The Management Plan and the Union Plan did not have investments in a single issuer that exceeded 5% of the respective plan's fiduciary net position at December 31, 2020 and 2019.

Changes in Net Pension Liability (Asset). Changes in the Authority's net pension liability (asset) are as follows:

	Management Plan		
	Total Pension Liability	Plan Net Position	Net Pension Liability (Asset)
Balances at 12/31/19	$ 55,312,482	$ 42,783,287	$ 12,529,195
Changes for the year:			
Service cost	1,905,043	-	1,905,043
Interest	3,919,747	-	3,919,747
Differences between expected and actual experience	(1,020,214)	-	(1,020,214)
Changes of benefit terms	-	-	-
Changes of assumptions	-	-	-
Employer contributions	-	2,376,191	(2,376,191)
Member contributions	-	303,018	(303,018)
Net investment income	-	9,556,538	(9,556,538)
Benefit payments, including refunds of employee contributions	(2,254,417)	(2,254,417)	-
Balances at 12/31/20	$ 57,862,641	$ 52,764,617	$ 5,098,024
Plan fiduciary net position as a percentage of total pension liability			91.19%

Net investment income includes $178,140 of trustee and other investment related expenses.

	Management Plan		
	Total Pension Liability	Plan Net Position	Net Pension Liability (Asset)
Balances at 12/31/18	$ 50,021,282	$ 43,899,410	$ 6,121,872
Changes for the year:			
Service cost	1,826,493	-	1,826,493
Interest	3,650,643	-	3,650,643
Differences between expected and actual experience	832,893	-	832,893
Changes of benefit terms	-	-	-
Changes of assumptions	1,093,916	-	1,093,916
Employer contributions	-	2,516,460	(2,516,460)
Member contributions	-	276,848	(276,848)
Net investment income	-	(1,796,686)	1,796,686
Benefit payments, including refunds of employee contributions	(2,112,745)	(2,112,745)	-
Balances at 12/31/19	$ 55,312,482	$ 42,783,287	$ 12,529,195
Plan fiduciary net position as a percentage of total pension liability			77.35%

Net investment income includes $169,580 of trustee and other investment related expenses.

	Union Plan		
	Total Pension Liability	Plan Net Position	Net Pension Liability (Asset)
Balances at 12/31/19	$ 136,126,927	$ 119,971,374	16,155,553
Changes for the year:			
Service cost	3,355,451	-	3,355,451
Interest	9,538,363	-	9,538,363
Differences between expected and actual experience	(1,450,770)	-	(1,450,770)
Changes of benefit terms	492,165	-	492,165
Changes of assumptions	-	-	-
Employer contributions	-	3,252,204	(3,252,204)
Member contributions	-	245,136	(245,136)
Net investment income	-	22,424,524	(22,424,524)
Benefit payments, including refunds of employee contributions	(5,944,707)	(5,944,707)	-
Balances at 12/31/20	$ 142,117,429	$ 139,948,531	$ 2,168,898
Plan fiduciary net position as a percentage of the total pension liability			98.47%

Net investment income includes $459,032 of trustee and other investment related expenses.

	Union Plan		
	Total Pension Liability	Plan Net Position	Net Pension Liability (Asset)
Balances at 12/31/18	$ 124,378,389	$ 127,083,966	$ (2,705,577)
Changes for the year:			
Service cost	3,140,218	-	3,140,218
Interest	8,965,814	-	8,965,814
Differences between expected and actual experience	(1,116,208)	-	(1,116,208)
Changes of benefit terms	-	-	-
Changes of assumptions	6,285,011	-	6,285,011
Employer contributions	-	3,085,110	(3,085,110)
Member contributions	-	230,428	(230,428)
Net investment income	-	(4,901,833)	4,901,833
Benefit payments, including refunds of employee contributions	(5,526,297)	(5,526,297)	-
Balances at 12/31/19	$ 136,126,927	$ 119,971,374	$ 16,155,553
Plan fiduciary net position as a percentage of the total pension liability			88.13%

Net investment income includes $271,538 of trustee and other investment related expenses.

Pennsylvania Act 205 (Act 205) is the authority by which benefit provisions are established and may be amended. Stand-alone financial reports were not issued for either of the Plans, as they are not required under the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974.

Changes in Actuarial Assumptions. The following actuarial assumptions were modified from 2018 to 2019:

- Mortality: The mortality assumption has been revised to reflect tables published in 2019 by the Society of Actuaries (SOA) which are based exclusively on public-sector pension plan experience. Factors for future mortality improvement have been updated as well. The revised assumption reflects an update from the RP-2000 Mortality Table and its companion mortality improvement scale.
- Retirement: For the Management Plan, Age-based rates of retirement have been adjusted to reflect (a) almost no retirements prior to age 60, and (b) more retirements than anticipated after age 65. For the Union Plan, Age-based rates of retirement have been adjusted to reflect (a) almost no retirements prior to age 60, (b) more retirements than anticipated between ages 60-64, and (c) employees continuing to work beyond age 70.
- Turnover: Terminations of employment prior to retirement eligibility have been slightly higher than assumed.
- Assumptions for surviving spouses: Assumptions related to married participants, who would be eligible for pre-retirement death benefits or would be expected to elect a joint & survivor annuity at retirement, have been revised to reflect plan experience. The percentage of participants assumed to be married upon eligibility for retirement is now 75% for males and 30% for females.
- Future increases to Medicare Part B premium: For the Management Plan, Updated projections anticipate 6% near-term increases, grading down to 4%.
- Interest rate: The valuation interest assumption has been reduced from 7.50% to 7.25%.
- Salary increases: The assumed rate of annual compensation increases over each participant's career has been reduced from 4.5% to 4.0%.

Sensitivity of the Net Pension Liability to Changes in Discount Rate. The following presents the net pension liability (asset) of the Authority, calculated using the discount rate of 7.00%, as well as what the Authority's net pension liability (asset) would be if it were calculated using a discount rate that is 1% lower (6.00%) or 1% higher (8.00%) than the current rate:

	1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
Management	$ 12,532,404	$ 5,098,024	$ (1,152,017)
Union	20,475,194	2,168,898	(13,193,860)
	$ 33,007,598	$ 7,266,922	$ (14,345,877)

Pension Expense and Deferred Inflows/Outflows of Resources Related to Pensions. For the years ended December 31, 2020 and 2019, the Authority recognized pension expense of $9,130,301 and $9,806,249, respectively. At December 31, 2020 and 2019, the Authority reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	2020	
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 1,240,099	$ 3,320,659
Changes of assumptions	8,203,646	-
Net difference between projected and actual earnings on pension plan investments	11,476,545	21,812,713
Contributions made subsequent to the measurement date	6,661,244	-
	$ 27,581,534	$ 25,133,372

	2019	
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 1,737,610	$ 1,441,696
Changes of assumptions	10,475,080	-
Net difference between projected and actual earnings on pension plan investments	17,835,196	7,899,540
Contributions made subsequent to the measurement date	5,628,395	-
	$ 35,676,281	$ 9,341,236

Deferred outflows of resources related to Authority pension contributions subsequent to the measurement date of $6,661,244 and $5,628,395 will be recognized as a reduction of the net pension liability in the years ending December 31, 2020 and 2019, respectively. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as follows:

Year Ending December 31,	Deferred Outflows	Deferred Inflows
2021	$ 6,449,164	$ 7,361,788
2022	5,946,305	7,328,079
2023	5,554,695	4,672,418
2024	1,371,524	4,656,322
2025	953,988	491,847
2026	644,614	441,570
2027	-	181,348
	$ 20,920,290	$ 25,133,372

8. Postemployment Benefits Other Than Pensions

General Information About the OPEB Plans. In addition to the pension benefits described in Note 7, the Authority provides certain post-retirement healthcare benefits to management and union retirees until age 65, which is a defined benefit, single-employer plan administered by the Authority. No assets are accumulated in a trust that meets the criteria of paragraph 4 of GASB Statement 75. This plan does not issue stand-alone Financial Statements.

In accordance with the Authority's Policy and Procedures Manual for Management Employees, certain healthcare benefits and life insurance are provided to all management employees, and their dependents, who retire on or after attaining age 55 with at least ten years of credited service. These benefits cease when the retiree turns 65.

Additionally, in accordance with the current labor agreement between the Authority and the Utility Workers Union of America AFL-CIO Local 433, certain healthcare benefits are provided to all union employees and their dependents who retire at age 60 through age 65 with 25 years of credited service. In addition to the healthcare benefits, the Authority provides full hospitalization for retirees and their dependents between the ages of 62 and 65 with 15 to 24 years of credited service and 25% of the life insurance coverage that was provided while employed with the Authority will be carried into retirement.

In addition to these post-retirement healthcare benefits, the Authority also provides to both management and union retirees, the Vision Program, the Prescription Drug Program, and the Dental Program. For these programs, however, the retiree shall be responsible to pay the entire prevailing premium being paid by the Authority for its employees. Usually, these premiums are taken directly out of the retirees' pension payments.

Employees Covered by Benefit Terms. As of the most recent actuarial valuations, the following employees were covered by the benefit terms:

Active employees	413
Retired employees with health coverage	15
Retired employees with life insurance only	141
Total active and inactive employees	569

Actuarial Assumptions. The methods and assumptions are as follows:

- Discount rate, using Fidelity Fixed Income Market Data for Municipal GO AA Yield Curve at 20 years: 2.75%
- Actuarial cost method: Individual Entry Age Normal Level Percent of Pay
- Salary increase: 4.0% annually

Mortality rate – Base mortality tables are applied to participant categories as follows:

- Active participants and terminated participants with deferred benefits: PubG-2010(A) Employee Table
- Non-disabled participants in payment status: PubG-2010(A) Retiree Table
- Disabled participants: PubNS-2010 Disabled Retiree Table
- Surviving beneficiaries: Pub-2010(A) Contingent Survivor Table

For the January 1, 2020 valuation, fully-generational mortality improvement for all participant categories is projected under Scale MP-2019. For the January 1, 2019 valuation, fully-generational mortality improvement for all participant categories was projected under Scale MP-2018. The MP scale is updated annually by the Society of Actuaries. Annual updates to the MP scale will be applied to each future actuarial valuation. The MP scale update is treated as an actuarial experience gain or loss, rather than as an assumption change.

- Short- and long-term medical and prescription drug trend assumptions used to project healthcare costs and drug coverage premiums were revised. The short-term trend was revised to consider more recent data. The long term trend, beginning in 2028, was revised using an updated Society of Actuaries (SOA) Long Term Healthcare Cost Trends Model.

- Historical trend rates, which are needed for normal cost allocation under Entry Age method:

Year	Medical Trend	Drug Trend	Year	Medical and Drug Trend
2018	6.75%	10.50%	1995	5.30%
2017	5.70%	5.20%	1990	8.80%
2016	7.10%	8.10%	1985	8.70%
2015	6.80%	11.10%	1980	10.80%
2010	7.60%	6.40%	1975	15.80%
2005	10.40%	10.50%	1970	13.40%
2000	10.90%	10.90%	1965	11.10%

The Retirement assumption was selected based upon a study of plan experience for the period 2003 to 2013. The Turnover assumption was selected based upon a study of plan experience for the period 2007 to 2013.

Changes in Actuarial Assumptions. The assumed discount rate of 3.71% as of the beginning of the measurement period was changed to 2.75% as of the end of the measurement period.

Changes in the Total OPEB Liability. The changes in the total OPEB liability of the Authority for the year ended December 31, 2020 were as follows:

	OPEB Liability
Balance at December 31, 2019	$ 12,087,137
Changes for the year:	
Service cost	880,548
Interest	533,331
Differences between expected and actual experience	(1,636,646)
Changes of benefit terms	1,669,049
Changes of assumptions	891,029
Benefits paid	(522,480)
Balances at December 31, 2020	$ 13,901,968

Sensitivity of the Total OPEB Liability to Changes in the Discount Rate. The following represents the total OPEB liability calculated using the stated discount rate, as well as what the total OPEB liability would be if it was calculated using a discount rate that is one-percentage-point lower or one-percentage-point higher than the current rate:

1% Decrease (1.75%)	Current Discount Rate (2.75%)	1% Increase (3.75%)
$ 14,928,523	$ 13,901,968	$ 12,975,620

Sensitivity of the Total OPEB Liability to Changes in the Medical Trend Rate. The following presents the total OPEB liability calculated using the stated medical trend assumption, as well as what the total OPEB liability would be if it was calculated using a medical trend rate that is one-percentage-point lower or one-percentage-point higher than the current rate:

	1% Decrease	Current	1% Increase
Initial rate	5.25%	6.25%	7.25%
Ultimate rate	3.00%	4.00%	5.00%
	$ 12,807,696	$ 13,901,968	$ 15,180,480

OPEB Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEBs. For the year ended December 31, 2020, the Authority recognized OPEB expense of $2,845,386. Cash payments into the plan are included in fringe benefits on the statement of revenues, expenses, and changes in net position and any remaining excess (deficiency) is reported as OPEB expense, net.

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ -	$ 2,937,220
Changes in assumptions or other inputs	1,108,049	232,529
Subtotal, to be recognized in future OPEB expense	1,108,049	3,169,749
Employer payments for OPEB subsequent to 12/31/2019 measurement date and before 12/31/2020 fiscal year-end (expected claims)	650,284	-
Total	$ 1,758,333	$ 3,169,749

The deferred inflows and outflows related to OPEBs at December 31, 2020, will be recognized in OPEB expense as follows:

Year Ending December 31	Deferred Outflows	Deferred Inflows
2021	$ 133,779	$ 371,321
2022	133,779	371,321
2023	133,779	371,321
2024	133,779	371,321
2025	133,779	371,321
Thereafter	439,154	1,313,144
	$ 1,108,049	$ 3,169,749

9. Contingencies

The Authority is exposed to various risks of loss related to torts; alleged negligence; acts of discrimination; breach of contract; disagreements arising from the interpretation of laws or regulations; theft of, damage to and destruction of assets; errors and omissions; injuries to employees and natural disasters, for which the Authority carries commercial insurance. While some of these claims may be for substantial amounts, they are not unusual in the ordinary course of providing collection, transportation and treatment of wastewater services for applicable municipalities. The Authority does not participate in any public entity risk pool, and does not retain risk related to any aforementioned exposure except for those amounts incurred relative to policy deductibles, which are not significant. Additionally, the Authority has not significantly reduced any of its insurance coverage from the prior years. Settled claims have not exceeded the Authority’s commercial coverage in any of the past three years. Except as noted below, the Authority’s management does not expect that the resolution of any outstanding claims and litigation will have a material adverse effect on the accompanying financial statements.

10. Environmental Permit Requirements

The Environmental Protection Agency’s (EPA) CSO control policy is a national framework for controlling Combined Sewer Overflows through the NPDES permitting program. The policy provides guidance on how communities such as the Authority and its 83 customers with Combined Sewer Overflows can achieve Clean Water Act (CWA) goals in a flexible, cost-effective manner. The CSO Policy identifies the plan as a Long Term Wet Weather Control

Plan, the name is shortened as Wet Weather Plan (WWP) to include both Combined Sewer Overflows and Sanitary Sewer Overflows.

The Authority initially submitted a WWP to the US EPA, PA DEP, and ACHD (Agencies) on January 29, 2013 pursuant to the terms of a Consent Decree that was entered by the Court in January 2008. The WWP contained a Selected Plan that the Authority identified as capable of achieving compliance with the Clean Water Act, but costs prohibitive for its rate payers. The WWP also contained three alternatives, each with costs exceeding $2 billion. Following the January 2013 WWP submission, the Agencies worked cooperatively with the Authority in modifying the Consent Decree to allow the Authority to develop a revised WWP that would establish a path forward designed to reduce Combined Sewer Overflows discharges and eliminate Sanitary Sewer Overflows, in accordance with the requirements of the Clean Water Act, while keeping the cost of controls affordable for the Authority's rate payers. As a result of these discussions, the Authority submitted a revised WWP to the Agencies on January 9, 2019, portions of which were modified and resubmitted with the title "Clean Water Plan" (CWP). The Agencies conditionally approved portions of the CWP on September 26, 2019, which only become effective upon entry by the Court of a Modified Consent Decree.

On October 2, 2019, the Modified Consent Decree was published in the Federal Register for a sixty (60) day public comment period. On May 12, 2020, the Modified Consent Decree was entered into Court and replaced the original Consent Decree entered in January 2008. The modified Consent Decree afforded a longer timetable, through the year 2036 and allows the Authority and our customer municipalities to use the best of evolving technology to meet the terms of the Modified Consent Decree.

On February 6, 2020, the NPDES permit administrated by PA DEP with EPA oversight was amended for construction of the treatment plant expansion from 250 MGD to 295 MGD with a 305 MGD CSO wet weather bypass.

The CWP, as approved in the modified Consent Decree, includes provisions for significant capital improvements to the Authority's conveyance and treatment system, to capture and treat a defined flow from its customer municipalities, and to demonstrate compliance with applicable receiving stream water quality standards. These conveyance system improvements include deep regional conveyance and storage tunnels with associated structures and consolidated sewers. The final design for the tunnels is just beginning, along with obtaining the required permits for construction and acquiring land for tunnel launching and retrieval areas.

11. Clean Water Assistance Fund

In January 2017, the Authority created the Clean Water Assistance Fund to help families pay their sewage treatment bills. This program serves low-income residential customers in the 83 municipalities that the Authority serves. It is administered by Dollar Energy. The Authority initially contributed approximately $1 million to establish this fund and contributed approximately $815,000 in additional funding in 2020. During 2020 and 2019, the fund paid approximately $310,000 and $180,000, respectively to approved applicants. To date, the Clean Water Assistance Fund has helped over 3,300 customers.

12. Green Revitalization of Our Waterways

The Authority created the Green Revitalization of Our Waterways (GROW) program in June 2017. The GROW program allows for any municipality or municipal sewer authority within the Authority's service area to apply for grants that may be used to install green storm water reduction technology, remove streams from the sewer system, reduce the amount of water seeping in through groundwater, or to separate out storm sewers. As part of the grant agreement, awardees are required to operate and maintain the project for at least 20 years. As of December 31, 2020, 133 grants have been approved. Payments made as of the end of 2020 total $7,412,847, of which $4,812,860 is included in depreciable assets and the remainder is included in construction in progress. As of December 31, 2020, the Authority has committed to $35,733,440 in grants that will be drawn upon in future years.

13. COVID-19

In early 2020, an outbreak of a novel strain of coronavirus was identified, and infections have been found in a number of countries around the world, including the United States. The coronavirus and its associated impacts on supply chains, travel, employee productivity, and other economic activities has had, and may continue to have, a material effect on financial markets and economic activity. The extent of the impact of the coronavirus on the Authority's operational and financial performance is currently uncertain and cannot be predicted.

ALLEGHENY COUNTY SANITARY AUTHORITY

NOTES TO FINANCIAL STATEMENTS

YEARS ENDED DECEMBER 31, 2020 AND 2019

14. Total Debt Service Schedule

	Series of 2013	Series of 2015	Series of 2016	Series of 2018	Series of 2020	Combined Debt Service	Annual Debt Service
June 1, 2021	$ 1,612,056	$ 5,341,638	$ 2,097,100	$ 3,524,478	$ 2,980,031	$ 15,555,303	
December 1, 2021	1,612,056	34,126,638	2,097,100	3,524,478	2,980,031	44,340,303	$ 59,895,606
June 1, 2022	1,612,056	4,624,813	2,097,100	3,524,478	4,025,031	15,883,478	
December 1, 2022	1,612,056	34,834,813	2,097,100	3,524,478	2,964,356	45,032,803	60,916,281
June 1, 2023	1,612,056	3,872,813	2,097,100	3,524,478	4,074,356	15,180,803	
December 1, 2023	1,612,056	35,592,813	2,097,100	3,524,478	2,947,706	45,774,153	60,954,956
June 1, 2024	1,612,056	3,090,213	2,097,100	3,769,478	7,247,706	17,816,553	
December 1, 2024	7,112,056	17,820,213	8,812,100	3,518,353	2,861,706	40,124,428	57,940,981
June 1, 2025	1,489,894	2,735,150	1,929,225	3,958,353	7,301,706	17,414,328	
December 1, 2025	8,989,894	12,540,150	10,719,225	3,507,353	2,772,906	38,529,528	55,943,856
June 1, 2026	1,312,019	2,509,203	1,709,475	7,317,353	16,547,906	29,395,956	
December 1, 2026	8,812,019	4,649,203	1,854,475	3,412,103	2,428,531	21,156,331	50,552,287
June 1, 2027	1,124,519	2,478,441	1,706,575	7,417,103	7,123,531	19,850,169	
December 1, 2027	8,624,519	13,263,441	2,181,575	3,311,978	2,311,156	29,692,669	49,542,838
June 1, 2028	938,519	2,208,816	1,697,075	7,521,978	7,246,156	19,612,544	
December 1, 2028	6,438,519	13,528,816	2,192,075	3,206,728	2,187,781	27,553,919	47,166,463
June 1, 2029	807,319	1,962,666	1,687,175	7,631,728	7,372,781	19,461,669	
December 1, 2029	3,307,319	13,777,666	2,202,175	3,096,103	2,058,156	24,441,419	43,903,088
June 1, 2030	754,819	1,667,291	1,676,875	7,746,103	7,513,156	19,358,244	
December 1, 2030	754,819	14,072,291	2,206,875	2,979,853	1,921,780	21,935,618	41,293,862
June 1, 2031	754,819	1,357,166	1,666,275	7,824,853	5,671,781	17,274,894	
December 1, 2031	754,819	3,952,166	12,651,275	2,901,122	1,828,031	22,087,413	39,362,307
June 1, 2032	754,819	1,313,375	1,446,575	7,951,122	5,768,031	17,233,922	
December 1, 2032	754,819	3,993,375	12,876,575	2,774,872	1,729,531	22,129,172	39,363,094
June 1, 2033	754,819	1,246,375	1,217,975	8,039,872	5,854,531	17,113,572	
December 1, 2033	754,819	4,061,375	13,107,975	2,686,025	1,638,431	22,248,625	39,362,197
June 1, 2034	754,819	1,176,000	980,175	8,151,025	5,918,431	16,980,450	
December 1, 2034	754,819	4,131,000	13,340,175	2,576,725	1,577,631	22,380,350	39,360,800
June 1, 2035	754,819	1,102,125	732,975	8,266,725	5,982,631	16,839,275	
December 1, 2035	754,819	4,207,125	13,587,975	2,462,925	1,513,296	22,526,140	39,365,415
June 1, 2036	754,819	1,024,500	475,875	8,382,925	6,058,297	16,696,416	
December 1, 2036	754,819	4,284,500	13,840,875	2,344,525	1,446,725	22,671,444	39,367,860
June 1, 2037	754,819	943,000	208,575	8,509,525	6,131,725	16,547,644	
December 1, 2037	754,819	4,363,000	14,113,575	2,221,225	1,366,300	22,818,919	39,366,563
June 1, 2038	754,819	857,500	-	8,636,225	17,716,300	27,964,844	
December 1, 2038	754,819	4,447,500	-	2,092,925	1,110,500	8,405,744	36,370,588
June 1, 2039	754,819	767,750	-	8,802,925	17,980,500	28,305,994	
December 1, 2039	754,819	4,537,750	-	1,925,175	846,475	8,064,219	36,370,213
June 1, 2040	754,819	673,500	-	8,980,175	18,256,475	28,664,969	
December 1, 2040	754,819	4,633,500	-	1,748,797	573,900	7,711,016	36,375,985
June 1, 2041	754,819	574,500	-	9,163,800	2,953,900	13,447,019	
December 1, 2041	9,789,819	4,734,500	-	1,563,425	526,300	16,614,044	30,061,063
June 1, 2042	517,650	470,500	-	9,358,425	3,006,300	13,352,875	
December 1, 2042	6,897,650	4,835,500	-	1,368,550	476,700	13,578,400	26,931,275
June 1, 2043	350,175	361,375	-	9,563,550	3,056,700	13,331,800	
December 1, 2043	6,855,175	4,946,375	-	1,163,675	425,100	13,390,325	26,722,125
June 1, 2044	179,419	246,750	-	9,778,675	3,110,100	13,314,944	
December 1, 2044	7,014,419	5,061,750	-	948,300	371,400	13,395,869	26,710,813
June 1, 2045	-	126,375	-	11,228,300	3,166,400	14,521,075	
December 1, 2045	-	5,181,375	-	691,299	315,500	6,188,174	20,709,249
June 1, 2046	-	-	-	11,756,300	3,225,500	14,981,800	
December 1, 2046	-	-	-	470,000	257,300	727,300	15,709,100
June 1, 2047	-	-	-	11,985,000	3,282,300	15,267,300	
December 1, 2047	-	-	-	239,700	196,800	436,500	15,703,800
June 1, 2048	-	-	-	12,224,700	3,346,800	15,571,500	
December 1, 2048	-	-	-	-	133,800	133,800	15,705,300
June 1, 2049	-	-	-	-	3,413,800	3,413,800	
December 1, 2049	-	-	-	-	68,200	68,200	3,482,000
June 1, 2050	-	-	-	-	3,478,200	3,478,200	
December 1, 2050	-	-	-	-	-	-	3,478,200
	$ 109,206,132	$ 304,308,670	$ 155,501,450	$ 288,324,822	$ 240,647,091	$ 1,097,988,165	$ 1,097,988,165

REQUIRED SUPPLEMENTARY INFORMATION

ALLEGHENY COUNTY SANITARY AUTHORITY

SCHEDULE OF CHANGES IN THE NET
PENSION LIABILITY AND RELATED RATIOS - MANAGEMENT

YEARS ENDED DECEMBER 31,

	2020	2019	2018	2017	2016	2015
Total Pension Liability:						
Service cost	$ 1,905,043	$ 1,826,493	$ 1,668,851	$ 1,420,751	$ 1,193,822	$ 1,012,344
Interest	3,919,747	3,650,643	3,420,033	3,135,922	2,864,194	2,597,036
Differences between expected and actual experience	(1,020,214)	832,893	(70,800)	816,498	1,043,646	163,825
Changes of benefit terms	-	-	-	228,011	-	-
Changes of assumptions	-	1,093,916	-	1,342,644	-	1,178,962
Benefit payments, including refunds of member contributions	(2,254,417)	(2,112,745)	(1,807,432)	(1,757,159)	(1,591,493)	(1,495,819)
Net Changes in Total Pension Liability	2,550,159	5,291,200	3,210,652	5,186,667	3,510,169	3,456,348
Total Pension Liability - Beginning	55,312,482	50,021,282	46,810,630	41,623,963	38,113,794	34,657,446
Total Pension Liability - Ending (a)	$ 57,862,641	$ 55,312,482	$ 50,021,282	$ 46,810,630	$ 41,623,963	$ 38,113,794
Plan Fiduciary Net Position:						
Plan member contributions	$ 303,018	$ 276,848	$ 266,378	$ 242,438	$ 215,651	$ 217,014
Employer actuarially recommended contributions	2,376,191	2,516,460	1,916,633	1,795,051	1,642,817	1,647,664
Net investment income	9,556,538	(1,796,686)	5,367,534	2,427,121	(64,985)	3,062,959
Benefit payments, including refunds of member contributions	(2,254,417)	(2,112,745)	(1,807,432)	(1,757,159)	(1,591,493)	(1,495,819)
Net Change in Plan Fiduciary Net Position	9,981,330	(1,116,123)	5,743,113	2,707,451	201,990	3,431,818
Plan Fiduciary Net Position - Beginning	42,783,287	43,899,410	38,156,297	35,448,846	35,246,856	31,815,038
Plan Fiduciary Net Position - Ending (b)	$ 52,764,617	$ 42,783,287	$ 43,899,410	$ 38,156,297	$ 35,448,846	$ 35,246,856
Net Pension Liability (Asset) - Ending (a-b)	$ 5,098,024	$ 12,529,195	$ 6,121,872	$ 8,654,333	$ 6,175,117	$ 2,866,938
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	91.19%	77.35%	87.76%	81.51%	85.16%	92.48%
Covered Payroll	$ 10,732,570	$ 10,179,102	$ 9,342,295	$ 8,594,987	$ 7,340,502	$ 6,455,960
Net Pension Liability as a Percentage of Covered Payroll	47.50%	123.09%	65.53%	100.69%	84.12%	44.41%

ALLEGHENY COUNTY SANITARY AUTHORITY

SCHEDULE OF CHANGES IN THE NET
PENSION LIABILITY AND RELATED RATIOS - UNION

YEARS ENDED DECEMBER 31,

	2020	2019	2018	2017	2016	2015
Total Pension Liability:						
Service cost	$ 3,355,451	$ 3,140,218	$ 2,944,731	$ 2,616,615	$ 2,476,956	$ 2,293,999
Interest	9,538,363	8,965,814	8,525,299	8,080,735	7,634,199	7,030,443
Differences between expected and actual experience	(1,450,770)	(1,116,208)	(238,155)	(179,689)	389,969	(415,816)
Changes of benefit terms	492,165	-	-	603,344	-	-
Changes of assumptions	-	6,285,011	-	3,411,383	-	3,319,486
Benefit payments, including refunds of member contributions	(5,944,707)	(5,526,297)	(5,052,414)	(4,763,085)	(4,509,841)	(4,067,193)
Net Changes in Total Pension Liability	5,990,502	11,748,538	6,179,461	9,769,303	5,991,283	8,160,919
Total Pension Liability - Beginning	136,126,927	124,378,389	118,198,928	108,429,625	102,438,342	94,277,423
Total Pension Liability - Ending (a)	$ 142,117,429	$ 136,126,927	$ 124,378,389	$ 118,198,928	$ 108,429,625	$ 102,438,342
Plan Fiduciary Net Position:						
Plan member contributions	$ 245,136	$ 230,428	$ 219,633	$ 205,330	$ 194,364	$ 179,401
Employer actuarially recommended contributions	3,252,204	3,085,110	3,059,402	3,307,866	3,170,502	3,124,830
Net investment income	22,424,524	(4,901,833)	18,425,789	7,341,987	(1,652,268)	12,699,402
Benefit payments, including refunds of member contributions	(5,944,707)	(5,526,297)	(5,052,414)	(4,763,085)	(4,509,841)	(4,067,193)
Net Change in Plan Fiduciary Net Position	19,977,157	(7,112,592)	16,652,410	6,092,098	(2,797,243)	11,936,440
Plan Fiduciary Net Position - Beginning	119,971,374	127,083,966	110,431,556	104,339,458	107,136,701	95,200,261
Plan Fiduciary Net Position - Ending (b)	$ 139,948,531	$ 119,971,374	$ 127,083,966	$ 110,431,556	$ 104,339,458	$ 107,136,701
Net Pension Liability (Asset) - Ending (a-b)	$ 2,168,898	$ 16,155,553	$ (2,705,577)	$ 7,767,372	$ 4,090,167	$ (4,698,359)
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	98.47%	88.13%	102.18%	93.43%	96.23%	104.59%
Covered Payroll	$ 21,089,748	$ 20,346,885	$ 19,156,669	$ 18,107,692	$ 17,147,336	$ 16,613,080
Net Pension Liability (Asset) as a Percentage of Covered Payroll	10.28%	79.40%	-14.12%	42.90%	23.85%	-28.28%

ALLEGHENY COUNTY SANITARY AUTHORITY

SCHEDULE OF AUTHORITY'S CONTRIBUTIONS

YEARS ENDED DECEMBER 31,

	2020	2019	2018	2017	2016
Actuarially determined contribution:					
Management	$ 2,822,303	$ 2,376,191	$ 2,516,461	$ 1,916,633	$ 1,795,051
Union	3,838,941	3,252,204	3,085,109	3,059,402	3,307,866
	6,661,244	5,628,395	5,601,570	4,976,035	5,102,917
Contributions in relation to the actuarially determined contribution:					
Management	2,822,303	2,376,191	2,516,461	1,916,633	1,795,051
Union	3,838,941	3,252,204	3,085,109	3,059,402	3,307,866
	6,661,244	5,628,395	5,601,570	4,976,035	5,102,917
Contribution deficiency (excess)	$ -	$ -	$ -	$ -	$ -
Covered payroll:					
Management	$ 10,923,002	$ 10,732,570	$ 10,179,102	$ 9,342,295	$ 8,594,987
Union	22,793,758	21,089,748	20,346,885	19,156,669	18,107,692
	$ 33,716,760	$ 31,822,318	$ 30,525,987	$ 28,498,964	$ 26,702,679
Contributions as a percentage of covered payroll	19.76%	17.69%	18.35%	17.46%	19.11%

	2015	2014	2013	2012	2011
Actuarially determined contribution:					
Management	$ 1,642,817	$ 1,647,664	$ 1,606,029	$ 1,529,224	$ 1,358,351
Union	3,170,502	3,124,830	2,260,312	2,199,113	1,804,689
	4,813,319	4,772,494	3,866,341	3,728,337	3,163,040
Contributions in relation to the actuarially determined contribution:					
Management	1,642,817	1,647,664	1,606,104	1,529,224	1,358,400
Union	3,170,502	3,124,830	2,260,313	2,199,952	1,804,700
	4,813,319	4,772,494	3,866,417	3,729,176	3,163,100
Contribution deficiency (excess)	$ -	$ -	$ (76)	$ (839)	$ (60)
Covered payroll:					
Management	$ 7,340,502	$ 6,455,960	$ 7,066,389	$ 6,957,730	$ 6,554,237
Union	17,147,336	16,613,080	16,193,768	15,871,099	15,750,647
	$ 24,487,838	$ 23,069,040	$ 23,260,157	$ 22,828,829	$ 22,304,884
Contributions as a percentage of covered payroll	19.66%	20.69%	16.62%	16.33%	14.18%

Valuation date: Actuarial calculations are performed each year as of January 1. Contributions noted above are as of each pension plan's calendar year ending December 31 using actuarially determined contribution rates calculated as of January 1, one year prior to the end of the calendar year in which contributions are reported.

Methods and assumptions used to determine the contribution rates:

Actuarial cost method	Entry Age Normal - Union Plan		
	Entry Age Normal - Management Plan		
Amortization method	Level-dollar monthly payments - Union Plan		
	Level-dollar monthly payments - Management Plan		
Remaining amortization period	17 years	Union Plan	
	15 years	Management Plan	
Asset valuation method	Smoothed market value (without phase-in) - Union Plan		
	Smoothed market value (with phase-in) - Management Plan		

Years ended December 31,	2020	2019	
Inflation	2.30%	2.30%	Union Plan
	2.30%	2.30%	Management Plan
Salary increases	4.00%	4.00%	Union Plan
	4.00%	4.00%	Management Plan
Investment rate of return (gross return assumption)	7.25%	7.25%	Union Plan
	7.25%	7.25%	Management Plan

Mortality - Union Plan

Base mortality tables are applied to participant categories as follows:

- Active participants and terminated participants with deferred benefits: PubG-2010(A) Employee Table
- Non-disabled participants in payment status: PubG-2010(A) Retiree Table
- Disabled participants: PubNS-2010 Disabled Retiree Table
- Surviving beneficiaries: Pub-2010(A) Contingent Survivor Table

For the January 1, 2020 valuation, fully-generational mortality improvement for all participant categories is projected under Scale MP-2019. For the January 1, 2019 valuation, fully-generational mortality improvement for all participant categories was projected under Scale MP-2018. The MP scale is updated annually by the Society of Actuaries. Annual updates to the MP scale will be applied to each future actuarial valuation. The MP scale update is treated as an actuarial experience gain or loss, rather than as an assumption change.

Mortality - Management Plan

Base mortality tables are applied to participant categories as follows:

- Active participants and terminated participants with deferred benefits: PubG-2010(A) Employee Table
- Non-disabled participants in payment status: PubG-2010(A) Retiree Table
- Disabled participants: PubNS-2010 Disabled Retiree Table
- Surviving beneficiaries: Pub-2010(A) Contingent Survivor Table

For the January 1, 2020 valuation, fully-generational mortality improvement for all participant categories is projected under Scale MP-2019. For the January 1, 2019 valuation, fully-generational mortality improvement for all participant categories was projected under Scale MP-2018. The MP scale is updated annually by the Society of Actuaries. Annual updates to the MP scale will be applied to each future actuarial valuation. The MP scale update is treated as an actuarial experience gain or loss, rather than as an assumption change.

Note: the mortality improvement assumptions were updated as of the December 31, 2006, 2010, 2012, 2014, 2015, 2016, 2019, 2020 valuations.

ALLEGHENY COUNTY SANITARY AUTHORITY

SCHEDULE OF CHANGES IN THE TOTAL OPEB LIABILITY AND RELATED RATIOS

YEAR ENDED DECEMBER 31,
LAST TEN YEARS*

	2020	2019
Total OPEB Liability:		
Service cost	$ 880,548	$ 976,634
Interest	533,331	463,583
Differences between expected and actual experience	(1,636,646)	(1,823,758)
Changes of benefit terms	1,669,049	-
Changes of assumptions	891,029	(289,943)
Benefit payments, including refunds of member contributions	(522,480)	(536,537)
Net Changes in Total OPEB Liability	1,814,831	(1,210,021)
Total OPEB Liability - Beginning	12,087,137	13,297,158
Total OPEB Liability - Ending (a)	$ 13,901,968	$ 12,087,137
Covered Payroll	$ 31,822,318	$ 30,525,987
Net OPEB Liability as a Percentage of Covered Payroll	43.69%	39.60%

* Until a full 10-year trend is compiled, the required information for the Plan is presented for as many years as are available.

SUPPLEMENTARY INFORMATION

ALLEGHENY COUNTY SANITARY AUTHORITY

SCHEDULE OF INVESTMENTS AND OTHER ASSETS

YEAR ENDED DECEMBER 31, 2020

	Cash and Cash Equivalents	Investments	Accrued Interest Receivable	Total
Current Account:				
Revenue Fund	$ 209,431,473	$ -	$ -	$ 209,431,473
Special Accounts:				
Capital Facilities Fund	81,936,033	-	-	81,936,033
Construction Fund 2015	-	-	-	-
Construction Fund 2018	120,873,880	-	-	120,873,880
Construction Fund 2020	69,999,530	-	-	69,999,530
	272,809,443	-	-	272,809,443
Debt Service Accounts:				
Debt Service Fund	5,919	-	-	5,919
Total	$ 482,246,835	$ -	$ -	$ 482,246,835

ALLEGHENY COUNTY SANITARY AUTHORITY

SCHEDULE OF INVESTMENTS AND OTHER ASSETS

YEAR ENDED DECEMBER 31, 2019

	Cash and Cash Equivalents	Investments	Accrued Interest Receivable	Total
Current Account:				
Revenue Fund	$ 175,476,686	$ -	$ -	$ 175,476,686
Special Accounts:				
Capital Facilities Fund	78,136,787	-	-	78,136,787
Construction Fund 2015	-	-	-	-
Construction Fund 2018	71,998,915	84,963,478	375,444	157,337,837
	150,135,702	84,963,478	375,444	235,474,624
Debt Service Accounts:				
Debt Service Fund	15,202	-	-	15,202
Total	$ 325,627,590	$ 84,963,478	$ 375,444	$ 410,966,512