

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PENNSYLVANIA-AMERICAN WATER COMPANY

Docket No. A-2017-2606103

**DIRECT TESTIMONY OF
Adrienne M. Vicari, P.E.,
UTILITY VALUATION EXPERT SELECTED BY
The Municipal Authority of the City of McKeesport**

Date: July 17, 2017

Adrienne M. Vicari, P.E. Statement No. 1

**DIRECT TESTIMONY OF
Adrienne M. Vicari, P.E.**

INTRODUCTION

1

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS FOR THE RECORD.**

3 A. Adrienne M. Vicari
4 369 East Park Drive
5 Harrisburg, PA 17111

6

7 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

8 A. My employer is Herbert, Rowland & Grubic, Inc. (HRG). I manage the Financial
9 Services Group in the capacity of Financial Services Practice Area Leader.

10

11 **Q. WHAT ARE YOUR RESPONSIBILITIES AS THE FINANCIAL SERVICES
12 PRACTICE AREA LEADER OF HRG?**

13 A. As the Financial Services Practice Area Leader I oversee the operations of the Financial
14 Services Group that include client development, assigning projects, reviewing work of
15 others, providing guidance and direction on projects, active participation in preparation of
16 work products, client contact and presentations to management.

17

18 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS
19 EXPERIENCE.**

20 A. I received a B.S. in Civil Engineering from Valparaiso University. I am a Professional
21 Engineer holding licenses in the Commonwealth of Pennsylvania and the State of Ohio.

1 My experience includes preparation of rate studies, tapping fee studies, wholesale user
2 charges and feasibility studies for water, wastewater and storm water systems. In
3 addition, I assist clients with developing long-term solutions to address budget shortfalls,
4 including analysis of financial transactions such as formulating financial plans for
5 stormwater utilities, to address the needs of communities.

6

7 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PENNSYLVANIA**
8 **PUBLIC UTILITY COMMISSION (“COMMISSION”)?**

9 A. No.

10

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

12 A. I am testifying in support of the Fair Market Valuation of the Municipal Authority of the
13 City of McKeesport (MACM) Sanitary Sewer System (SSS) as of December 31, 2016.

14

15 **QUALIFICATION AS UTILITY VALUATION EXPERT**

16 **Q. IS HRG ON THE COMMISSION’S REGISTRY OF UTILITY VALUATION**
17 **EXPERTS?**

18 A. Yes.

19

20 **Q. PLEASE DESCRIBE THE PROCESS BY WHICH HRG WAS PLACED ON THE**
21 **COMMISSION’S REGISTRY OF UTILITY VALUATION EXPERTS.**

22 A. HRG filed an application and supporting documents as required to register as a Utility
23 Valuation Expert (UVE) to the Secretary of the Pennsylvania Public Utility Commission

1 on October 4, 2016. Copies of the application and supporting documents were also sent
2 to the Office of Consumer Advocate and Office of Small Business Advocate.

3
4 **Q. PLEASE EXPLAIN YOUR PERSONAL QUALIFICATIONS TO ACT AS A UVE**
5 **IN THIS PROCEEDING.**

6 A. I have completed a variety of valuation studies for various water and wastewater clients
7 in Pennsylvania. Please see my resume attached as MACM Exhibit AMV No. I.

8
9 **Q. HAVE YOU EVER HAD YOUR PROFESSIONAL CREDENTIALS REVOKED**
10 **OR SUSPENDED?**

11 A. No.

12
13 **Q. DO YOU HAVE SPECIFIC EXPERIENCE WITH THE VALUATION AND**
14 **APPRAISAL OF UTILITY ASSETS?**

15 A. Yes. Please see my attached resume that lists clients where I have completed a variety of
16 valuation studies.

17
18 **Q. HAVE YOU OR OTHER HRG EMPLOYEES DERIVED ANY MATERIAL**
19 **FINANCIAL BENEFIT FROM THE SALE OF THE MACM SSS ASSETS**
20 **OTHER THAN FEES FOR YOUR SERVICES RENDERED?**

21 A. No.

22

1 Q. ARE YOU OR ANYONE FROM HRG AN IMMEDIATE FAMILY MEMBER OF
2 A DIRECTOR, OFFICER, OR EMPLOYEE OF EITHER PENNSYLVANIA
3 AMERICAN WATER COMPANY OR THE MACM?

4 A. No.

5

6 Q. IS HRG IN COMPLIANCE WITH APPLICABLE PENNSYLVANIA LAWS?

7 A. Yes.

8

9 Q. DOES HRG HAVE THE FINANCIAL AND TECHNICAL FITNESS,
10 INCLUDING PROFESSIONAL LICENSES AND TECHNICAL
11 CERTIFICATIONS, TO PERFORM A FAIR MARKET VALUATION OF THE
12 ASSETS OF THE MACM?

13 A. Yes, as indicated by my resume and HRG's application to be registered as a UVE.

14

15 Q. ARE YOU AWARE OF ANY FACT, INCLUDING BUT NOT LIMITED TO ANY
16 POTENTIAL CONFLICT OF INTEREST THAT WOULD CAST DOUBT UPON
17 YOUR ABILITY TO PROVIDE A THOROUGH, OBJECTIVE, UNBIASED, AND
18 FAIR VALUATION IN THIS PROCEEDING?

19 A. No.

20

21 **FEES PAID FOR UTILITY VALUATION EXPERT SERVICES**

22 Q. HOW IS HRG BEING COMPENSATED FOR ITS SERVICES IN THIS
23 MATTER?

1 A. HRG submitted a proposal to the MACM outlining our Scope of Services and
2 compensation that was based on our Financial Services Group hourly rates.

3

4 **Q. WHAT IS THE ESTIMATED TOTAL COMPENSATION THAT HRG WILL**
5 **RECEIVE FOR ITS SERVICES IN THIS MATTER?**

6 A. \$48,000.

7

8 **Q. PLEASE DESCRIBE THE PROCESS BY WHICH THIS COMPENSATION WAS**
9 **NEGOTIATED?**

10 A. The fee was set forth in our proposal and was accepted by the MACM.

11

12 **Q. ARE THESE FEES CONSISTENT WITH COMPENSATION RECEIVED FOR**
13 **SIMILAR SERVICES PROVIDED TO OTHER CLIENTS?**

14 A. Yes. Our fee was developed by estimating the amount of time it would take HRG to
15 complete the work and was priced at our Financial Services Group hourly rates as to
16 estimate the fee.

17

18 **FAIR MARKET VALUATION OF THE MACM SANITARY SEWER SYSTEM**

19 **Q. DO YOU RECOGNIZE APPENDIX A-5 (HRG REPORT) TO THE**
20 **APPLICATION IN THIS PROCEEDING?**

21 A. Yes.

22

23 **Q. HOW DO YOU RECOGNIZE IT?**

1 A. The Fair Market Valuation as of December 31, 2016 was prepared by staff of the
2 Financial Services Group under my direction.

3

4 **Q. IS the HRG REPORT A TRUE AND ACCURATE COPY OF YOUR**
5 **VALUATION REPORT?**

6 A. Yes.

7

8 **Q. PLEASE DESCRIBE THE PROCESS BY WHICH YOU PREPARED THE**
9 **VALUATION REPORT.**

10 A. The valuation report was based on the requirements of Section 1329 of the Pennsylvania
11 Public Utility Code that became effective June 13, 2016 and the Final Implementation
12 Order of the Commission at Docket M-2016-2543193 adopted October 27, 2016. The
13 valuation used three approaches: cost, market and income as indicators of fair market
14 value. Since no single approach can be considered superior and each approach has
15 limitations, an average of the three approaches weighted equally was used to develop the
16 fair market value of the MACM SSS. A more detailed explanation is presented in the
17 valuation report.

18

19 **Q. IS THERE ANYTHING THAT YOU WOULD CHANGE IN THE VALUATION**
20 **REPORT SINCE ITS PREPARATION?**

21 A. Yes, during the course of informal discovery by OCA and the parties, we attempted to
22 verify the average age of the collection system assets and discovered that it was
23 understated. This has had the effect of reducing our Net Depreciated Original Cost which

1 in turn reduces our Average Fair Appraisal Value for the system from \$207,010,000 to
2 \$190,840,000.

3 Explanation of Augmentation of HRG UVE Report and Revised Fair Market Value

4 During recent informal discovery by OCA and the parties, HRG was asked to review its
5 Accumulated Depreciation accrual with respect the calculation of Reproduction Cost of
6 the Collection System gravity pipelines, NARUC account 361. In particular, HRG was
7 asked for information and calculations supporting its use of a 20% depreciation accrual as
8 of December 31, 2016 and to confirm our use of a 50 year life of these assets. This
9 request necessitated a review of the source of our information and a reconsideration of
10 the values included in our report.

11 The initial source of information on the collection system was contained in an appraisal
12 report prepared by Industrial Appraisal dated December 31, 2016. The report indicated
13 an acquisition date for the collection system of 2008 and a 50 year life. Accordingly, we
14 assumed a 42 year remaining service life. However, when we received on April 4, 2017
15 the Asset Listing prepared by KLH Engineers, Inc. the year of acquisition for the gravity
16 sewer mains pre-dated 2008. Many of the mains in service were acquired in 1959-1960.
17 HRG was not aware of the dates of acquisition until our recent review and they were not
18 reflected in the HRG Report.

19 Based on our review of this information, we have calculated the appropriate value for
20 gravity sewers as of December 31, 2016 based on their year of acquisition. We have now
21 determined that the accumulated depreciation represent 51% of the reproduction cost of
22 the gravity mains. This included a reevaluation of the service lives of these assets in light
23 of their condition and continuing to provide service over the next 42 years as originally

1 anticipated. This has resulted in a change to our estimated service life from 50 to 85
2 years.

3 Finally, as the result of our reexamination of the Reproduction Cost of the gravity mains,
4 HRG reassessed the unit costs by size of line. Initially, values taken from Industrial
5 Appraisal Report included engineering fees at 15% of the reproduction cost. We have
6 since eliminated any values included in the Industrial Appraisal report and have relied
7 solely on current unit costs as obtained from recent construction bids in western
8 Pennsylvania. However, these unit prices did not include the project overheads
9 associated with the construction of these facilities. HRG's experience suggests that these
10 project overheads represent 20% of the cost of the facilities and account for engineering,
11 construction observation, legal, and financing fees typically capitalized as a project costs.
12 We have reflected these costs in our reproduction cost values.

13 The impact of these adjustments are reflected on the attached Exhibits as follows:

14 HRG's Updated Valuation Appraisal- MACM Exhibit AMV-II

15 Schedule C – Reproduction Cost- MACM Exhibit AMV-III

16 Schedule D – Reproduction Cost of Collection System Assets by Area 12/31/2016-
17 MACM Exhibit AMV-IV, and

18 Schedules E, F, G, H - Detailed Reproduction Cost of Sewer Mains, Manholes, and
19 Other Sewer System Structures for McKeesport, Duquesne, Dravosburg, and Port Vue-
20 MACM Exhibit AMV-V.

1 Q. WAS THE FAIR MARKET VALUATION OF THE MACM SSS ASSETS
2 DETERMINED IN COMPLIANCE WITH THE UNIFORM STANDARDS OF
3 PROFESSIONAL APPRAISAL PRACTICE (USPAP)?

4 A. Yes. The USPAP calls for the cost, market and income approaches to be considered.
5 HRG developed a value for each approach and after consideration, calculated an equal
6 weighting of each approach to determine the fair market value.

7
8 Q. DID YOU EMPLOY THE COST, MARKET AND INCOME APPROACHES IN
9 PREPARING YOUR VALUATION?

10 A. Yes, as presented in the HRG Report, and attached schedules and as augmented by this
11 testimony.

12
13 Q. DID YOU RELY UPON A LICENSED ENGINEER'S ASSESSMENT OF THE
14 TANGIBLE ASSETS OF THE MACM SSS IN PERFORMING YOUR
15 VALUATION?

16 A. Yes. KLH Engineers, Inc. (KLH) prepared an Assessment of Tangible Assets of the
17 Municipal Authority of the City of McKeesport dated April 2017. KLH is an engineering
18 firm. The assessment was signed by John C. Mowry, P.E., Vice President.

19
20 Q. DID THE LICENSED ENGINEER'S ASSESSMENT INCLUDE AN INVENTORY
21 OF THE USED AND USEFUL UTILITY PLANT ASSETS TO BE
22 TRANSFERRED COMPILED BY YEAR AND ACCOUNT?

23 A. Yes.

1

2 Q. DID THE LICENSED ENGINEER'S ASSESSMENT IDENTIFY SEPARATELY
3 ANY UTILITY PLANT THAT IS BEING HELD FOR FUTURE USE?

4 A. No listing of utility plant held for future use was included.

5

6 Q. DID THE LICENSED ENGINEER'S ASSESSMENT LIST ALL NON-
7 DEPRECIABLE PROPERTY SUCH AS LAND AND RIGHTS-OF-WAY?

8 A. Yes. As part of the Inventory of Assets, KLH included a list of non-depreciable property
9 including Land and Land Rights.

10

11 Q. TO THE BEST OF YOUR KNOWLEDGE, WAS THE LICENSED ENGINEER'S
12 INVENTORY DEVELOPED FROM AVAILABLE RECORDS, MAPS, WORK
13 ORDERS, DEBT ISSUE CLOSING DOCUMENTS FUNDING CONSTRUCTION
14 PROJECTS, AND OTHER SOURCES TO ENSURE AN ACCURATE LISTING
15 OF UTILITY PLANT INVENTORY BY UTILITY ACCOUNT?

16 A. Yes, as stated in the Overview of the Study section of the KLH Assessment.

17

18 Q. DO YOU HAVE ANY REASON TO DOUBT THE ACCURACY OF THE
19 LICENSED ENGINEER'S INVENTORY OF THE ASSETS?

20 A. No.

21

22 Q. DID YOU INCORPORATE THE LICENSED ENGINEER'S ASSESSMENT INTO
23 YOUR COST APPROACH IN DEVELOPING YOUR VALUATION?

1 A. Yes. The Engineering Assessment provided the foundation for classifying the utility
2 plant by NARUC accounts and the ages of utility plant used to restate costs to a current
3 price level.
4

5 **Q. DID YOU HAVE TO EXERCISE PROFESSIONAL DISCRETION IN**
6 **DEVELOPING ANY ASPECT OF YOUR VALUATION?**

7 A. Yes. The nature of valuation requires experience and informed judgement in such
8 matters.
9

10 **Q. WHAT, IF ANY, FACTORS DID YOU TAKE INTO CONSIDERATION WHEN**
11 **HAVING TO MAKE DISCRETIONARY DECISIONS?**

12 A. Discretionary factors included:

- 13 • Assumptions of the service area growth.
- 14 • Selection of method for restating costs to a current price level.
- 15 • Assumptions for inflation used in projecting expenses, for discount factor to
16 restate future earnings at a present day level and for rate of return to calculate
17 value of return.
- 18 • Selection of applicable service lives to calculate depreciation for valuation
19 purposes.
- 20 • Judgement for pricing collection system mains in the cost approach.
- 21 • Interpretation of Implementation Order for selecting Reproduction Cost as the
22 appropriate cost measure for valuation purposes.
- 23 • Assumptions regarding operations under PAWC's ownership.

1 Q. DO YOU AGREE WITH THE FAIR MARKET APPRAISAL PRESENTED IN
2 THE AUS REPORT?

3 A. While AUS employed the same appraisal approaches of Cost, Market and Income, our
4 techniques varied resulting in a different fair market value.

5

6 Q. CAN YOU PLEASE EXPLAIN?

7 A. Yes, each consultant approaches appraisals from their own perspective, determines their
8 own scope and assumptions in order to arrive at the fair market value which is informed
9 by the various industry accepted approaches they considered. While both HRG and AUS
10 considered Cost, Market and Income approaches as required by Act 12 and Section 1329
11 there is latitude in how these are calculated, analyzed and weighted. This is apparent
12 from a comparison of our two reports.

13 For example, HRG has a higher value based on the Cost Approach. This is because we
14 have considered the Going Concern Value as an addition to the cost since it is not
15 included in the cost of the individual assets. We believe that the value of the assets alone
16 does not reflect the true value of the utility. We feel that AUS should have recognized
17 this and incorporated the concept into their valuation as well. We have also paid a great
18 deal of attention to the value of the collection system values. These are long life assets
19 that are very costly to replace but they are the basis for revenue generation. HRG did
20 specific valuations of these assets.

21 Our Market Value approach is higher as well. We evaluated prior transactions and
22 applied them to the customer base while AUS considered a more investment model using
23 financial market metrics. Financial metrics that rely upon industry averages for price

1 earnings ratio, and market to book values may be more suitable for utilities where there is
2 a history of earnings and reliable book values for utility property. HRG took a simpler
3 approach of identifying utility sales and calculating an average sales price per customer.
4 Similarly, we employed different assumptions with respect to our determination of the
5 Income approach, estimated O&M, and rate increases, but that's not surprising since
6 there is much more uncertainty when attempting to estimate revenues and expenses for a
7 twenty year period.

8
9 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

10 A. Yes. However, I reserve the right to supplement my testimony as additional issues and
11 facts arise during the course of the proceeding

MACM Exhibit AMV No. I
Witness: Adrienne M. Vicari, P.E.

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PENNSYLVANIA-AMERICAN WATER COMPANY

Docket No. A-2017-2606103

Exhibit to Accompany

the

Direct Testimony

of

Adrienne M. Vicari, P.E.

Municipal Authority of McKeesport



ADRIENNE M. VICARI, P.E.
Financial Services Practice Area Leader

Ms. Vicari is the Financial Services Practice Area Leader at Herbert, Rowland & Grubic, Inc. (HRG). She has experience in a broad range of financial, project management, and design engineering services for municipal wastewater, water, and stormwater clients. Ms. Vicari is responsible for developing financing strategies and capital project plans for municipal and private entities. These strategies include both long range financial planning as well as assisting clients with the obtainment of federal, state and local project financing.

As a practice area leader for HRG, Ms. Vicari is responsible for financial services projects, marketing and business development. She provides direct financial services to clients, staff and management personnel and evaluates the financial impacts of proposed engineering projects on capital and operating costs. In addition, Ms. Vicari has designed wastewater collection, conveyance and treatment facilities and CSO utility separation. Ms. Vicari also has experience with feasibility studies, environmental plans and reports, permit applications, and construction administration.

STORMWATER AUTHORITY IMPLEMENTATION

Ms. Vicari is a leading expert in the Commonwealth of Pennsylvania in Stormwater Authority development and implementation. She has experience in performing feasibility studies to determine the benefit and feasibility of implementing stormwater utilities in addition to guiding municipalities through the options of forming a municipal owned utility or municipal authority. Ms. Vicari does not provide a one-size fits all solution to the stormwater needs of our clients. Instead, she has utilized knowledge specific to the community, county, region and state to provide custom fit solutions for the following communities:

- Derry Township Municipal Authority, Derry Township, PA - Project Manager for the implementation of a Stormwater Authority for Derry Township.
- York County Planning Commission, York County, PA - Project Manager for a Stormwater Authority Implementation Study and Regional Stormwater Permitting to benefit 52 municipalities in York County.
- Wyoming Valley Sanitary Authority (Regional Stormwater Authority Feasibility Study to consider the feasibility, benefits and cost savings of implementing a stormwater authority to service up to 35 municipalities in Luzerne County.)
- Clarion Borough Stormwater Authority, Clarion County, PA- Project Manager for the implementation of a Stormwater Authority for Clarion Borough.
- West Goshen Township, West Chester, PA- Project Manager for the implementation of a Stormwater Authority for West Goshen Township.
- Hemlock Farms Community Association, Pike County, PA - Project Engineer for a Stormwater Authority Feasibility Study to consider implementing a stormwater utility to serve the Community Association located in 3 municipalities in Pike County.
- State College Borough, Centre County, PA - Project Manager for a Stormwater Utility Feasibility Study to consider a Borough owned stormwater utility versus a municipal authority for the

EDUCATION:

B.S., Civil Engineering,
Valparaiso University, 2001

LICENSE(S):

Professional Engineer, PA
Professional Engineer, OH

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- implementation of stormwater and pavement management solutions inside the Borough.
- Lower Paxton Township, Dauphin County, PA – Project engineer for a Stormwater Feasibility Study to consider long-term management of the Township's stormwater system through either a Township Department or municipal authority.

UTILITY VALUATION

Limerick Township, Montgomery County, PA - Project Manager serving as the "Utility Valuation Expert" for the Township under Act 12 of 2016. Work included determining the fair annual rental value of the Township's wastewater facilities and providing associated testimony to the Public Utility Commission.

City of McKeesport, Allegheny County, PA - Project Manager serving as the "Utility Valuation Expert" for the City under Act 12 of 2016. Work included determining the fair annual rental value of the City's wastewater facilities for submission to the Public Utility Commission.

City of Altoona, Blair County, PA - Valuation of Altoona Water Authority's water and wastewater systems and determination of a fair annual rental value to be paid by Authority to the City of Altoona.

Reading Area Water Authority, Berks County, PA - Valuation of the system and determination of a fair annual rental value to be paid by Authority to the City of Reading.

West Manheim Township, York County, PA - Valuation of Township wastewater system and Cost Benefit Analysis for possible sale to private or public utility.

New Cumberland Borough, Cumberland County, PA - Valuation and support of acquisition of Borough wastewater system (currently entering into an agreement for sale with PAWC.)

INFRASTRUCTURE BANK DEVELOPMENT

Dauphin County, PA - Project Engineer and Financial Specialist for the development of an expanded infrastructure bank administered by Dauphin County to fund transportation improvement needs of various municipalities or private entities within the county. Developed cash flow scenarios and established funding terms for the lending program.

FINANCIAL CONSULTING SERVICES

Financial consulting services provided to municipal clients include a variety of project and clients specific activities. Among these are project financial plans to determine affordability and user charge impacts; project cash flow projections to determine financing requirements and user charge calculations consistent with the financing terms. For many clients, these services are combined in the preparation of an application for financial assistance to the Pennsylvania Infrastructure Investment Authority (PENNVEST) and the subsequent closing activities.

GRANT ADMINISTRATION AND COMPLIANCE

Commonwealth of Pennsylvania, Office of the Budget, Harrisburg, PA - Project Manager for technical reviews performed on behalf of the Pennsylvania Department of Environmental Protection for projects receiving PENNVEST funding to ensure projects meet federal and state funding requirements associated with solicitation of Disadvantage Business Enterprises.

Dauphin County, PA - Project Manager for technical reviews performed on behalf of the Dauphin County Department of Community and Economic Development to ensure projects receiving Community Development Block Grant (CDBG) funds comply with all federal and state requirements associated with the funding.

PROJECT FINANCING

Ms. Vicari has assisted clients in obtaining capital project funding from various federal, state and local agencies including the Pennsylvania Infrastructure Investment Authority (PENNVEST), United States Department of Agriculture Rural Utility Service (RUS), Pennsylvania Department of Community and Economic Development (DCED), the

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Commonwealth Financing Authority (CFA), along with appropriations from State and Federal budgets. Tasks included guiding clients to appropriate funding opportunities, obtaining legislative support from state and federal officials, promoting projects through the creation and submission of compelling funding application packages, assisting with the preparation and submission of post-award documentation, loan closing requirements and fund disbursement requests. Funds obtained include:

South Creek Township, Gillett, PA - Commonwealth Financing Authority (\$2,951,000 grant obtained), PENNVEST (\$1,175,937 grant obtained), Federal Appropriation through the EPA (\$200,000 grant obtained), State appropriated Safe Water Grant (\$150,000 grant obtained), County Entitlement DCED Community Development Block Grant (CDBG) (\$160,000 grant obtained). Project fully funded through grant dollars.

Port Matilda Borough Authority, Port Matilda, PA - PENNVEST (1,500,000 grant obtained). County Entitlement DCED Community Development Block Grant (CDBG) (\$163,000 in total grants obtained). Project fully funded through grant dollars.

The Harrisburg Authority, Harrisburg, PA - Commonwealth Financing Authority (\$5,520,000 grant obtained), PENNVEST (\$26,000,000, \$5,668,000, and \$1,888,000 loans obtained), USACE Section 22 Technical Assistance

Delaware Township Municipal Authority, Watsonstown, PA - Commonwealth Financing Authority (\$4,000,000 grant obtained), PENNVEST (\$2,338,000 grant and \$8,462,000 loan obtained)

DCO Energy, Blair County, PA - PENNVEST (\$10,000,000 loan obtained)

Alexandria Borough-Porter Township Joint Municipal Authority, Huntingdon County, PA - PENNVEST (\$5,772,230 grant obtained/\$13,822,080 loan obtained)

Woodward Township Sewage & Water Authority, Houtzdale, PA - PENNVEST (\$3,984,365 grant obtained/\$4,165,635 loan obtained)

Berwick Area Joint Sewer Authority, Berwick, PA - PENNVEST (\$2,258,060 grant/ \$2,040,551 loan obtained), Growing Greener II (\$500,000 grant obtained)

Bradford Township, Woodland, PA - PENNVEST (\$751,681 grant/\$1,210,646 loan obtained)

Erie Sewer Authority, Erie, PA - Commonwealth Financing Authority (\$505,360 grant obtained)

Port Matilda Borough, Port Matilda, PA - County Initiative DCED CDBG (\$100,000 grant obtained), state appropriated grant (\$40,000 grant obtained)

Suburban Lock Haven Water Authority, Lock Haven, PA - PENNVEST (\$381,168 grant/\$3,857,832 in loans obtained)

Northern Blair Regional Sewer Authority, Tyrone, PA - Commonwealth Financing Authority (\$1,000,000 grant obtained)

City of Harrisburg, PA - PENNVEST (\$900,000 loan obtained)

Howe Township Municipal Authority, Howe Township, PA - PENNVEST (\$460,000 advanced funding loan obtained)

Boggs Township, Clearfield, PA - PENNVEST (\$2,645,758 grant obtained)

Middletown Borough Authority, Middletown, PA - PENNVEST (\$1,275,000 loan obtained)

Haines Woodward Municipal Authority, Centre County, PA - PENNVEST (\$143,812 grant/\$536,188 loan administered)

Millerstown Municipal Authority, Millerstown, PA - PENNVEST (administered \$1,807,500 loan),b Commonwealth Financing Authority (administered \$3,615,000 grant)

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Strasburg Township, Lancaster County, PA - PENNVEST (\$1,639,003 grant obtained/\$1,405,997 loan obtained)

Courtdale Borough, Luzerne County, PA - PENNVEST (\$1,785,000 grant obtained)

Milton Regional Sewer Authority, Milton, PA - USACE Section 22 Technical Assistance obtained

UTILITY RATE STUDIES AND LONG TERM CAPITAL FINANCING PLANS

Ms. Vicari has been involved in the development of financial plans for water and wastewater systems to insure financial security for both regulated investor and municipally owned utilities. Responsibilities included evaluating current and proposed income and expenses along with proposed capital improvement expenditures in order to develop tools for planning the timing and magnitude of necessary rate increases, along with providing options for the restructuring of rates. Plans include:

Northampton Bucks County Municipal Authority, Bucks County, PA - Publicly owned water and wastewater systems serving over 25,000 customers. Performed detailed rate studies to restructure rates to allow for equitable distribution of costs amongst system users and derive revenue need to meet increased costs of operation and fund capital improvement plan.

As the retained Special Projects Engineer for the Authority, HRG assisted in the review of wholesale charges imposed by the Authority's treatment provider. Work included reviewing Intermunicipal Agreements dating back to 1965, along with historic and current debt service and operation and maintenance costs, to determine the appropriateness of the proposed wholesale rate increase.

New Wilmington Borough, Lawrence County, PA- Reviewed historic costs and charges in support of litigation filed against wholesale customers based upon delinquent charges. Developed retail and wholesale rates to ensure equitable distribution of costs amongst retail and wholesale customers of the system, in compliance with existing intermunicipal agreements.

The Harrisburg Authority, Harrisburg, PA - Publicly owned water and wastewater systems serving over 21,000 customers. Developed detailed 5-year and 20-Year Capital Improvements Plans for both systems evaluating the timing and funding for necessary system upgrades and improvements. Plans were wrapped into detailed rate studies which evaluated upcoming revenue and expenses to determine the timing and magnitude of rate increases necessary to recover the cost of providing service. Proposed rates were developed to fulfill trust indenture requirements. Rate studies performed 2010/2011 and 2013.

Borough of Steelton, Steelton, PA - Publicly owned wastewater system serving roughly 2,400 customers in multiple municipalities. Evaluated existing intermunicipal agreements along with current and historical billing structures to establish a program for correct intermunicipal billing procedures. Determined proposed operation and maintenance costs along with costs of service for each customer class in order to develop separate rate structures for each class of customer served by the system.

Borough of Littlestown, Littlestown, PA - Assisted this publicly owned water and wastewater system in the development of user rates for approximately 2,350 customers. The Borough recently embarked on a wastewater treatment plant upgrade and completed improvements to their well pumping and disinfection buildings (five), and wanted to make sure increased debt service and revised operating expenses were reflected in billing. Work included evaluating twelve consecutive months of existing retail customer billing records, the existing fee structure, expenses and upcoming capital expenditures to calculate projected necessary revenue requirements for a 5-year future period. Two revised rate structures were presented for each system to help the Borough meet its goals. Analysis of the impacts to retail and wholesale customer bills were presented to better assist the Borough with the decision of which option for each system would be the most uniform and reasonable to implement.

Northern Blair County Regional Sewer Authority, Tyrone, PA - Municipally owned wastewater collection and conveyance system serving approximately 3,970 customers. The Authority has agreements with Tyrone Borough and Logan Township for the treatment of wastewater collected in the Authority's system. Worked with the Authority and municipalities in the review of existing agreements and associated annual treatments costs, preparation of annual budgets and end of year reconciliations. Assisted entities in understanding the basis of treatment charges and the effects of increased flow, BOD and TSS loadings to overall costs, in charge of reviewing existing industrial user

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agreements, assisting in the preparation of new agreements and preparing annual end-of-year reconciliations for the contributing industrial users and municipalities.

South Creek Township, Gillett, PA – Publicly owned wastewater system providing various levels of sewer service to approximately 230 customers. Evaluated likely operation and maintenance costs for this start-up utility and proposed rate structures and billing charges for customers on centralized service, small flow treatment facilities and sewage management plans.

Slippery Rock Municipal Authority, Slippery Rock, PA – Publicly owned water and wastewater system serving approximately 2100 customers. Evaluated existing customer base, fee structure, expenses and upcoming capital expenditures to propose a revised rate structure which met the goals of the Authority and surrounding community.

CAN DO Inc., Hazelton, PA – Non-profit industrial/economic development corporation which provides water and wastewater service to approximately 180 commercial, industrial and wholesale customers. Services included review and analysis of existing rates based upon Public Utility Commission guidelines, cost of service study and PUC filing for water and wastewater user fee increases.

Port Matilda Borough Authority, Port Matilda, PA – Publicly owned wastewater system serving approximately 330 customers. Work included review of current billing methods, system needs and expansions in order provide a financial management plan which would restructure rates, remove disparity between current expenses and customer revenue, and restore financial soundness of the system.

Liverpool Municipal Authority, Liverpool, PA – Municipally owned water and wastewater system serving approximately 333 customers. Increases in operation and maintenance expenses, along with additional debt service costs, created a disparity between revenue and expenditures. Project included projecting operation, maintenance and capital costs over a five-year period and determining necessary rate increases to fund future budgets. The Authority's existing billing structure was revised in order to arrive at a structure which better fit customer types and usage and which appropriately allocated costs among users.

Port Matilda Borough, Port Matilda, PA – PUC governed water system serving approximately 330 customers. Work included analysis of revised rate structure options in order to eliminate a high minimum charge and restore rate equity to low volume users of the system. Work included capital improvement planning and the establishment of an equipment replacement fund. Rate recommendations were developed to fit the rate policy objectives of the Borough and plan for fiscal health of the system.

Milton Regional Sewer Authority, Milton, PA – Regional wastewater system serving 11,000 EDUs in seven municipalities. Provided revenue and expense budget to evaluate changes in operational costs over five year period associated with significant upgrades to the treatment facility and regionalizing with two new municipalities. Budget evaluated impact on process changes to operations budget, along with the impact of additional users, higher flows and new debt service costs. Identified revenue need and strategy for implementing stepped rate increase to minimize impact on user rates in any given year.

Evans City Water and Sewer Authority - Publicly owned water and wastewater system providing retail and wholesale service to approximately 850 customers. Work included completing rate analysis for the water and sewer utilities. Various rate options were evaluated in comparison to the Authority's rate policy objectives to arrive at a rate structure which included minimum charge and volumetric components. Rates were updated to include additional debt service costs related to a significant treatment plant upgrade and trust indenture requirements associated with project financing.

Additional analysis included evaluation of current intermunicipal agreements and Court Orders establishing billing methods and formulas for wastewater service provided to retail and wholesale customers. Supported Authority in litigation filed against wholesale customers associated with delinquency in payments and successfully negotiated a revised wholesale rate structure which fully recovers the cost of providing service.

South Coatesville Borough – Project Management for the development retail and wholesale rates to ensure equitable distribution of costs amongst retail and wholesale customers of the system, in compliance with existing intermunicipal agreements.

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Howe Township Municipal Authority - Project Manager for the development of rates and tapping fee charges in support of the new startup utility to ensure operation, maintenance and debt service could be adequately funded.

City of DuBois - Project manager for an analysis to review current charges for service in order to switch billing methodology/structure and ensure adequate revenue to implement necessary capital improvement project.

Hampton Shaler Water Authority - Project Manager for a cost of service study and rate analysis to develop rates adequate to meet increased operation, maintenance and capital improvement needs.

INTERMUNICIPAL/INDUSTRIAL USER RECONCILIATIONS

Northern Blair County Regional Sewer Authority (Blair County, PA) - Financial Services Manager responsible for the development of new Intermunicipal Agreements for industrial customers discharging over 25,000 gallons per day. Agreements established appropriate capacity allocations, charging mechanisms, and sampling protocols, which resulted in securing over \$500,000 in past due capacity fees. Work includes performing annual reconciliations in which charges to individual industrial users and wholesale municipalities are calculated based upon total flow along with cBOD and TSS concentrations. Annual treatment and conveyance costs are evaluated using these cost causative parameters and allocated based upon formulas developed for use by the Authority.

Middletown Borough Authority, Dauphin County, PA - Financial Services Engineer responsible for annual reconciliations for wholesale municipal customers in conformance with billing practices established through Intermunicipal Agreements in which system costs allocated to wholesale service are calculated using causative parameters and allocated based upon formulas developed for use by the Authority.

CAPITAL CHARGE STUDIES (ACT 57 TAPPING FEE EVALUATIONS)

Ms. Vicari has prepared tapping fee studies in accordance with PA Act 57 of 2003. Studies included the calculation of capital charges including connection fees, customer facilities fees, and tapping fees in order to provide municipal water and wastewater clients a means to recover specific costs and equity in their systems. Studies include:

- University Area Joint Authority, State College, PA
- Northern Blair Regional Sewer Authority, Tyrone, PA
- Mechanicsburg Borough, Cumberland County, PA
- Borough of Littlestown, Littlestown, PA
- Cranberry Township, Butler County, PA
- Borough of Steelton, Steelton, PA
- Steelton Borough Authority, Steelton, PA
- South Creek Township, Gillett, PA
- Port Matilda Borough, Port Matilda, PA
- Port Matilda Borough Authority, Port Matilda, PA
- City of Hermitage, Hermitage, PA
- Westfall Township Municipal Authority, Matamoras, PA
- Lycoming County Water and Sewer Authority, Montoursville, PA
- Benner Township Water Authority, Bellefonte, PA
- Spring-Benner-Walker Joint Authority, Bellefonte, PA
- Lower Swatara Municipal Authority, Middletown, PA
- Howe Township Municipal Authority, Newport, PA

CONSULTING AND ENGINEER ANNUAL REPORTS

Ms. Vicari is responsible for the preparation and submission of annual reports to municipal bond trustees for the utilities listed below. Reports include analysis of state and federal regulations and associated compliance, system maintenance, repair and operation, capacity, revenues and expenses.

- The City of Harrisburg, Harrisburg, PA - Sewer Collection System
- The City of Harrisburg, Harrisburg, PA - Sewer Collection and Treatment Facilities

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- The Harrisburg Authority, Harrisburg, PA - Sewer Collection System
- The Harrisburg Authority, Harrisburg, PA - Sewer Collection and Treatment Facilities
- The Harrisburg Authority, Harrisburg, PA - Water Treatment and Distribution System
- Mid Centre County Authority, Milesburg, PA - Sewer Collection, Conveyance and Treatment Facilities
- Evans City Water and Sewer Authority - Water and Sewer Facilities
- Lycoming County Water and Sewer Authority - Water and Wastewater Facilities

SELF LIQUIDATING DEBT REPORTS

Ms. Vicari assisted in the development of Self Liquidating Debt Reports in support of Local Government Unit Debt Act filings for the following clients:

- North Codorus Township,
- Milton Regional Sewer Authority, Milton, PA
- Evans City Water and Sewer Authority, Evans City, PA
- Millerstown Municipal Authority, Millerstown, PA
- Alexandria Borough/Porter Township Joint Sewer Authority, Huntingdon County, PA
- Littlestown Borough, Littlestown, PA
- East Lampeter Sewer Authority, Lancaster, PA
- Mechanicsburg Borough, Cumberland County, PA
- North Codorus Sewer Authority, Spring Grove, PA

TAX EXEMPT BONDS AND BANK LOAN FINANCINGS

- Evans City Water and Sewer Authority, Butler County, PA - Provided financing assistance for \$9,295,000 upgrade and expansion to the wastewater treatment facility
- The Harrisburg Authority, Harrisburg, PA - Provided financing assistance for \$50,000,000 upgrade and expansion to the Advanced Wastewater Treatment Facility including \$30,000,000 variable rate demand bonds, \$20,000,000 PENNVEST note and \$2,000,000 interim financing note.
- Woodward Township Sewage and Water Authority, Clearfield County, PA - Provided financing assistance for the refinancing of \$792,000 USDA loan via tax-exempt bank note
- Northern Blair County Regional Sewer Authority, Blair County, PA - Provided financing assistance for various tax-exempt bank financings ranging from \$280,000 to \$2,400,000 to fund various improvements to the wastewater collection and conveyance system
- Royaltown Borough Authority, Dauphin County, PA - Provided financial assistance in evaluating various tax-exempt bank loan options for water system upgrade.

RULES AND REGULATIONS/DEVELOPER HANDBOOKS

- Benner Township Water and Sewer Authority, Bellefonte, PA - Project Manager responsible for writing Rules and Regulations for a startup water authority acquiring assets of existing HOAs. Wrote Developer Handbook to outline process for develop reviews and approvals, construction standards, etc. for developer constructed facilities.
- Port Matilda Borough Authority, Port Matilda, PA - Project Manager responsible for reviewing Authority's Rules and Regulations, including rates and charges and system connections to identify necessary revisions to provide the utility with an established guidelines for use in effective management of the utility.
- South Creek Township, Bradford, PA - Project Manager responsible for writing Rules and Regulations for a startup sewer authority which established rates, charges and billing procedures, system connection and extension requirements, surcharges, industrial discharges, etc.

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- Northwestern Chester County Authority, Honey Brook, PA - Financial Services Project Engineer responsible for reviewing Authority's Rules and Regulations, including rates and charges, system connections, surcharges, and customer classifications. Identified necessary revisions to provide the utility with an established guidelines for use in effective management of the utility.

EXPERT OPINION AND TESTIMONY

Northampton Bucks County Municipal Authority, Bucks County, PA - As the retained Special Projects Engineer for the Authority, assisted in the review of wholesale charges imposed by the Authority's treatment provider. Work included reviewing Intermunicipal Agreements dating back to 1965, along with historic and current debt service and operation and maintenance costs, to determine the appropriateness of the proposed wholesale rate increases and provide an expert opinion.

City of Harrison, Hamilton County, OH - Provided expert report, opinion and testimony for the City of Harrison in regards to rights to provide water service to properties in and around the City of Harrison. Work included providing an opinion as to which entity could serve the best interest of customers.

New Wilmington Borough, Lawrence County, PA - Reviewed historic costs and charges in support of litigation filed against wholesale customers based upon delinquent charges. Supported legal counsel in various phases of litigation.

Evans City Water and Sewer Authority - Reviewed Intermunicipal agreements and Court Orders establishing billing methods and formulas for wastewater service provided to retail and wholesale customers. Supported legal counsel the filing of litigation against wholesale customers associated with delinquency in payments and successfully negotiated a revised wholesale rate structure which fully recovers the cost of providing service.

WASTEWATER COLLECTION AND TREATMENT

New Wastewater Collection and Treatment Facilities, South Creek Township, Gillett, PA - Role: Project Manager. Responsible for planning, permitting, design, funding acquisition and construction administration client contact and overall project management. Project entailed design of a new wastewater collection and treatment facility. System consists of approximately 25,000 linear feet of low pressure sewer, a 0.25 MGD extended aeration treatment facility, decentralized treatment including three (3) small flow treatment facilities, and a sewage management plan.

Wastewater Treatment Facility Upgrade/ BNR Upgrade for Berwick Area Joint Sewer Authority, Berwick, PA - Role: Wastewater Engineering Technician. Responsible for planning, permitting, design, funding acquisition and construction administration. Project entailed upgrade of a 2.2 MGD treatment facility including modifications to existing oxidation ditches, secondary clarifiers, utility water system, controls and SCADA to add increased nitrogen and phosphorus removal and bring the plant into compliance with the Chesapeake Bay Tributary Strategy. A 2.2 MGD sludge treatment system was also added to assist with nitrogen removal and limit the amount of sludge generated at the plant

Sunnyside Sanitary Sewer Extension for Spring-Benner-Walker Joint Authority, Bellefonte, PA - Role: Wastewater Engineering Technician. Responsible for permitting, design and funding acquisition. Project entailed design of a sanitary sewer extension to service residences along Sunnyside Boulevard and included 3,000 linear feet of collection and conveyance piping and one pump station.

Influent Structure Design for Berwick Area Joint Sewer Authority, Berwick, PA - Role: Project Manager. Responsible for design. Project entailed design of a building to house the influent metering pit and sludge receiving station at the treatment facility. Work included the design of process piping modifications, selection of odor control equipment, and coordination of architectural, electrical, and mechanical project components of the building design.

Alternative Analysis for Wastewater Needs, South Creek Township, Gillett, PA - Role: Project Manager. Responsible for a study designed to evaluate cost saving options to identify a reliable and economically feasible solution for the Township's wastewater needs. Project entailed analysis of centralized collection and treatment, community on-lot systems, small flow facilities and a sewage management plan. Findings were compiled into a report and ultimately included in the Township's Consent Order and Agreement with the PA DEP. The recommended alternative is proposed to save the Township approximately \$1.5 million in project costs when compared to their original intended solution.

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Basis of Design Study for Milton Regional Sewer Authority, Milton, PA – Role: Wastewater Engineering Technician. Responsible for completion of a Basis of Design Report. Project entailed installation of a centrifuge and related equipment to handle sludge dewatering processes at a wastewater treatment facility. Study included analyzing current and future sludge flows, evaluating existing dewatering equipment, sizing and selecting proposed sludge pumps, centrifuges; polymer feed equipment and conveyors to be used in project design, proposing related equipment and building modifications, and establishing an opinion of probable construction costs.

Scott Road Pump Station Study for University Area Joint Authority, State College, PA – Role: Site Design Engineer. Responsible for flow analysis, evaluation of various pump capacities and pumping arrangements, and cost analysis of potential alternatives. Project entailed completion of a study designed to analyze wet weather flows at the existing pump station and evaluate options for increasing station capacity.

SEWAGE FACILITIES PLANNING

Act 537 Sewage Facilities Plan, South Creek Township, PA – Role: Project Manager. Responsible for revision of Act 537 Planning documents to incorporate mutual goals of both the Township and the PA DEP. Project entailed completions of an Act 537 Plan as the main component of the Township's Consent Order and Agreement with the PA DEP for the design and construction of a wastewater collection and treatment system.

Cranberry Township, Butler County, PA – Financial Services Engineer responsible for financial analysis performed to compare long term costs of upgrading and maintaining a treatment facility designed to handle full twenty year flows of the service area as compared to costs associated with a second option to become wholesale customer of neighboring sewer authority, thus allowing for a smaller treatment facility upgrade to be implemented. Evaluated capital and operational costs and present worth costs of each option and prepared report outlining analysis and recommendations.

WATER SYSTEM TREATMENT AND DISTRIBUTION

Reconstruction of Wells 3 & 5, Port Matilda, PA – Role: Project Manager. Responsible for planning, permitting, design, funding acquisition and construction administration. Project entailed reconstruction of the Borough's main water supply wells. Project was implemented in order to remove surface water contaminants from the wells, comply with the Borough's Consent Order and Agreement, and bring the municipality into compliance with the Safe Drinking Water Act.

Beneficial Reuse Treatment and Conveyance for University Area Joint Authority, State College, PA – Role: Water Systems Engineering Technician. Responsible for design and layout as well as obtaining necessary municipal, county, and state permits. Project entailed installation of pipelines designed to convey treated wastewater effluent to commercial facilities for industrial usage. The design was constructed in three phases, using dual 12-inch ductile iron pipes to transport water 15,000 linear feet, serving factories and local agriculture.

Water Supply Feasibility Study, Port Matilda, PA – Role: Project Manager. Responsible for completion of a study designed to evaluate the Borough's water well system and analyze alternatives for system upgrade to insure a long-term viable water supply. Project entailed evaluation of rebuilding filtration plant and regionalization options in terms of capital cost, present worth cost, reliability, operability, and other related factors in order to recommend a solution to bring the Borough back into compliance with the Safe Drinking Water Act.

Water System Evaluation for Benner Township Water Authority- Benner Township, PA – Role: Site Design Engineer. Responsible for the evaluation of privately constructed wells and water treatment and distribution systems which the authority was interested in acquiring. Project entailed evaluation of existing infrastructure, opinion of value, recommendation for infrastructure improvements, opinion of operation and maintenance costs, and an outline of steps necessary to both acquire the system and implement the authority.

RELATED EXPERIENCE

From July 2002 to September 2004, Ms. Vicari was a project engineer/designer with GRW Engineers, Inc. in Indianapolis, IN. Tasks included designing wastewater facilities including gravity, pressure and vacuum collection with extended aeration, and media filtration treatment systems; assessing rehabilitation/replacement needs for existing wastewater facilities and designing solutions; and engineering stormwater master plans designed to analyze and

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prioritize stormwater problems within municipalities, as well as creating planning level design solutions, cost estimates, and strategies for improved handling of flooding issues. Ms. Vicari also investigated combined sewer systems and sources of infiltration/inflow; designed CSO separation projects; and acquired project funding for municipalities through IDEM, USDA RD, and IDOC grants and loan programs. She also compiled preliminary engineering and environmental reports, and performed construction administrative services for the construction and rehabilitation of wastewater collection, conveyance, and treatment facilities.

From June 2001 to July 2002, Ms. Vicari was a project engineer/designer with Sweetland Engineering & Assoc., Inc. in State College, PA. Duties included designing wastewater collection, conveyance, and treatment facilities; beneficial reuse conveyance; and retaining walls. Ms. Vicari was a Project Manager. Responsible for transportation enhancement projects and was responsible for attaining environmental permits and loans for clients including Act 537 Plans, E&S Plans, Wetland Finding reports, NPDES permits, Public Water Supply permits, PENNVEST loans, PENNDOT grants, and DCED grants. She was also responsible for communication with clients and subcontractors for various projects.

From May 2000 to August 2000, Ms. Vicari was an intern with Powers & Schram, Inc. in State College, PA. She assisted in the design of timber and concrete bridges and buildings. She also drafted various types of structural drawings using AutoCAD.

From June 1999 to August 1999, Ms. Vicari was an intern with Gannett Fleming in State College, PA. She aided in the creation of GIS systems for various government agencies and companies.

From May 1998 to August 1998, Ms. Vicari was an intern for the Engineering and Public Works Department with State College Borough in State College, PA. She helped create the Borough's GIS system and oversaw its field annotations. She also oversaw the microsurfacing of streets, analyzed sewers in need of repair, redesigned simple traffic patterns, aided in the reconstruction of a major road, designed plans using AutoCAD, and gave presentations to various local agencies.

Ms. Vicari's past experience included work on the following projects:

Wastewater Collection and Treatment

- Wastewater Collection and Treatment Facilities for Lauramie Township Regional Sewer District, Stockwell, IN
- Wastewater Collection and Treatment Facilities for Rockfield Regional Sewer District, Rockfield, IN
- Wastewater Collection and Treatment Facilities, Jackson Township, PA
- Wastewater Collection and Treatment System, Dearborn County, IN
- Wastewater Collection System for Twin Lakes Regional Sewer District, Monticello, IN
- Wastewater Collection and Conveyance System Rehabilitation, Reynolds, IN

Sewage Facilities Planning

- Preliminary Engineering Reports (PERs), Indianapolis, IN
- Preliminary Engineering Report (PER), Town of Reynolds, IN
- Preliminary Engineering Report (PER) for Rockfield Regional Sewer District, Rockfield, IN
- Preliminary Engineering Report (PER) for Dearborn County Regional Sewer District, Dearborn City, IN
- Preliminary Engineering Report (PER) for Twin Lakes Regional Sewer District, Monticello, IN
- Preliminary Engineering Report (PER), Rockfield, IN
- Act 537 Sewage Facilities Plan, Watts Township, PA
- Act 537 Sewage Facilities Plan, New Buffalo Borough, PA

Combined Sewer Systems

- Combined Sewer Overflow Long-Term Control Plan (CSO LTCP), City of Aurora, IN
- Combined Sewer Overflow (CSO) System Investigations, Indianapolis, IN
- Combined Sewer Separation and Rehabilitation, Phillipsburg Borough, PA

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Stormwater Systems

- Stormwater Projects Plan, Fort Wayne, IN
- Drainage Improvement Plan, Avon, IN
- Stormwater Inventory Project, Avon, IN
- Stormwater Management Plan for Flying J Travel Plaza, Porter County, PA

TRAINING

- Project Management for Engineers, SmartPros Engineering
- Project Managers Boot Camp, PSMJ

PUBLICATION(S) AND PAPER(S)

Thinking About Adopting a Stormwater Fee? The Authority Magazine, Pennsylvania Municipal Authorities Association, October 2015

PRESENTATION(S) AND LECTURE(S)

EPA Region 3, Water Finance Conference, Led presentations on Asset Management and Capital Improvement Planning for water and wastewater utilities.

Pennsylvania Water Environment Association (PWEA), Conducted grant and financing workshops at their annual Conference each year (2011-2016).

Pennsylvania Water Environment Association (PWEA), Conducted Stormwater Authority workshops at regional conferences.

Pennsylvania Municipal Authorities Association (PMAA), Conducted various workshops on Stormwater Authorities, asset management and various grant and financing topics.

Pennsylvania Municipal Authorities Association (PMAA), Participated in webinars on Stormwater Authorities and Capital Charge Studies (2015-2016).

Lebanon County Association of Townships (LCATS), Led presentation to Township Supervisors on Stormwater Authority Implementation.

AWARD(S) AND RECOGNITION(S)

West Shore Chamber of Commerce, Luminary Awards, Shining Star Award for excellence in career development and public service, 2016.

PROFESSIONAL MEMBERSHIP(S)

Pennsylvania Water Environment Association
Pennsylvania Municipal Authorities Association
Society of Professional Engineers

MACM Exhibit AMV No. II (Revised)
Witness: Adrienne M. Vicari, P.E.

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PENNSYLVANIA-AMERICAN WATER COMPANY

Docket No. A-2017-2606103

Exhibit to Accompany

the

Direct Testimony

of

Adrienne M. Vicari, P.E

Municipal Authority of McKeesport

Municipal Authority of the City of McKeesport

Valuation Appraisal

COST APPROACH		
Schedule B	Original Cost less Depreciation *	
	Original Cost	92,830,000
	<u>less: Accumulated Depreciation</u>	<u>(18,490,000)</u>
	Depreciated Original Cost	\$ 74,340,000
	<u>Plus Provision for Going Value</u>	<u>19,800,000</u>
	Net Depreciated Original Cost: \$ 94,140,000	
Schedule C	Reproduction Cost *	
	Reproduction Cost	291,970,000
	<u>less: Accumulated Depreciation</u>	<u>(141,730,000)</u>
	Depreciated Reproduction Cost	\$ 150,240,000
	<u>Plus Provision for Going Value</u>	<u>19,800,000</u>
	Net Depreciated Reproduction Cost: \$ 170,040,000	
	\$ 170,040,000	
MARKET APPROACH		
Schedule J	Comparison of Other Wastewater System Acquisitions *	
	Average Market Value per Customer	\$ 8,661
	<u>Multiplied by Number of MACM Customers</u>	<u>21,953</u>
	Estimated Market Value: \$ 190,130,000	\$ 190,130,000
INCOME APPROACH		
Schedule L	Cash Flow Basis *	
	\$ 194,970,000	194,970,000
	<u>Plus Provision for Going Value</u>	<u>19,800,000</u>
	<u>Less Provision for Erosion on Return</u>	<u>(930,000)</u>
	Estimated Market Value: \$ 213,840,000	
Schedule M	Estimated Rate Base and Return Basis *	
	Market Value	\$ 192,010,000
	<u>Plus Provision for Going Value</u>	<u>19,800,000</u>
	<u>Less Provision for Erosion on Return</u>	<u>-930,000</u>
	Estimated Market Value: \$ 210,880,000	
	Averaged - Market Value - Income Approach: \$ 212,360,000	
	\$ 212,360,000	

* Values Rounded to nearest \$10,000.

Average of Fair Value Approaches: \$ 190,840,000

MACM Exhibit AMV No. III (Revised)
Witness: Adrienne M. Vicari, P.E.

PENNSYLVANIA PUBLIC UTILITY COMMISSION

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Municipal Authority of McKeesport

Municipal Authority of the City of McKeesport

Cost Approach

Calculation of Reproduction Cost less Accumulated Depreciation (as of 12/31/2016)

SCHEDULE: C

Year	Bldg #	NARUC Account	Asset	Service Life	Age	Original Cost	10385 ENR Index	Trend Factor	Reproduction Cost	Annual Depreciation	Accumulated Depreciation	Reproduction Cost less Depreciation
Code 354 - Structures and Improvements												
1960	601	354	CONSTRUCTION COST EST	50	56.5	51,484	824	12.6032	648,861	12,977	648,861	0
1960	501	354	CONSTRUCTION COST EST	50	56.5	83,533	824	12.6032	1,052,779	21,056	1,052,779	0
1960	701	354	CONSTRUCTION COST EST	50	56.5	31,290	824	12.6032	394,353	7,887	394,353	0
1960	202	354	CONSTRUCTION COST EST	50	56.5	286,202	824	12.6032	3,607,048	72,141	3,607,048	0
1960	203	354	CONSTRUCTION COST EST	50	56.5	115,338	824	12.6032	1,453,623	29,072	1,453,623	0
1960	801	354	CONSTRUCTION COST EST	50	56.5	9,740	824	12.6032	122,755	2,455	122,755	0
1960	205	354	CONSTRUCTION COST EST	50	56.5	47,172	824	12.6032	594,516	11,890	594,516	0
1960	217	354	ITEM PROCESS PIPING	50	56.5	18,880	824	12.6032	237,948	4,759	237,948	0
1960	218	354	STRUCTURE COST EST	50	56.5	280,787	824	12.6032	3,538,802	70,776	3,538,802	0
1960	201	354	CONSTRUCTION COST EST	50	56.5	50,569	824	12.6032	637,329	12,747	637,329	0
1960	206	354	CONSTRUCTION COST EST	50	56.5	28,687	824	12.6032	361,547	7,231	361,547	0
1968	702	354	CONSTRUCTION COST EST	50	48.5	61,843	1155	8.9913	556,052	11,121	539,370	16,682
1970	1301	354	CONSTRUCTION COST EST	50	46.5	6,521	1381	7.5199	49,037	981	45,605	3,433
1975	202	354	BUILDING ADDITION COST EST	50	41.5	106,080	2212	4.6948	498,029	9,961	413,364	84,665
1975	207	354	CONSTRUCTION COST EST	50	41.5	147,294	2212	4.6948	691,523	13,830	573,964	117,559
1975	207	354	ITEM POWER FEED MAINS	50	41.5	9,133	2212	4.6948	42,878	858	35,589	7,289
1975	207	354	ITEM PROCESS PIPING	50	41.5	230,139	2212	4.6948	1,080,467	21,609	896,788	183,679
1975	214	354	ITEM POWER FEED MAINS	50	41.5	302,268	2212	4.6948	1,419,102	28,382	1,177,854	241,247
1975	214	354	ITEM PROCESS PIPING	50	41.5	1,922,449	2212	4.6948	9,025,603	180,512	7,491,250	1,534,352
1975	214	354	STRUCTURE COST EST	50	41.5	1,733,304	2212	4.6948	8,137,596	162,752	6,754,205	1,383,391
1975	217	354	STRUCTURE COST EST	50	41.5	335,807	2212	4.6948	1,576,562	31,531	1,308,547	268,016
1975	215	354	STRUCTURE COST EST	50	41.5	393,386	2212	4.6948	1,846,887	36,938	1,532,916	313,971
1975	216	354	STRUCTURE COST EST	50	41.5	395,941	2212	4.6948	1,858,882	37,178	1,542,872	316,010
1975	206	354	BUILDING ADDITION COST EST	50	41.5	44,202	2212	4.6948	207,522	4,150	172,243	35,279
1975	201	354	CONSTRUCTION COST EST	50	41.5	131,479	2212	4.6948	617,274	12,345	512,337	104,937
1980	199	354	FENCING #1 COST ESTIMATE	15	36.5	10,039	3237	3.2082	32,207	2,147	32,207	0
1990	299	354	METAL GUARDRAIL COST EST	20	26.5	11,362	4732	2.1946	24,935	1,247	24,935	0
1990	199	354	GRAVEL PARKING LOTS COST EST	15	26.5	35,528	4732	2.1946	77,971	5,198	77,971	0
1995	1401	354	CONSTRUCTION COST EST	50	21.5	40,788	5471	1.8982	77,423	1,548	33,292	44,131
1995	1402	354	CONSTRUCTION COST EST	50	21.5	19,209	5471	1.8982	36,462	729	15,679	20,784
2000	299	354	GRAVEL PARKING LOTS COST EST	15	16.5	11,577	6221	1.6693	19,325	1,288	19,325	0
2000	299	354	REIN CONC PARKING LOT COST EST	15	16.5	24,140	6221	1.6693	40,297	2,686	40,297	0
2000	299	354	REIN CONC ROADWAYS COST EST	15	16.5	60,350	6221	1.6693	100,742	6,716	100,742	0
2001	202	354	ITEM POWER FEED MAINS	50	15.5	142,854	6342	1.6375	233,920	4,678	72,515	161,405
2001	202	354	ITEM PROCESS PIPING	50	15.5	54,944	6342	1.6375	89,969	1,799	27,891	62,079
2001	206	354	BUILDING ADDITION COST EST	50	15.5	128,684	6342	1.6375	210,717	4,214	65,322	145,395
2002	1401	354	ITEM PROCESS PIPING	50	14.5	7,342	6538	1.5884	11,662	233	3,382	8,280
2004	801	354	TOTAL PROJECT COST	50	12.5	148,000	7115	1.4596	216,017	4,320	54,004	162,013
2005	801	354	ENGINEERING FEES	50	11.5	34,000	7446	1.3947	47,420	948	10,906	36,513
2008	202	354	ROOF C&I BUILDING REPLACEMENT	20	8.5	160,825	8310	1.2497	200,985	10,049	85,419	115,566
2008	101	354	BUILDING PURCHASE COST	50	8.5	110,000	8310	1.2497	137,468	2,749	23,370	114,099
2008	206	354	ROOF GARAGE REPLACEMENT	10	8.5	41,895	8310	1.2497	52,357	5,236	44,503	7,854
2008	201	354	ROOF GRIT BOX-NO ROOF BEFORE	10	8.5	46,870	8310	1.2497	58,574	5,857	49,788	8,786
2009	101	354	CARPETING	15	7.5	8,261	8570	1.2118	10,010	667	5,005	5,005
2009	101	354	RAMP COST	50	7.5	9,000	8570	1.2118	10,906	218	1,636	9,270
2010	401	354	COMPLETE SITE PURCHASE COST	40	6.5	3,800,000	8799	1.1803	4,484,984	112,125	728,810	3,756,174
2011	1201	354	ITEM PROCESS PIPING	50	5.5	84,925	9070	1.1450	97,240	1,945	10,696	86,543
2011	301	354	COMPLETE SITE PURCHASE COST	40	5.5	330,000	9070	1.1450	377,851	9,446	51,955	325,897
2011	101	354	SHOWER ROOM	25	5.5	6,000	9070	1.1450	6,870	275	1,511	5,359
2012	1001	354	ITEM POWER FEED MAINS	50	4.5	428,445	9308	1.1157	478,010	9,560	43,021	434,990
2012	1001	354	ITEM PROCESS PIPING	50	4.5	382,744	9308	1.1157	427,022	8,540	38,432	388,590
2012	102	354	BUILDING-GARAGE COST	30	4.5	115,000	9308	1.1157	128,304	4,277	19,246	109,058
2012	102	354	CONCRETE PAD	25	4.5	45,000	9308	1.1157	50,206	2,008	9,037	41,169
2012	102	354	ELECTRIC	30	4.5	30,000	9308	1.1157	33,471	1,116	5,021	28,450
2012	102	354	MISC/PIPING	30	4.5	35,000	9308	1.1157	39,049	1,302	5,857	33,192
2013	1299	354	FENCING COST ESTIMATE	15	3.5	16,316	9547	1.0878	17,749	1,183	4,141	13,607
2013	1101	354	ITEM PROCESS PIPING	50	3.5	255,963	9547	1.0878	278,440	5,569	18,491	258,949
2013	1101	354	STRUCTURE COST EST	50	3.5	93,416	9547	1.0878	101,619	2,032	7,113	94,506
2013	199	354	FENCING #2 COST ESTIMATE	15	3.5	17,854	9547	1.0878	19,422	1,295	4,532	14,890
2014	701	354	BUILDING ADDITION COST	50	2.5	2,492,500	9807	1.0590	2,639,536	52,791	131,977	2,507,559
2014	202	354	BUILDING ADDITION COST	50	2.5	417,812	9807	1.0590	442,459	8,849	22,123	420,336
2014	601	354	BUILDING ADDITION COST EST	50	2.5	37,203	9807	1.0590	39,398	788	1,970	37,428
2014	501	354	BUILDING ADDITION COST EST	50	2.5	68,849	9807	1.0590	72,911	1,458	3,646	69,265
2014	203	354	BUILDING ADDITION COST EST	50	2.5	113,090	9807	1.0590	119,761	2,395	5,988	113,773
2014	1201	354	CONSTRUCTION COST EST	50	2.5	1,001,446	9807	1.0590	1,060,523	21,210	53,026	1,007,497
2014	1202	354	CONSTRUCTION COST EST	50	2.5	375,850	9807	1.0590	398,022	7,960	19,901	378,121

Municipal Authority of the City of McKeesport

SCHEDULE: C

Cost Approach

Calculation of Reproduction Cost less Accumulated Depreciation (as of 12/31/2016)

Year	Bldg #	NARUC Account	Asset	Service Life	Age	Original Cost	10385 ENR Index	Trend Factor	Reproduction Cost	Annual Depreciation	Accumulated Depreciation	Reproduction Cost less Depreciation
2014	1001	354	CONSTRUCTION COST EST	50	2.5	5,046,922	9807	1.0590	5,344,647	106,893	267,232	5,077,415
2014	699	354	FENCING COST ESTIMATE	15	2.5	10,036	9807	1.0590	10,628	709	1,771	8,857
2014	1099	354	FENCING COST ESTIMATE	15	2.5	23,880	9807	1.0590	25,289	1,686	4,215	21,074
2014	1099	354	GRAVEL PARKING LOTS COST EST	15	2.5	11,107	9807	1.0590	11,762	784	1,960	9,802
2014	699	354	REIN CONC SIDEWALKS COST EST	25	2.5	5,438	9807	1.0590	5,759	230	576	5,183
2014	1002	354	STRUCTURE COST EST	50	2.5	79,528	9807	1.0590	84,219	1,684	4,211	80,009
2014	301	354	ALUMINUM STEPS WITH RAILING	20	2.5	5,500	9807	1.0590	5,824	291	728	5,096
2014	299	354	ASPHALT PARKING LOTS COST EST	15	2.5	18,314	9807	1.0590	19,394	1,293	3,232	16,162
2014	299	354	ASPHALT ROADWAYS COST EST	15	2.5	98,730	9807	1.0590	104,554	6,970	17,426	87,129
2014	210	354	CONSTRUCTION COST	50	2.5	227,300	9807	1.0590	240,709	4,814	12,035	228,673
2014	208	354	CONSTRUCTION COST	50	2.5	4,043,354	9807	1.0590	4,281,877	85,638	214,094	4,067,784
2014	211	354	CONSTRUCTION COST EST	50	2.5	575,000	9807	1.0590	608,920	12,178	30,446	578,474
2014	209	354	CONSTRUCTION COST EST	50	2.5	378,778	9807	1.0590	401,123	8,022	20,056	381,067
2014	299	354	FENCING COST ESTIMATE	15	2.5	93,936	9807	1.0590	99,477	6,632	16,580	82,898
2014	299	354	LIGHTING COST ESTIMATE	20	2.5	140,410	9807	1.0590	148,693	7,435	18,587	130,106
2014	299	354	REIN CONC CURBING COST EST	20	2.5	14,831	9807	1.0590	15,706	785	1,963	13,743
2014	299	354	REIN CONC SIDEWALKS COST EST	20	2.5	24,718	9807	1.0590	26,176	1,309	3,272	22,904
2014	218	354	RENOVATION COST	20	2.5	110,000	9807	1.0590	116,489	5,824	14,561	101,928
2014	219	354	STRUCTURE COST	50	2.5	6,497,100	9807	1.0590	6,880,374	137,607	344,019	6,536,355
2014	220	354	STRUCTURE COST	50	2.5	1,348,050	9807	1.0590	1,427,573	28,551	71,379	1,356,195
2014	221	354	STRUCTURE COST EST	50	2.5	54,904	9807	1.0590	58,143	1,163	2,907	55,236
2014	222	354	STRUCTURE COST EST	50	2.5	54,904	9807	1.0590	58,143	1,163	2,907	55,236
2014	223	354	STRUCTURE COST EST	50	2.5	22,689	9807	1.0590	24,027	481	1,201	22,826
2014	224	354	STRUCTURE COST EST	50	2.5	49,801	9807	1.0590	52,739	1,055	2,637	50,102
2014	201	354	BUILDING ADDITION COST	50	2.5	1,202,000	9807	1.0590	1,272,908	25,458	63,645	1,209,263
2015	799	354	ASPHALT ROADWAYS COST EST	15	1.5	9,500	10036	1.0348	8,796	586	880	7,916
2015	799	354	FENCING COST ESTIMATE	15	1.5	10,500	10036	1.0348	10,865	724	1,087	9,779
2015	601	354	HOIST WIRE ROPE 2 TON CAPACITY C	25	1.5	7,200	10036	1.0348	7,451	298	447	7,003
2015	501	354	HOIST WIRE ROPE 2 TON CAPACITY C	25	1.5	7,200	10036	1.0348	7,451	298	447	7,003
2015	203	354	HOIST WIRE ROPE 3 TON CAPACITY C	25	1.5	7,500	10036	1.0348	7,761	310	466	7,295
2015	601	354	ITEM POWER FEED MAINS	50	1.5	259,000	10036	1.0348	268,012	5,360	8,040	259,971
2015	501	354	ITEM POWER FEED MAINS	50	1.5	211,000	10036	1.0348	218,341	4,367	6,550	211,791
2015	702	354	ITEM POWER FEED MAINS	50	1.5	373,000	10036	1.0348	385,978	7,720	11,579	374,399
2015	202	354	ITEM POWER FEED MAINS	50	1.5	86,000	10036	1.0348	88,992	1,780	2,670	86,322
2015	203	354	ITEM POWER FEED MAINS	50	1.5	450,000	10036	1.0348	465,657	9,313	13,970	451,687
2015	1202	354	ITEM POWER FEED MAINS	50	1.5	112,500	10036	1.0348	116,414	2,328	3,492	112,922
2015	601	354	ITEM PROCESS PIPING	50	1.5	130,000	10036	1.0348	134,523	2,690	4,036	130,487
2015	501	354	ITEM PROCESS PIPING	50	1.5	130,000	10036	1.0348	134,523	2,690	4,036	130,487
2015	701	354	ITEM PROCESS PIPING	50	1.5	38,600	10036	1.0348	39,943	799	1,198	38,745
2015	202	354	ITEM PROCESS PIPING	50	1.5	37,200	10036	1.0348	38,494	770	1,155	37,339
2015	203	354	ITEM PROCESS PIPING	50	1.5	229,000	10036	1.0348	236,968	4,739	7,109	229,859
2015	1002	354	ITEM PROCESS PIPING	50	1.5	21,000	10036	1.0348	21,731	435	652	21,079
2015	1201	354	MONORAIL C/O 1-10" I-BEAM	50	1.5	22,000	10036	1.0348	22,765	455	683	22,082
2015	1001	354	MONORAIL C/O 1-12" I-BEAM	50	1.5	10,300	10036	1.0348	10,658	213	320	10,339
2015	1001	354	MONORAIL C/O 1-8" I-BEAM	50	1.5	6,300	10036	1.0348	6,519	130	196	6,324
2015	701	354	MONORAIL 30' LONG I-BEAM RAIL, 4"	50	1.5	31,200	10036	1.0348	32,286	646	969	31,317
2015	701	354	MONORAIL 8" I-BEAM RAIL 20' LONG,	50	1.5	8,200	10036	1.0348	8,485	170	255	8,231
2015	799	354	REIN CONC ROADWAYS COST EST	15	1.5	7,000	10036	1.0348	7,244	483	724	6,519
2015	214	354	CONTROL PANEL BASIN 4 2 1/2X1X3	50	1.5	20,000	10036	1.0348	20,696	414	621	20,075
2015	220	354	CRANE BRIDGE 1 TON CAP TUBULAR	50	1.5	50,000	10036	1.0348	51,740	1,035	1,532	50,187
2015	214	354	ITEM POWER FEED MAINS	50	1.5	87,420	10036	1.0348	90,462	1,809	2,714	87,748
2015	210	354	ITEM POWER FEED MAINS	50	1.5	35,000	10036	1.0348	36,218	724	1,087	35,131
2015	211	354	ITEM POWER FEED MAINS	50	1.5	183,100	10036	1.0348	189,471	3,789	5,684	183,787
2015	208	354	ITEM POWER FEED MAINS	50	1.5	500,000	10036	1.0348	517,397	10,348	15,522	501,875
2015	209	354	ITEM POWER FEED MAINS	50	1.5	175,000	10036	1.0348	181,089	3,622	5,433	175,656
2015	214	354	ITEM PROCESS PIPING	50	1.5	127,200	10036	1.0348	131,626	2,633	3,949	127,677
2015	211	354	ITEM PROCESS PIPING	50	1.5	160,000	10036	1.0348	165,567	3,311	4,967	160,600
2015	208	354	ITEM PROCESS PIPING	50	1.5	452,000	10036	1.0348	467,727	9,355	14,032	453,695
2015	209	354	ITEM PROCESS PIPING	50	1.5	154,675	10036	1.0348	160,057	3,201	4,802	155,255
2015	211	354	MONORAIL C/O 1-12" I-BEAM	50	1.5	12,400	10036	1.0348	12,831	257	385	12,446
2015	209	354	MONORAIL C/O 1-12" I-BEAM	50	1.5	18,600	10036	1.0348	19,247	385	577	18,670
2015	210	354	MONORAIL C/O 1-12" I-BEAM	50	1.5	10,000	10036	1.0348	10,348	207	310	10,037
2015	208	354	MONORAIL 12" I-BEAM RAIL 16' LONG	50	1.5	6,000	10036	1.0348	6,209	124	186	6,022
Total Structures and Improvements:						42,408,434			78,924,885	1,660,972	38,876,568	40,048,317
Code 355 - Power Generation Equipment												
1991	1301	355	GENERATOR 35 KW DRIVEN BY 6 CYL	15	25.5	12,971	4835	2.1479	27,860	1,857	27,860	0

Municipal Authority of the City of McKeesport

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2002	1402	355	GENERATOR TYPE SG0020-J363-0N181	15	14.5	13,159	6538	1.5884	20,902	1,393	20,205	697
2004	801	355	GENERATOR 20KW DRIVEN BY 4 CYL	15	12.5	26,215	7115	1.4596	38,263	2,551	31,886	6,377
2012	1099	355	GENERATOR 1000 KW 3 PHASE DRIVE	15	4.5	380,840	9308	1.1157	424,898	28,327	127,469	297,429
2015	1202	355	GENERATOR 300 KW DRIVEN BY DIE	15	1.5	82,500	10036	1.0348	85,370	5,691	8,537	76,833
2015	699	355	GENERATOR 400KW 60 HERTZ, 480 V	15	1.5	104,000	10036	1.0348	107,619	7,175	10,762	96,857
2015	702	355	GENERATOR 750 KW, 937.5 KVA, DRIV	15	1.5	152,500	10036	1.0348	157,806	10,520	15,781	142,025
2015	599	355	GENERATOR DIESEL ENGINE 300KW	15	1.5	74,000	10036	1.0348	76,575	5,105	7,657	68,917
Total Power Generation Equipment:						846,185			939,293	62,626	250,157	689,135

Code 361 - Collection Sewers - Gravity												
VAR	9801	361	COLLECTION LINES	50	45	30,000,000			0	0	0	0
2016	1501	361	PORT VUE COLLECTION SYSTEM-TN	50	0.5	1,400,000			0	0	0	0
2016	9801	361	SEWER PIPE LINER-MYER BLVD INSK	50	0.5	10,989			0	0	0	0
Total Collection Sewers - Gravity:						31,410,989			0	0	0	0

NOTE: A description of additional Collection System Asset Reproduction Costs can be found at the bottom of this schedule.

Code 371 - Pumping Equipment												
1975	207	371	PANEL CONTROL, VARIABLE FREQU	15	41.5	20,457	2212	4.6948	96,042	6,403	96,042	0
1975	207	371	PUMP CENTRIFUGAL 12X22, TYPE 611	15	41.5	12,238	2212	4.6948	57,456	3,830	57,456	0
1975	207	371	PUMP CENTRIFUGAL 12X22, TYPE 611	15	41.5	12,238	2212	4.6948	57,456	3,830	57,456	0
1975	207	371	PUMP CENTRIFUGAL 12X22, TYPE 611	15	41.5	12,238	2212	4.6948	57,456	3,830	57,456	0
1975	207	371	PUMP CENTRIFUGAL 4X12, TYPE 611	15	41.5	6,101	2212	4.6948	28,643	1,910	28,643	0
1975	207	371	PUMP CENTRIFUGAL 4X12, TYPE 611	15	41.5	6,101	2212	4.6948	28,643	1,910	28,643	0
1991	1301	371	BANK OF 2 SUBMERSIBLE PUMPS 6",	15	25.5	14,268	4835	2.1479	30,646	2,043	30,646	0
1991	1301	371	PUMP CONTROL PANEL 3X1X3 1/2, 2 F	15	25.5	5,765	4835	2.1479	12,383	826	12,383	0
2002	1401	371	BANK OF 2 SUBMERSIBLE PUMPS 5H	10	14.5	14,891	6538	1.5884	23,653	2,365	23,653	0
2003	207	371	PUMP SUBMERSIBLE SIZE 4X4, 3HP M	15	13.5	40,300	6695	1.5513	62,516	4,168	56,264	6,252
2004	801	371	TANK SS 4X3 1/2X5 WITH 2-SIZE 6" 5H	15	12.5	55,263	7115	1.4596	80,661	5,377	67,217	13,443
2006	901	371	DUPLEX SEWAGE STATION C/O 2-S	15	10.5	27,591	7751	1.3398	36,966	2,464	25,876	11,090
2013	214	371	PUMP DOUBLE DISC DUPLEX TYPE, \	15	3.5	21,542	9547	1.0878	23,434	1,562	5,468	17,966
2013	214	371	PUMP DOUBLE DISC DUPLEX TYPE, \	15	3.5	21,542	9547	1.0878	23,434	1,562	5,468	17,966
2015	501	371	BANK OF 3 CENTRIFUGAL PUMPS, SI	15	1.5	121,000	10036	1.0348	125,210	8,347	12,521	112,689
2015	601	371	BANK OF 3 CENTRIFUGAL PUMPS, SI	15	1.5	155,000	10036	1.0348	160,393	10,693	16,039	144,354
2015	1201	371	BANK OF 3 SUBMERSIBLE PUMPS SI	15	1.5	155,600	10036	1.0348	161,014	10,734	16,101	144,913
2015	701	371	BANK OF 3 WILO MODEL FA20.78D SL	15	1.5	457,000	10036	1.0348	472,901	31,527	47,290	425,611
2015	1001	371	BANK OF 4 CENTRIFUGAL PUMPS S.O	15	1.5	390,000	10036	1.0348	403,570	26,905	40,357	363,213
2015	203	371	BANK OF 4 YEOMANS CENTRIFUGAL,	15	1.5	338,000	10036	1.0348	349,760	23,317	34,976	314,784
2015	1201	371	MUFFIN MONSTER 5HP MOTOR	15	1.5	77,000	10036	1.0348	79,679	5,312	7,968	71,711
2015	202	371	MUFFIN MONSTER MODEL 3000411T-1	15	1.5	33,500	10036	1.0348	34,666	2,311	3,467	31,199
2015	207	371	PANEL PUMP CONTROL SPECIAL BUI	15	1.5	15,000	10036	1.0348	15,522	1,035	1,552	13,970
2015	202	371	PUMP DBL DISC VERTICAL BELT DRI	15	1.5	43,000	10036	1.0348	44,496	2,966	4,450	40,047
2015	202	371	PUMP DBL DISC VERTICAL BELT DRI	15	1.5	43,000	10036	1.0348	44,496	2,966	4,450	40,047
2015	217	371	PUMP VERTICAL TURBINE SIZE 6", 40	15	1.5	28,500	10036	1.0348	29,492	1,966	2,949	26,542
2015	217	371	PUMP VERTICAL TURBINE SIZE 6", 40	15	1.5	28,500	10036	1.0348	29,492	1,966	2,949	26,542
2016	207	371	RAS PUMP	15	0.5	21,859	10385	1.0000	21,859	1,457	729	21,130
2016	901	371	SUBMERSIBLE PUMP RAM INDUSTRI	15	0.5	9,840	10385	1.0000	9,840	656	328	9,512
2016	207	371	VFD DRIVE	15	0.5	7,500	10385	1.0000	7,500	500	250	7,250
Total Pumping Equipment:						2,194,834			2,609,275	174,740	749,046	1,860,229

Code 380 - Treatment and Disposal Equipment												
1975	207	380	BLOWER CENTRIFUGAL ORDER #GS2	15	41.5	10,046	2212	4.6948	47,164	3,144	47,164	0
1975	207	380	BLOWER CENTRIFUGAL ORDER #GS2	15	41.5	10,046	2212	4.6948	47,164	3,144	47,164	0
1975	207	380	BLOWER CENTRIFUGAL ORDER #GS2	15	41.5	10,046	2212	4.6948	47,164	3,144	47,164	0
1999	214	380	FINE BUBBLE AERATION SYSTEM FO	15	17.5	530,970	6059	1.7140	910,072	60,671	910,072	0
2001	202	380	TOWER BELT FILTER PRESS TYPE 225	25	15.5	640,705	6342	1.6375	1,049,138	41,966	650,466	398,672
2006	301	380	SCALE CHLORINE 2 CYLINDER CAPA	15	10.5	7,252	7751	1.3398	9,716	648	6,801	2,915
2007	214	380	DIGESTER SYSTEM PROJECT NO. 1081	25	9.5	98,988	7967	1.3035	129,031	5,161	49,032	79,999
2007	214	380	DIGESTER SYSTEM PROJECT NO. 1081	25	9.5	98,988	7967	1.3035	129,031	5,161	49,032	79,999
2008	215	380	CLARIFIER SIZE 115" DIA DATE 2/08 W	25	8.5	413,155	8310	1.2497	516,325	20,653	175,550	340,774
2008	216	380	CLARIFIER SIZE 115" DIA DATE 2/08 W	25	8.5	413,155	8310	1.2497	516,325	20,653	175,550	340,774
2012	701	380	BAR SCREEN TRAVELING SS 2X40, SP	25	4.5	212,794	9308	1.1157	237,411	9,496	42,754	194,677
2012	501	380	SCREEN BAR SS 5X6	25	4.5	14,282	9308	1.1157	15,934	637	2,868	13,066
2015	601	380	BAR SCREEN MANUAL SS 5X6	25	1.5	15,000	10036	1.0348	15,522	621	931	14,591
2015	209	380	BLOWER ROTARY GACHCRA CAT NC	15	1.5	6,000	10036	1.0348	6,209	414	621	5,588
2015	211	380	BLOWER ROTARY HELIFLOW MODEL	15	1.5	43,500	10036	1.0348	45,014	3,001	4,501	40,512
2015	211	380	BLOWER ROTARY HELIFLOW MODEL	15	1.5	43,500	10036	1.0348	45,014	3,001	4,501	40,512

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2015	211	380	BLOWER ROTARY HELIFLOW MODEL	15	1.5	43,500	10036	1.0348	45,014	3,001	4,501	40,512
2015	211	380	BLOWER ROTARY HELIFLOW MODEL	15	1.5	43,500	10036	1.0348	45,014	3,001	4,501	40,512
2015	209	380	BLOWER ROTARY MODEL HYFLMBA	15	1.5	57,500	10036	1.0348	59,501	3,967	5,950	53,551
2015	209	380	BLOWER ROTARY MODEL HYFLMBA	15	1.5	57,500	10036	1.0348	59,501	3,967	5,950	53,551
2015	209	380	BLOWER ROTARY MODEL HYFLMBA	15	1.5	57,500	10036	1.0348	59,501	3,967	5,950	53,551
2015	209	380	BLOWER ROTARY MODEL HYFLMBA	15	1.5	57,500	10036	1.0348	59,501	3,967	5,950	53,551
2015	209	380	BLOWER ROTARY MODEL HYFLMBA	15	1.5	57,500	10036	1.0348	59,501	3,967	5,950	53,551
2015	218	380	COARSE BUBBLE AERATION SYSTEM	15	1.5	51,000	10036	1.0348	52,774	3,518	5,277	47,497
2015	218	380	COARSE BUBBLE AERATION SYSTEM	15	1.5	51,000	10036	1.0348	52,774	3,518	5,277	47,497
2015	218	380	COARSE BUBBLE AERATION SYSTEM	15	1.5	51,000	10036	1.0348	52,774	3,518	5,277	47,497
2015	218	380	COARSE BUBBLE AERATION SYSTEM	15	1.5	51,000	10036	1.0348	52,774	3,518	5,277	47,497
2015	219	380	DUAL MODE SEQUENTIAL BATCH RE	25	1.5	2,698,000	10036	1.0348	2,791,873	111,675	167,512	2,624,361
2015	308	380	GRIT COLLECTION SYSTEM C/O 2-E	15	1.5	975,000	10036	1.0348	1,008,924	67,262	100,892	908,031
2015	1001	380	MANUAL BAR SCREEN SS 5X10	25	1.5	20,000	10036	1.0348	20,696	828	1,242	19,454
2015	202	380	PRESS ROTARY SLUDGE 6 STATION P	25	1.5	1,800,000	10036	1.0348	1,862,629	74,505	111,758	1,750,871
2015	210	380	SCALE CHLORINE CYLINDER 2-CYLIN	15	1.5	6,500	10036	1.0348	6,726	448	673	6,054
2015	203	380	SCREEN BAR SS 6X10	25	1.5	25,000	10036	1.0348	25,870	1,035	1,552	24,318
2015	1001	380	TRAVELING BAR SCREEN PROJECT N	15	1.5	350,000	10036	1.0348	362,178	24,145	36,218	325,960
2015	220	380	UV SYSTEM AQUARAY 3X HOVCS CC	15	1.5	1,047,000	10036	1.0348	1,083,429	72,229	108,343	975,086
Total Treatment and Disposal Equipment:						10,068,427			11,527,187	573,552	2,802,206	8,724,981
Code 385 - Instrumentation and Computer Equipment												
2013	101	385	ITEM MISC EDP EQUIPMENT	5	3.5	14,606	9547	1.0878	15,889	3,178	11,122	4,767
2013	201	385	SERVER PROLIANT ML350 G6 W/ I-A	5	3.5	5,254	9547	1.0878	5,715	1,143	4,001	1,715
2015	210	385	CHLORINATION SYSTEM C/O 1-WALL	15	1.5	12,000	10036	1.0348	12,418	828	1,242	11,176
2015	210	385	ITEM MISC MACHINERY C/O CHLORIN	15	1.5	18,500	10036	1.0348	19,144	1,276	1,914	17,229
2015	1202	385	PANEL SCADA 5X1X6 W/ ALLEN BR.	15	1.5	86,500	10036	1.0348	89,510	5,967	8,951	80,559
2015	1001	385	PANEL SCADA 5X1X6 W/ PANELVIEW	15	1.5	86,500	10036	1.0348	89,510	5,967	8,951	80,559
2015	501	385	PANEL SCADA 5X1X6, PANELVIEW C	15	1.5	86,500	10036	1.0348	89,510	5,967	8,951	80,559
2015	702	385	PANEL SCADA STL 5X1X6 WITH PANI	15	1.5	86,500	10036	1.0348	89,510	5,967	8,951	80,559
2015	601	385	PANEL SCADA STL 5X1X6, PANELVIE	15	1.5	86,500	10036	1.0348	89,510	5,967	8,951	80,559
2015	202	385	SCADA SYSTEM C/O I-CPU CA	15	1.5	576,120	10036	1.0348	596,165	39,744	59,617	536,549
Total Instrumentation and Computer Equipment:						1,058,980			1,096,879	76,006	122,650	974,229
Code 389 - Other Plant and Misc. Equipment												
2003	214	389	FLOWMETER SIZE 8" W/ DIGITAL REA	15	13.5	5,992	6695	1.5513	9,295	620	8,366	930
2013	9801	389	FLOWMETER SYSTEM W/ SENSORS &	15	3.5	160,432	9547	1.0878	174,520	11,635	40,721	133,799
2014	203	389	READOUT FLOWMETER EXPLOSION P	15	2.5	13,822	9807	1.0590	14,637	976	2,440	12,198
2015	1201	389	FLOWMETER SIZE 12" EXPLOSION PR	15	1.5	10,000	10036	1.0348	10,348	690	1,035	9,313
2015	601	389	FLOWMETER SIZE 20", DIGITAL REAL	15	1.5	14,500	10036	1.0348	15,005	1,000	1,500	13,504
2015	501	389	FLOWMETER SIZE 20", DIGITAL REAL	15	1.5	14,500	10036	1.0348	15,005	1,000	1,500	13,504
2015	701	389	FLOWMETER SIZE 20", DIGITAL REAL	15	1.5	14,500	10036	1.0348	15,005	1,000	1,500	13,504
2015	1002	389	FLOWMETER SIZE 36" W/ DIGITAL RE	15	1.5	26,000	10036	1.0348	26,905	1,794	2,690	24,214
2016	9801	389	FLOWMETER W/SENSOR	15	0.5	29,451	10385	1.0000	29,451	1,963	982	28,469
Total Other Plant and Misc. Equipment:						289,197			310,170	20,678	60,735	249,435
Code 390 - Office Furniture and Equipment												
1998	201	390	ITEM MISC FURNITURE & EQUIPMEN	25	18.5	5,428	5920	1.7542	9,522	381	7,046	2,476
2005	101	390	ITEM MISC FURNITURE & EQUIPMEN	25	11.5	5,901	7446	1.3947	8,230	329	3,786	4,444
2009	101	390	ITEM MISC MINOR OFFICE FURNITUR	25	7.5	21,954	8570	1.2118	26,603	1,064	7,981	18,622
2010	101	390	ITEM MISC OFFICE MACHINES & DEV	15	6.5	6,269	8799	1.1803	7,399	493	3,206	4,193
2015	201	390	ITEM MISC FURNITURE & EQUIPMEN	25	1.5	5,100	10036	1.0348	5,277	211	317	4,961
Total Office Furniture and Equipment:						44,652			57,032	2,479	22,336	34,696
Code 391 - Transportation Equipment												
1987	9801	391	TRUCK DUMP 1988	8	29.5	13,871	4406	2.3570	32,694	4,087	32,694	0
2003	9801	391	TRUCK PICKUP 4X4	8	13.5	20,846	6695	1.5513	32,337	4,042	32,337	0
2004	9801	391	PICKUP CREW CAB 4 DOOR 4X4	8	12.5	22,675	7115	1.4596	33,096	4,137	33,096	0
2007	9801	391	SPRINTER W/ CAMERA SYSTEM 2006	8	9.5	126,140	7967	1.3035	164,424	20,553	164,424	0
2008	9801	391	TRAILBLAZER	8	8.5	9,995	8310	1.2497	12,491	1,561	12,491	0
2009	9801	391	TRUCK DUMP 2008	8	7.5	46,982	8570	1.2118	56,932	7,116	53,373	3,558
2009	9801	391	TRUCK PICKUP 2 DOOR 4X4	8	7.5	20,081	8570	1.2118	24,334	3,042	22,813	1,521
2010	9801	391	TRUCK PICKUP 1996	8	6.5	7,500	8799	1.1803	8,852	1,106	7,192	1,660
2010	9801	391	TRUCK VACTOR 2009	8	6.5	356,691	8799	1.1803	420,988	52,623	342,053	78,935
2010	9801	391	VAN PARCEL 2004	8	6.5	7,000	8799	1.1803	8,262	1,033	6,713	1,549
2011	9801	391	BACKHOE CAT 420D FDP24791	10	5.5	40,000	9070	1.1450	45,800	4,580	25,190	20,610
2011	9801	391	TRUCK DUMP 2000	8	5.5	7,000	9070	1.1450	8,015	1,002	5,510	2,505

Municipal Authority of the City of McKeesport

SCHEDULE: C

Cost Approach

Calculation of Reproduction Cost less Accumulated Depreciation (as of 12/31/2016)

Year	Bldg #	NARUC Account	Asset	Service Life	Age	Original Cost	10385 ENR Index	Trend Factor	Reproduction Cost	Annual Depreciation	Accumulated Depreciation	Reproduction Cost less Depreciation
2011	9801	391	TRUCK PICKUP 2006 SILVERADO	8	5.5	9,500	9070	1.1450	10,878	1,360	7,478	3,399
2011	9801	391	TRUCK PICKUP 2007	8	5.5	9,700	9070	1.1450	11,107	1,388	7,636	3,471
2012	9801	391	BACKHOE 2012	10	4.5	88,636	9308	1.1157	98,890	9,889	44,501	54,390
2012	9801	391	TAHOE	8	4.5	34,995	9308	1.1157	39,043	4,880	21,962	17,082
2012	9801	391	TRUCK DUMP	8	4.5	73,193	9308	1.1157	81,660	10,208	45,934	35,726
2013	9801	391	SILVERADO 2013	8	3.5	18,502	9547	1.0878	20,127	2,516	8,805	11,321
2014	9801	391	SILVERADO	8	2.5	23,917	9807	1.0590	25,328	3,166	7,915	17,413
2014	9801	391	TRUCK VACTOR	8	2.5	414,614	9807	1.0590	439,073	54,884	137,210	301,862
2015	9801	391	CUTAWAY	8	1.5	32,443	10036	1.0348	33,572	4,196	6,295	27,277
2015	9801	391	VAN COMMERCIAL CUTAWAY 3500	8	1.5	32,443	10036	1.0348	33,572	4,196	6,295	27,277
2016	9801	391	SILVERADO	8	0.5	32,733	10385	1.0000	32,733	4,092	2,046	30,687
Total Transportation Equipment:						1,449,457			1,674,286	205,658	1,033,962	640,243
Code 393 - Tools, Shop and Garage Equipment												
1990	206	393	ITEM MISC SHOP TOOLS & EQUIPMEN	10	26.5	10,191	4732	2.1946	22,365	2,237	22,365	0
2009	101	393	ITEM MISC TOOLS & EQUIPMENT	10	7.5	8,995	8570	1.2118	10,900	1,090	8,175	2,725
2015	102	393	SAW	10	1.5	7,136	10036	1.0348	7,384	738	1,108	6,277
Total Tools, Shop and Garage Equipment:						26,322			40,650	4,065	31,648	9,002
Code 394 - Laboratory Equipment												
1995	301	394	ITEM MISC LAB EQUIPMENT	10	21.5	7,268	5471	1.8982	13,796	1,380	13,796	0
2010	202	394	ITEM MISC LAB APPARATUS & EQUIP	10	6.5	41,985	8799	1.1803	49,553	4,955	32,210	17,344
2010	301	394	SAMPLER REFRIGERATED ALL WEAT	10	6.5	11,162	8799	1.1803	13,174	1,317	8,563	4,611
2015	202	394	ITEM MISC LAB EQUIPMENT & GLAS	10	1.5	10,000	10036	1.0348	10,348	1,035	1,552	8,796
2015	202	394	SEALER TRAY	10	1.5	7,200	10036	1.0348	7,451	745	1,118	6,333
Total Laboratory Equipment:						77,615			94,322	9,432	57,239	37,083
Code 395 - Power Operated Equipment												
2010	301	395	CRANE BOOM HYDRAULIC 8' MOTOR	15	6.5	8,558	8799	1.1803	10,101	673	4,377	5,724
Total Power Operated Equipment:						8,558			10,101	673	4,377	5,724
Code 396 - Communication Equipment												
2004	201	396	TELEPHONE SYSTEM W/ 2-PAR	10	12.5	6,000	7115	1.4596	8,757	876	8,757	0
2010	101	396	TELEPHONE SYSTEM PARTNER	10	6.5	10,232	8799	1.1803	12,076	1,208	7,850	4,227
Total Communication Equipment:						16,232			20,834	2,083	16,607	4,227
Code 397 - Miscellaneous Equipment												
2012	301	397	SURVEILLANCE SYSTEM C/O 5-CC	10	4.5	6,665	9308	1.1157	7,436	744	3,346	4,090
2013	101	397	SURVEILLANCE SYSTEM C/O 12-C	10	3.5	14,688	9547	1.0878	15,978	1,598	5,592	10,386
2014	401	397	SURVEILLANCE SYSTEM C/O 5-CC	10	2.5	6,911	9807	1.0590	7,319	732	1,830	5,489
2015	201	397	SURVEILLANCE SYSTEM C/O 9-CC	10	1.5	12,600	10036	1.0348	13,038	1,304	1,956	11,083
Total Miscellaneous Equipment:						40,864			43,771	4,377	12,724	31,047
Code 398 - Other Tangible Plant												
1975	206	398	THREADER PIPE	15	41.5	5,936	2212	4.6948	27,869	1,858	27,869	0
1995	202	398	ITEM MISC EQUIPMENT	15	21.5	11,074	5471	1.8982	21,021	1,401	21,021	0
2000	206	398	PUMP PORTABLE SIZE 4" DRIVEN BY	10	16.5	12,143	6221	1.6693	20,270	2,027	20,270	0
2002	301	398	ITEM MISC MACHINERY	15	14.5	11,636	6538	1.5884	18,483	1,232	17,867	616
2007	9801	398	REGULATOR UPGRADES	25	9.5	2,820,000	7967	1.3035	3,675,875	147,035	1,396,833	2,279,043
2010	201	398	COPIER BLUEPRINT	8	6.5	9,588	8799	1.1803	11,316	1,415	9,195	2,122
2010	206	398	SPREADER SALT SS 8X4X3 SALT DOG	15	6.5	6,046	8799	1.1803	7,136	476	3,092	4,044
2015	202	398	AIR COMPRESSOR	15	1.5	7,397	10036	1.0348	7,654	510	765	6,889
2015	202	398	BOILER- RAYTHERM 2 STAGE	15	1.5	5,417	10036	1.0348	5,605	374	561	5,045
Total Other Tangible Plant:						2,889,237			3,795,230	156,328	1,497,471	2,297,758
Subtotal:						92,829,983			291,977,280	5,224,138	141,733,287	150,243,992

Municipal Authority of the City of McKeesport

Cost Approach

Calculation of Reproduction Cost less Accumulated Depreciation (as of 12/31/2016)

Year	Bldg #	NARUC Account	Asset	Service Life	Age	Original Cost	10385 ENR Index	Trend Factor	Reproduction Cost	Annual Depreciation	Accumulated Depreciation	Reproduction Cost less Depreciation
Cost of Future Capital Projects												
			Conveyor Repairs & Reconfiguration			130,000	10385	1.0000	130,000			
			Bettis Road Pump Station			20,000	10385	1.0000	20,000			
			RIDC Pump Station No. 1			250,000	10385	1.0000	250,000			
			Roof on Maintenance Shop			50,000	10385	1.0000	50,000			
			Thickener Demolition			100,000	10385	1.0000	100,000			
			Aeration Blowers			600,000	10385	1.0000	600,000			
			RAS Pumps			100,000	10385	1.0000	100,000			
			Headworks Oder Control			350,000	10385	1.0000	350,000			
			Demolish Ineinerator			350,000	10385	1.0000	350,000			
			Glenn Avenue Pump Station			300,000	10385	1.0000	300,000			
			Regulators			100,000	10385	1.0000	100,000			
			Dravosburg WWTP - Pump to MACM			5,503,000	10385	1.0000	5,503,000			
			Duquesne WWTP - Pump to MACM			15,511,000	10385	1.0000	15,511,000			
			Duquesne WWTP - Conveyance Upgrades			310,000	10385	1.0000	310,000			
			Total Future Capital Projects			23,674,900			23,674,900			

SUMMARY												
						Original Cost	Reproduction Cost	Annual Depreciation	Accumulated Depreciation	Reproduction Cost less Depreciation		
354			Structures and Improvements			42,408,434	78,924,885	1,660,972	38,876,568	40,048,317		
355			Power Generation Equipment			846,185	939,293	62,620	250,157	689,135		
361			Collection Sewers - Gravity			31,410,989	0	0	0	0		
361			Sewer System Piping*				187,644,962	2,206,705	95,698,931	91,946,032		
361			Collection Sewers - Force*				2,160,343	43,207	64,810	2,095,532		
361			CSO Structures*				1,028,142	20,563	431,820	596,322		
371			Pumping Equipment			2,194,834	2,609,275	174,740	749,046	1,860,229		
380			Treatment and Disposal Equipment			10,068,427	11,527,187	573,552	2,802,206	8,724,981		
385			Instrumentation and Computer Equipment			1,058,980	1,096,879	76,006	122,650	974,229		
389			Other Plant and Misc. Equipment			289,197	310,170	20,678	60,735	249,435		
390			Office Furniture and Equipment			44,652	57,032	2,479	22,336	34,696		
391			Transportation Equipment			1,449,457	1,674,206	205,658	1,033,962	640,243		
393			Tools, Shop and Garage Equipment			26,322	40,650	4,065	31,648	9,002		
394			Laboratory Equipment			77,615	94,322	9,432	57,239	37,083		
395			Power Operated Equipment			8,558	10,101	673	4,377	5,724		
396			Communication Equipment			16,232	20,834	2,083	16,607	4,227		
397			Miscellaneous Equipment			40,864	43,771	4,377	12,724	31,047		
398			Other Tangible Plant			2,889,237	3,795,230	156,328	1,497,471	2,297,758		
			Future Capital Projects**			0	0	0	0	0		
			Total Cost of Assets:			92,829,983	291,977,280	5,224,138	141,733,287	150,243,992		

Collection System Assets

* See Schedules D through I of the Appendix for the Reproduction Cost breakdown of Sewer System Piping, Force Collection Mains and CSO Structures for the four wastewater treatment plants.

** The future capital projects listed on Schedule P are replacements of existing assets, therefore the costs are excluded from the Cost Approach.

MACM Exhibit AMV No. IV (Revised)
Witness: Adrienne M. Vicari, P.E.

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PENNSYLVANIA-AMERICAN WATER COMPANY

Docket No. A-2017-2606103

Exhibit to Accompany

the

Direct Testimony

of

Adrienne M. Vicari, P.E

Municipal Authority of McKeesport

Municipal Authority of the City of McKeesport

SCHEDULE: D

Cost Approach

Reproduction Cost of Collection System Assets by Service Area (as of 12/31/2016)

	<u>McKeesport</u>	<u>Duquesne</u>	<u>Dravosburg</u>	<u>Port Vue</u>	<u>Other</u>	<u>Total</u>
<i>Sewer System Piping</i>						
Sewer System - Piping	104,271,037	26,242,914	9,576,332	18,940,981	-	159,031,262
Sewer System - Other	-	2,475,341	-	-	-	2,475,341
Sewer System - Manholes	15,575,681	5,281,339	1,640,508	3,640,831	-	26,138,360
Subtotal	\$ 119,846,718	\$ 33,999,593	\$ 11,216,840	\$ 22,581,811	\$ -	\$ 187,644,962
<i>Collection Sewers - Force</i>						
Pressure Sewers - Force Main	2,053,159	-	-	11,184	-	2,064,343
Air Release Manholes	-	-	-	-	96,000	96,000
Subtotal	\$ 2,053,159	\$ -	\$ -	\$ 11,184	\$ 96,000	\$ 2,160,343
<i>CSO Structures</i>						
CSO Structures	771,107	114,238	28,560	114,238	-	1,028,142
Subtotal	\$ 771,107	\$ 114,238	\$ 28,560	\$ 114,238	\$ -	\$ 1,028,142
Total:	\$ 122,670,983	\$ 34,113,831	\$ 11,245,399	\$ 22,707,233	\$ 96,000	\$ 190,833,447

MACM Exhibit AMV No. V (Revised)
Witness: Adrienne M. Vicari, P.E.

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PENNSYLVANIA-AMERICAN WATER COMPANY

Docket No. A-2017-2606103

Exhibit to Accompany

the

Direct Testimony

of

Adrienne M. Vicari, P.E

Municipal Authority of McKeesport

MCKEESPORT SERVICE AREA

<i>Sewer System - Piping</i>				
<u>Piping Size</u>	<u>Linear Feet</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
8"	47,086	1959	\$159.91	7,529,616
10"	30,762	1959	\$169.39	5,210,837
12"	62,339	1959	\$172.69	10,765,447
15"	26,574	1959	\$197.44	5,246,664
16"	2,557	1959	\$197.44	504,844
18"	8,936	1959	\$217.93	1,947,440
20"	979	1959	\$228.08	223,294
24"	24,729	1959	\$239.30	5,917,749
30"	11,733	1959	\$249.72	2,929,965
36"	225	1959	\$294.73	66,315
Totals:	215,920			\$40,342,171
8"	92,567	1976	\$159.91	14,802,574
10"	10,108	1976	\$169.39	1,712,214
12"	22,833	1976	\$172.69	3,943,076
15"	1,780	1976	\$197.44	351,436
16"	9,864	1976	\$197.44	1,947,509
24"	12,932	1976	\$228.08	2,949,582
30"	3,944	1976	\$249.72	984,896
Totals:	154,028			\$26,691,288
8"	70,433	1989	\$159.91	11,263,082
10"	17,064	1989	\$169.39	2,890,505
15"	1,817	1989	\$197.44	358,741
24"	10,245	1989	\$239.30	2,451,669
Totals:	99,559			\$16,963,998
8"	17,838	1999	\$159.91	2,852,510
10"	4,403	1999	\$169.39	745,833
18"	21,090	1999	\$217.93	4,596,186
Totals:	43,331			\$8,194,529
8"	213	2008	\$159.91	34,061
12"	173	2008	\$172.69	29,876
15"	66	2008	\$197.44	13,031
20"	31	2008	\$228.08	7,071
21"	758	2008	\$239.30	181,392
24"	1,623	2008	\$239.30	388,390
36"	382	2008	\$294.73	112,588
42"	252	2008	\$315.94	79,616
48"	462	2008	\$332.51	153,619
60"	485	2008	\$476.26	230,984
72"	219	2008	\$601.30	131,684
Totals:	4,664			\$1,362,311
30"	2,300	2009	\$249.72	574,356
36"	16,000	2009	\$294.73	4,715,712
Totals:	18,300			\$5,290,068
8"	23,000	2010	\$159.91	3,677,976
Totals:	23,000			\$3,677,976
24"	865	2011	\$228.08	197,293
30"	1,169	2011	\$249.72	291,923
54"	238	2011	\$332.51	79,137
72"	1,963	2011	\$601.30	1,180,344
Totals:	4,235			\$1,748,696
Total Price:				\$104,271,037

<i>Sewer System - Manholes</i>				
<u>Asset</u>	<u>Number of Manholes</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
Manholes	2,490	1960	\$6,098.54	15,185,375
Manholes	51	2008	\$6,098.54	311,026
Manholes	13	2011	\$6,098.54	79,281
Totals:	2,554		Total Price:	\$15,575,681

Total Reproduction Cost:				\$119,846,718
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DUQUESNE SERVICE AREA

<i>Sewer System - Piping</i>				
<u>Piping Size</u>	<u>Linear Feet</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
8"	19,000	1959	\$159.91	3,038,328
10"	8,314	1959	\$169.39	1,408,325
12"	16,895	1959	\$172.69	2,917,631
15"	7,200	1959	\$197.44	1,421,539
16"	691	1959	\$197.44	136,428
18"	2,415	1959	\$217.93	526,306
20"	273	1959	\$228.08	62,267
24"	7,356	1959	\$239.30	1,760,320
30"	3,487	1959	\$249.72	870,774
36"	164	1959	\$294.73	48,336
Totals:	65,795			\$12,190,255
8"	25,018	1976	\$159.91	4,000,678
10"	2,732	1976	\$169.39	462,779
12"	6,171	1976	\$172.69	1,065,682
15"	481	1976	\$197.44	94,967
16"	2,666	1976	\$197.44	526,364
24"	3,495	1976	\$239.30	836,367
30"	1,066	1976	\$249.72	266,202
Totals:	41,629			\$7,253,040
8"	19,036	1989	\$159.91	3,044,085
10"	4,612	1989	\$169.39	781,236
15"	491	1989	\$197.44	96,941
24"	2,769	1989	\$239.30	662,633
Totals:	26,908			\$4,584,895
8"	4,821	1999	\$159.91	770,936
10"	1,190	1999	\$169.39	201,576
18"	5,700	1999	\$217.93	1,242,212
Totals:	11,711			\$2,214,725
Total Price:				\$26,242,914

<i>Sewer System - Other</i>				
<u>Asset</u>	<u>Linear Feet</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
4.5' x 3'	6,237	1963	\$396.88	2,475,341
Totals:				\$2,475,341

<i>Sewer System - Manholes</i>				
<u>Asset</u>	<u>Number of Manholes</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
Manholes	396	1963	\$6,098.54	2,415,023
Large Manholes	23	1963	\$6,098.54	140,267
Manholes	280	1976	\$6,098.54	1,707,592
Manholes	128	1989	\$6,098.54	780,614
Manholes	39	1999	\$6,098.54	237,843
Totals:	866			\$5,281,339

Total Reproduction Cost:				\$33,999,593
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DRAVOSBURG SERVICE AREA

<i>Sewer System - Piping</i>				
<u>Piping Size</u>	<u>Linear Feet</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
6"	1,100	1962	\$154.90	170,390
8"	21,114	1962	\$159.91	3,376,382
10"	7,957	1962	\$169.39	1,347,852
12"	7,396	1962	\$172.69	1,277,230
15"	320	1962	\$197.44	63,180
18"	2,376	1962	\$197.44	469,108
20"	360	1962	\$217.93	78,456
24"	1,440	1962	\$228.08	328,441
60"	428	1962	\$476.26	203,838
72"	2,227	1962	\$601.30	1,339,086
Eggshape	613	1962	\$601.30	368,594
Totals:	45,331			\$9,022,556
8"	2,017	1980	\$159.91	322,543
Totals:	2,017			\$322,543
8"	1,446	1984	\$159.91	231,233
Totals:	1,446			\$231,233
Total Price:				\$9,576,332

<i>Sewer System - Manholes</i>				
<u>Asset</u>	<u>Number of Manholes</u>	<u>Service Date</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
Manholes	269	1962	\$6,098.54	1,640,508
Totals:				\$1,640,508

Total Reproduction Cost:				\$11,216,840
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PORT VUE SERVICE AREA

<i>Sewer System - Piping</i>				
<u>Piping Size</u>	<u>Linear Feet</u>	<u>Service Date(s)</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
6"	1,898	1919, 1928, 1949, 1960	\$154.90	294,000
8"	72,309	1919, 1928, 1949, 1960	\$159.91	11,563,077
10"	14,232	1919, 1928, 1949, 1960	\$169.39	2,410,787
12"	6,985	1919, 1928, 1949, 1960	\$172.69	1,206,254
15"	8,661	1919, 1928, 1949, 1960	\$197.44	1,709,993
18"	1,317	1919, 1928, 1949, 1960	\$197.44	260,023
21"	3,944	1919, 1928, 1949, 1960	\$239.30	943,815
24"	1,650	1919, 1928, 1949, 1960	\$239.30	394,852
27"	661	1919, 1928, 1949, 1960	\$239.30	158,180
Totals:	111,657			\$18,940,981
Total Price:				\$18,940,981

<i>Sewer System - Manholes</i>				
<u>Asset</u>	<u>Number of Manholes</u>	<u>Service Date(s)</u>	<u>Cost per Unit</u>	<u>Reproduction Cost</u>
Manholes	597	1919, 1928, 1949, 1960	\$6,098.54	3,640,831
Totals:				\$3,640,831

Total Reproduction Cost:				\$22,581,811
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