5. Provide copies of two appraisals performed by separate utility valuation experts establishing the system's fair market value.

RESPONSE: See enclosed appraisals performed by Jerome C. Weinert, P.E., Principal and Director for AUS Consultants, Inc. on behalf of Pennsylvania-American Water Company ("**PAWC**") and by Adrienne M. Vicari, P.E., Practice Area Leader, Financial Services, for Herbert, Rowland, and Grubic, Inc., on behalf of the Township of Sadsbury ("**Sadsbury**"). See also **Schedule 2.2** of the *Assets Purchase Agreement* ("**APA**") attached as **Appendix A-24-a** for the two appraisals establishing the System's fair market value.

Jerome C. Weinert
Principal & Director

AUS Consultants
Depreciation and Valuation
8555 West Forest Home Avenue
Suite 201
Greenfield, WI 53228
Telephone 414-529-5755
Fax 414-529-5750
E-Mail weinertj@auswest.net

November 21, 2017

Mr. Andrew L. Swope
Vice President, General Counsel
Pennsylvania-American Water Company
800 West Hersheypark Drive
Hersey, PA 17033

RE: Sadsbury Township, PA Wastewater Utility Appraisal

Enclosed is the appraisal report for Sadsbury, PA's wastewater utility system as of January 1, 2017 prepared for Pennsylvania-American Water Company. The report was prepared based on the 2016-2017 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PA CS) Paragraph 1329 "Valuation of acquired water and wastewater systems", collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12). The intended users of this appraisal are Pennsylvania-American Water Company and the Pennsylvania Public Utility Commission.

Based on our appraisal the Fair Market Value of Sadsbury's wastewater system property, plant, and equipment operating as Pennsylvania rate regulated wastewater utility is $8,910,000 determined based on the cost, income, and market approaches to value, as detailed in the following table:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

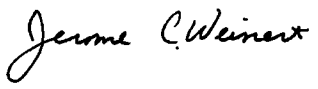
Fair Market Value Appraisal

Revised: 6-21-2017

	Investor-owned Utility	Weight	Wtd Value Indicator
Cost Approach			
Depreciated Replacement Cost New	$ 8,517,587	50%	4,258,794
Depreciated Original Cost	6,128,876		
Net Book Financials	6,916,575		
Income Approach			
Investor-Owned Utility	8,783,602	40%	3,513,441
Market Approach			
Investor-Owned Utility	11,374,184	10%	1,137,418
Appraisal Conclusion			8,909,653
Appraisal Conclusion	**8,910,000**		

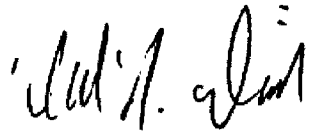
As the purpose of this appraisal was to fulfill the requirements of Act 12 in the establishment of value for rate making of Sadsbury's wastewater utility's property, plant and equipment the cost approach conclusion of $8,517,587 is consistent with the purpose of the appraisal. This cost approach conclusion is detailed in the Cost Approach of this report. As the cost approach work papers details our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the wastewater industry account classifications and the installation year of the property this detail can be used to establish the booked value for future accounting and rate making.

Respectfully Submitted,
AUS Consultants, Depreciation & Valuation
By:

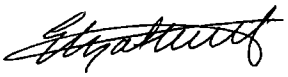


Jerome C. Weinert, ASA, P.E., CDP
Principal and Director

David A. Sheffer
Principal



Michael J. Diedrich, ASA, P.E., CDP
Certified General Appraiser
Principal



Elizabeth A. Weinert
Associate

November 20, 2017

ASA: Accredited Senior Appraiser in the Machinery and Equipment (Public Utilities) discipline of the American Society of Appraisers
P.E.: Registered Professional Engineer State of Wisconsin
CDP: Certified Depreciation Professions in the Society of Depreciation Professionals

Enclosures

AUS CONSULTANTS

Sadsbury, Pennsylvania's Wastewater Utility

Fair Market Value Appraisal Report
As of January 1, 2017
for
Pennsylvania American Water Company

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AUS CONSULTANTS

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November 20, 2017

Pennsylvania American Water Company
Hersey, Pennsylvania

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8555 West Forest Home Avenue
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E-Mail weinertj@auswest.net

RE: The Sadsbury, Pennsylvania Wastewater Utility Appraisal

Enclosed is the appraisal report for Sadsbury, PA's wastewater utility system as of January 1, 2017 prepared for our client Pennsylvania American Water Company. The report was prepared based on the 2016-2017 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated (PA CS) Statues Section 1329 "Valuation of acquired water and wastewater systems", collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12). The intended users of this appraisal are Pennsylvania American Water Company and the Pennsylvania Public Utility Commission.

Based on our appraisal, the Fair Market Value of the Sadsbury PA's wastewater utility's property, plant, and equipment operating as Pennsylvania rate regulated wastewater utility is $8,910,000 determined based on the cost, income, and market approaches to value, as detailed in the following table:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Fair Market Value Appraisal

Revised: 6-21-2017

		Investor-owned Utility	Weight	Wtd Value Indicator
Cost Approach				
Depreciated Replacement Cost New	$	8,517,587	50%	4,258,794
Depreciated Original Cost		6,128,876		
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Market Approach				
Investor-Owned Utility		11,374,184	10%	1,137,418
Appraisal Conclusion				8,909,653
Appraisal Conclusion		**8,910,000**		

As the purpose of this appraisal was to fulfill the requirements of Section 1329 of the PA CS in the establishment of value for rate making of Sadsbury's property, plant and equipment the cost approach conclusion of $8,517,587 is consistent with the purpose of the appraisal. This cost approach conclusion is detailed in the Cost Approach of this report. As the cost approach work papers details our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the wastewater industry account classifications and the installation year of the property this detail can be used to establish the booked value for future accounting and rate making.

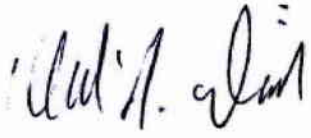
.

Respectfully Submitted,

AUS Consultants, Depreciation & Valuation
By:

Jerome C. Weinert, ASA, P.E., CDP
Principal and Director

David A. Sheffer
Principal



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November 21, 2017

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AUS CONSULTANTS

APPRAISAL CERTIFICATION
for the Fair Market Appraisal of
Sadsbury Township, Pennsylvania's Wastewater Utility
As of January 1, 2017
Prepared for
Pennsylvania-American Water Company

AUS Consultants, Depreciation & Valuation, certifies that, to the best of its knowledge and belief:

- The statements of fact contained in this report are true and correct.

- Over the last three years, AUS Consultants has not appraised these properties.

- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.

- Neither AUS Consultants, Depreciation & Valuation, nor its professional staff has no present or prospective interest in the property that is the subject of this report, and has no personal interest with respect to the parties involved.

- Neither AUS Consultants, Depreciation & Valuation, nor its professional staff has any bias with respect to the property that is the subject of this report or to the parties involved.

- Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.

- Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice 2016-2017 Edition.

- The signer (David A. Sheffer) of this report has made personal inspections of the property that is the subject of this report.

- All individuals who participated in the preparation of this report and who are Senior Members of the American Society of Appraisers are re-certified as required by the mandatory re-certification as set out in the constitution by-laws and administrative rules of the American Society of Appraisers.

AUS CONSULTANTS

- No individuals provided significant professional assistance to the persons signing this report. However, the following Pennsylvania-American Water Company personnel provided information and assistance obtained from Sadsbury Township, Pennsylvania and Herbert E. MacCombie, Jr. PE Consulting Engineers and Surveyors, Inc. Engineer's Assessment report which was the inventory starting point of the Cost Approach.

AUS Consultants, Depreciation & Valuation
By:

Jerome C. Weinert

Jerome C. Weinert, ASA, P.E., CDP
Principal and Director

David A. Sheffer
Principal

Michael J. Diedrich, ASA, P.E., CDP
Certified General Appraiser
Principal

Elizabeth A. Weinert
Associate

November 21, 2017

AUS CONSULTANTS

NARRATIVE REPORT

AUS CONSULTANTS

EXECUTIVE SUMMARY

The purpose of this appraisal is the determination of the fair market value of the property plant and equipment of Sadsbury Township, Pennsylvania's wastewater utility for our client Pennsylvania-American Water Company. The report was prepared based on the 2016-2017 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues Paragraph 1329: "Valuation of acquired water and wastewater systems", collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12) and the Pennsylvania Public Utility Commission's Final Implementation Order M-2016-2543193 adopted October 27, 2016. The intended users of this appraisal are Pennsylvania American Water Company and the Pennsylvania Public Utility Commission (PUC).

The value established in this appraisal was based on the definition of Market Value as:

> *"The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress."* *The Appraisal of Real Estate, 14th Edition, page 58.*

In arriving at our opinion of value of Sadsbury wastewater utility's property, plant, and equipment as it is operated as a investor-owned Pennsylvania PUC rate regulated wastewater utility the cost, income, and market approaches to value were considered. Detailed explanations of each approach to value are included below in the section "Appraisal Procedures and Results". The following summarizes the data, analysis and conclusions of each of those valuation approaches.

Cost Approach - The philosophy in the cost approach to value is that the maximum value of a property is established by the cost to acquire or build a similar property. In this appraisal, the cost approach to value was analyzed using reproduction/replacement cost approach.

Reproduction cost and replacement cost are defined as:

> Reproduction cost – "Reproduction cost is the estimated cost to construct, as of the effective appraisal date, an exact duplicate or replica of the building [property] being appraised, insofar as possible, using the same materials, construction standards, design, layout, and quality of workmanship and embodying all the deficiencies, super-adequacies, and obsolescence of the subject improvements [property]."[1]
>
> Replacement cost – "Replacement cost is the estimated cost to construct, as of the effective appraisal date, a substitute for the building [property] being appraised using contemporary materials, standards, design and layout. When this cost basis is used, some existing obsolescence in the property may be cured. Replacement cost may be the only alternative if reproduction cost cannot be estimated"[2]
>
> In the wastewater industry the property's reproduction costs and replacement costs are quite similar; therefore, the property's cost new was determined based on its replacement cost new estimated by the trended original cost and the inventory-unit cost methods.

The trended original cost method was utilized in preparing the replacement cost new. "Trending is a method of estimating a property's replacement cost new in which an *index* or *trend factor* is applied to the property's *historical costs* to convert the known historical costs into an indication of current (appraisal date) costs. Simply put, trending reflects the movement of price over time."[3] In the trended original cost method, Sadsbury's investment in wastewater plant and equipment is restated to costs reflective of the appraisal date, by the application of cost trends to the property's original investment. AUS Consultants utilized the Engineer's Assessment performed by Herbert E. MacCombie, Jr., PE Consulting Engineers and Surveyors, Inc. (Engineer's Assessment tab) as the starting point of the Cost Approach. Utilizing the Engineer's Assessment AUS Consultant developed Sadsbury's original cost less depreciation in property, plant and equipment at January 1, 2017 (AUS Original Cost Less Depreciation tab).

The cost trends were applied to each of the Sadsbury's various investment categories (plant accounts) by original year of placement for that investment. The cost indexes

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[1] The Appraisal of Real Estate, 14th Edition. pages 569-570
[2] Ibid, page 570
[3] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Third Edition. Page 50

used in these studies were the Handy-Whitman Index of Public Utility Construction Costs for the water industry in the northeastern region of the United States, AUS General Plant Indexes, and various United States Bureau of Labor Statistics (US BLS) indexes as detailed in the following table:

Property Description		Costing					
NARUC Account	Account Description	Cost Index Source	Table	Region		Line Reference	Lookup
351	Organizations	US BLS	USBLS	Professional Labor	US	USBLS	3	USBLS3
352	Franchises	US BLS	USBLS	Professional Labor	US	USBLS	3	USBLS3
353	Land & Land Rights	US BLS	USBLS	General Inflation	US	USBLS	1	USBLS1
353.1	Land Improvements	US BLS	USBLS	General Inflation	US	USBLS	1	USBLS1
354	Structures & Improvements	Handy Whitman	HW	Water	No Atl	W-1	15	HWW-115
354.3	Structures & Improvements - Pump Stations	Handy Whitman	HW	Water	No Atl	W-1	15	HWW-115
354 4	Structures & Improvements - Treatment Plants	Handy Whitman	HW	Water	No Atl	W-1	15	HWW-115
355	Power Generating Equipment	US BLS	USBLS	Generators	US	USBLS	4	USBLS4
360	Collection Sewers - Force	Handy Whitman	HW	Water	No. Atl	W-1	43	HWW-143
361	Collection Sewers - Gravity	Handy Whitman	HW	Water	No. Atl	W-1	43	HWW-143
362	Special Collection Structures	Handy Whitman	HW	Water	No Atl	W-1	43	HWW-143
363	Services to Customers	Handy Whitman	HW	Water	No. Atl	W-1	39	HWW-139
364	Flow Measuring Devices	Handy Whitman	HW	Water	No Atl	W-1	40	HWW-140
365	Flow Measuring Installations	Handy Whitman	HW	Water	No. Atl	W-1	40	HWW-140
366	Reuse Services	Handy Whitman	HW	Water	No. Atl	W-1	39	HWW-139
367	Reuse Meters & Meter Installations	Handy Whitman	HW	Water	No. Atl	W-1	39	HWW-139
370	Receiving Wells	Handy Whitman	HW	Water	No Atl	W-1	2	HWW-12
371	Pumping Equipment	Handy Whitman	HW	Water	No Atl	W-1	9	HWW-19
374	Reuse Distribution Reservoirs	Handy Whitman	HW	Water	No Atl	W-1	2	HWW-12
375	Reuse Transmission & Distribution System	Handy Whitman	HW	Water	No Atl	W-1	34	HWW-134
380	Treatment & Disposal Equipment	Handy Whitman	HW	Water	No Atl	W-1	16	HWW-116
381	Plant Sewers	Handy Whitman	HW	Water	No Atl	W-1	34	HWW-134
382	Outfall Sewer Lines	Handy Whitman	HW	Water	No Atl	W-1	34	HWW-134
389	Othe Plant & Miscellaneous Equipment	Handy Whitman	HW	Water	No Atl	W-1	34	HWW-134
390 1	Furniture	AUS	AUS	General Plant	No Atl	T-1	12	AUST-112
390 2	Office Equipment	AUS	AUS	General Plant	No Atl	T-1	13	AUST-113
390 3	EDP Equipment	AUS	AUS	General Plant	No Atl	T-1	14	AUST-114
391	Transportation Equipment	AUS	AUS	General Plant	No Atl	T-1	4	AUST-14
392	Stores Equipment	AUS	AUS	General Plant	No Atl	USBLS	1	USBLS1
393	Tools, Shop, & Garage Equipment	AUS	AUS	General Plant	No Atl	T-1	7	AUST-17
394	Laboratory Equipment	AUS	AUS	General Plant	No Atl	USBLS	1	USBLS1
395	Power Operated Equipment	AUS	AUS	General Plant	No Atl	T-1	8	AUST-18
396	Communications Equipment	US BLS	USBLS	Communication	US	USBLS	2	USBLS2
396 1	Communications Equipment	US BLS	USBLS	Communication	US	USBLS	2	USBLS2
396 2	SCADA Systems	US BLS	USBLS	Communication	US	USBLS	2	USBLS2
397	Miscellaneous Equipment	US BLS	USBLS	CPI	US	USBLS	1	USBLS1
398	Other Tangible Plant	US BLS	USBLS	CPI	US	USBLS	1	USBLS1

Using the trended original cost method, Sadsbury's investment in plant, property and equipment of $7,480,601 was determined to have a reproduction cost new of $10,652,193.

Replacement Cost New Less Depreciation - The replacement cost described above reflects the cost of new property; however, Sadsbury's wastewater system property is

not new and has experienced normal depreciation and potentially functional and/or economic obsolescence. These various forms of depreciation are defined as follows:

> Normal depreciation/deterioration, akin to physical deterioration, is "loss in value caused by wear, tear, age and use."[4]
>
> Functional obsolescence is "the loss in value or usefulness of a property caused by inefficiencies or inadequacies of the property itself, when compared to a more efficient of less costly replacement property that new technology has developed."[5]
>
> Economic, or external, obsolescence is defined as "a loss in value caused by factors outside a property"[6] and is most often indicated by insufficient earning.

Based on our experience in regard to: water and wastewater depreciation studies and our analysis of Sadsbury's wastewater system operating performance; we found that Sadsbury's wastewater utility's property experiences normal depreciation but not any significant functional or economic obsolescence (see Income Approach).

In order to ascertain the service lives of the various types of Sadsbury's property, plant and equipment, we considered AUS Consultants' past water and wastewater depreciation studies, documentation provided by Sadsbury Township, and the interviews with Pennsylvania American's personnel and consultants. Through our experience and the above described information the following normal depreciation parameters of survival/retirement characteristics and service lives were determined for Sadsbury's wastewater utility property:

---

[4] The Dictionary of Real Estate Appraisal, 4th Edition

[5] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition. Page 67.

[6] The Appraisal of Real Estate, 13th Edition, page 442.

Property Description				Depreciation			
NARUC Account	Account Description	Depreciable / Non-deprecable	Survivor - Retirement Characteristics	Physical Life	Functional Life	Minimum Condition	Economic Obsolescence
							0%
351	Organizations	Non-depreciable	SQ.0	100	100	100%	0%
352	Franchises	Non-depreciable	SQ.0	100	100	100%	0%
353	Land & Land Rights	Non-depreciable	SQ.0	100	100	100%	0%
353.1	Land Improvements	Depreciable	R4 0	45	45	10%	0%
354	Structures & Improvements	Depreciable	R4.0	45	45	10%	0%
354 3	Structures & Improvements - Pump Stations	Depreciable	R4 0	45	45	10%	0%
354 4	Structures & Improvements - Treatment Plants	Depreciable	R4 0	45	45	10%	0%
355	Power Generating Equipment	Depreciable	R3 0	35	35	10%	0%
360	Collection Sewers - Force	Depreciable	R3 0	65	65	10%	0%
361	Collection Sewers - Gravity	Depreciable	R3 0	70	70	10%	0%
362	Special Collection Structures	Depreciable	R3 0	75	75	10%	0%
363	Services to Customers	Depreciable	R3 0	55	55	10%	0%
364	Flow Measuring Devices	Depreciable	R3 0	35	35	10%	0%
365	Flow Measuring Installations	Depreciable	R3 0	35	35	10%	0%
366	Reuse Services	Depreciable	R3 0	45	45	10%	0%
367	Reuse Meters & Meter Installations	Depreciable	R3 0	35	35	10%	0%
370	Receiving Wells	Depreciable	R4 0	45	45	10%	0%
371	Pumping Equipment	Depreciable	R3 0	35	35	10%	0%
374	Reuse Distribution Reservoirs	Depreciable	R4 0	55	55	10%	0%
375	Reuse Transmission & Distribution System	Depreciable	R4 0	65	65	10%	0%
380	Treatment & Disposal Equipment	Depreciable	R3 0	45	45	10%	0%
381	Plant Sewers	Depreciable	R4 0	65	65	10%	0%
382	Outfall Sewer Lines	Depreciable	R4 0	65	65	10%	0%
389	Othe Plant & Miscellaneous Equipment	Depreciable	R3 0	45	45	10%	0%
390.1	Furniture	Depreciable	R3 0	22	22	10%	0%
390 2	Office Equipment	Depreciable	R3 0	12	12	10%	0%
390 3	EDP Equipment	Depreciable	R3 0	8	8	10%	0%
391	Transportation Equipment	Depreciable	R3 0	12	12	10%	0%
392	Stores Equipment	Depreciable	R3 0	35	35	10%	0%
393	Tools, Shop, & Garage Equipment	Depreciable	R3 0	25	25	10%	0%
394	Laboratory Equipment	Depreciable	R3 0	25	25	10%	0%
395	Power Operated Equipment	Depreciable	R3 0	18	18	10%	0%
396	Communications Equipment	Depreciable	R3 0	12	12	10%	0%
396 1	Communications Equipment	Depreciable	R3 0	12	12	10%	0%
396 2	SCADA Systems	Depreciable	R3 0	12	12	10%	0%
397	Miscellaneous Equipment	Depreciable	R3 0	35	35	10%	0%
398	Other Tangible Plant	Depreciable	R3 0	35	35	10%	0%

Normal Depreciation – The extent of the normal depreciation in the property was evaluated using age-life depreciation techniques. In age-life depreciation, the property's depreciation or condition is estimated using the following formula:

$$\text{Depreciation (\%)} = \frac{\text{Age (years)} \times 100\%}{\text{Service Life (years)}}$$

$$\text{Condition (\%)} = \frac{\text{Remaining Life (years)} \times (100\%)}{\text{Service Life (years)}}$$

where: the property's Service Life = Age + Remaining Life

When the above depreciation lives are used to quantify the property's depreciation is applied to the replacement cost new (RCN) of $10,652,193 the resultant RCN less normal depreciation (RCNLD) was found to be $8,517,587 detailed as follows:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Account	Account Description	Original Cost	OC less Depreciation	Replacement cost New	RCN less Depreciation
Plant in Service					
353	Land & Land Rights	18,343	18,343	25,235	25,235
354	Structures & Improvements - Pump Station	152,560	93,461	298,865	183,085
355	Power Generating Equipment	40,000	20,732	58,880	30,518
360	Collection Mains - Force	92,500	67,840	170,385	124,960
361	Collection Mains - Gravity	5,668,395	4,706,722	7,984,952	6,534,161
363	Services	546,316	432,822	842,151	659,483
364	Flow Meters	98,731	83,541	125,321	97,580
371	Pumping Equipment	225,000	116,618	479,025	248,279
Total Plant in Service		6,841,845	5,540,079	9,984,814	7,903,301
Plant not Dedicated to Service					
361	Collection Mains - Gravity	584,547	537,817	608,595	559,253
363	Services	54,209	50,980	58,784	55,033
Total Plant not Dedicated to Service		638,756	588,797	667,379	614,286
Total Plant		7,480,601	6,128,876	10,652,193	8,517,587

The preliminary cost approach to value of Sadsbury's sewer utility property was found to $8,517,587.

Income Approach

The income approach to value establishes the value of the property based on its economic returns. There are two generally accepted procedures in performing an income analysis: the direct capitalization of anticipated income, and the discounted cash flow procedures.

In the direct capitalization approach, anticipated earnings are capitalized directly into value using a market-required return. Sadsbury's wastewater operation will be moving from a municipal operation, wherein economic returns are not the primary objective of the operation to a private (investor owned) rate regulated sewer utility operation in which economic returns are one of the objectives of the operation; therefore, the direct capitalization of earnings approach was not utilized in this appraisal.

In the discounted cash flow (DCF) approach, the property's economic returns are forecast for future periods. The cash flows (after-tax debt-free cash flows) from operations are discounted to the appraisal date using a market derived discount resulting in the DCF approach's income indicator of value. Use of the DCF approach allows the appraiser to address the property's historical operating experience and its migration, in future periods, to an operation as a rate regulated operation; thus making the DCF approach preferable.

In preparing this appraisal's DCF analysis first the results from Sadsbury's wastewater utility's operations were evaluated based on an analysis of historical operating performances over the period 2014 through 2015 resulting in operating statistics such as revenues and their growth, various operating expenses stated as function of their typical drivers (revenues, plant investment, income from operations, etc.). Second similar operating statistics were developed from public investor-owned water/wastewater utilities. Next, the results of future periods operations were forecast based on the migration of Sadsbury's historical operations over time to operations of the Sadsbury's wastewater operation similar to a public investor-owned water/wastewater utility. Finally, the resultant cash flows from future period operations on the Sadsbury wastewater system were discounted to the appraisal date using a market derived discount rate for a public investor-owned water/wastewater utilities. The following table presents the results of the discounted cash flow analysis:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017
Discounted Cash Flow Analysis

Discount Rate									7 05%	AUS Input					
Capitalization Rate									5 33%	AUS Input					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Period	Age	Revenues	Operating Expenses	Income from Operations	Non-Operating Income (Expense)	Income Before State and Federal Taxes	State and Federal Taxes @ 41 49%	After Tax Income	Non Cash Expense (depreciation)	Capital Expenditures	Change in Working Capital	Debt-free Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
AUS Input	AUS Input	Forecast	Forecast	(3)-(4)	Forecast	(5)+(6)	(6)*41 49%	(7)-(8)	Forecast	Forecast	Forecast	(9)-(6)+(10)-(11)-(12)	See Note below	(13)*(14)	∑(15)
1	0 5	1,234,548	789,484	445,064	(117,074)	327,990	136,083	191,907	135,174	127,200	-	316,955	0 967	306,495	306,495
2	1 5	1,499,976	932,856	567,120	(114,632)	452,488	187,737	264,751	137,869	129,758	14,839	372,655	0 903	336,507	643,002
3	2 5	1,522,476	947,531	574,945	(112,542)	462,403	191,851	270,552	140,619	132,367	2,615	388,731	0 843	327,700	970,702
4	3 5	1,545,313	962,441	582,872	(110,555)	472,317	195,964	276,353	143,425	135,030	2,555	392,748	0 788	309,485	1,280,187
5	4 5	1,800,290	1,100,442	699,848	(108,439)	591,409	245,376	346,033	146,288	137,746	14,089	448,525	0 736	330,409	1,610,596
6	5 5	1,827,294	1,117,674	709,620	(106,651)	602,969	250,172	352,797	149,208	140,516	2,618	465,522	0 688	320,279	1,930,875
7	6 5	1,854,703	1,135,182	719,521	(104,958)	614,563	254,982	359,581	152,189	143,343	2,568	470,817	0 642	302,265	2,233,140
8	7 5	2,067,994	1,251,266	816,728	(103,176)	713,552	296,053	417,499	155,229	146,227	11,795	517,882	0 600	310,729	2,543,869
9	8 5	2,099,014	1,270,807	828,207	(101,668)	726,539	301,441	425,098	158,330	149,170	2,615	533,311	0 560	298,654	2,842,523
10	9 5	2,193,470	1,324,035	869,435	(100,187)	769,248	319,161	450,087	161,496	152,172	5,721	553,877	0 524	290,232	3,132,755
11	10 5	2,336,046	1,402,828	933,218	(98,745)	834,473	346,223	488,250	164,724	155,235	8,063	588,421	0 489	287,738	3,420,493
12	11 5	2,371,087	1,424,696	946,391	(97,497)	848,894	352,206	496,688	168,020	158,359	2,626	601,220	0 457	274,758	3,695,251
13	12 5	2,406,653	1,446,906	959,747	(96,332)	863,415	358,231	505,184	171,380	161,547	2,592	608,757	0 427	259,939	3,955,190
14	13 5	2,442,753	1,468,468	973,285	(95,248)	878,037	364,298	513,739	174,809	164,800	2,559	616,437	0 399	245,958	4,201,148
15	14 5	2,552,677	1,531,227	1,021,450	(94,171)	927,279	384,728	542,551	178,308	168,118	6,192	640,720	0 372	238,348	4,439,496
16	15 5	2,590,967	1,555,092	1,035,875	(93,244)	942,631	391,098	551,533	181,879	171,504	2,554	652,598	0 348	227,104	4,666,600
17	16 5	2,629,832	1,579,332	1,050,500	(92,393)	958,107	397,519	560,588	185,521	174,960	2,529	661,013	0 325	214,829	4,881,429
18	17 5	2,669,279	1,603,956	1,065,323	(91,616)	973,707	403,991	569,716	189,231	178,484	2,503	669,583	0 304	203,553	5,084,982
19	18 5	2,709,318	1,628,969	1,080,349	(90,913)	989,436	410,517	578,919	193,030	182,079	2,480	678,303	0 284	192,638	5,277,620
20 and beyond	19 5	2,831,237	1,697,454	1,133,783	(90,199)	1,043,584	432,983	610,601	196,891	185,747	6,522	705,429	4 970	3,505,982	8,783,602
Age											19 5				
PW(Age) = 1/(1+Discount Rate)^(Age)											0 265				
PW to Perpetuity = 1/Capitalization Rate											18 762				
$PW_{(20and Beyond)}$ = PW to Perpetuity * PW Factor$_{(19 5)}$											4 97				

Based on the above described discounted cash flow analysis, the Income Approach to value of the Sadsbury's wastewater property and its operations was determined to be $8,763,602.

Market Approach

The market or comparable sales approach to value looks to market sales of comparable properties in order to arrive at value. In this appraisal, the market approach was addressed from a comparable sales approach of Pennsylvania wastewater systems and market value to book value ratios based on investor owned water utilities financial performance as reported in Value Line Investment Survey.

Market Sales – In the comparable sale market approach the sales of Pennsylvania municipal wastewater systems to investor owned water/wastewater utilities were used to insure comparability. As the purpose of this appraisal is to define the value of Sadsbury's waste water utility under Section 1329 of the PA CS the market comparable sales were limited to sales subsequent to the passage of Section 1329 in 2016. The sale

of the City of McKeesport, Pennsylvania wastewater system to Pennsylvania American Water (announced September 9 2016) and the sale of New Garden Township's sewer utility to Aqua Pennsylvania, Inc. (August 2016) were analyze in relationship to those properties' depreciated original cost (Market Approach tab).

Financial Market Ratios – In the market approach based on market financial ratios the market data of companies (nine) in the water/wastewater industry as reported in Value Line Investment Surveys (January 2017) were analyzed. In the analysis the companies' stock (market) and debt (book value) per share are compared as a ratio to the book investment value per share.

The following table summarizes both the comparable sales and financial market ratio analysis and the Market Approach conclusion of this appraisal:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Market Approach Summary
Revised: 6-21-2017

Comparable Sales	Purchase Price to Depreciated Original Cost (Book Value)	Purchase Price to Financials (Net Book Value)	Purchase Price to RCNLD		
New Garden	1.59	1.64	0.96		
McKeesport	2.02	2.19	1.03		
Mean	1.81	1.92	1.00		
Financial Markets	**Market Value per Share to Book Value per Share**			**American**	**Aqua**
Market to Book (equity)	2.79			2.48	2.87
Market to Book (equity and debt)	1.96			1.64	1.93
Minumum	1.59	1.64	0.96		
Mean	2.09	2.21	1.02		
Median	1.99	2.07	1.00		
Maximum	2.79	2.79	1.03		
Market Conclusion	**Value to Depreciated Original Cost (Book Value)**	**Value to Financial (Net Book Value)**	**Value to RCNLD**	**Average**	
Use	2.00	2.10	1.00		
Sadsbury	5,540,079	6,916,575	8,517,587		
Market to Book Ratio	2.00	2.10	1.00		
Market Value	11,080,158	14,524,808	8,517,587	11,374,184	
Use	11,374,184				

The market approach conclusion of this appraisal was determined to be $11,374,184.

Cost Approach Revisited – Before concluding this appraisal's fair market value the preliminary cost approach conclusion of $8,517,587 needs to be reviewed in light of the above described income and market analyses in order to evaluate if external obsolescence exists in the preliminary replacement cost new less depreciation conclusion. The appraisal literature in regards to developing a cost approach states:

> "The last step in the implementation of the cost approach is to estimate *economic obsolescence*. Economic obsolescence (sometimes called "external obsolescence") has been previously defined as the loss in value or usefulness of a property caused by factors external to the asset. These factors include increased cost of raw materials, labor, utilities (without an offsetting increase in product price); reduced demand for the product; increased competition; environmental or other regulations; or similar factors.
>
> The difficulty in measuring the full effect of economic obsolescence is one of the weaknesses of the cost approach. Because economic obsolescence is usually a function of outside influences that affect an entire business (i.e., all tangible and intangible assets) rather than individual assets or isolated groups of assets, it is sometimes measured using the income approach or by using the income approach to help identify the existence of economic influences on value. However, the cost approach can be used to measure some forms of economic obsolescence."[7]

The above described income approach value conclusion of $8,574,610 and the market approach conclusion of $8,642,523 for the Sadsbury's future wastewater system compared to the preliminary cost approach conclusion of $8,517,587 indicates no significant external obsolescence exists in the cost approach conclusion of $8,517,587.

Value Conclusion

The Fair Market Value of Sadsbury's wastewater property, plant and equipment and its operation was determined to be $8,910,000 as follows:

[7] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition, pp. 96-97.

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Fair Market Value Appraisal

Revised: 6-21-2017

	Investor-owned Utility		Weight	Wtd Value Indicator
Cost Approach				
Depreciated Replacement Cost New	$	8,517,587	50%	4,258,794
Depreciated Original Cost		6,128,876		
Net Book Financials		6,916,575		
Income Approach				
Investor-Owned Utility		8,783,602	40%	3,513,441
Market Approach				
Investor-Owned Utility		11,374,184	10%	1,137,418
Appraisal Conclusion				8,909,653
Appraisal Conclusion		**8,910,000**		

As the purpose of this appraisal was to fulfill the requirements of Section 1329 of the PA CS in the establishment of value for rate making of Sadsbury's property, plant and equipment the cost approach conclusion of $8,517,587 is consistent with the purpose of the appraisal. This cost approach conclusion is detailed (Cost Approach tab of this report). As the cost approach work papers details our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the wastewater industry account classifications and the installation year of the property this detail can be used to establish the booked value for future accounting and rate making.

PURPOSE AND SCOPE OF WORK

The purpose of this appraisal of Sadsbury, Pennsylvania's wastewater utility is the determination of the fair market value of the property plant and equipment of Sadsbury wastewater utility. The report was prepared based on the 2016-2017 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PA CS) Paragraph 1329: Valuation of acquired water and wastewater systems, collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12). The intended users of this appraisal are Pennsylvania American Water Company and Pennsylvania Public Utility Commission.

The value established in this appraisal was based on the definition of Market Value as:

> *"The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress." The Appraisal of Real Estate, 14th Edition, page 58.*

In conducting this appraisal, we utilized several sources of data:

- Annual (year-end) Sadsbury, Pennsylvania wastewater operational financial statements cover the period 2014 through 2015 results.
- The Herbert E. MacCombie, Jr., PE consulting Engineers and Surveyors, Inc. Sadsbury, Pennsylvania wastewater facilities' inventory at January 2017.
- The Handy-Whitman (water industry) Index of Public Utilities Construction Costs for northeastern United States, AUS Consultant General Plant Cost Indexes for the period 1946 through January 1, 2017, and various cost indexes published by the United States Bureau of Labor Statistics (US BLS).

- We interviews and discussions with Pennsylvania American Water Company personnel.

In preparing this fair market value appraisal of the Sadsbury, Pennsylvania's wastewater system property, plant and equipment, and its operations, the cost, income, and market approaches to value were considered. Primary reliance was placed on the cost approach for the property, plant and equipment, with the income approach and market approaches being utilized to confirm the overall value of the sewer system's operation. A detailed explanation of each approach to value is included below in the section "Appraisal Procedures and Results".

WATER/WASTEWATER INDUSTRY NATIONALLY AND IN PENNSYLVANIA AND SADSBURY PENNSYLVANIA WASTEWATER FACILITIES

Water/wastewater Industry

The water and wastewater industry in the United States consist of both municipal authorities (literally thousands) and private investor owned companies. Of the investor owned there are nine which are large enough to be tracked by Value Line Investment Surveys, of which, two are major players in the northeast portion of the United States, American Water Works Company, Inc. and Aqua America, Inc. American and Aqua have been particularly active in the acquisition of municipal water and wastewater authorities as such in this appraisal these two were reviewed as being indicative of the industry's financial and operating performance.

Pennsylvania Water / Wastewater Industry

The water and wastewater industry in Pennsylvania also consists of both municipal and investor owned systems. Over last several years the need for infrastructure improvements has lead the Pennsylvania legislature to pass legislation facilitating the acquisition of municipal water and/or wastewater authorities' systems to private investor owned rate regulated companies such as American Water and Aqua America. This legislation, Act 12 of the Pennsylvania legislator's 2016 legislative session (Act 12). The Act 12 legislation added a section (1329) modifying Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PA CS) adding Section 1329: Valuation of acquired water and wastewater systems (see Act 12 tab), collectively referred to as Act 12. This appraisal was developed to meet the valuation criteria established by Section 1329 in the valuation of acquired water and wastewater systems.

Sadsbury Township, Pennsylvania's Wastewater Facilities, its Property and Operations[8]

Sadsbury Township, Pennsylvania ("Township") provides sanitary sewer service to customers located in a portion of Sadsbury Township, Chester County, Pennsylvania. The Township began providing sanitary sewer service to residents and business of the Township in 1999 after the construction of a sanitary sewer collection and conveyance trunk line through the eastern portion of the Township. Sadsbury Township's population as determined by the 2010 census was 3,570 residents. The population was estimated at 3,729 residents in 2015 by the Delaware Valley Regional Planning Commission's "Regional and County Population Forecast 2015-2040." Based upon the latest records used for billing the Sadsbury Sanitary Sewer System has a total of 998 customers. Included in that number are 14 residences, which are not connected to the system but have sewer available to them. Sadsbury Township has Nine Hundred and Forty-Eight (948) residential customers, of which 240 are on private wells. Sadsbury Township has Forty-Eight (48) commercial customers, of which 11 are on private wells. One of the commercial customers on a private well is the Lincoln Crest Mobile Home Park. There are two customers on the Township billing records, which were not classified as either commercial or residential.

OVERVIEW OF SADSBURY TOWNSHIP SANITARY SEWER FACILITIES

The Sadsbury Township Sanitary Sewer System is comprised of the service area within the Township. In order to make the implementation of sanitary sewer service more economically feasible to the residents the 1998 Act 537 revision to the Official Sewage Facilities Plan for Sadsbury Township presented a phased approach consisting of four phased areas with several sub-phases. The four phases included:

1. Pomeroy Area

   Phase 1A Completed December 2000
   The area North of Valley Road, South of the Amtrak/Conrail Railroad from Buck Run East to the Township Line.

[8] Extracted from Engineer's Assessment

Phase 1B Completed August 2005
The area South of Valley Road from Buck Run East to the Township Line.

2. Sadsburyville Area

Phase 2A Completed December 2007
The area North of the U.S. Route 30 Bypass, East to the Township Line.

Phase 2B Completed December 2004 & July 2009
The area South of the U.S. Route 30 Bypass to a point South of Business Route 30, from Morris Lane West to Octorara Road.

3. Pomeroy Heights Area

Phase 3A Completed August 2005
The area including Washington Lane, Lincoln Avenue and those properties along Old Wilmington Road North of Washington Lane to a point just North of Lincoln Avenue.

Phase 3B Completed July 2009
The area South of Washington Lane extending to the North side of the Amtrak/Conrail Railroad, West to Old Wilmington Road.

4. Area West of Pomeroy

Phase 4 Completed September 2011
West of Buck Run in close proximity to Valley Road west to Shamrock Drive.

The connection of the four phased areas was made possible by the construction of Sadsbury Sewer Corporation (SSC) Collection and Conveyance System, Main Interceptor, Pump Station and Force Main. SSC was a private group of investors formed to develop a sewer collection system to serve a number of large properties East of the Buck Run. After much deliberation between the representatives of SSC and Sadsbury Township, the alignment of the SSC Collection and Conveyance System, Main Interceptor, Pump Station and Force Main was determined. The SSC collection and conveyance system consisted of two trunk lines. The Easterly trunk provides sewer

service to an area comprised predominantly of industrial lands primarily in the easterly portion of the Township. The line generally runs south along Old Wilmington Road and Southwesterly along Quarry Road. The Westerly trunk line provides sewer service to the Sadsburyville area and runs southwesterly along the East side of the Buck Run. The two trunk lines are connected to the Main Interceptor, which generally follows the Buck Run beginning in the vicinity of the intersection of Greenbelt Drive and Quarry Road. The interceptor extends southward, crossing under the Amtrak/Conrail Railroad tracks into the Bert Reel Park. The line continues through the park turning east towards Old Wilmington Road then continuing south generally along Old Wilmington Road and Valley Road through easements. The interceptor crosses Valley Road near Timicula Road and connects with the Main Pump Station along the southwesterly side of Timicula Road south of Valley Road. The Main Pump Station situated known as the "Stottsville Pump Station" has two alternating pumps with a rated capacity of 700 GPM each.. From the pump station, a force main extends northeasterly through easements and within road rights-of-way to the discharge point in the Pennsylvania American Parkesburg Interceptor at a gravity manhole located within the cartway of Valley Road near Newport Road. An additional gravity sewer is located along Olive Alley and Penn Street and is connected to a Pennsylvania American trunk line within Valley Road just east of the Sadsbury Township–Valley Township Boundary Line. Sewage generated from the Sadsbury Township Sewer Service Area is treated at the Pennsylvania American Water Coatesville Wastewater Treatment Plant.

In addition to the four phases of the service area completed by the Township to serve the existing residences, several residential developments have been competed and sanitary sewers dedicated to the Township. They include:

1. Lincoln Crest The Lincoln Crest development contains approximately 125 units, which are largely mobile homes. The development is located along the northerly side of Business Route 30 west of Old Wilmington Road in the Sadsburyville portion of the service area. The collection system is private with a single point of entry to the westerly SSC trunk line along the northerly side of Business Route 30.

2. Quarry Ridge The Quarry Ridge Development contains approximately 158 detached single family homes and is located along the westerly side of Old Wilmington Road and the southerly side of Quarry

Road. The development has a gravity sewer system which connects to the easterly SSC trunk line within the cartway of Quarry Road.

3. Sadsbury Village The Sadsbury Village Development contains approximately 146 attached townhouses and is located along the southerly side of Business Route 30 west of Old Wilmington Road in the Sadsburyville section of the Township. The development has a gravity sewer system which connects to the westerly SSC trunk line through easements to the west of the development.

4. Octorara Glen The Octorara Glen Development contains approximately 43 detached single family homes and is located on the southeasterly side of Octorara Road north of the Buck Run. The development has a gravity sewer system which connects to the westerly SSC trunk line through easements to the east.

5. Sadsbury Park The Sadsbury Park Development is a multi-phased subdivision and land development currently under construction in the Township. The Development contains a mix of housing types, including detached single family homes and townhouses. The development has been partially completed with 30 detached single family homes and 63 townshouse units of the total 445 approved units. The extensive gravity sewer system has not yet been completed or accepted by the Township. The system drains through easement to the easterly SSC trunk line.

6. Sadsbury Crossing The Sadsbury Crossing Development contains approximately 19 detached single family homes and is located in the southwestern portion of the Township. The development has gravity sewer service which is connected to the Pennsylvania American system through easements to the Borough of Parkesburg collection system.

The flow generated from several commercial and industrial developments is collected in sanitary sewer lines not yet dedicated to the Township. Flow generated from the Bellaire Industrial Park located in the eastern portion of the Township south of Business Route 30 and west of Washington Lane containing approximately 10 commercial and industrial facilities and flows westerly towards Old Wilmington Road from the Industrial Park into the Easterly SSC trunk line. Flow generated from the five (5) light industrial and commercial sites within the Morris Farm Industrial Park is collected in a sanitary sewer system which is not dedicated to the Township and flows south across Business Route 30 into the Bellaire Industrial park system.

The Cowan Estates Development located along the southerly side of Business Route 30 has a capped sewer system. Although the improvements have been dedicated to the Township, the system has not yet been connected to the public sewer conveyance line.

APPRAISAL PROCEDURES AND RESULTS

The purpose of this appraisal of Sadsbury Township, Pennsylvania's wastewater system is the determination of the fair market value of the wastewater's property plant and equipment as of January 1, 2017. The report was prepared based on the 2016-2017 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PS CS) Section 1329: Valuation of acquired water and wastewater systems, collectively referred to as Act 12 of the Pennsylvania legislator's 2016 legislative session (Act 12). The intended users of this appraisal are New Pennsylvania American Water Company and Pennsylvania Public Utility Commission.

The value established in this appraisal was based on the definition of Market Value as:

> *"The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress."* *The Appraisal of Real Estate, 14th Edition, page 58.*

In conducting this appraisal, we utilized several sources of data:

- Annual (year-end) Sadsbury Township, Pennsylvania wastewater operational financial statements cover the period 2014 through 2015.

- The Herbert E. MacCombie, Jr., PE Consulting Engineers & Surveyors, Inc.: Sadsbury, Pennsylvania wastewater facilities' Original Cost Study at January 1, 2017.

- The Handy-Whitman (water industry) Index of Public Utilities Construction Costs for northeastern United States, AUS Consultant General Plant Cost Indexes for the period 1946 through January 1, 2017, and various cost indexes published by the United States Bureau of Labor Statistics (US BLS).

- We conducted interviews and discussions with Pennsylvania American Water company personnel.

In preparing this fair market value appraisal of the Sadsbury's wastewater system's property, plant and equipment, and its operations; the cost, income, and market approaches to value were considered. Primary reliance was placed on the cost approach for the property, plant and equipment, with the income approach and market approaches being utilized to confirm the overall value of the sewer system's operation. Detailed explanation of each approach to value is included below.

Cost Approach - The philosophy in the cost approach to value is that the maximum value of a property is established by the cost to acquire or build a similar property. In this appraisal, the cost approach to value was analyzed using reproduction/replacement cost approach.

Reproduction cost and replacement cost are defined as:

> Reproduction cost – "The estimated cost to construct, at current prices as of the effective date of the appraisal, an exact duplicate or replica of the [property] being appraised, using the same materials, construction standards, design, layout, and quality of workmanship and embodying all the deficiencies, super-adequacies, and obsolescence of the subject [property]."[9]
>
> Replacement cost – "The estimated cost to construct, at current prices as of the effective appraisal date, a substitute for the [property] being appraised using modern materials and current standards, design and layout."[10]
>
> In the wastewater industry the property's reproduction costs and replacement costs are quite similar; therefore, the property's cost new was determined based on its replacement cost new.

The trended original cost method was utilized in preparing the replacement cost new. "Trending is a method of estimating a property's replacement cost new in which an *index* or *trend factor* is applied to the property's *historical cost* to convert the known cost into

[9] The Appraisal of Real Estate, 13th Edition. Page 385
[10] ibid

an indication of current cost. Simply put, trending reflects the movement of price over time."[11] In the trended original cost method, Sadsbury's investment in wastewater plant and equipment is restated to costs reflective of the appraisal date, by the application of cost trends to the property's original investment. AUS Consultants utilized the Engineer's Assessment performed by Herbert E. MacCombie, Jr., PE Consulting Engineers and Surveyors, Inc. (Engineer's Assessment tab) as the starting point of the Cost Approach. Utilizing the Engineer's Assessment of Sadsbury's original cost in property, plant and equipment AUS Consultants developed the plant's depreciated original cost at January 1, 2017 (Property Record (Original Cost) and Depreciated Original Cost tabs).

The cost trends are applied to each of the various investment categories (plant accounts) by original year of placement for that investment. The cost indexes used in these studies were the Handy-Whitman Index of Public Utility Construction Costs for the water industry of the northeastern region of the United States, AUS Consultants of General Plant Indexes, and various United States Bureau of Labor Statistics (US BLS) indexes. The following table presents the development of the cost approach for a portion of account 361 Collection Mains (this example will be used to describe the entire cost approach:

[11] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition. Page 59

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols (16) & (4))	Cost Index Lookup f(Cols (16) & (2017))	Cols (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	1999	$100,632	HWW-143	183.3	337.6	1.842	185,364
361	Collection Sewers - Gravity	1999	$34,146	HWW-143	183.3	337.6	1.842	62,897
361	Collection Sewers - Gravity	1999	$179,433	HWW-143	183.3	337.6	1.842	330,516
361	Collection Sewers - Gravity	1999	$35,000	HWW-143	183.3	337.6	1.842	64,470
361	Collection Sewers - Gravity	1999	$10,400	HWW-143	183.3	337.6	1.842	19,157
Subtotal			$359,611					662,404

Using the trended original cost method, Sadsbury's investment in this example of account 361 Collection Mains of $359,611 was determined to have a replacement cost new of $662,404. When the trended cost method is applied to each of Sadsbury's investment in plant, property and equipment of $7,480,601 was determined to have a replacement cost new of $10,652,193.

Replacement Cost New less Depreciation - The reproduction cost described above reflects the cost of new property; however, the Sadsbury's wastewater system property is not new and has experienced normal depreciation and potentially functional and or economic obsolescence. These various forms of depreciation are defined as follows:

> Normal depreciation/deterioration, akin to physical deterioration, is "loss in value caused by wear, tear, age and use."[12]
>
> Functional obsolescence is "the loss in value or usefulness of a property caused by inefficiencies or inadequacies of the property itself, when compared to a more

[12] The Dictionary of Real Estate Appraisal, 4th Edition

efficient of less costly replacement property that new technology has developed."[13]

Economic, or external, obsolescence is defined as "A loss in value caused by factors outside a property"[14] and is most often indicated by insufficient earning.

Based on our experience in regard to: water and wastewater depreciation studies and our analysis of Sadsbury's wastewater system operating performance: Sadsbury's property experiences normal depreciation but not any significant functional or economic obsolescence (see Income Approach).

In order to ascertain the service lives of the various types of Sadsbury's property, plant and equipment, we considered AUS Consultants' past water and wastewater depreciation studies, interviews with Pennsylvania American's personnel, and documents provided by Sadsbury's. Through our experience and the above described interviews the following normal depreciation parameters of survival/retirement characteristics and service lives were determined for Sadsbury's wastewater utility property:

[13] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition. Page 67.
[14] The Appraisal of Real Estate, 13th Edition, page 442.

Property Description				Depreciation			
NARUC Account	Account Description	Depreciable / Non-depreciable	Survivor - Retirement Characteristics	Physical Life	Functional Life	Minimum Condition	Economic Obsolescence
							0%
351	Organizations	Non-depreciable	SQ 0	100	100	100%	0%
352	Franchises	Non-depreciable	SQ 0	100	100	100%	0%
353	Land & Land Rights	Non-depreciable	SQ 0	100	100	100%	0%
353 1	Land Improvements	Depreciable	R4 0	45	45	10%	0%
354	Structures & Improvements	Depreciable	R4 0	45	45	10%	0%
354.3	Structures & Improvements - Pump Stations	Depreciable	R4 0	45	45	10%	0%
354 4	Structures & Improvements - Treatment Plants	Depreciable	R4 0	45	45	10%	0%
355	Power Generating Equipment	Depreciable	R3 0	35	35	10%	0%
360	Collection Sewers - Force	Depreciable	R3 0	65	65	10%	0%
361	Collection Sewers - Gravity	Depreciable	R3.0	70	70	10%	0%
362	Special Collection Structures	Depreciable	R3 0	75	75	10%	0%
363	Services to Customers	Depreciable	R3 0	55	55	10%	0%
364	Flow Measuring Devices	Depreciable	R3 0	35	35	10%	0%
365	Flow Measuring Installations	Depreciable	R3.0	35	35	10%	0%
366	Reuse Services	Depreciable	R3 0	45	45	10%	0%
367	Reuse Meters & Meter Installations	Depreciable	R3 0	35	35	10%	0%
370	Receiving Wells	Depreciable	R4 0	45	45	10%	0%
371	Pumping Equipment	Depreciable	R3 0	35	35	10%	0%
374	Reuse Distribution Reservoirs	Depreciable	R4 0	55	55	10%	0%
375	Reuse Transmission & Distribution System	Depreciable	R4 0	65	65	10%	0%
380	Treatment & Disposal Equipment	Depreciable	R3 0	45	45	10%	0%
381	Plant Sewers	Depreciable	R4 0	65	65	10%	0%
382	Outfall Sewer Lines	Depreciable	R4 0	65	65	10%	0%
389	Othe Plant & Miscellaneous Equipment	Depreciable	R3 0	45	45	10%	0%
390 1	Furniture	Depreciable	R3 0	22	22	10%	0%
390 2	Office Equipment	Depreciable	R3 0	12	12	10%	0%
390 3	EDP Equipment	Depreciable	R3 0	8	8	10%	0%
391	Transportation Equipment	Depreciable	R3 0	12	12	10%	0%
392	Stores Equipment	Depreciable	R3 0	35	35	10%	0%
393	Tools, Shop, & Garage Equipment	Depreciable	R3 0	25	25	10%	0%
394	Laboratory Equipment	Depreciable	R3 0	25	25	10%	0%
395	Power Operated Equipment	Depreciable	R3 0	18	18	10%	0%
396	Communications Equipment	Depreciable	R3 0	12	12	10%	0%
396 1	Communications Equipment	Depreciable	R3 0	12	12	10%	0%
396 2	SCADA Systems	Depreciable	R3 0	12	12	10%	0%
397	Miscellaneous Equipment	Depreciable	R3.0	35	35	10%	0%
398	Other Tangible Plant	Depreciable	R3 0	35	35	10%	0%

Normal Depreciation – The extent of the depreciation in the property was evaluated using age-life depreciation techniques. In age-life depreciation, the property's depreciation or condition is estimated using the following formula:

$$\text{Depreciation (\%)} = \frac{\text{Age (years) x100\%}}{\text{Service Life (years)}}$$

$$\text{Condition (\%)} = \frac{\text{Remaining Life (years) x (100\%)}}{\text{Service Life (years)}}$$

where: the property's Service Life = Age + Remaining Life

When the above depreciation lives are used to quantify the property's depreciation is applied to the replacement cost new of the example account 361 Collection Mains of $662,404 the replacement cost new less depreciation was determined to be $498,326.

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser. Investor-Owned Utility
January 1, 2017

Development of Cost New less Depreciation (RCNLD)

(1)	(2)	(4)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
Account	Description	Service Date	Cost New	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Cost New less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Account Parameters Lookup	2017 (Col (4)+0 5)	(23)/(22)	Cols (21)&(24)	Iowa Lookup 9(Col (25))	Cols (22)*(26)	Cols (23)+(27)	Cols (27)/(28)	Cols (20)*(29)
Account	Description	Year	RCN	Iowa Survival / Retirement Curve	Life	Age	Age%	Iowa Lookup	Iowa Condition	Expectancy	Total Life	Condition Percent	RCNLD
361	Collection Sewers - Gravity	1999	185,364	R3 0	70	17 5	25	R3 0025	0 75917	53 14	70 64	75 23%	139,449
361	Collection Sewers - Gravity	1999	62,897	R3 0	70	17 5	25	R3 0025	0 75917	53 14	70 64	75 23%	47,317
361	Collection Sewers - Gravity	1999	330,516	R3 0	70	17 5	25	R3 0025	0 75917	53 14	70 64	75 23%	248,647
361	Collection Sewers - Gravity	1999	64,470	R3 0	70	17 5	25	R3 0025	0 75917	53 14	70 64	75 23%	48,501
361	Collection Sewers - Gravity	1999	19,157	R3 0	70	17 5	25	R3 0025	0 75917	53 14	70 64	75 23%	14,412
Subtotal			662,404										498,326

When the above depreciation lives are used to quantify the property's depreciation is applied to each of Sadsbury's investment in plant, property and equipment the replacement cost new (RCN) of $10,652,193 the resultant RCN less depreciation (RCNLD) was found to be $8,517,587 detailed as follows:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Account	Account Description	Original Cost	OC less Depreciation	Replacement cost New	RCN less Depreciation
Plant in Service					
353	Land & Land Rights	18,343	18,343	25,235	25,235
354	Structures & Improvements - Pump Station	152,560	93,461	298,865	183,085
355	Power Generating Equipment	40,000	20,732	58,880	30,518
360	Collection Mains - Force	92,500	67,840	170,385	124,960
361	Collection Mains - Gravity	5,668,395	4,706,722	7,984,952	6,534,161
363	Services	546,316	432,822	842,151	659,483
364	Flow Meters	98,731	83,541	125,321	97,580
371	Pumping Equipment	225,000	116,618	479,025	248,279
Total Plant in Service		6,841,845	5,540,079	9,984,814	7,903,301
Plant not Dedicated to Service					
361	Collection Mains - Gravity	584,547	537,817	608,595	559,253
363	Services	54,209	50,980	58,784	55,033
Total Plant not Dedicated to Service		638,756	588,797	667,379	614,286
Total Plant		7,480,601	6,128,876	10,652,193	8,517,587

The preliminary cost approach to value of Sadsbury's wastewater utility property was found to $8,517,587.

Income Approach

The income approach to value establishes the value of the property based on its economic returns. There are two generally accepted procedures in performing an income analysis: the direct capitalization of anticipated income, and the discounted cash flow procedures.

In the direct capitalization approach, anticipated earnings are capitalized directly into value using a market-required return. Sadsbury's wastewater operation will be moving from a municipal operation, wherein economic returns are not the primary objective of the operation to a private (investor owned) rate regulated sewer utility operation in which economic returns are one of the objectives of the operation; therefore, the direct capitalization of earnings approach was not utilized in this appraisal.

In the discounted cash flow (DCF) approach, the property's economic returns are forecast for future periods. The cash flows (after-tax debt-free cash flows) from operations are discounted to the appraisal date using a market derived discount resulting in the DCF approach's income indicator of value. Use of the DCF approach allows the appraiser to address the property's historical operating experience and its migration, in future periods, to an operation as a rate regulated operation; thus making the DCF approach preferable.

In preparing this appraisal's DCF analysis first the results from Sadsbury's wastewater utility's operations was evaluated based on an analysis of historical operating performances over the period 2014 through 2015 (Income Approach tab). In the analysis of the operating statistics such as revenues and their growth, various operating expenses those expenses were stated as function of their typical drivers (revenues, plant investment, income from operations, etc). Details provided in Income Approach tab. Second, similar operating statistics were developed from public investor-owned water/wastewater utilities. Using the above described analyses the results of future periods operations were forecast based on the migration of Sadsbury's historical operations type experience over time to operations of the Sadsbury's wastewater operation similar to a public investor-owned water/wastewater utilities. These forecasts are detailed in the Income Approach tab.

Finally the resultant cash flows from future period operations of the Sadsbury's wastewater system were discounted to the appraisal date using a discount market derived discount rate for a public investor-owned water/wastewater utility (Income Approach Tab – Cost of Capital / Required Return section). The following table presents the results of the discounted cash flow analysis:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser, Investor-Owned Utility
As of January 1, 2017
Discounted Cash Flow Analysis

Discount Rate									7 05%	AUS Input						
Capitalization Rate									5 33%	AUS Input						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Period	Age	Revenues	Operating Expenses	Income from Operations	Non-Operating Income (Expense)	Income Before State and Federal Taxes	State and Federal Taxes @ 41 49%	After Tax Income	Non Cash Expense (depreciation)	Capital Expenditures	Change in Working Capital	Debt-free Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows	
AUS Input	AUS Input	Forecast	Forecast	(3)-(4)	Forecast	(5)+(6)	(6)*41 49%	(7)-(8)	Forecast	Forecast	Forecast	(9)-(6)+(10)-(11)-(12)	See Note below	(13)*(14)	Σ(15)	
1	0 5	1,234,548	789,484	445,064	(117,074)	327,990	136,083	191,907	135,174	127,200	-	316,955	0 967	306,495	306,495	
2	1 5	1,499,976	932,856	567,120	(114,632)	452,488	187,737	264,751	137,869	129,758	14,839	372,655	0 903	336,507	643,002	
3	2 5	1,522,476	947,531	574,945	(112,542)	462,403	191,851	270,552	140,619	132,367	2,615	388,731	0 843	327,700	970,702	
4	3 5	1,545,313	962,441	582,872	(110,555)	472,317	195,964	276,353	143,425	135,030	2,555	392,748	0 788	309,485	1,280,187	
5	4 5	1,800,290	1,100,442	699,848	(108,439)	591,409	245,376	346,033	146,288	137,746	14,089	448,925	0 736	330,409	1,610,596	
6	5 5	1,827,294	1,117,674	709,620	(106,651)	602,969	250,172	352,797	149,208	140,516	2,618	465,522	0 688	320,279	1,930,875	
7	6 5	1,854,703	1,135,182	719,521	(104,958)	614,563	254,982	359,581	152,189	143,343	2,568	470,817	0 642	302,265	2,233,140	
8	7 5	2,067,994	1,251,266	816,728	(103,176)	713,552	296,053	417,499	155,229	146,227	11,795	517,882	0 600	310,729	2,543,869	
9	8 5	2,099,014	1,270,807	828,207	(101,668)	726,539	301,441	425,098	158,330	149,170	2,615	533,311	0 560	298,654	2,842,523	
10	9 5	2,193,470	1,324,035	869,435	(100,187)	769,248	319,161	450,087	161,496	152,172	5,721	553,877	0 524	290,232	3,132,755	
11	10 5	2,336,046	1,402,828	933,218	(98,745)	834,473	346,223	488,250	164,724	155,235	8,063	588,421	0 489	287,738	3,420,493	
12	11 5	2,371,087	1,424,696	946,391	(97,497)	848,894	352,206	496,688	168,020	158,359	2,626	601,220	0 457	274,758	3,695,251	
13	12 5	2,406,553	1,446,906	959,747	(96,332)	863,415	358,231	505,184	171,380	161,547	2,592	608,757	0 427	259,939	3,955,190	
14	13 5	2,442,753	1,469,468	973,285	(95,248)	878,037	364,298	513,739	174,809	164,800	2,559	616,437	0 399	245,958	4,201,148	
15	14 5	2,552,677	1,531,227	1,021,450	(94,171)	927,279	384,728	542,551	178,308	168,118	6,192	640,720	0 372	238,348	4,439,496	
16	15 5	2,590,967	1,555,092	1,035,875	(93,244)	942,631	391,098	551,533	181,879	171,504	2,554	652,598	0 348	227,104	4,666,600	
17	16 5	2,629,832	1,579,332	1,050,500	(92,393)	958,107	397,519	560,588	185,521	174,960	2,529	661,013	0 325	214,829	4,881,429	
18	17 5	2,669,279	1,603,956	1,065,323	(91,616)	973,707	403,991	569,716	189,238	178,484	2,503	669,583	0 304	203,553	5,084,982	
19	18 5	2,709,318	1,628,969	1,080,349	(90,913)	989,436	410,517	578,919	193,030	182,079	2,480	678,303	0 284	192,638	5,277,620	
20 and beyond	19 5	2,831,237	1,697,454	1,133,783	(90,199)	1,043,584	432,983	610,601	196,898	185,747	6,522	705,429	4 970	3,505,982	8,783,602	
Age											19 5					
PW(Age) = 1/(1+Discount Rate)^(Age)											0 265					
PW to Perpetuity = 1/Capitalization Rate											18 762					
PW(20and Beyond) = PW to Perpetuity * PW Factor(19 5)											4 97					

Based on the above described discounted cash flow analysis, the Income Approach to value of the Sadsbury's wastewater property and its operations was determined to be $8,574,610.

Market Approach

The market or comparable sales approach to value looks to market sales of comparable properties in order to arrive at value. In this appraisal, the market approach was addressed from a comparable sales approach Pennsylvania wastewater systems) and

market value to book value ratios based on investor owned water utilities reported in Value Line Investment Survey.

Market Sales – In the comparable sale market approach the sales of Pennsylvania municipal wastewater systems to investor owned water/wastewater utilities were used to insure comparability. The sale of the City of McKeesport, Pennsylvania wastewater system to Pennsylvania American Water (announced September 9 2016) and the sale of New Garden Township's sewer utility to Aqua Pennsylvania, Inc. (August 2016) were analyze in relationship to those properties' depreciated original cost (Market Approach tab).

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Comparable Sales Approach

Market Sales Basis

	OCLD	Net Book Financials	RCNLD
New Garden Statistics			
Purchase Price (Aqua-PA and New Garden)	29,500,000	29,500,000	29,500,000
AUS Depreciated Original Cost 6-30-2016	18,567,728	17,967,319	30,615,410
Purchase to DOC	1.59	1.64	0.96
McKeesport Wastewater System			
Purchase Price (America-PA and McKeesport)	162,000,000	162,000,000	162,000,000
AUS Depreciated Original Cost 3-31-2016	$ 80,085,602	$ 73,950,630	156,524,909
Rate Base OCLD	$ 80,085,602	$ 73,813,794	
Purchase to DOC	2.02	2.19	1.03

Financial Market Ratios – In the market approach based on market financial ratios were based on market data of companies (nine) in the water industry as reported in Value Line Investment Surveys (January 2017) were analyzed. In the analysis the companies' stock (market) and debt (book) per share are compared as a ratio to the book value per share.

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser. Investor-Owned Utility
January 1, 2017

Comparable Sales Approach

Financial Basis[1]

	Industry Averages	American States Water	American Water	Aqua America	California Water	Connecticut Water	Consolidated Water	Middlesex Water	SJW Corp	York
Price per Share		44 95	72 05	29.98	33 75	55 67	10 85	41 32	55 14	38 3
Book value per share		13 7	29 05	10 45	13 55	20 7	9 75	13 5	20 25	8 65
Market to Book Ratio		3 28	2 48	2 87	2 49	2 69	1 11	3 06	2 72	4 43
Minimum	1 11									
Mean	2 79		2 48	2 87						
Median	2 72									
Maximum	4 43									
Debt (Total)		398 2	6,857 0	1,880 5	618 7	203 1	0 5	150 5	439 7	84 6
Outstanding Shares		36 60	178 00	177 40	48 00	11 20	14 80	16 30	20 46	12 87
Debt per share		10 88	38 52	10 6	12 89	18 13	0 03	9 23	21 49	6 57
Market Value per Share (Equity+Debt)		55 83	110 57	40 58	46 64	73 8	10 88	50 55	76 63	44 87
Book Value per Share (Equity+Debt)		24 58	67 57	21 05	26 44	38 83	9 78	22 73	41 74	15 22
Market to Book Ratio		2 27	1 64	1 93	1 76	1 9	1 11	2 22	1 84	2 95
Minimum	1 11									
Mean	1 96		1 64	1 93						
Median	1 9									
Maximum	2 95									

1 Value Line Investment Survey

The following table summarizes both the comparable sales and financial market ratio analysis and the Market Approach conclusion of this appraisal:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Market Approach Summary
Revised: 6-21-2017

Comparable Sales	Purchase Price to Depreciated Original Cost (Book Value)	Purchase Price to Financials (Net Book Value)	Purchase Price to RCNLD		
New Garden	1.59	1.64	0.96		
McKeesport	2.02	2.19	1.03		
Mean	1.81	1.92	1.00		
Financial Markets	**Market Value per Share to Book Value per Share**			**American**	**Aqua**
Market to Book (equity)	2.79			2.48	2.87
Market to Book (equity and debt)	1.96			1.64	1.93
Minumum	1.59	1.64	0.96		
Mean	2.09	2 21	1.02		
Median	1.99	2.07	1.00		
Maximum	2.79	2.79	1.03		
Market Conclusion	**Value to Depreciated Original Cost (Book Value)**	**Value to Financial (Net Book Value)**	**Value to RCNLD**	**Average**	
Use	2.00	2.10	1.00		
Sadsbury	5,540,079	6,916,575	8,517,587		
Market to Book Ratio	2.00	2.10	1.00		
Market Value	11,080,158	14,524,808	8,517,587	11,374,184	
Use	11,374,184				

The market approach conclusion of this appraisal was determined to be $11,374,184.

Cost Approach Revisited – Before concluding this appraisal's fair market value the preliminary cost approach conclusion of $8,517,587 needs to be evaluated to determine if external obsolescence exists in the preliminary reproduction cost new less depreciation conclusion. The appraisal literature in regards to developing a cost approach states:

> "The last step in the implementation of the cost approach is to estimate *economic obsolescence*. Economic obsolescence (sometimes called "external obsolescence") has been previously defined as the loss in value or usefulness of a property caused by factors external to the asset. These factors include increased cost of raw materials, labor, utilities (without an offsetting increase in product price); reduced demand for the

product; increased competition; environmental or other regulations; or similar factors.

The difficulty in measuring the full effect of economic obsolescence is one of the weaknesses of the cost approach. Because economic obsolescence is usually a function of outside influences that affect an entire business (i.e., all tangible and intangible assets) rather than individual assets or isolated groups of assets, it is sometimes measured using the income approach or by using the income approach to help identify the existence of economic influences on value. However, the cost approach can be used to measure some forms of economic obsolescence."[15]

The above described income approach value conclusion of $8,574,610 for the Sadsbury's future sewer system and the market approach conclusion of $8,642,523 compared to the preliminary cost approach conclusion of $8,517,587 indicates no significant external obsolescence exists in the cost approach conclusion of $8,517,587. Applying 0% external obsolescence to our example account of 361 Collection Mains Gravity the fair market value was determined as follow:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col 30	EO	Fair Market Value
361	Collection Sewers - Gravity	1999	100,632	75,705	185,364	139,449	0%	139,449
361	Collection Sewers - Gravity	1999	34,146	25,688	62,897	47,317	0%	47,317
361	Collection Sewers - Gravity	1999	179,433	134,987	330,516	248,647	0%	248,647
361	Collection Sewers - Gravity	1999	35,000	26,331	64,470	48,501	0%	48,501
361	Collection Sewers - Gravity	1999	10,400	7,824	19,157	14,412	0%	14,412
Subtotal			359,611	270,535	662,404	498,326		498,326

Therefore, the preliminary cost approach conclusion of $8,517,587 can be considered the final cost approach conclusion as follows:

[15] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition, pp. 96-97.

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Account	Account Description	Original Cost	OC less Depreciation	Replacement cost New	RCN less Depreciation	Fair Market Value
Plant in Service						
353	Land & Land Rights	18,343	18,343	25,235	25,235	25,235
354	Structures & Improvements - Pump Station	152,560	93,461	298,865	183,085	183,085
355	Power Generating Equipment	40,000	20,732	58,880	30,518	30,518
360	Collection Mains - Force	92,500	67,840	170,385	124,960	124,960
361	Collection Mains - Gravity	5,668,395	4,706,722	7,984,952	6,534,161	6,534,161
363	Services	546,316	432,822	842,151	659,483	659,483
364	Flow Meters	98,731	83,541	125,321	97,580	97,580
371	Pumping Equipment	225,000	116,618	479,025	248,279	248,279
Total Plant in Service		6,841,845	5,540,079	9,984,814	7,903,301	7,903,301
Plant not Dedicated to Service						
361	Collection Mains - Gravity	584,547	537,817	608,595	559,253	559,253
363	Services	54,209	50,980	58,784	55,033	55,033
Total Plant not Dedicated to Service		638,756	588,797	667,379	614,286	614,286
Total Plant		7,480,601	6,128,876	10,652,193	8,517,587	8,517,587

Value Conclusion

The Fair Market Value of Sadsbury's wastewater property, plant and equipment and its operation was determined to be $8,910,000 as follows:

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Fair Market Value Appraisal

Revised: 6-21-2017

	Investor-owned Utility		Weight	Wtd Value Indicator
Cost Approach				
Depreciated Replacement Cost New	$	8,517,587	50%	4,258,794
Depreciated Original Cost		6,128,876		
Net Book Financials		6,916,575		
Income Approach				
Investor-Owned Utility		8,783,602	40%	3,513,441
Market Approach				
Investor-Owned Utility		11,374,184	10%	1,137,418
Appraisal Conclusion				8,909,653
Appraisal Conclusion		**8,910,000**		

As the purpose of this appraisal was to fulfill the requirements of Section 1329 of the PA CS in the establishment of value for rate making of Sadsbury's wastewater property, plant and equipment the cost approach conclusion of $8,517,587 is consistent with the purpose of the appraisal. This cost approach conclusion is detailed (Cost Approach tab of this report). As the cost approach work papers details our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the water industry account classifications and the installation year of the property this detail can be used to establish the booked value for future accounting and rate making.

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Valuation Summary

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Fair Market Value Appraisal

	Investor-owned Utility	Weight	Wtd Value Indicator
Cost Approach			
Depreciated Replacement Cost New	$ 8,517,587	50%	4,258,794
Depreciated Original Cost	6,128,876		
Net Book Financials	6,916,575		
Income Approach			
Investor-Owned Utility	8,574,610	40%	3,429,844
Market Approach			
Investor-Owned Utility	8,642,523	10%	864,252
Appraisal Conclusion			8,552,890
Appraisal Conclusion	**8,575,000**		

1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols. (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	EO	Fair Market Value
353	Land & Land Rights		18,343.00	18,343	25,235	25,235		25,235
354	Structures & Improvements		152,560.00	93,461	298,865	183,085		183,085
355	Power Generating Equipment		40,000.00	20,732	58,880	30,518		30,518
360	Collection Sewers - Force		92,500.00	67,840	170,385	124,960		124,960
361	Collection Sewers - Gravity		5,668,395.00	4,706,722	7,984,952	6,534,161		6,534,161
363	Services to Customers		546,316.00	432,822	842,151	659,483		659,483
364	Flow Measuring Devices		98,731.00	83,541	125,321	97,580		97,580
371	Pumping Equipment		225,000.00	116,618	479,025	248,279		248,279
			6,841,845.00	5,540,079	9,984,814	7,903,301		7,903,301

Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col. 30	EO	Fair Market Value
361	Collection Sewers - Gravity		584,547.00	537,817	608,595	559,253		559,253
363	Services to Customers		54,209.00	50,980	58,784	55,033		55,033
			638,756.00	588,797	667,379	614,286		614,286
Total Plant			**7,480,601**	**6,128,876**	**10,652,193**	**8,517,587**	**-**	**8,517,587**

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017
Discounted Cash Flow Analysis

Discount Rate 7.05%
Capitalization Rate 5.33%

Period	Age	Revenues	Operating Expenses	Income from Operations	Non-Operating Income (Expense)	Income Before State and Federal Taxes	State and Federal Taxes	After Tax Income	Non Cash Expense (depreciation)	Capital Expenditures	Change in Working Capital	Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
1	0.5	1,234,548	789,484	445,064	(117,074)	327,990	136,083	191,907	135,174	127,200	-	182,690	0.967	176,661	176,661
2	1.5	1,499,976	932,856	567,120	(114,632)	452,488	187,737	264,751	137,869	129,758	14,839	284,654	0.903	257,043	433,704
3	2.5	1,522,476	947,531	574,945	(112,542)	462,403	191,851	270,552	140,619	132,367	2,615	299,344	0.843	252,347	686,051
4	3.5	1,545,313	962,441	582,872	(110,555)	472,317	195,954	276,353	143,425	135,030	2,555	301,862	0.788	237,867	923,918
5	4.5	1,800,290	1,100,442	699,848	(108,439)	591,409	245,376	346,033	146,288	137,746	14,089	401,725	0.736	295,670	1,219,588
6	5.5	1,827,294	1,117,674	709,620	(106,651)	602,969	250,172	352,797	149,208	140,516	2,618	417,278	0.688	287,087	1,506,675
7	6.5	1,854,703	1,135,182	719,521	(104,958)	614,563	254,982	359,581	152,189	143,343	2,568	421,421	0.642	270,552	1,777,227
8	7.5	2,067,994	1,251,266	816,728	(103,176)	713,552	296,053	417,499	155,229	146,227	11,795	503,477	0.600	302,086	2,079,313
9	8.5	2,099,014	1,270,807	828,207	(101,668)	726,539	301,441	425,098	158,330	149,170	2,615	518,092	0.560	290,132	2,369,445
10	9.5	2,193,470	1,324,035	869,435	(100,187)	769,248	319,161	450,087	161,496	152,172	5,721	550,046	0.524	288,224	2,657,669
11	10.5	2,336,046	1,402,828	933,218	(98,745)	834,473	346,223	488,250	164,724	155,235	8,063	605,196	0.489	295,941	2,953,610
12	11.5	2,371,087	1,424,696	946,391	(97,497)	848,894	352,206	496,688	168,020	158,359	2,626	617,386	0.457	282,145	3,235,755
13	12.5	2,406,653	1,446,906	959,747	(96,332)	863,415	358,231	505,184	171,380	161,547	2,592	624,228	0.427	266,545	3,502,300
14	13.5	2,442,753	1,469,468	973,285	(95,248)	878,037	364,298	513,739	174,809	164,800	2,559	631,117	0.399	251,816	3,754,116
15	14.5	2,552,677	1,531,227	1,021,450	(94,171)	927,279	384,728	542,551	178,308	168,118	6,192	668,832	0.372	248,806	4,002,922
16	15.5	2,590,967	1,555,092	1,035,875	(93,244)	942,631	391,098	551,533	181,879	171,504	2,554	679,938	0.348	236,618	4,239,540
17	16.5	2,629,832	1,579,332	1,050,500	(92,393)	958,107	397,519	560,588	185,521	174,960	2,529	687,490	0.325	223,434	4,462,974
18	17.5	2,669,279	1,603,956	1,065,323	(91,616)	973,707	403,991	569,716	189,238	178,484	2,503	695,098	0.304	211,310	4,674,284
19	18.5	2,709,318	1,628,969	1,080,349	(90,913)	989,436	410,517	578,919	193,030	182,079	2,480	702,760	0.284	199,584	4,873,868
20 and beyond	19.5	2,831,237	1,697,454	1,133,783	(90,199)	1,043,584	432,983	610,601	196,898	185,747	6,522	744,616	4.970	3,700,742	8,574,610

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Comparable Sales Approach

Market Sales Basis

	OCLD	Net Book Financials	RCNLD
New Garden Statistics			
Purchase Price (Aqua-PA and New Garden)	29,500,000	29,500,000	29,500,000
AUS Depreciated Original Cost 6-30-2016	18,567,728	17967319	30,615,410
Purchase to DOC	1 59	1 64	0.96
McKeesport Wastewater System			
Purchase Price (America-PA and McKeesport)	156,000,000	156,000,000	
AUS Depreciated Original Cost 3-31-2016	$ 101,915,080	$ 85,320,322	
Contibuted Property	$ 14,647,396		
Rate Base OCLD	$ 87,267,683	$ 73,813,794	
Purchase to DOC	1 53	1 83	

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Comparable Sales Approach

Financial Basis[1]

	Industry Averages	American States Water	American Water	Aqua America	California Water	Connecticut Water	Consolidated Water	Middlesex Water	SJW Corp	York
Price per Share		44 95	72 05	29.98	33 75	55 67	10 85	41 32	55 14	38 3
Book value per share		13 7	29 05	10 45	13 55	20.7	9 75	13 5	20 25	8 65
Market to Book Ratio		3 28	2.48	2.87	2.49	2 69	1 11	3 06	2 72	4 43
Minimum	1 11									
Mean	2 79		2 48	2 87						
Median	2 72									
Maximum	4 43									
Debt (Total)		398 2	6,857 0	1,880 5	618 7	203.1	0 5	150 5	439 7	84 6
Outstanding Shares		36 60	178 00	177 40	48 00	11 20	14.80	16 30	20 46	12 87
Debt per share		10 88	38 52	10.6	12 89	18 13	0 03	9 23	21 49	6 57
Market Value per Share (Equity+Debt)		55 83	110.57	40.58	46 64	73 8	10 88	50 55	76 63	44 87
Book Value per Share (Equity+Debt)		24 58	67 57	21 05	26 44	38 83	9 78	22 73	41 74	15 22
Market to Book Ratio		2 27	1 64	1.93	1 76	1 9	1 11	2 22	1 84	2 95
Minimum	1 11									
Mean	1 96		1 64	1 93						
Median	1 9									
Maximum	2 95									

1 Value Line Investment Survey

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017

Market Approach Summary

Comparable Sales	Purchase Price to Depreciated Original Cost (Book Value)
New Garden	1 59
McKeesport	1 53
Mean	1 56

Financial Markets	Market Value per Share to Book Value per Share	American	Aqua
Market to Book (equity)	2 79	2 48	2 87
Market to Book (equity and debt)	1 96	1 64	1 93
Minumum	1 53		
Mean	1 89		
Median	1 59		
Maximum	2 79		

Market Conclusion	Value to Depreciated Original Cost (Book Value)
Use	1 56
Sadsbury	5,540,079
Market to Book Ratio	1 56
Market Value	8,642,523
Use	8,642,523

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)

361

(1)		(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols. (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
361	SSC - Segment #1	15" SDR-35 PVCP	1999	L.F.	2,800	35.94	$100,632
361	SSC - Segment #1	12" SDR-35 PVCP	1999	L F	900	37.94	$34,146
361	SSC - Segment #1	12" DIP w/Steel Casing Bore & Jack	1999	L.F.	349	514.13	$179,433
361	SSC - Segment #1	Concrete Manhole w/ Frame & Cover	1999	EA.	14	2,500.00	$35,000
361	SSC - Segment #1	Concrete Manhole w/ Watertight Frame & Cover	1999	EA.	4	2,600.00	$10,400
Subtotal							$359,611

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Account Parameters Lookup	2017-(Col (4)+0.5)	(9)/(8)	Cols. (7)&(10)	IowaLookup f(Col (11))	Cols (8)*(12)	Cols. (9)+(13)	Cols. (13)/(14)	Cols. (6)*(15)
Account	Description	Year	OC	Iowa Survival / Retirement Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
361	Collection Sewers - Gravity	1999	$100,632	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	75,705
361	Collection Sewers - Gravity	1999	$34,146	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	25,688
361	Collection Sewers - Gravity	1999	$179,433	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	134,987
361	Collection Sewers - Gravity	1999	$35,000	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	26,331
361	Collection Sewers - Gravity	1999	$10,400	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	7,824
Subtotal			$359,611										270,535

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols. (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	1999	$100,632	HWW-143	183.3	337.6	1.842	185,364
361	Collection Sewers - Gravity	1999	$34,146	HWW-143	183.3	337.6	1.842	62,897
361	Collection Sewers - Gravity	1999	$179,433	HWW-143	183.3	337.6	1.842	330,516
361	Collection Sewers - Gravity	1999	$35,000	HWW-143	183.3	337.6	1.842	64,470
361	Collection Sewers - Gravity	1999	$10,400	HWW-143	183.3	337.6	1.842	19,157
Subtotal			$359,611					662,404

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New less Depreciation (RCNLD)

(1)	(2)	(4)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
Account	Description	Service Date	Cost New	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Cost New less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Account Parameters Lookup	2017-(Col (4)+0.5)	(23)/(22)	Cols (21)&(24)	IowaLookup f(Col. (25))	Cols (22)*(26)	Cols (23)+(27)	Cols. (27)/(28)	Cols. (20)*(29)
Account	Description	Year	RCN	Iowa Survival / Retirement Curve	Life	Age	Age%	Iowa Lookup	Iowa Condition	Expectancy	Total Life	Condition Percent	RCNLD
361	Collection Sewers - Gravity	1999	185,364	R3 0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	139,449
361	Collection Sewers - Gravity	1999	62,897	R3 0	70	17.5	25	R3.0025	0.75917	53 14	70.64	75.23%	47,317
361	Collection Sewers - Gravity	1999	330,516	R3 0	70	17 5	25	R3.0025	0.75917	53.14	70.64	75 23%	248,647
361	Collection Sewers - Gravity	1999	64,470	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	48,501
361	Collection Sewers - Gravity	1999	19,157	R3 0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75 23%	14,412
Subtotal			662,404										498,326

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols. (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col. 30	EO	Fair Market Value
361	Collection Sewers - Gravity	1999	100,632	75,705	185,364	139,449	0%	139,449
361	Collection Sewers - Gravity	1999	34,146	25,688	62,897	47,317	0%	47,317
361	Collection Sewers - Gravity	1999	179,433	134,987	330,516	248,647	0%	248,647
361	Collection Sewers - Gravity	1999	35,000	26,331	64,470	48,501	0%	48,501
361	Collection Sewers - Gravity	1999	10,400	7,824	19,157	14,412	0%	14,412
Subtotal			359,611	270,535	662,404	498,326		498,326

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach

AUS Consultants
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8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
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J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col. (16)	RCN Development Col 20	RCNLD Development Col 30	Account Parameters Lookup	Cols. (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	EO	Fair Market Value
353	Land & Land Rights		18,343.00	18,343	25,235	25,235		25,235
354	Structures & Improvements		152,560.00	93,461	298,865	183,085		183,085
355	Power Generating Equipment		40,000.00	20,732	58,880	30,518		30,518
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363	Services to Customers		546,316.00	432,822	842,151	659,483		659,483
364	Flow Measuring Devices		98,731.00	83,541	125,321	97,580		97,580
371	Pumping Equipment		225,000.00	116,618	479,025	248,279		248,279
			6,841,845.00	5,540,079	9,984,814	7,903,301		7,903,301

Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col 30	EO	Fair Market Value
361	Collection Sewers - Gravity		584,547.00	537,817	608,595	559,253		559,253
363	Services to Customers		54,209.00	50,980	58,784	55,033		55,033
			638,756.00	588,797	667,379	614,286		614,286
Total Plant			**7,480,601**	**6,128,876**	**10,652,193**	**8,517,587**	-	**8,517,587**

1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col 30	EO	Fair Market Value
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	9,600.00	9,600	13,968	13,968	0%	13,968
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	1.00	1	1	1	0%	1

1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
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Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col 30	EO	Fair Market Value
353	Land & Land Rights	1999	1.00	1	1	1	0%	1
353	Land & Land Rights	1999	751.00	751	1,093	1,093	0%	1,093
353	Land & Land Rights	2000	1.00	1	1	1	0%	1
353	Land & Land Rights	2002	3,946.00	3,946	5,327	5,327	0%	5,327
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2006	3,946.00	3,946	4,747	4,747	0%	4,747
353	Land & Land Rights	2006	1.00	1	1	1	0%	1
353	Land & Land Rights	2006	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2005	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2004	-	-	-	-	0%	-
353	Land & Land Rights	2004	-	-	-	-	0%	-
353	Land & Land Rights	2004	-	-	-	-	0%	-
353	Land & Land Rights	2003	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1

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1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col 30	EO	Fair Market Value
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2010	1.00	1	1	1	0%	1
353	Land & Land Rights	2001	-	-	-	-	0%	-
353	Land & Land Rights	2004	1.00	1	1	1	0%	1
353	Land & Land Rights	2006	1.00	1	1	1	0%	1
353	Land & Land Rights	2008	1.00	1	1	1	0%	1
353	Land & Land Rights	2014	1.00	1	1	1	0%	1
353	Land & Land Rights	2016	1.00	1	1	1	0%	1
353 Land & Land Rights			18,343.00	18,343	25,235	25,235		25,235
354	Structures & Improvements	1999	1,000.00	613	1,959	1,200	0%	1,200
354	Structures & Improvements	1999	2,500.00	1,532	4,898	3,001	0%	3,001
354	Structures & Improvements	1999	200.00	123	392	240	0%	240
354	Structures & Improvements	1999	600.00	368	1,175	720	0%	720
354	Structures & Improvements	1999	400.00	245	784	480	0%	480
354	Structures & Improvements	1999	25,000.00	15,315	48,975	30,002	0%	30,002
354	Structures & Improvements	1999	10,260.00	6,285	20,099	12,313	0%	12,313
354	Structures & Improvements	1999	75,000.00	45,945	146,925	90,006	0%	90,006
354	Structures & Improvements	1999	35,000.00	21,441	68,565	42,003	0%	42,003
354	Structures & Improvements	1999	200.00	123	392	240	0%	240
354	Structures & Improvements	1999	240.00	147	470	288	0%	288
354	Structures & Improvements	1999	600.00	368	1,175	720	0%	720
354	Structures & Improvements	1999	1,560.00	956	3,056	1,872	0%	1,872
354 Structures & Improvements			152,560.00	93,461	298,865	183,085		183,085
355	Power Generating Equipment	1999	40,000.00	20,732	58,880	30,518	0%	30,518
355 Power Generating Equipment			40,000.00	20,732	58,880	30,518		30,518
360	Collection Sewers - Force	1999	85,000.00	62,339	156,570	114,828	0%	114,828
360	Collection Sewers - Force	1999	7,500.00	5,501	13,815	10,132	0%	10,132
360 Collection Sewers - Force			92,500.00	67,840	170,385	124,960		124,960
361	Collection Sewers - Gravity	1999	100,632.00	75,705	185,364	139,449	0%	139,449
361	Collection Sewers - Gravity	1999	34,146.00	25,688	62,897	47,317	0%	47,317
361	Collection Sewers - Gravity	1999	179,433.00	134,987	330,516	248,647	0%	248,647

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Pennsylvania American Water Company
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Wastewater
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Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols. (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col 30	EO	Fair Market Value
361	Collection Sewers - Gravity	1999	35,000.00	26,331	64,470	48,501	0%	48,501
361	Collection Sewers - Gravity	1999	10,400.00	7,824	19,157	14,412	0%	14,412
361	Collection Sewers - Gravity	1999	55,250.00	41,565	101,771	76,562	0%	76,562
361	Collection Sewers - Gravity	1999	6,400.00	4,815	11,789	8,869	0%	8,869
361	Collection Sewers - Gravity	1999	6,400.00	4,815	11,789	8,869	0%	8,869
361	Collection Sewers - Gravity	1999	8,500.00	6,395	15,657	11,779	0%	11,779
361	Collection Sewers - Gravity	1999	69,574.00	52,341	128,155	96,411	0%	96,411
361	Collection Sewers - Gravity	1999	79,408.00	59,739	146,270	110,039	0%	110,039
361	Collection Sewers - Gravity	1999	6,355.00	4,781	11,706	8,806	0%	8,806
361	Collection Sewers - Gravity	1999	69,240.00	52,089	127,540	95,948	0%	95,948
361	Collection Sewers - Gravity	1999	39,100.00	29,415	72,022	54,182	0%	54,182
361	Collection Sewers - Gravity	1999	81,594.00	61,383	150,296	113,068	0%	113,068
361	Collection Sewers - Gravity	1999	32,790.00	24,668	60,399	45,438	0%	45,438
361	Collection Sewers - Gravity	1999	7,070.00	5,319	13,023	9,797	0%	9,797
361	Collection Sewers - Gravity	1999	25,600.00	19,259	47,155	35,475	0%	35,475
361	Collection Sewers - Gravity	1999	3,400.00	2,558	6,263	4,712	0%	4,712
361	Collection Sewers - Gravity	1999	71,950.00	54,128	132,532	99,704	0%	99,704
361	Collection Sewers - Gravity	1999	17,600.00	13,240	32,419	24,389	0%	24,389
361	Collection Sewers - Gravity	1999	3,400.00	2,558	6,263	4,712	0%	4,712
361	Collection Sewers - Gravity	2000	403,348.00	308,682	706,666	540,811	0%	540,811
361	Collection Sewers - Gravity	2000	130,731.00	100,048	229,041	175,285	0%	175,285
361	Collection Sewers - Gravity	2000	47,946.00	36,693	84,001	64,286	0%	64,286
361	Collection Sewers - Gravity	2000	51,000.00	39,030	89,352	68,381	0%	68,381
361	Collection Sewers - Gravity	2000	19,800.00	15,153	34,690	26,548	0%	26,548
361	Collection Sewers - Gravity	2000	10,400.00	7,959	18,221	13,945	0%	13,945
361	Collection Sewers - Gravity	2005	16,283.00	13,630	23,057	19,301	0%	19,301
361	Collection Sewers - Gravity	2005	45,200.00	37,837	64,003	53,577	0%	53,577
361	Collection Sewers - Gravity	2005	70,022.00	58,615	99,151	82,999	0%	82,999
361	Collection Sewers - Gravity	2005	25,581.00	21,414	36,223	30,322	0%	30,322
361	Collection Sewers - Gravity	2005	11,779.00	9,860	16,679	13,962	0%	13,962
361	Collection Sewers - Gravity	2005	7,200.00	6,027	10,195	8,534	0%	8,534
361	Collection Sewers - Gravity	2005	4,200.00	3,516	5,947	4,978	0%	4,978
361	Collection Sewers - Gravity	2005	2,500.00	2,093	3,540	2,963	0%	2,963
361	Collection Sewers - Gravity	2005	7,000.00	5,860	9,912	8,297	0%	8,297
361	Collection Sewers - Gravity	2005	2,000.00	1,674	2,832	2,371	0%	2,371
361	Collection Sewers - Gravity	2007	105,609.00	91,267	120,605	104,227	0%	104,227
361	Collection Sewers - Gravity	2007	272,074.00	235,126	310,709	268,515	0%	268,515

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Wastewater
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Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col. (16)	RCN Development Col 20	RCNLD Development Col 30	EO	Fair Market Value
361	Collection Sewers - Gravity	2007	172,818.00	149,349	197,358	170,557	0%	170,557
361	Collection Sewers - Gravity	2007	228,652.00	197,601	261,121	225,661	0%	225,661
361	Collection Sewers - Gravity	2007	81,727.00	70,628	93,332	80,658	0%	80,658
361	Collection Sewers - Gravity	2007	3,159.00	2,730	3,608	3,118	0%	3,118
361	Collection Sewers - Gravity	2007	33,192.00	28,685	37,905	32,758	0%	32,758
361	Collection Sewers - Gravity	2007	33,828.00	29,234	38,632	33,386	0%	33,386
361	Collection Sewers - Gravity	2007	191,995.00	165,922	219,258	189,483	0%	189,483
361	Collection Sewers - Gravity	2007	22,725.00	19,639	25,952	22,428	0%	22,428
361	Collection Sewers - Gravity	2007	30,000.00	25,926	34,260	29,607	0%	29,607
361	Collection Sewers - Gravity	2007	13,700.00	11,840	15,645	13,520	0%	13,520
361	Collection Sewers - Gravity	2007	23,100.00	19,963	26,380	22,798	0%	22,798
361	Collection Sewers - Gravity	2007	19,000.00	16,420	21,698	18,751	0%	18,751
361	Collection Sewers - Gravity	2007	10,000.00	8,642	11,420	9,869	0%	9,869
361	Collection Sewers - Gravity	2009	31,634.00	28,243	32,710	29,203	0%	29,203
361	Collection Sewers - Gravity	2009	94,540.00	84,405	97,754	87,275	0%	87,275
361	Collection Sewers - Gravity	2009	9,910.00	8,848	10,247	9,149	0%	9,149
361	Collection Sewers - Gravity	2009	2,550.00	2,277	2,637	2,354	0%	2,354
361	Collection Sewers - Gravity	2009	5,340.00	4,768	5,522	4,930	0%	4,930
361	Collection Sewers - Gravity	2009	3,050.00	2,723	3,154	2,816	0%	2,816
361	Collection Sewers - Gravity	2005	55,569.00	46,517	78,686	65,868	0%	65,868
361	Collection Sewers - Gravity	2005	347,348.00	290,765	491,845	411,723	0%	411,723
361	Collection Sewers - Gravity	2005	200,977.00	168,238	284,583	238,224	0%	238,224
361	Collection Sewers - Gravity	2005	102,371.00	85,695	144,957	121,344	0%	121,344
361	Collection Sewers - Gravity	2005	122,342.00	102,412	173,236	145,016	0%	145,016
361	Collection Sewers - Gravity	2005	13,800.00	11,552	19,541	16,358	0%	16,358
361	Collection Sewers - Gravity	2005	31,500.00	26,369	44,604	37,338	0%	37,338
361	Collection Sewers - Gravity	2005	17,500.00	14,649	24,780	20,743	0%	20,743
361	Collection Sewers - Gravity	2005	9,000.00	7,534	12,744	10,668	0%	10,668
361	Collection Sewers - Gravity	2005	7,000.00	5,860	9,912	8,297	0%	8,297
361	Collection Sewers - Gravity	2005	8,000.00	6,697	11,328	9,483	0%	9,483
361	Collection Sewers - Gravity	2009	7,751.00	6,920	8,015	7,156	0%	7,156
361	Collection Sewers - Gravity	2009	8,600.00	7,678	8,892	7,939	0%	7,939
361	Collection Sewers - Gravity	2009	6,203.00	5,538	6,414	5,726	0%	5,726

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(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col. (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols. (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	EO	Fair Market Value
361	Collection Sewers - Gravity	2011	4,416.00	4,069	4,579	4,219	0%	4,219
361	Collection Sewers - Gravity	2011	20,400.00	18,797	21,155	19,492	0%	19,492
361	Collection Sewers - Gravity	2011	11,856.00	10,924	12,295	11,329	0%	11,329
361	Collection Sewers - Gravity	2005	20,636.00	17,274	29,221	24,461	0%	24,461
361	Collection Sewers - Gravity	2005	4,255.00	3,562	6,025	5,044	0%	5,044
361	Collection Sewers - Gravity	2005	1,800.00	1,507	2,549	2,134	0%	2,134
361	Collection Sewers - Gravity	2005	5,000.00	4,186	7,080	5,927	0%	5,927
361	Collection Sewers - Gravity	2009	98,977.00	88,367	102,342	91,371	0%	91,371
361	Collection Sewers - Gravity	2009	46,937.00	41,905	48,533	43,330	0%	43,330
361	Collection Sewers - Gravity	2009	21,701.00	19,375	22,439	20,034	0%	20,034
361	Collection Sewers - Gravity	2009	16,652.00	14,867	17,218	15,372	0%	15,372
361	Collection Sewers - Gravity	2009	14,686.00	13,112	15,185	13,557	0%	13,557
361	Collection Sewers - Gravity	2009	8,204.00	7,325	8,483	7,574	0%	7,574
361	Collection Sewers - Gravity	2009	1,458.00	1,302	1,508	1,346	0%	1,346
361	Collection Sewers - Gravity	2009	9,881.00	8,822	10,217	9,122	0%	9,122
361	Collection Sewers - Gravity	2009	2,132.00	1,903	2,204	1,968	0%	1,968
361	Collection Sewers - Gravity	2009	15,499.00	13,838	16,026	14,308	0%	14,308
361	Collection Sewers - Gravity	2009	26,277.00	23,460	27,170	24,257	0%	24,257
361	Collection Sewers - Gravity	2009	10,200 00	9,107	10,547	9,416	0%	9,416
361	Collection Sewers - Gravity	2009	5,320 00	4,750	5,501	4,911	0%	4,911
361	Collection Sewers - Gravity	2009	3,050.00	2,723	3,154	2,816	0%	2,816
361	Collection Sewers - Gravity	2009	7,050.00	6,294	7,290	6,509	0%	6,509
361	Collection Sewers - Gravity	2009	4,780.00	4,268	4,943	4,413	0%	4,413
361	Collection Sewers - Gravity	2011	204,259.00	188,204	211,817	195,168	0%	195,168
361	Collection Sewers - Gravity	2011	68,055.00	62,706	70,573	65,026	0%	65,026
361	Collection Sewers - Gravity	2011	16,065.00	14,802	16,659	15,350	0%	15,350
361	Collection Sewers - Gravity	2011	10,312.00	9,501	10,694	9,853	0%	9,853
361	Collection Sewers - Gravity	2011	5,595.00	5,155	5,802	5,346	0%	5,346
361	Collection Sewers - Gravity	2011	4,763.00	4,389	4,939	4,551	0%	4,551
361	Collection Sewers - Gravity	2011	20,850.00	19,211	21,621	19,922	0%	19,922
361	Collection Sewers - Gravity	2011	-	-	-	-	0%	-
361	Collection Sewers - Gravity	2011	-	-	-	-	0%	-
361	Collection Sewers - Gravity	2011	1,519.00	1,400	1,575	1,451	0%	1,451
361	Collection Sewers - Gravity	2011	2,581.00	2,378	2,676	2,466	0%	2,466
361	Collection Sewers - Gravity	2011	36,838.00	33,943	38,201	35,198	0%	35,198
361	Collection Sewers - Gravity	2011	14,400.00	13,268	14,933	13,759	0%	13,759

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NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	EO	Fair Market Value
361	Collection Sewers - Gravity	2011	31,200.00	28,748	32,354	29,811	0%	29,811
361	Collection Sewers - Gravity	2011	2,800.00	2,580	2,904	2,676	0%	2,676
361	Collection Sewers - Gravity	2011	6,000.00	5,528	6,222	5,733	0%	5,733
361	Collection Sewers - Gravity	2011	-	-	-	-	0%	-
361	Collection Sewers - Gravity	2011	-	-	-	-	0%	-
361	Collection Sewers - Gravity	2011	4,000.00	3,686	4,148	3,822	0%	3,822
361	Collection Sewers - Gravity	2001	24,960.00	19,481	41,983	32,768	0%	32,768
361	Collection Sewers - Gravity	2001	12,680.00	9,897	21,328	16,647	0%	16,647
361	Collection Sewers - Gravity	1999	46,600.00	35,057	85,837	64,575	0%	64,575
361	Collection Sewers - Gravity	1999	31,548.00	23,734	58,111	43,717	0%	43,717
361	Collection Sewers - Gravity	1999	23,220.00	17,468	42,771	32,177	0%	32,177
361	Collection Sewers - Gravity	2001	56,875.00	44,391	95,664	74,666	0%	74,666
361	Collection Sewers - Gravity	2001	13,112.00	10,234	22,054	17,213	0%	17,213
361	Collection Sewers - Gravity	2001	15,000.00	11,708	25,230	19,692	0%	19,692
361	Collection Sewers - Gravity	2001	49,150.00	38,362	82,670	64,524	0%	64,524
361	Collection Sewers - Gravity	2001	9,504.00	7,418	15,986	12,477	0%	12,477
361	Collection Sewers - Gravity	2001	16,800.00	13,112	28,258	22,055	0%	22,055
361	Collection Sewers - Gravity	2002	56,950.00	45,201	92,202	73,181	0%	73,181
361	Collection Sewers - Gravity	2002	16,500.00	13,096	26,714	21,203	0%	21,203
361	Collection Sewers - Gravity	2006	125,475.00	106,729	156,593	133,198	0%	133,198
361	Collection Sewers - Gravity	2006	41,500.00	35,300	51,792	44,054	0%	44,054
361	Collection Sewers - Gravity	2006	68,699.00	58,435	85,736	72,927	0%	72,927
361	Collection Sewers - Gravity	2006	59,170.00	50,330	73,844	62,812	0%	62,812
361	Collection Sewers - Gravity	2013	49,452.00	46,979	50,342	47,825	0%	47,825
361	Collection Sewers - Gravity	2013	36,000.00	34,200	36,648	34,816	0%	34,816
361	Collection Sewers - Gravity		5,668,395.00	4,706,722	7,984,952	6,534,161		6,534,161
363	Services to Customers	2000	2,300.00	1,619	4,216	2,967	0%	2,967
363	Services to Customers	2000	160.00	113	293	206	0%	206
363	Services to Customers	2000	40,750.00	28,680	74,695	52,570	0%	52,570
363	Services to Customers	2000	4,602.00	3,239	8,435	5,937	0%	5,937
363	Services to Customers	2005	1,520.00	1,204	2,367	1,875	0%	1,875
363	Services to Customers	2005	17,890.00	14,171	27,855	22,064	0%	22,064
363	Services to Customers	2007	3,072.00	2,545	4,040	3,348	0%	3,348
363	Services to Customers	2007	40,935.00	33,919	53,830	44,604	0%	44,604
363	Services to Customers	2004	1,250.00	967	2,054	1,590	0%	1,590
363	Services to Customers	2004	7,500.00	5,804	12,323	9,537	0%	9,537
363	Services to Customers	2004	5,220.00	4,040	8,576	6,637	0%	6,637
363	Services to Customers	2004	4,993.00	3,864	8,203	6,348	0%	6,348
363	Services to Customers	2005	11,360.00	8,998	17,688	14,011	0%	14,011
363	Services to Customers	2005	116,420.00	92,216	181,266	143,581	0%	143,581

1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col. 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col 30	EO	Fair Market Value
363	Services to Customers	2009	560.00	484	666	575	0%	575
363	Services to Customers	2007	240.00	199	316	262	0%	262
363	Services to Customers	2007	3,780.00	3,132	4,971	4,119	0%	4,119
363	Services to Customers	2009	6,525.00	5,635	7,758	6,700	0%	6,700
363	Services to Customers	2009	6,000.00	5,182	7,134	6,161	0%	6,161
363	Services to Customers	2009	15,877.00	13,711	18,878	16,303	0%	16,303
363	Services to Customers	2011	1,400.00	1,260	1,550	1,395	0%	1,395
363	Services to Customers	2011	35,610.00	32,056	39,420	35,486	0%	35,486
363	Services to Customers	2001	14,261.00	10,294	29,934	21,606	0%	21,606
363	Services to Customers	2000	19,065.00	13,418	34,946	24,595	0%	24,595
363	Services to Customers	2001	15,735.00	11,358	33,028	23,840	0%	23,840
363	Services to Customers	2001	19,905.00	14,367	41,781	30,158	0%	30,158
363	Services to Customers	2002	24,180.00	17,891	42,871	31,720	0%	31,720
363	Services to Customers	2006	10,950.00	8,873	15,374	12,458	0%	12,458
363	Services to Customers	2006	76,650.00	62,109	107,617	87,202	0%	87,202
363	Services to Customers	2006	7,040.00	5,705	9,884	8,009	0%	8,009
363	Services to Customers	2006	22,646.00	18,350	31,795	25,763	0%	25,763
363	Services to Customers	2013	7,920.00	7,419	8,387	7,856	0%	7,856
363	Services to Customers		546,316.00	432,822	842,151	659,483		659,483
364	Flow Measuring Devices	1999	25,000.00	12,958	51,000	26,433	0%	26,433
364	Flow Measuring Devices	2015	73,731.00	70,583	74,321	71,147	0%	71,147
364	Flow Measuring Devices		98,731.00	83,541	125,321	97,580		97,580
371	Pumping Equipment	1999	225,000.00	116,618	479,025	248,279	0%	248,279
371	Pumping Equipment		225,000.00	116,618	479,025	248,279		248,279
			6,841,845.00	5,540,079	9,984,814	7,903,301		7,903,301

Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col 20	RCNLD Development Col 30	EO	Fair Market Value
361	Collection Sewers - Gravity	2008	23,184.00	20,381	24,876	21,868	0%	21,868
361	Collection Sewers - Gravity	2008	43,350.00	38,109	46,515	40,891	0%	40,891
361	Collection Sewers - Gravity	2008	23,200.00	20,395	24,894	21,884	0%	21,884
361	Collection Sewers - Gravity	2008	774.00	680	831	731	0%	731
361	Collection Sewers - Gravity	2008	5,016.00	4,410	5,382	4,731	0%	4,731
361	Collection Sewers - Gravity	2008	17,332.00	15,237	18,597	16,349	0%	16,349
361	Collection Sewers - Gravity	2008	774.00	680	831	731	0%	731
361	Collection Sewers - Gravity	2008	66,002.00	58,022	70,820	62,258	0%	62,258
361	Collection Sewers - Gravity	2008	62,544.00	54,982	67,110	58,996	0%	58,996
361	Collection Sewers - Gravity	2008	3,192.00	2,806	3,425	3,011	0%	3,011
361	Collection Sewers - Gravity	2009	69,090.00	61,684	71,439	63,781	0%	63,781
361	Collection Sewers - Gravity	2009	30,815.00	27,512	31,863	28,447	0%	28,447
361	Collection Sewers - Gravity	2013	25,227.00	23,966	25,681	24,397	0%	24,397

1	2	4	6	16	20	30	31	32

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Summary of the Original Cost (OC), OC less Depreciation, Cost New (RCN) and RCN less Depreciation

(1)	(2)	(4)	(6)	(16)	(20)	(30)	(31)	(32)
NARUC Account	Description	Service Date	Original Cost	Original Cost less Depreciation	Cost New	Cost New less Depreciation	External Obsolescence	Fair Market Value
HEM Input	HEM Input	HEM Input	HEM Input	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col 30	Account Parameters Lookup	Cols (30)*(100%-(31))
Account	Description	Year	OC	OCLD Development Col (16)	RCN Development Col. 20	RCNLD Development Col 30	EO	Fair Market Value
361	Collection Sewers - Gravity	2013	17,960.00	17,062	18,283	17,369	0%	17,369
361	Collection Sewers - Gravity	2015	95,025.00	92,991	95,975	93,921	0%	93,921
361	Collection Sewers - Gravity	2015	34,970.00	34,222	35,320	34,564	0%	34,564
361	Collection Sewers - Gravity	2015	66,092.00	64,678	66,753	65,324	0%	65,324
361	Collection Sewers - Gravity		584,547.00	537,817	608,595	559,253		559,253
363	Services to Customers	2008	10,270.00	8,696	12,745	10,791	0%	10,791
363	Services to Customers	2009	4,169.00	3,600	4,957	4,281	0%	4,281
363	Services to Customers	2015	31,636.00	30,772	32,680	31,788	0%	31,788
363	Services to Customers	2015	8,134.00	7,912	8,402	8,173	0%	8,173
363	Services to Customers		54,209.00	50,980	58,784	55,033		55,033
			638,756.00	588,797	667,379	614,286		614,286
Total Plant			**7,480,601**	**6,128,876**	**10,652,193**	**8,517,587**	-	**8,517,587**

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
Replacement Cost New

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
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1	2	4	6	16	17	18	19	20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols (18)/(17)	Cols. (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
353	Land & Land Rights		$18,343.00					25,235
354	Structures & Improvements		$152,560.00					298,865
355	Power Generating Equipment		$40,000.00					58,880
360	Collection Sewers - Force		$92,500.00					170,385
361	Collection Sewers - Gravity		$5,668,395.00					7,984,952
363	Services to Customers		$546,316.00					842,151
364	Flow Measuring Devices		$98,731.00					125,321
371	Pumping Equipment		$225,000.00					479,025
			$6,841,845.00					9,984,814

Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity		$584,547.00					608,595
363	Services to Customers		$54,209.00					58,784
			$638,756.00					667,379
			$7,480,601					**$10,652,193**

1 2 4 6 16 17 18 19 20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$9,600.00	USBLS1	167	243	1.455	13,968
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1

1	2	4	6	16	17	18	19	20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols (18)/(17)	Cols. (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$1.00	USBLS1	167	243	1.455	1
353	Land & Land Rights	1999	$751.00	USBLS1	167	243	1.455	1,093
353	Land & Land Rights	2000	$1.00	USBLS1	172	243	1.413	1
353	Land & Land Rights	2002	$3,946.00	USBLS1	180	243	1.35	5,327
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2006	$3,946.00	USBLS1	202	243	1.203	4,747
353	Land & Land Rights	2006	$1.00	USBLS1	202	243	1.203	1
353	Land & Land Rights	2006	$1.00	USBLS1	202	243	1.203	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2005	$1.00	USBLS1	195	243	1.246	1
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1

1	2	4	6	16	17	18	19	20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols (16) & (2017))	Cols. (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2004	$0.00	USBLS1	189	243	1.286	-
353	Land & Land Rights	2004	$0.00	USBLS1	189	243	1.286	-
353	Land & Land Rights	2004	$0.00	USBLS1	189	243	1.286	-
353	Land & Land Rights	2003	$1.00	USBLS1	184	243	1.321	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2010	$1.00	USBLS1	218	243	1.115	1
353	Land & Land Rights	2001	$0.00	USBLS1	177	243	1.373	-
353	Land & Land Rights	2004	$1.00	USBLS1	189	243	1.286	1
353	Land & Land Rights	2006	$1.00	USBLS1	202	243	1.203	1
353	Land & Land Rights	2008	$1.00	USBLS1	215	243	1.13	1
353	Land & Land Rights	2014	$1.00	USBLS1	237	243	1.025	1
353	Land & Land Rights	2016	$1.00	USBLS1	240	243	1.013	1
353	Land & Land Rights		$18,343.00					25,235
354	Structures & Improvements	1999	$1,000.00	HWW-115	343	672	1.959	1,959
354	Structures & Improvements	1999	$2,500.00	HWW-115	343	672	1.959	4,898
354	Structures & Improvements	1999	$200.00	HWW-115	343	672	1.959	392
354	Structures & Improvements	1999	$600.00	HWW-115	343	672	1.959	1,175
354	Structures & Improvements	1999	$400.00	HWW-115	343	672	1.959	784

1	2	4	6	16	17	18	19	20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols (18)/(17)	Cols. (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
354	Structures & Improvements	1999	$25,000.00	HWW-115	343	672	1.959	48,975
354	Structures & Improvements	1999	$10,260.00	HWW-115	343	672	1.959	20,099
354	Structures & Improvements	1999	$75,000.00	HWW-115	343	672	1.959	146,925
354	Structures & Improvements	1999	$35,000.00	HWW-115	343	672	1.959	68,565
354	Structures & Improvements	1999	$200.00	HWW-115	343	672	1.959	392
354	Structures & Improvements	1999	$240.00	HWW-115	343	672	1.959	470
354	Structures & Improvements	1999	$600.00	HWW-115	343	672	1.959	1,175
354	Structures & Improvements	1999	$1,560.00	HWW-115	343	672	1.959	3,056
354	Structures & Improvements		$152,560.00					298,865
355	Power Generating Equipment	1999	$40,000.00	USBLS4	139.9	206	1.472	58,880
355	Power Generating Equipment		$40,000.00					58,880
360	Collection Sewers - Force	1999	$85,000.00	HWW-143	183.3	337.6	1.842	156,570
360	Collection Sewers - Force	1999	$7,500.00	HWW-143	183.3	337.6	1.842	13,815
360	Collection Sewers - Force		$92,500.00					170,385
361	Collection Sewers - Gravity	1999	$100,632.00	HWW-143	183.3	337.6	1.842	185,364
361	Collection Sewers - Gravity	1999	$34,146.00	HWW-143	183.3	337.6	1.842	62,897
361	Collection Sewers - Gravity	1999	$179,433.00	HWW-143	183.3	337.6	1.842	330,516
361	Collection Sewers - Gravity	1999	$35,000.00	HWW-143	183.3	337.6	1.842	64,470
361	Collection Sewers - Gravity	1999	$10,400.00	HWW-143	183.3	337.6	1.842	19,157
361	Collection Sewers - Gravity	1999	$55,250.00	HWW-143	183.3	337.6	1.842	101,771
361	Collection Sewers - Gravity	1999	$6,400.00	HWW-143	183.3	337.6	1.842	11,789
361	Collection Sewers - Gravity	1999	$6,400.00	HWW-143	183.3	337.6	1.842	11,789
361	Collection Sewers - Gravity	1999	$8,500.00	HWW-143	183.3	337.6	1.842	15,657
361	Collection Sewers - Gravity	1999	$69,574.00	HWW-143	183.3	337.6	1.842	128,155
361	Collection Sewers - Gravity	1999	$79,408.00	HWW-143	183.3	337.6	1.842	146,270
361	Collection Sewers - Gravity	1999	$6,355.00	HWW-143	183.3	337.6	1.842	11,706
361	Collection Sewers - Gravity	1999	$69,240.00	HWW-143	183.3	337.6	1.842	127,540
361	Collection Sewers - Gravity	1999	$39,100.00	HWW-143	183.3	337.6	1.842	72,022
361	Collection Sewers - Gravity	1999	$81,594.00	HWW-143	183.3	337.6	1.842	150,296
361	Collection Sewers - Gravity	1999	$32,790.00	HWW-143	183.3	337.6	1.842	60,399
361	Collection Sewers - Gravity	1999	$7,070.00	HWW-143	183.3	337.6	1.842	13,023
361	Collection Sewers - Gravity	1999	$25,600.00	HWW-143	183.3	337.6	1.842	47,155
361	Collection Sewers - Gravity	1999	$3,400.00	HWW-143	183.3	337.6	1.842	6,263
361	Collection Sewers - Gravity	1999	$71,950.00	HWW-143	183.3	337.6	1.842	132,532
361	Collection Sewers - Gravity	1999	$17,600.00	HWW-143	183.3	337.6	1.842	32,419
361	Collection Sewers - Gravity	1999	$3,400.00	HWW-143	183.3	337.6	1.842	6,263

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols (18)/(17)	Cols. (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	2000	$403,348.00	HWW-143	192.7	337.6	1.752	706,666
361	Collection Sewers - Gravity	2000	$130,731.00	HWW-143	192.7	337.6	1.752	229,041
361	Collection Sewers - Gravity	2000	$47,946.00	HWW-143	192.7	337.6	1.752	84,001
361	Collection Sewers - Gravity	2000	$51,000.00	HWW-143	192.7	337.6	1.752	89,352
361	Collection Sewers - Gravity	2000	$19,800.00	HWW-143	192.7	337.6	1.752	34,690
361	Collection Sewers - Gravity	2000	$10,400.00	HWW-143	192.7	337.6	1.752	18,221
361	Collection Sewers - Gravity	2005	$16,283.00	HWW-143	238.5	337.6	1.416	23,057
361	Collection Sewers - Gravity	2005	$45,200.00	HWW-143	238.5	337.6	1.416	64,003
361	Collection Sewers - Gravity	2005	$70,022.00	HWW-143	238.5	337.6	1.416	99,151
361	Collection Sewers - Gravity	2005	$25,581.00	HWW-143	238.5	337.6	1.416	36,223
361	Collection Sewers - Gravity	2005	$11,779.00	HWW-143	238.5	337.6	1.416	16,679
361	Collection Sewers - Gravity	2005	$7,200.00	HWW-143	238.5	337.6	1.416	10,195
361	Collection Sewers - Gravity	2005	$4,200.00	HWW-143	238.5	337.6	1.416	5,947
361	Collection Sewers - Gravity	2005	$2,500.00	HWW-143	238.5	337.6	1.416	3,540
361	Collection Sewers - Gravity	2005	$7,000.00	HWW-143	238.5	337.6	1.416	9,912
361	Collection Sewers - Gravity	2005	$2,000.00	HWW-143	238.5	337.6	1.416	2,832
361	Collection Sewers - Gravity	2007	$105,609.00	HWW-143	295.7	337.6	1.142	120,605
361	Collection Sewers - Gravity	2007	$272,074.00	HWW-143	295.7	337.6	1.142	310,709
361	Collection Sewers - Gravity	2007	$172,818.00	HWW-143	295.7	337.6	1.142	197,358
361	Collection Sewers - Gravity	2007	$228,652.00	HWW-143	295.7	337.6	1.142	261,121
361	Collection Sewers - Gravity	2007	$81,727.00	HWW-143	295.7	337.6	1.142	93,332
361	Collection Sewers - Gravity	2007	$3,159.00	HWW-143	295.7	337.6	1.142	3,608
361	Collection Sewers - Gravity	2007	$33,192.00	HWW-143	295.7	337.6	1.142	37,905
361	Collection Sewers - Gravity	2007	$33,828.00	HWW-143	295.7	337.6	1.142	38,632
361	Collection Sewers - Gravity	2007	$191,995.00	HWW-143	295.7	337.6	1.142	219,258
361	Collection Sewers - Gravity	2007	$22,725.00	HWW-143	295.7	337.6	1.142	25,952
361	Collection Sewers - Gravity	2007	$30,000.00	HWW-143	295.7	337.6	1 142	34,260
361	Collection Sewers - Gravity	2007	$13,700.00	HWW-143	295.7	337.6	1.142	15,645
361	Collection Sewers - Gravity	2007	$23,100.00	HWW-143	295.7	337.6	1.142	26,380
361	Collection Sewers - Gravity	2007	$19,000.00	HWW-143	295.7	337.6	1.142	21,698

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
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Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols. (16) & (2017))	Cols. (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	2007	$10,000.00	HWW-143	295.7	337.6	1.142	11,420
361	Collection Sewers - Gravity	2009	$31,634.00	HWW-143	326.6	337.6	1.034	32,710
361	Collection Sewers - Gravity	2009	$94,540.00	HWW-143	326.6	337.6	1.034	97,754
361	Collection Sewers - Gravity	2009	$9,910.00	HWW-143	326.6	337.6	1.034	10,247
361	Collection Sewers - Gravity	2009	$2,550.00	HWW-143	326.6	337.6	1.034	2,637
361	Collection Sewers - Gravity	2009	$5,340.00	HWW-143	326.6	337.6	1.034	5,522
361	Collection Sewers - Gravity	2009	$3,050.00	HWW-143	326.6	337.6	1.034	3,154
361	Collection Sewers - Gravity	2005	$55,569.00	HWW-143	238.5	337.6	1.416	78,686
361	Collection Sewers - Gravity	2005	$347,348.00	HWW-143	238.5	337.6	1.416	491,845
361	Collection Sewers - Gravity	2005	$200,977.00	HWW-143	238.5	337.6	1.416	284,583
361	Collection Sewers - Gravity	2005	$102,371.00	HWW-143	238.5	337.6	1.416	144,957
361	Collection Sewers - Gravity	2005	$122,342.00	HWW-143	238.5	337.6	1.416	173,236
361	Collection Sewers - Gravity	2005	$13,800.00	HWW-143	238.5	337.6	1.416	19,541
361	Collection Sewers - Gravity	2005	$31,500.00	HWW-143	238.5	337.6	1.416	44,604
361	Collection Sewers - Gravity	2005	$17,500.00	HWW-143	238.5	337.6	1.416	24,780
361	Collection Sewers - Gravity	2005	$9,000.00	HWW-143	238.5	337.6	1.416	12,744
361	Collection Sewers - Gravity	2005	$7,000.00	HWW-143	238.5	337.6	1.416	9,912
361	Collection Sewers - Gravity	2005	$8,000.00	HWW-143	238.5	337.6	1.416	11,328
361	Collection Sewers - Gravity	2009	$7,751.00	HWW-143	326.6	337.6	1.034	8,015
361	Collection Sewers - Gravity	2009	$8,600.00	HWW-143	326.6	337.6	1.034	8,892
361	Collection Sewers - Gravity	2009	$6,203.00	HWW-143	326.6	337.6	1.034	6,414
361	Collection Sewers - Gravity	2011	$4,416.00	HWW-143	325.7	337.6	1.037	4,579
361	Collection Sewers - Gravity	2011	$20,400.00	HWW-143	325.7	337.6	1.037	21,155
361	Collection Sewers - Gravity	2011	$11,856.00	HWW-143	325.7	337.6	1.037	12,295
361	Collection Sewers - Gravity	2005	$20,636.00	HWW-143	238.5	337.6	1.416	29,221
361	Collection Sewers - Gravity	2005	$4,255.00	HWW-143	238.5	337.6	1.416	6,025
361	Collection Sewers - Gravity	2005	$1,800.00	HWW-143	238.5	337.6	1.416	2,549
361	Collection Sewers - Gravity	2005	$5,000.00	HWW-143	238.5	337.6	1.416	7,080

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
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Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols (16) & (4))	Cost Index Lookup f(Cols (16) & (2017))	Cols (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	2009	$98,977.00	HWW-143	326.6	337.6	1.034	102,342
361	Collection Sewers - Gravity	2009	$46,937.00	HWW-143	326.6	337.6	1.034	48,533
361	Collection Sewers - Gravity	2009	$21,701.00	HWW-143	326.6	337.6	1.034	22,439
361	Collection Sewers - Gravity	2009	$16,652.00	HWW-143	326.6	337.6	1.034	17,218
361	Collection Sewers - Gravity	2009	$14,686.00	HWW-143	326.6	337.6	1.034	15,185
361	Collection Sewers - Gravity	2009	$8,204.00	HWW-143	326.6	337.6	1.034	8,483
361	Collection Sewers - Gravity	2009	$1,458.00	HWW-143	326.6	337.6	1.034	1,508
361	Collection Sewers - Gravity	2009	$9,881.00	HWW-143	326.6	337.6	1.034	10,217
361	Collection Sewers - Gravity	2009	$2,132.00	HWW-143	326.6	337.6	1.034	2,204
361	Collection Sewers - Gravity	2009	$15,499.00	HWW-143	326.6	337.6	1.034	16,026
361	Collection Sewers - Gravity	2009	$26,277.00	HWW-143	326.6	337.6	1.034	27,170
361	Collection Sewers - Gravity	2009	$10,200.00	HWW-143	326.6	337.6	1.034	10,547
361	Collection Sewers - Gravity	2009	$5,320.00	HWW-143	326.6	337.6	1.034	5,501
361	Collection Sewers - Gravity	2009	$3,050.00	HWW-143	326.6	337.6	1.034	3,154
361	Collection Sewers - Gravity	2009	$7,050.00	HWW-143	326.6	337.6	1.034	7,290
361	Collection Sewers - Gravity	2009	$4,780.00	HWW-143	326.6	337.6	1.034	4,943
361	Collection Sewers - Gravity	2011	$204,259.00	HWW-143	325.7	337.6	1.037	211,817
361	Collection Sewers - Gravity	2011	$68,055.00	HWW-143	325.7	337.6	1.037	70,573
361	Collection Sewers - Gravity	2011	$16,065.00	HWW-143	325.7	337.6	1.037	16,659
361	Collection Sewers - Gravity	2011	$10,312.00	HWW-143	325.7	337.6	1.037	10,694
361	Collection Sewers - Gravity	2011	$5,595.00	HWW-143	325.7	337.6	1.037	5,802
361	Collection Sewers - Gravity	2011	$4,763.00	HWW-143	325.7	337.6	1.037	4,939
361	Collection Sewers - Gravity	2011	$20,850.00	HWW-143	325.7	337.6	1.037	21,621
361	Collection Sewers - Gravity	2011	$0.00	HWW-143	325.7	337.6	1.037	-
361	Collection Sewers - Gravity	2011	$0.00	HWW-143	325.7	337.6	1.037	-
361	Collection Sewers - Gravity	2011	$1,519.00	HWW-143	325.7	337.6	1.037	1,575
361	Collection Sewers - Gravity	2011	$2,581.00	HWW-143	325.7	337.6	1.037	2,676
361	Collection Sewers - Gravity	2011	$36,838.00	HWW-143	325.7	337.6	1.037	38,201
361	Collection Sewers - Gravity	2011	$14,400.00	HWW-143	325.7	337.6	1.037	14,933
361	Collection Sewers - Gravity	2011	$31,200.00	HWW-143	325.7	337.6	1.037	32,354
361	Collection Sewers - Gravity	2011	$2,800.00	HWW-143	325.7	337.6	1.037	2,904

1	2	4	6	16	17	18	19	20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols (16) & (4))	Cost Index Lookup f(Cols (16) & (2017))	Cols (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	2011	$6,000.00	HWW-143	325.7	337.6	1.037	6,222
361	Collection Sewers - Gravity	2011	$0.00	HWW-143	325.7	337.6	1.037	-
361	Collection Sewers - Gravity	2011	$0.00	HWW-143	325 7	337.6	1.037	-
361	Collection Sewers - Gravity	2011	$4,000.00	HWW-143	325.7	337.6	1.037	4,148
361	Collection Sewers - Gravity	2001	$24,960.00	HWW-143	200.7	337.6	1.682	41,983
361	Collection Sewers - Gravity	2001	$12,680.00	HWW-143	200.7	337.6	1.682	21,328
361	Collection Sewers - Gravity	1999	$46,600.00	HWW-143	183.3	337.6	1.842	85,837
361	Collection Sewers - Gravity	1999	$31,548.00	HWW-143	183.3	337.6	1.842	58,111
361	Collection Sewers - Gravity	1999	$23,220.00	HWW-143	183.3	337.6	1.842	42,771
361	Collection Sewers - Gravity	2001	$56,875.00	HWW-143	200.7	337.6	1.682	95,664
361	Collection Sewers - Gravity	2001	$13,112.00	HWW-143	200.7	337.6	1.682	22,054
361	Collection Sewers - Gravity	2001	$15,000.00	HWW-143	200.7	337.6	1.682	25,230
361	Collection Sewers - Gravity	2001	$49,150.00	HWW-143	200.7	337.6	1.682	82,670
361	Collection Sewers - Gravity	2001	$9,504.00	HWW-143	200.7	337.6	1.682	15,986
361	Collection Sewers - Gravity	2001	$16,800.00	HWW-143	200.7	337.6	1.682	28,258
361	Collection Sewers - Gravity	2002	$56,950.00	HWW-143	208.5	337.6	1.619	92,202
361	Collection Sewers - Gravity	2002	$16,500.00	HWW-143	208.5	337.6	1.619	26,714
361	Collection Sewers - Gravity	2006	$125,475.00	HWW-143	270.6	337.6	1.248	156,593
361	Collection Sewers - Gravity	2006	$41,500.00	HWW-143	270.6	337.6	1.248	51,792
361	Collection Sewers - Gravity	2006	$68,699.00	HWW-143	270.6	337.6	1.248	85,736
361	Collection Sewers - Gravity	2006	$59,170.00	HWW-143	270.6	337.6	1.248	73,844
361	Collection Sewers - Gravity	2013	$49,452.00	HWW-143	331.7	337.6	1.018	50,342
361	Collection Sewers - Gravity	2013	$36,000.00	HWW-143	331.7	337.6	1.018	36,648
361	Collection Sewers - Gravity		$5,668,395.00					7,984,952
363	Services to Customers	2000	$2,300.00	HWW-139	348	638	1.833	4,216
363	Services to Customers	2000	$160.00	HWW-139	348	638	1.833	293
363	Services to Customers	2000	$40,750.00	HWW-139	348	638	1.833	74,695
363	Services to Customers	2000	$4,602.00	HWW-139	348	638	1 833	8,435
363	Services to Customers	2005	$1,520.00	HWW-139	409.8	638	1.557	2,367
363	Services to Customers	2005	$17,890.00	HWW-139	409.8	638	1.557	27,855
363	Services to Customers	2007	$3,072.00	HWW-139	485.3	638	1.315	4,040
363	Services to Customers	2007	$40,935.00	HWW-139	485.3	638	1.315	53,830
363	Services to Customers	2004	$1,250.00	HWW-139	388.3	638	1.643	2,054
363	Services to Customers	2004	$7,500.00	HWW-139	388.3	638	1.643	12,323
363	Services to Customers	2004	$5,220.00	HWW-139	388.3	638	1.643	8,576
363	Services to Customers	2004	$4,993.00	HWW-139	388.3	638	1.643	8,203

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols. (16) & (4))	Cost Index Lookup f(Cols (16) & (2017))	Cols. (18)/(17)	Cols. (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
363	Services to Customers	2005	$11,360.00	HWW-139	409.8	638	1.557	17,688
363	Services to Customers	2005	$116,420.00	HWW-139	409.8	638	1.557	181,266
363	Services to Customers	2009	$560.00	HWW-139	536.8	638	1.189	666
363	Services to Customers	2007	$240.00	HWW-139	485.3	638	1.315	316
363	Services to Customers	2007	$3,780.00	HWW-139	485.3	638	1.315	4,971
363	Services to Customers	2009	$6,525.00	HWW-139	536.8	638	1.189	7,758
363	Services to Customers	2009	$6,000.00	HWW-139	536.8	638	1.189	7,134
363	Services to Customers	2009	$15,877.00	HWW-139	536.8	638	1.189	18,878
363	Services to Customers	2011	$1,400.00	HWW-139	576.3	638	1.107	1,550
363	Services to Customers	2011	$35,610.00	HWW-139	576.3	638	1.107	39,420
363	Services to Customers	2001	$14,261.00	HWW-139	304	638	2.099	29,934
363	Services to Customers	2000	$19,065.00	HWW-139	348	638	1.833	34,946
363	Services to Customers	2001	$15,735.00	HWW-139	304	638	2.099	33,028
363	Services to Customers	2001	$19,905.00	HWW-139	304	638	2.099	41,781
363	Services to Customers	2002	$24,180.00	HWW-139	359.8	638	1.773	42,871
363	Services to Customers	2006	$10,950.00	HWW-139	454.3	638	1.404	15,374
363	Services to Customers	2006	$76,650.00	HWW-139	454.3	638	1.404	107,617
363	Services to Customers	2006	$7,040.00	HWW-139	454.3	638	1.404	9,884
363	Services to Customers	2006	$22,646.00	HWW-139	454.3	638	1.404	31,795
363	Services to Customers	2013	$7,920.00	HWW-139	602.3	638	1.059	8,387
363	Services to Customers		$546,316.00					842,151
364	Flow Measuring Devices	1999	$25,000.00	HWW-140	198	404	2.04	51,000
364	Flow Measuring Devices	2015	$73,731.00	HWW-140	400.8	404	1.008	74,321
364	Flow Measuring Devices		$98,731.00					125,321
371	Pumping Equipment	1999	$225,000.00	HWW-19	505	1075	2.129	479,025
371	Pumping Equipment		$225,000.00					479,025
			$6,841,845.00					9,984,814

Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	2008	$23,184.00	HWW-143	314.7	337.6	1.073	24,876
361	Collection Sewers - Gravity	2008	$43,350.00	HWW-143	314.7	337.6	1.073	46,515
361	Collection Sewers - Gravity	2008	$23,200.00	HWW-143	314.7	337.6	1.073	24,894
361	Collection Sewers - Gravity	2008	$774.00	HWW-143	314.7	337.6	1.073	831
361	Collection Sewers - Gravity	2008	$5,016.00	HWW-143	314.7	337.6	1.073	5,382

1	2	4	6	16	17	18	19	20

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Cost New (RCN)

(1)	(2)	(4)	(6)	(16)	(17)	(18)	(19)	(20)
Account	Description	Year	Original Cost	Cost Trend Reference	Year Index	Spot Index	Cost Translator	Cost New
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup	Cost Index Lookup f(Cols (16) & (4))	Cost Index Lookup f(Cols (16) & (2017))	Cols. (18)/(17)	Cols (6)*(19)
Account	Description	Year	OC	Cost Trend Reference	YearIndex	Spot Index	Translator	RCN
361	Collection Sewers - Gravity	2008	$17,332.00	HWW-143	314.7	337.6	1.073	18,597
361	Collection Sewers - Gravity	2008	$774.00	HWW-143	314.7	337.6	1.073	831
361	Collection Sewers - Gravity	2008	$66,002.00	HWW-143	314.7	337.6	1.073	70,820
361	Collection Sewers - Gravity	2008	$62,544.00	HWW-143	314.7	337.6	1.073	67,110
361	Collection Sewers - Gravity	2008	$3,192.00	HWW-143	314.7	337.6	1.073	3,425
361	Collection Sewers - Gravity	2009	$69,090.00	HWW-143	326.6	337.6	1.034	71,439
361	Collection Sewers - Gravity	2009	$30,815.00	HWW-143	326.6	337.6	1.034	31,863
361	Collection Sewers - Gravity	2013	$25,227.00	HWW-143	331.7	337.6	1.018	25,681
361	Collection Sewers - Gravity	2013	$17,960.00	HWW-143	331.7	337.6	1.018	18,283
361	Collection Sewers - Gravity	2015	$95,025.00	HWW-143	334.4	337.6	1.01	95,975
361	Collection Sewers - Gravity	2015	$34,970.00	HWW-143	334.4	337.6	1.01	35,320
361	Collection Sewers - Gravity	2015	$66,092.00	HWW-143	334.4	337.6	1.01	66,753
361	Collection Sewers - Gravity		$584,547.00					608,595
363	Services to Customers	2008	$10,270.00	HWW-139	514.3	638	1.241	12,745
363	Services to Customers	2009	$4,169.00	HWW-139	536.8	638	1.189	4,957
363	Services to Customers	2015	$31,636.00	HWW-139	617.8	638	1.033	32,680
363	Services to Customers	2015	$8,134.00	HWW-139	617.8	638	1.033	8,402
363	Services to Customers		$54,209.00					58,784
			$638,756.00					667,379
			$7,480,601					**$10,652,193**

1	2	4	6	7	8	9	10	11	12	13	14	15	16

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement Curve	Account Parameters Lookup	2017-(Col (4)+0 5)	(9)/(8)	Cols (7)&(10)	IowaLookup f(Col (11))	Cols (8)*(12)	Cols. (9)+(13)	Cols (13)/(14)	Cols (6)*(15)
Account	Description	Year	OC	Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
353	Land & Land Rights		$18,343.00										18,343
354	Structures & Improvements		$152,560.00										93,461
355	Power Generating Equipment		$40,000 00										20,732
360	Collection Sewers - Force		$92,500 00										67,840
361	Collection Sewers - Gravity		$5,668,395.00										4,706,722
363	Services to Customers		$546,316.00										432,822
364	Flow Measuring Devices		$98,731 00										83,541
371	Pumping Equipment		$225,000 00										116,618
			$6,841,845 00										5,540,079

Account	Description	Year	OC	Iowa Survival / Retirement Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
361	Collection Sewers - Gravity		$584,547.00										537,817
363	Services to Customers		$54,209.00										50,980
			$638,756 00										588,797
			$7,480,601										**$6,128,876**

1	2	4	6	7	8	9	10	11	12	13	14	15	16

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement Curve	Account Parameters Lookup Life	2017-(Col (4)+0 5) Age	(9)/(8) Age%	Cols (7)&(10) IowaLookup	IowaLookup f(Col (11)) Iowa % Cond	Cols (8)*(12) Expectancy	Cols (9)+(13) Total Life	Cols (13)/(14) Condition Percent	Cols (6)*(15) OCLD
Account	Description	Year	OC										
353	Land & Land Right	1999	$1.00	SQ 0	100	17 5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ 0018	0 82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82 00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99 50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99 50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17 5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82 00	99 50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ 0	100	17.5		18 SQ.0018	0 82	82.00	99.50	100 00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17 5		18 SQ.0018	0.82	82.00	99.50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ.0018	0 82	82 00	99.50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ 0018	0.82	82 00	99.50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ 0018	0 82	82.00	99.50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ 0018	0 82	82.00	99 50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ.0018	0 82	82.00	99 50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ.0018	0.82	82.00	99.50	100 00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100 00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17 5		18 SQ.0018	0.82	82.00	99 50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0 82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99 50	100.00%	1
353	Land & Land Right	1999	$9,600.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99 50	100.00%	9,600
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0 82	82 00	99.50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ.0	100	17.5		18 SQ 0018	0.82	82.00	99 50	100 00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100 00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0 82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99 50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82 00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ 0018	0.82	82.00	99 50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1.00	SQ.0	100	17.5		18 SQ 0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99.50	100.00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ 0018	0.82	82 00	99 50	100 00%	1
353	Land & Land Right	1999	$1 00	SQ 0	100	17 5		18 SQ 0018	0.82	82.00	99 50	100 00%	1
353	Land & Land Right	1999	$751.00	SQ 0	100	17.5		18 SQ.0018	0.82	82.00	99 50	100 00%	751
353	Land & Land Right	2000	$1.00	SQ.0	100	16.5		17 SQ.0017	0.83	83.00	99.50	100.00%	1
353	Land & Land Right	2002	$3,946.00	SQ 0	100	14.5		15 SQ.0015	0.85	85.00	99.50	100.00%	3,946
353	Land & Land Right	2005	$1 00	SQ 0	100	11.5		12 SQ.0012	0.88	88.00	99.50	100.00%	1
353	Land & Land Right	2006	$3,946 00	SQ.0	100	10 5		11 SQ.0011	0.89	89.00	99.50	100.00%	3,946
353	Land & Land Right	2006	$1.00	SQ.0	100	10 5		11 SQ.0011	0.89	89.00	99.50	100.00%	1
353	Land & Land Right	2006	$1.00	SQ.0	100	10.5		11 SQ.0011	0.89	89.00	99.50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5		12 SQ.0012	0.88	88.00	99 50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5		12 SQ 0012	0.88	88.00	99 50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11 5		12 SQ.0012	0.88	88.00	99.50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5		12 SQ.0012	0.88	88.00	99 50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11 5		12 SQ.0012	0.88	88.00	99.50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ 0	100	11.5		12 SQ 0012	0 88	88.00	99.50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ 0	100	11.5		12 SQ.0012	0.88	88.00	99.50	100 00%	1
353	Land & Land Right	2004	$1 00	SQ 0	100	12.5		13 SQ.0013	0.87	87.00	99.50	100 00%	1

1	2	4	6	7	8	9	10	11	12	13	14	15	16

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost less Depreciation (OCLD)

				Depreciation									
(1)	(2)	(4)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement Curve	Account Parameters Lookup	2017-(Col (4)+0 5)	(9)/(8)	Cols (7)&(10)	IowaLookup f(Col (11))	Cols (8)*(12)	Cols (9)+(13)	Cols (13)/(14)	Cols (6)*(15)
Account	Description	Year	OC	Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5	12	SQ.0012	0.88	88.00	99 50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ 0	100	11.5	12	SQ.0012	0.88	88.00	99.50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5	12	SQ.0012	0 88	88 00	99.50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ 0	100	11 5	12	SQ.0012	0.88	88.00	99 50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ.0	100	11.5	12	SQ.0012	0.88	88.00	99.50	100 00%	1
353	Land & Land Right	2005	$1 00	SQ.0	100	11 5	12	SQ.0012	0.88	88.00	99.50	100 00%	1
353	Land & Land Right	2004	$1.00	SQ.0	100	12.5	13	SQ.0013	0.87	87.00	99 50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5	12	SQ 0012	0 88	88 00	99.50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ 0	100	11.5	12	SQ.0012	0 88	88 00	99.50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5	12	SQ.0012	0 88	88.00	99.50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5	12	SQ 0012	0.88	88 00	99 50	100.00%	1
353	Land & Land Right	2005	$1 00	SQ.0	100	11.5	12	SQ.0012	0 88	88.00	99.50	100 00%	1
353	Land & Land Right	2005	$1 00	SQ 0	100	11 5	12	SQ.0012	0 88	88.00	99.50	100.00%	1
353	Land & Land Right	2005	$1.00	SQ.0	100	11.5	12	SQ 0012	0.88	88 00	99 50	100.00%	1
353	Land & Land Right	2004	$1.00	SQ.0	100	12 5	13	SQ.0013	0 87	87.00	99.50	100.00%	1
353	Land & Land Right	2004	$1.00	SQ 0	100	12 5	13	SQ.0013	0 87	87 00	99.50	100.00%	1
353	Land & Land Right	2004	$1.00	SQ.0	100	12 5	13	SQ.0013	0 87	87 00	99.50	100.00%	1
353	Land & Land Right	2004	$1.00	SQ 0	100	12.5	13	SQ.0013	0.87	87.00	99.50	100 00%	1
353	Land & Land Right	2008	$1.00	SQ 0	100	8.5	9	SQ 0009	0 91	91.00	99 50	100 00%	1
353	Land & Land Right	2008	$1.00	SQ.0	100	8.5	9	SQ 0009	0.91	91 00	99 50	100.00%	1
353	Land & Land Right	2008	$1.00	SQ.0	100	8 5	9	SQ.0009	0 91	91 00	99 50	100.00%	1
353	Land & Land Right	2008	$1.00	SQ 0	100	8 5	9	SQ.0009	0 91	91 00	99.50	100.00%	1
353	Land & Land Right	2004	$0.00	SQ 0	100	12.5	13	SQ.0013	0.87	87 00	99 50	100.00%	-
353	Land & Land Right	2004	$0.00	SQ 0	100	12.5	13	SQ.0013	0.87	87.00	99.50	100.00%	-
353	Land & Land Right	2004	$0.00	SQ.0	100	12.5	13	SQ.0013	0.87	87.00	99 50	100 00%	-
353	Land & Land Right	2003	$1.00	SQ 0	100	13.5	14	SQ 0014	0.86	86 00	99 50	100 00%	1
353	Land & Land Right	2008	$1.00	SQ 0	100	8.5	9	SQ.0009	0 91	91.00	99 50	100 00%	1
353	Land & Land Right	2008	$1.00	SQ.0	100	8.5	9	SQ 0009	0.91	91 00	99.50	100 00%	1
353	Land & Land Right	2008	$1.00	SQ 0	100	8 5	9	SQ.0009	0.91	91.00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ.0007	0.93	93.00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ 0007	0.93	93.00	99 50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ 0	100	6.5	7	SQ.0007	0.93	93 00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ 0007	0.93	93.00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ.0007	0.93	93.00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ 0007	0 93	93 00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ.0007	0.93	93.00	99.50	100.00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ 0007	0.93	93.00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ 0007	0.93	93.00	99.50	100.00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ.0007	0.93	93.00	99.50	100 00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ 0007	0 93	93.00	99.50	100.00%	1
353	Land & Land Right	2010	$1.00	SQ.0	100	6.5	7	SQ.0007	0 93	93.00	99.50	100.00%	1
353	Land & Land Right	2001	$0 00	SQ.0	100	15.5	16	SQ.0016	0.84	84.00	99 50	100.00%	-
353	Land & Land Right	2004	$1.00	SQ.0	100	12.5	13	SQ.0013	0 87	87.00	99.50	100.00%	1
353	Land & Land Right	2006	$1.00	SQ.0	100	10.5	11	SQ.0011	0 89	89.00	99 50	100.00%	1
353	Land & Land Right	2008	$1.00	SQ.0	100	8.5	9	SQ.0009	0 91	91.00	99 50	100.00%	1
353	Land & Land Right	2014	$1 00	SQ.0	100	2 5	3	SQ.0003	0 97	97.00	99.50	100.00%	1
353	Land & Land Right	2016	$1 00	SQ.0	100	0 5	1	SQ.0001	0.99	99.00	99 50	100.00%	1
353	Land & Land Rights		$18,343 00										18,343
354	Structures & Impr	1999	$1,000.00	R4 0	45	17.5	39	R4.0039	0.61495	27 67	45 17	61.26%	613
354	Structures & Impr	1999	$2,500 00	R4 0	45	17.5	39	R4.0039	0.61495	27.67	45.17	61.26%	1,532
354	Structures & Impr	1999	$200 00	R4 0	45	17 5	39	R4.0039	0.61495	27.67	45 17	61 26%	123
354	Structures & Impr	1999	$600 00	R4.0	45	17.5	39	R4.0039	0.61495	27 67	45 17	61 26%	368
354	Structures & Impr	1999	$400 00	R4.0	45	17.5	39	R4.0039	0.61495	27 67	45 17	61.26%	245
354	Structures & Impr	1999	$25,000 00	R4.0	45	17.5	39	R4 0039	0 61495	27.67	45 17	61.26%	15,315
354	Structures & Impr	1999	$10,260 00	R4 0	45	17 5	39	R4 0039	0.61495	27 67	45.17	61.26%	6,285
354	Structures & Impr	1999	$75,000 00	R4.0	45	17.5	39	R4.0039	0.61495	27.67	45 17	61.26%	45,945
354	Structures & Impr	1999	$35,000 00	R4.0	45	17 5	39	R4.0039	0.61495	27.67	45 17	61.26%	21,441
354	Structures & Impr	1999	$200.00	R4.0	45	17.5	39	R4.0039	0.61495	27.67	45 17	61.26%	123
354	Structures & Impr	1999	$240.00	R4 0	45	17.5	39	R4.0039	0.61495	27.67	45 17	61.26%	147

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement Curve	Account Parameters Lookup Life	2017-(Col (4)+0.5) Age	(9)/(8) Age%	Cols. (7)&(10) IowaLookup	IowaLookup f(Col (11)) Iowa % Cond	Cols. (8)*(12) Expectancy	Cols (9)+(13) Total Life	Cols (13)/(14) Condition Percent	Cols (6)*(15) OCLD
Account	Description	Year	OC										
354	Structures & Impr	1999	$600.00	R4.0	45	17.5	39	R4.0039	0.61495	27.67	45.17	61.26%	368
354	Structures & Impr	1999	$1,560.00	R4.0	45	17.5	39	R4.0039	0.61495	27.67	45.17	61.26%	956
354	Structures & Improvements		$152,560.00										93,461
355	Power Generating	1999	$40,000.00	R3.0	35	17.5	50	R3.0050	0.53792	18.83	36.33	51.83%	20,732
355	Power Generating Equipment		$40,000.00										20,732
360	Collection Sewers	1999	$85,000.00	R3.0	65	17.5	27	R3.0027	0.74058	48.14	65.64	73.34%	62,339
360	Collection Sewers	1999	$7,500.00	R3.0	65	17.5	27	R3.0027	0.74058	48.14	65.64	73.34%	5,501
360	Collection Sewers - Force		$92,500.00										67,840
361	Collection Sewers	1999	$100,632.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	75,705
361	Collection Sewers	1999	$34,146.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	25,688
361	Collection Sewers	1999	$179,433.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	134,987
361	Collection Sewers	1999	$35,000.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	26,331
361	Collection Sewers	1999	$10,400.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	7,824
361	Collection Sewers	1999	$55,250.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	41,565
361	Collection Sewers	1999	$6,400.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	4,815
361	Collection Sewers	1999	$6,400.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	4,815
361	Collection Sewers	1999	$8,500.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	6,395
361	Collection Sewers	1999	$69,574.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	52,341
361	Collection Sewers	1999	$79,408.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	59,739
361	Collection Sewers	1999	$6,355.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	4,781
361	Collection Sewers	1999	$69,240.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	52,089
361	Collection Sewers	1999	$39,100.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	29,415
361	Collection Sewers	1999	$81,594.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	61,383
361	Collection Sewers	1999	$32,790.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	24,668
361	Collection Sewers	1999	$7,070.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	5,319
361	Collection Sewers	1999	$25,600.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	19,259
361	Collection Sewers	1999	$3,400.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	2,558
361	Collection Sewers	1999	$71,950.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	54,128
361	Collection Sewers	1999	$17,600.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	13,240
361	Collection Sewers	1999	$3,400.00	R3.0	70	17.5	25	R3.0025	0.75917	53.14	70.64	75.23%	2,558
361	Collection Sewers	2000	$403,348.00	R3.0	70	16.5	24	R3.0024	0.76851	53.80	70.30	76.53%	308,682
361	Collection Sewers	2000	$130,731.00	R3.0	70	16.5	24	R3.0024	0.76851	53.80	70.30	76.53%	100,048
361	Collection Sewers	2000	$47,946.00	R3.0	70	16.5	24	R3.0024	0.76851	53.80	70.30	76.53%	36,693
361	Collection Sewers	2000	$51,000.00	R3.0	70	16.5	24	R3.0024	0.76851	53.80	70.30	76.53%	39,030
361	Collection Sewers	2000	$19,800.00	R3.0	70	16.5	24	R3.0024	0.76851	53.80	70.30	76.53%	15,153
361	Collection Sewers	2000	$10,400.00	R3.0	70	16.5	24	R3.0024	0.76851	53.80	70.30	76.53%	7,959
361	Collection Sewers	2005	$16,283.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	13,630
361	Collection Sewers	2005	$45,200.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	37,837
361	Collection Sewers	2005	$70,022.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	58,615
361	Collection Sewers	2005	$25,581.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	21,414
361	Collection Sewers	2005	$11,779.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	9,860
361	Collection Sewers	2005	$7,200.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	6,027
361	Collection Sewers	2005	$4,200.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	3,516
361	Collection Sewers	2005	$2,500.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	2,093
361	Collection Sewers	2005	$7,000.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	5,860
361	Collection Sewers	2005	$2,000.00	R3.0	70	11.5	16	R3.0016	0.8443	59.10	70.60	83.71%	1,674
361	Collection Sewers	2007	$105,609.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	91,267
361	Collection Sewers	2007	$272,074.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	235,126
361	Collection Sewers	2007	$172,818.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	149,349
361	Collection Sewers	2007	$228,652.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	197,601
361	Collection Sewers	2007	$81,727.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	70,628
361	Collection Sewers	2007	$3,159.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	2,730
361	Collection Sewers	2007	$33,192.00	R3.0	70	9.5	14	R3.0014	0.8635	60.45	69.95	86.42%	28,685

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Sadsbury Township Wastewater Utility
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January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement	Account Parameters Lookup	2017-(Col (4)+0 5)	(9)/(8)	Cols (7)&(10)	IowaLookup f(Col (11))	Cols (8)*(12)	Cols (9)+(13)	Cols (13)/(14)	Cols. (6)*(15)
Account	Description	Year	OC	Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
361	Collection Sewers	2007	$33,828.00	R3.0	70	9.5	14	R3.0014	0.8635	60 45	69 95	86.42%	29,234
361	Collection Sewers	2007	$191,995.00	R3.0	70	9 5	14	R3 0014	0 8635	60 45	69 95	86 42%	165,922
361	Collection Sewers	2007	$22,725.00	R3.0	70	9 5	14	R3.0014	0 8635	60 45	69.95	86 42%	19,639
361	Collection Sewers	2007	$30,000.00	R3.0	70	9 5	14	R3.0014	0 8635	60 45	69 95	86 42%	25,926
361	Collection Sewers	2007	$13,700.00	R3 0	70	9.5	14	R3.0014	0.8635	60.45	69 95	86 42%	11,840
361	Collection Sewers	2007	$23,100.00	R3 0	70	9 5	14	R3.0014	0 8635	60 45	69 95	86.42%	19,963
361	Collection Sewers	2007	$19,000 00	R3 0	70	9.5	14	R3.0014	0 8635	60 45	69 95	86.42%	16,420
361	Collection Sewers	2007	$10,000 00	R3 0	70	9 5	14	R3 0014	0.8635	60 45	69.95	86.42%	8,642
361	Collection Sewers	2009	$31,634.00	R3.0	70	7 5	11	R3.0011	0 89247	62.47	69 97	89 28%	28,243
361	Collection Sewers	2009	$94,540.00	R3 0	70	7 5	11	R3 0011	0 89247	62 47	69 97	89 28%	84,405
361	Collection Sewers	2009	$9,910.00	R3 0	70	7 5	11	R3.0011	0 89247	62 47	69 97	89 28%	8,848
361	Collection Sewers	2009	$2,550.00	R3.0	70	7.5	11	R3 0011	0.89247	62 47	69.97	89.28%	2,277
361	Collection Sewers	2009	$5,340.00	R3 0	70	7 5	11	R3.0011	0 89247	62.47	69 97	89.28%	4,768
361	Collection Sewers	2009	$3,050.00	R3 0	70	7.5	11	R3 0011	0 89247	62.47	69 97	89 28%	2,723
361	Collection Sewers	2005	$55,569.00	R3 0	70	11 5	16	R3.0016	0.8443	59 10	70 60	83.71%	46,517
361	Collection Sewers	2005	$347,348.00	R3 0	70	11 5	16	R3.0016	0.8443	59 10	70 60	83.71%	290,765
361	Collection Sewers	2005	$200,977.00	R3.0	70	11 5	16	R3.0016	0 8443	59 10	70.60	83.71%	168,238
361	Collection Sewers	2005	$102,371.00	R3 0	70	11 5	16	R3.0016	0 8443	59 10	70 60	83 71%	85,695
361	Collection Sewers	2005	$122,342.00	R3.0	70	11 5	16	R3.0016	0 8443	59 10	70 60	83.71%	102,412
361	Collection Sewers	2005	$13,800.00	R3.0	70	11 5	16	R3 0016	0 8443	59 10	70 60	83.71%	11,552
361	Collection Sewers	2005	$31,500 00	R3.0	70	11 5	16	R3 0016	0 8443	59 10	70 60	83.71%	26,369
361	Collection Sewers	2005	$17,500 00	R3.0	70	11 5	16	R3 0016	0.8443	59 10	70 60	83.71%	14,649
361	Collection Sewers	2005	$9,000.00	R3.0	70	11.5	16	R3 0016	0.8443	59.10	70.60	83.71%	7,534
361	Collection Sewers	2005	$7,000 00	R3.0	70	11 5	16	R3 0016	0.8443	59.10	70 60	83.71%	5,860
361	Collection Sewers	2005	$8,000.00	R3.0	70	11.5	16	R3.0016	0 8443	59 10	70 60	83.71%	6,697
361	Collection Sewers	2009	$7,751.00	R3.0	70	7.5	11	R3.0011	0.89247	62 47	69 97	89.28%	6,920
361	Collection Sewers	2009	$8,600 00	R3 0	70	7.5	11	R3 0011	0.89247	62 47	69.97	89.28%	7,678
361	Collection Sewers	2009	$6,203 00	R3 0	70	7 5	11	R3 0011	0.89247	62 47	69.97	89 28%	5,538
361	Collection Sewers	2011	$4,416.00	R3.0	70	5 5	8	R3 0008	0.9216	64 51	70 01	92 14%	4,069
361	Collection Sewers	2011	$20,400.00	R3.0	70	5 5	8	R3 0008	0.9216	64.51	70 01	92 14%	18,797
361	Collection Sewers	2011	$11,856.00	R3.0	70	5.5	8	R3.0008	0.9216	64.51	70 01	92.14%	10,924
361	Collection Sewers	2005	$20,636 00	R3.0	70	11 5	16	R3 0016	0 8443	59.10	70.60	83.71%	17,274
361	Collection Sewers	2005	$4,255 00	R3 0	70	11 5	16	R3.0016	0.8443	59.10	70 60	83.71%	3,562
361	Collection Sewers	2005	$1,800 00	R3 0	70	11 5	16	R3 0016	0 8443	59 10	70 60	83 71%	1,507
361	Collection Sewers	2005	$5,000.00	R3 0	70	11 5	16	R3 0016	0.8443	59.10	70.60	83.71%	4,186
361	Collection Sewers	2009	$98,977 00	R3.0	70	7.5	11	R3.0011	0 89247	62 47	69 97	89.28%	88,367
361	Collection Sewers	2009	$46,937 00	R3.0	70	7 5	11	R3 0011	0.89247	62 47	69 97	89.28%	41,905
361	Collection Sewers	2009	$21,701 00	R3 0	70	7.5	11	R3.0011	0.89247	62.47	69.97	89.28%	19,375
361	Collection Sewers	2009	$16,652 00	R3.0	70	7 5	11	R3.0011	0.89247	62.47	69.97	89 28%	14,867
361	Collection Sewers	2009	$14,686.00	R3.0	70	7 5	11	R3 0011	0 89247	62 47	69.97	89 28%	13,112
361	Collection Sewers	2009	$8,204 00	R3 0	70	7.5	11	R3 0011	0.89247	62.47	69.97	89.28%	7,325
361	Collection Sewers	2009	$1,458.00	R3.0	70	7 5	11	R3 0011	0 89247	62 47	69.97	89 28%	1,302
361	Collection Sewers	2009	$9,881.00	R3.0	70	7.5	11	R3.0011	0.89247	62 47	69.97	89 28%	8,822
361	Collection Sewers	2009	$2,132 00	R3.0	70	7.5	11	R3.0011	0.89247	62 47	69.97	89.28%	1,903
361	Collection Sewers	2009	$15,499 00	R3 0	70	7.5	11	R3.0011	0.89247	62.47	69.97	89.28%	13,838
361	Collection Sewers	2009	$26,277 00	R3 0	70	7.5	11	R3.0011	0 89247	62 47	69 97	89 28%	23,460

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Pennsylvania American Water Company
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January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement Curve	Account Parameters Lookup	2017-(Col (4)+0 5)	(9)/(8)	Cols (7)&(10)	IowaLookup f(Col (11))	Cols (8)*(12)	Cols (9)+(13)	Cols (13)/(14)	Cols (6)*(15)
Account	Description	Year	OC	Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
361	Collection Sewers	2009	$10,200.00	R3.0	70	7 5	11	R3.0011	0.89247	62.47	69.97	89.28%	9,107
361	Collection Sewers	2009	$5,320.00	R3.0	70	7 5	11	R3.0011	0.89247	62.47	69 97	89.28%	4,750
361	Collection Sewers	2009	$3,050.00	R3.0	70	7 5	11	R3 0011	0.89247	62.47	69 97	89.28%	2,723
361	Collection Sewers	2009	$7,050 00	R3.0	70	7.5	11	R3 0011	0.89247	62.47	69 97	89.28%	6,294
361	Collection Sewers	2009	$4,780.00	R3.0	70	7.5	11	R3 0011	0 89247	62.47	69.97	89.28%	4,268
361	Collection Sewers	2011	$204,259 00	R3 0	70	5 5	8	R3.0008	0.9216	64.51	70.01	92.14%	188,204
361	Collection Sewers	2011	$68,055 00	R3 0	70	5.5	8	R3 0008	0 9216	64.51	70.01	92 14%	62,706
361	Collection Sewers	2011	$16,065 00	R3 0	70	5.5	8	R3.0008	0.9216	64.51	70.01	92 14%	14,802
361	Collection Sewers	2011	$10,312.00	R3.0	70	5 5	8	R3.0008	0 9216	64.51	70.01	92.14%	9,501
361	Collection Sewers	2011	$5,595 00	R3 0	70	5.5	8	R3.0008	0 9216	64.51	70.01	92.14%	5,155
361	Collection Sewers	2011	$4,763.00	R3.0	70	5.5	8	R3 0008	0 9216	64.51	70.01	92.14%	4,389
361	Collection Sewers	2011	$20,850.00	R3.0	70	5 5	8	R3 0008	0 9216	64.51	70 01	92.14%	19,211
361	Collection Sewers	2011	$0 00	R3 0	70	5 5	8	R3 0008	0 9216	64.51	70.01	92 14%	-
361	Collection Sewers	2011	$0 00	R3.0	70	5.5	8	R3.0008	0 9216	64.51	70 01	92 14%	-
361	Collection Sewers	2011	$1,519.00	R3.0	70	5.5	8	R3 0008	0.9216	64.51	70.01	92.14%	1,400
361	Collection Sewers	2011	$2,581.00	R3.0	70	5 5	8	R3.0008	0 9216	64.51	70.01	92 14%	2,378
361	Collection Sewers	2011	$36,838.00	R3.0	70	5 5	8	R3 0008	0 9216	64.51	70 01	92 14%	33,943
361	Collection Sewers	2011	$14,400.00	R3 0	70	5.5	8	R3.0008	0 9216	64.51	70.01	92.14%	13,268
361	Collection Sewers	2011	$31,200 00	R3.0	70	5.5	8	R3 0008	0 9216	64.51	70.01	92.14%	28,748
361	Collection Sewers	2011	$2,800 00	R3 0	70	5 5	8	R3 0008	0 9216	64 51	70.01	92 14%	2,580
361	Collection Sewers	2011	$6,000.00	R3 0	70	5 5	8	R3 0008	0.9216	64.51	70.01	92.14%	5,528
361	Collection Sewers	2011	$0 00	R3.0	70	5.5	8	R3.0008	0.9216	64 51	70.01	92.14%	-
361	Collection Sewers	2011	$0.00	R3.0	70	5.5	8	R3 0008	0.9216	64.51	70.01	92.14%	-
361	Collection Sewers	2011	$4,000.00	R3.0	70	5.5	8	R3.0008	0.9216	64 51	70.01	92.14%	3,686
361	Collection Sewers	2001	$24,960 00	R3.0	70	15 5	22	R3 0022	0 78729	55.11	70.61	78.05%	19,481
361	Collection Sewers	2001	$12,680 00	R3 0	70	15 5	22	R3 0022	0 78729	55 11	70 61	78 05%	9,897
361	Collection Sewers	1999	$46,600 00	R3 0	70	17 5	25	R3.0025	0.75917	53.14	70.64	75 23%	35,057
361	Collection Sewers	1999	$31,548 00	R3.0	70	17.5	25	R3.0025	0 75917	53.14	70 64	75.23%	23,734
361	Collection Sewers	1999	$23,220.00	R3.0	70	17.5	25	R3 0025	0 75917	53.14	70 64	75.23%	17,468
361	Collection Sewers	2001	$56,875 00	R3.0	70	15.5	22	R3.0022	0.78729	55.11	70 61	78 05%	44,391
361	Collection Sewers	2001	$13,112.00	R3.0	70	15 5	22	R3.0022	0.78729	55.11	70.61	78.05%	10,234
361	Collection Sewers	2001	$15,000.00	R3.0	70	15 5	22	R3.0022	0 78729	55.11	70 61	78.05%	11,708
361	Collection Sewers	2001	$49,150.00	R3.0	70	15 5	22	R3.0022	0.78729	55.11	70 61	78.05%	38,362
361	Collection Sewers	2001	$9,504.00	R3.0	70	15.5	22	R3.0022	0.78729	55.11	70 61	78 05%	7,418
361	Collection Sewers	2001	$16,800.00	R3.0	70	15.5	22	R3.0022	0 78729	55 11	70.61	78 05%	13,112
361	Collection Sewers	2002	$56,950.00	R3.0	70	14.5	21	R3.0021	0 79673	55 77	70 27	79.37%	45,201
361	Collection Sewers	2002	$16,500.00	R3.0	70	14 5	21	R3 0021	0 79673	55 77	70 27	79.37%	13,096
361	Collection Sewers	2006	$125,475 00	R3.0	70	10 5	15	R3 0015	0.85389	59 77	70 27	85 06%	106,729
361	Collection Sewers	2006	$41,500.00	R3.0	70	10.5	15	R3.0015	0.85389	59.77	70 27	85.06%	35,300
361	Collection Sewers	2006	$68,699 00	R3.0	70	10.5	15	R3.0015	0.85389	59.77	70.27	85.06%	58,435
361	Collection Sewers	2006	$59,170 00	R3 0	70	10 5	15	R3 0015	0 85389	59.77	70.27	85 06%	50,330
361	Collection Sewers	2013	$49,452.00	R3 0	70	3 5	5	R3 0005	0 9509	66.56	70.06	95 00%	46,979
361	Collection Sewers	2013	$36,000.00	R3 0	70	3.5	5	R3 0005	0.9509	66.56	70.06	95 00%	34,200
361	Collection Sewers - Gravity		$5,668,395.00										4,706,722
363	Services to Custor	2000	$2,300 00	R3 0	55	16 5	30	R3.0030	0.71294	39.21	55.71	70 38%	1,619
363	Services to Custor	2000	$160 00	R3 0	55	16 5	30	R3.0030	0 71294	39 21	55.71	70 38%	113
363	Services to Custor	2000	$40,750.00	R3.0	55	16 5	30	R3.0030	0.71294	39.21	55.71	70 38%	28,680
363	Services to Custor	2000	$4,602.00	R3.0	55	16.5	30	R3.0030	0.71294	39 21	55 71	70.38%	3,239
363	Services to Custor	2005	$1,520.00	R3 0	55	11 5	21	R3.0021	0 79673	43 82	55 32	79.21%	1,204
363	Services to Custor	2005	$17,890.00	R3.0	55	11.5	21	R3 0021	0 79673	43 82	55 32	79 21%	14,171
363	Services to Custor	2007	$3,072.00	R3.0	55	9.5	17	R3 0017	0.83474	45.91	55 41	82.86%	2,545
363	Services to Custor	2007	$40,935.00	R3 0	55	9 5	17	R3 0017	0 83474	45.91	55 41	82 86%	33,919

1	2	4	6	7	8	9	10	11	12	13	14	15	16

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost less Depreciation (OCLD)

(1)	(2)	(4)	(6)	Depreciation (7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement	Account Parameters Lookup	2017-(Col (4)+0 5)	(9)/(8)	Cols (7)&(10)	IowaLookup ((Col (11))	Cols (8)*(12)	Cols (9)+(13)	Cols (13)/(14)	Cols (6)*(15)
Account	Description	Year	OC	Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
363	Services to Custor	2004	$1,250.00	R3 0	55	12.5	23	R3.0023	0 77789	42.78	55.28	77.39%	967
363	Services to Custor	2004	$7,500.00	R3.0	55	12.5	23	R3.0023	0.77789	42.78	55.28	77.39%	5,804
363	Services to Custor	2004	$5,220.00	R3.0	55	12.5	23	R3.0023	0 77789	42.78	55.28	77.39%	4,040
363	Services to Custor	2004	$4,993.00	R3.0	55	12.5	23	R3.0023	0.77789	42 78	55 28	77.39%	3,864
363	Services to Custor	2005	$11,360.00	R3 0	55	11.5	21	R3.0021	0 79673	43.82	55 32	79.21%	8,998
363	Services to Custor	2005	$116,420.00	R3 0	55	11 5	21	R3.0021	0 79673	43 82	55 32	79.21%	92,216
363	Services to Custor	2009	$560.00	R3.0	55	7.5	14	R3 0014	0.8635	47 49	54 99	86 36%	484
363	Services to Custor	2007	$240.00	R3 0	55	9 5	17	R3 0017	0 83474	45 91	55 41	82 86%	199
363	Services to Custor	2007	$3,780 00	R3 0	55	9 5	17	R3 0017	0 83474	45 91	55 41	82 86%	3,132
363	Services to Custor	2009	$6,525 00	R3 0	55	7.5	14	R3.0014	0 8635	47.49	54 99	86.36%	5,635
363	Services to Custor	2009	$6,000.00	R3 0	55	7.5	14	R3.0014	0.8635	47 49	54.99	86.36%	5,182
363	Services to Custor	2009	$15,877 00	R3.0	55	7 5	14	R3.0014	0.8635	47 49	54 99	86.36%	13,711
363	Services to Custor	2011	$1,400 00	R3.0	55	5.5	10	R3.0010	0.90216	49.62	55 12	90.02%	1,260
363	Services to Custor	2011	$35,610 00	R3.0	55	5.5	10	R3.0010	0.90216	49 62	55.12	90 02%	32,056
363	Services to Custor	2001	$14,261 00	R3.0	55	15 5	28	R3.0028	0.73133	40 22	55 72	72.18%	10,294
363	Services to Custor	2000	$19,065.00	R3.0	55	16.5	30	R3.0030	0.71294	39 21	55 71	70 38%	13,418
363	Services to Custor	2001	$15,735 00	R3.0	55	15.5	28	R3.0028	0.73133	40 22	55 72	72.18%	11,358
363	Services to Custor	2001	$19,905 00	R3 0	55	15.5	28	R3.0028	0.73133	40.22	55 72	72.18%	14,367
363	Services to Custor	2002	$24,180 00	R3 0	55	14.5	26	R3.0026	0.74986	41 24	55.74	73.99%	17,891
363	Services to Custor	2006	$10,950 00	R3 0	55	10 5	19	R3.0019	0 81568	44.86	55 36	81.03%	8,873
363	Services to Custor	2006	$76,650.00	R3.0	55	10 5	19	R3.0019	0 81568	44.86	55 36	81.03%	62,109
363	Services to Custor	2006	$7,040.00	R3.0	55	10 5	19	R3.0019	0 81568	44.86	55 36	81.03%	5,705
363	Services to Custor	2006	$22,646.00	R3.0	55	10.5	19	R3.0019	0.81568	44.86	55.36	81 03%	18,350
363	Services to Custor	2013	$7,920.00	R3 0	55	3 5	6	R3.0006	0 94112	51 76	55 26	93 67%	7,419
363	Services to Customers		$546,316 00										432,822
364	Flow Measuring D	1999	$25,000.00	R3 0	35	17 5	50	R3.0050	0 53792	18.83	36 33	51 83%	12,958
364	Flow Measuring D	2015	$73,731.00	R3.0	35	1 5	4	R3.0004	0 96069	33 62	35 12	95 73%	70,583
364	Flow Measuring Devices		$98,731.00										83,541
371	Pumping Equipme	1999	$225,000.00	R3.0	35	17 5	50	R3.0050	0 53792	18.83	36 33	51.83%	116,618
371	Pumping Equipment		$225,000.00										116,618
			$6,841,845.00										5,540,079

Account	Description	Year	OC	Iowa Survival / Retirement Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
361	Collection Sewers	2008	$23,184 00	R3 0	70	8 5	12	R3 0012	0 88279	61.80	70 30	87.91%	20,381
361	Collection Sewers	2008	$43,350.00	R3 0	70	8.5	12	R3 0012	0.88279	61.80	70.30	87.91%	38,109
361	Collection Sewers	2008	$23,200.00	R3.0	70	8 5	12	R3.0012	0 88279	61.80	70.30	87.91%	20,395
361	Collection Sewers	2008	$774.00	R3.0	70	8 5	12	R3.0012	0.88279	61.80	70 30	87.91%	680
361	Collection Sewers	2008	$5,016.00	R3 0	70	8.5	12	R3.0012	0 88279	61.80	70 30	87 91%	4,410
361	Collection Sewers	2008	$17,332 00	R3 0	70	8.5	12	R3 0012	0.88279	61.80	70 30	87 91%	15,237
361	Collection Sewers	2008	$774.00	R3.0	70	8 5	12	R3.0012	0.88279	61.80	70 30	87.91%	680
361	Collection Sewers	2008	$66,002 00	R3.0	70	8.5	12	R3.0012	0 88279	61.80	70.30	87.91%	58,022
361	Collection Sewers	2008	$62,544 00	R3 0	70	8.5	12	R3 0012	0.88279	61.80	70.30	87.91%	54,982
361	Collection Sewers	2008	$3,192 00	R3 0	70	8 5	12	R3.0012	0 88279	61.80	70 30	87.91%	2,806
361	Collection Sewers	2009	$69,090 00	R3 0	70	7 5	11	R3 0011	0 89247	62.47	69.97	89 28%	61,684
361	Collection Sewers	2009	$30,815 00	R3 0	70	7 5	11	R3.0011	0 89247	62.47	69 97	89 28%	27,512
361	Collection Sewers	2013	$25,227 00	R3 0	70	3.5	5	R3 0005	0.9509	66.56	70 06	95 00%	23,966
361	Collection Sewers	2013	$17,960.00	R3.0	70	3.5	5	R3.0005	0.9509	66.56	70.06	95 00%	17,062
361	Collection Sewers	2015	$95,025.00	R3.0	70	1 5	2	R3.0002	0 98032	68.62	70.12	97 86%	92,991
361	Collection Sewers	2015	$34,970 00	R3 0	70	1 5	2	R3 0002	0 98032	68 62	70 12	97 86%	34,222
361	Collection Sewers	2015	$66,092.00	R3.0	70	1.5	2	R3.0002	0 98032	68 62	70 12	97 86%	64,678
361	Collection Sewers - Gravity		$584,547.00										537,817
363	Services to Custor	2008	$10,270.00	R3.0	55	8 5	15	R3.0015	0.85389	46 96	55 46	84 67%	8,696
363	Services to Custor	2009	$4,169.00	R3.0	55	7.5	14	R3 0014	0.8635	47 49	54 99	86.36%	3,600
363	Services to Custor	2015	$31,636.00	R3.0	55	1.5	3	R3 0003	0.9705	53.38	54 88	97 27%	30,772
363	Services to Custor	2015	$8,134 00	R3.0	55	1 5	3	R3 0003	0.9705	53.38	54 88	97.27%	7,912

1	2	4	6	7	8	9	10	11	12	13	14	15	16
Pennsylvania American Water Company													
Sadsbury Township Wastewater Utility													
Wastewater													
Potential Purchaser: Investor-Owned Utility													
January 1, 2017													
Development of Original Cost less Depreciation (OCLD)													
				Depreciation									
(1)	(2)	(4)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Description	Year	Original Cost	Iowa Survival / Retirement Curve	Service Life	Age	Age as % of Service Life	Iowa Lookup	Iowa Condition	Remaining Life Expectancy	Total Life	Condition Percent	Original Cost less Depreciation
HEM Input	HEM Input	HEM Input	HEM Input	Account Parameters Lookup Iowa Survival / Retirement Curve	Account Parameters Lookup	2017-[Col (4)+0 5)	(9)/(8)	Cols. (7)&(10)	IowaLookup f(Col (11))	Cols. (8)*(12)	Cols (9)+(13)	Cols. (13)/(14)	Cols (6)*(15)
Account	Description	Year	OC	Curve	Life	Age	Age%	IowaLookup	Iowa % Cond	Expectancy	Total Life	Condition Percent	OCLD
363	Services to Customers		$54,209.00										50,980
			$638,756 00										588,797
			$7,480,601										**$6,128,876**

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
Cost Indices

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
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Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
Handy Whitman Index of Public Utility Construction Costs
Water Industry – Northeastern United States

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Cost Trends Of

Water Utility Construction

COST TREND TABLES
1912 to July 1, 2016

W-1

COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	7	7	7	7	9	13	15	15	17	16	16	16	16	16
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	8	8	8	9	11	16	17	18	20	18	18	18	19	18
9	Electric Pumping Equipment	311	-	-	15	15	17	20	22	24	24	23	21	22	23	23
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	8	8	8	9	11	16	17	18	20	18	18	18	19	18
16	Large Treatment Plant Equip.	320	9	9	9	9	11	14	16	17	20	19	18	18	20	20
17	Small Treatment Plant Equip.	320	10	10	10	10	13	17	19	19	22	20	20	20	21	20
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	4	4	4	12	15	17	19	20	15	13	12	13	13	13
24	Elevated Steel Tanks	330	4	4	4	11	14	16	18	19	16	13	11	12	11	10
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Steel Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Concrete Cylinder Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	9	10	8	9	11	16	19	20	22	22	20	21	22	21
35	Cast Iron Mains	331	9	10	9	9	12	18	20	22	25	24	22	23	24	23
36	Cement-Asbestos Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	Steel Mains	331	6	7	6	7	8	11	13	13	14	15	14	14	14	15
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	6	6	5	6	6	9	10	11	12	13	12	12	13	13
40	Meters	334	23	23	23	23	26	29	35	37	37	37	37	37	37	37
41	Meter Installations	334	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Hydrants Installed	335	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		14	16	13	14	26	38	31	29	29	24	25	26	24	23
47	Clarifier Equipment-Installed		-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	Filter Gallery Piping-Installed		8	8	8	8	10	14	16	18	20	18	17	18	19	19
49																
50																
51																
52																
53																
54																
55																
56																

W-1

COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	17	17	17	17	17	16	14	14	15	15	15	17	17	17
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	19	18	18	18	17	16	15	15	16	16	16	18	18	18
9	Electric Pumping Equipment	311	23	23	23	22	22	22	22	23	24	24	25	26	26	26
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	19	18	18	18	17	16	15	15	16	16	16	18	18	18
16	Large Treatment Plant Equip.	320	20	20	20	20	20	19	17	17	18	18	18	20	20	20
17	Small Treatment Plant Equip.	320	20	20	20	20	20	19	17	17	19	19	19	21	21	21
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	12	12	12	12	11	10	9	9	12	11	12	14	14	14
24	Elevated Steel Tanks	330	11	10	10	10	10	9	8	8	10	10	11	12	13	13
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Steel Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Concrete Cylinder Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	21	21	20	20	20	20	18	18	19	19	20	21	22	22
35	Cast Iron Mains	331	23	21	20	21	21	20	18	18	20	20	21	23	24	24
36	Cement-Asbestos Mains	331	-	-	-	-	-	-	-	-	-	-	31	32	32	33
37	Steel Mains	331	15	15	15	16	16	16	14	13	14	14	14	16	16	16
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	13	13	13	14	14	14	13	11	12	13	13	14	14	14
40	Meters	334	37	37	37	37	37	37	37	35	26	26	26	31	32	32
41	Meter Installations	334	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Hydrants Installed	335	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		23	22	22	22	21	20	20	20	21	21	23	26	25	25
47	Clarifier Equipment-Installed		-	-	-	-	-	-	-	-	-	-	-	17	23	24
48	Filter Gallery Piping-Installed		19	18	18	18	18	18	15	16	18	18	18	19	20	20
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	17	18	20	20	20	21	23	27	31	32	33	35	36	38
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	18	19	20	21	21	22	24	28	32	35	36	38	38	39
9	Electric Pumping Equipment	311	26	27	27	27	27	27	31	39	43	45	49	55	55	55
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	18	19	20	21	21	22	24	28	32	35	36	38	38	39
16	Large Treatment Plant Equip.	320	21	22	23	24	24	25	28	32	35	36	38	40	41	42
17	Small Treatment Plant Equip.	320	21	22	24	24	24	25	28	33	37	39	41	43	43	44
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	14	16	16	13	14	16	20	26	29	27	28	30	31	32
24	Elevated Steel Tanks	330	12	15	15	14	15	14	17	23	26	25	26	28	29	31
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	-	-	-	-	-	-	-	-	-	-	-	42	43	45
28	Steel Mains	331	-	-	-	-	-	-	-	-	-	-	-	40	40	43
29	Concrete Cylinder Mains	331	-	-	-	-	-	-	-	-	-	-	-	44	45	47
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	23	23	24	25	25	26	29	35	41	42	43	45	47	48
35	Cast Iron Mains	331	24	25	27	27	28	28	32	39	46	46	48	50	51	53
36	Cement-Asbestos Mains	331	33	34	36	36	37	37	44	49	59	61	62	64	65	67
37	Steel Mains	331	16	17	18	18	18	19	21	24	28	29	31	32	34	36
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	14	15	16	16	17	17	19	22	25	27	28	29	31	33
40	Meters	334	33	35	37	37	37	37	40	42	48	52	59	61	61	65
41	Meter Installations	334	-	-	-	-	-	-	-	-	-	29	31	34	35	36
42	Hydrants Installed	335	-	-	-	-	-	-	-	-	-	35	37	41	41	43
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		25	27	28	28	28	30	33	38	44	45	45	49	49	50
47	Clarifier Equipment-Installed		25	26	27	27	27	29	32	37	43	43	44	46	46	49
48	Filter Gallery Piping-Installed		21	21	22	22	22	23	25	30	35	37	37	39	40	41
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	39	41	44	47	49	51	52	53	55	56	57	59	61	64
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	41	43	46	49	50	52	53	53	54	55	56	57	59	61
9	Electric Pumping Equipment	311	55	56	63	69	73	74	74	71	71	71	73	74	78	81
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	41	43	46	49	50	52	53	53	54	55	56	57	59	61
16	Large Treatment Plant Equip.	320	44	45	48	50	52	54	55	56	58	59	60	62	64	67
17	Small Treatment Plant Equip.	320	46	47	50	53	54	56	58	58	60	60	62	63	66	68
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	32	33	38	42	37	36	35	35	35	41	44	45	46	47
24	Elevated Steel Tanks	330	31	33	35	38	38	38	38	37	36	37	38	38	41	44
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	47	50	52	56	57	61	62	63	64	65	66	67	69	71
28	Steel Mains	331	44	46	49	52	55	57	57	58	59	60	61	63	65	67
29	Concrete Cylinder Mains	331	48	50	52	54	56	59	60	60	61	62	62	64	66	70
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	51	53	57	60	63	65	68	69	71	72	73	74	75	76
35	Cast Iron Mains	331	56	59	62	66	68	72	73	75	77	79	79	80	80	81
36	Cement-Asbestos Mains	331	68	70	75	78	81	84	86	86	87	89	88	81	82	82
37	Steel Mains	331	38	40	43	46	48	51	53	55	56	58	60	63	65	66
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	35	36	39	41	44	46	48	50	51	53	55	58	60	63
40	Meters	334	67	70	77	78	78	78	78	78	84	87	87	93	101	101
41	Meter Installations	334	38	40	44	45	46	48	51	52	54	55	57	59	62	65
42	Hydrants Installed	335	44	44	48	50	51	53	54	55	56	57	58	58	61	64
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		52	53	57	58	58	59	60	61	61	62	65	66	67	68
47	Clarifier Equipment-Installed		50	49	53	55	57	58	58	59	60	60	63	65	66	67
48	Filter Gallery Piping-Installed		44	46	48	50	53	54	56	57	58	59	60	61	63	65
49																
50																
51																
52																
53																
4																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	67	72	78	86	94	100	115	127	133	139	148	164	179	189
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	64	69	75	84	92	100	117	127	130	137	148	163	181	191
9	Electric Pumping Equipment	311	81	84	89	93	96	100	122	155	174	184	192	205	222	245
10																
11																
12									-							
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	64	69	75	84	92	100	117	127	130	137	148	163	181	191
16	Large Treatment Plant Equip.	320	69	73	79	89	96	100	118	134	144	152	162	175	191	208
17	Small Treatment Plant Equip.	320	70	74	80	90	96	100	120	139	150	160	172	186	204	223
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	49	53	75	82	85	100	140	159	171	172	173	178	191	208
24	Elevated Steel Tanks	330	48	55	71	80	86	100	152	183	182	183	195	206	228	250
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	74	78	84	91	96	100	129	137	142	150	158	166	180	196
28	Steel Mains	331	69	74	80	88	96	100	113	125	133	141	152	166	180	199
29	Concrete Cylinder Mains	331	72	78	80	88	95	100	113	134	138	140	148	162	176	189
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	77	80	84	94	98	100	110	146	154	162	173	185	202	219
35	Cast Iron Mains	331	82	83	88	97	99	100	143	158	163	167	178	185	202	218
36	Cement-Asbestos Mains	331	82	85	88	97	98	100	127	148	159	167	176	202	212	234
37	Steel Mains	331	68	72	78	88	97	100	115	128	139	151	164	179	197	212
38	PVC Mains	331	-	-	-	-	-	-	25	100	104	108	113	122	132	138
39	Services Installed	333	66	72	79	89	96	100	115	123	130	139	145	160	175	184
40	Meters	334	101	106	108	108	106	100	93	93	98	101	105	108	122	127
41	Meter Installations	334	68	73	79	89	97	100	113	120	131	147	152	162	177	189
42	Hydrants Installed	335	68	72	80	90	96	100	123	143	157	167	182	194	207	222
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		69	74	82	93	98	100	139	174	195	218	246	290	350	406
47	Clarifier Equipment-Installed		68	72	82	93	98	100	140	167	181	199	210	232	272	310
48	Filter Gallery Piping-Installed		68	72	78	90	97	100	119	130	136	144	151	158	171	185
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	197	206	217	227	234	238	248	255	258	262	270	282	295	302
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	198	206	218	225	233	239	251	265	271	274	281	294	308	316
9	Electric Pumping Equipment	311	260	271	277	282	284	299	311	330	349	355	368	386	428	442
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	198	206	218	225	233	239	251	265	271	274	281	294	308	316
16	Large Treatment Plant Equip.	320	227	242	251	262	269	276	286	301	313	322	332	342	348	357
17	Small Treatment Plant Equip.	320	243	259	268	279	286	293	303	317	328	334	343	354	360	366
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	210	182	184	181	184	196	220	216	229	253	261	248	246	250
24	Elevated Steel Tanks	330	244	197	200	198	207	219	260	268	278	285	277	249	242	252
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	208	222	225	236	235	242	253	266	273	279	284	295	305	305
28	Steel Mains	331	215	223	230	234	232	241	255	272	279	287	293	302	316	324
29	Concrete Cylinder Mains	331	203	213	218	232	239	243	258	269	277	288	295	303	311	317
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	231	239	244	254	255	263	280	295	301	307	311	321	327	332
35	Cast Iron Mains	331	223	245	253	264	263	269	282	296	304	313	320	329	339	341
36	Cement-Asbestos Mains	331	253	244	249	255	259	275	315	340	338	332	319	335	338	354
37	Steel Mains	331	233	228	231	237	242	248	265	277	281	288	295	302	304	311
38	PVC Mains	331	137	151	149	151	150	160	197	217	211	200	183	193	191	204
39	Services Installed	333	198	207	215	221	226	230	245	258	262	272	283	292	300	307
40	Meters	334	128	141	148	135	135	137	140	150	159	162	196	195	175	200
41	Meter Installations	334	207	230	239	247	255	259	269	282	294	310	320	337	347	358
42	Hydrants Installed	335	245	264	270	285	296	307	320	343	363	372	378	385	391	398
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		458	496	506	540	560	575	579	580	565	528	539	555	562	566
47	Clarifier Equipment-Installed		356	389	398	431	442	446	451	455	442	416	435	458	492	514
48	Filter Gallery Piping-Installed		201	217	223	234	237	243	251	266	279	289	297	309	319	321
49																
50																
51																
52																
53																
4																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
								2001		2002		2003		2004	
			1996	1997	1998	1999	2000	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul 1
1	**Source of Supply Plant**														
2	Collecting & Impounding Res.	305	309	317	318	318	326	328	338	338	346	344	345	364	370
3															
4															
5															
6															
7	**Pumping Plant**														
8	Structures & Improvements	304	321	331	337	343	362	370	380	382	390	393	388	405	418
9	Electric Pumping Equipment	311	450	473	489	505	530	531	531	516	533	534	546	547	569
10															
11															
12															
13															
14	**Water Treatment Plant**														
15	Structures & Improvements	304	321	331	337	343	362	370	380	382	390	393	388	405	418
16	Large Treatment Plant Equip.	320	367	380	391	401	413	419	429	435	445	448	449	461	462
17	Small Treatment Plant Equip.	320	375	389	401	410	424	431	440	444	454	456	457	470	476
18															
19															
20															
21															
22	**Transmission Plant**														
23	Steel Reservoirs	330	251	255	268	268	270	270	275	275	275	275	275	278	313
24	Elevated Steel Tanks	330	268	273	283	288	299	305	314	429	429	429	429	438	481
25	Concrete Reservoirs	330	-	-				-	-	-	-	-	-	-	-
26															
27	Cast Iron Mains	331	311	320	323	328	348	355	365	368	387	390	381	387	386
28	Steel Mains	331	329	337	342	351	377	384	392	394	400	404	395	421	437
29	Concrete Cylinder Mains	331	324	331	338	345	372	395	405	409	416	420	411	417	423
30															
31															
32															
33	**Distribution Plant**														
34	Mains-Average All Types	331	339	347	355	361	377	383	392	395	406	407	403	415	426
35	Cast Iron Mains	331	348	358	364	370	390	396	406	409	424	426	422	430	428
36	Cement-Asbestos Mains	331	364	372	375	382	405	418	423	429	448	450	441	450	454
37	Steel Mains	331	316	322	334	339	346	352	359	361	363	364	363	378	413
38	PVC Mains	331	211	216	216	219	231	241	241	246	254	256	250	258	259
39	Services Installed	333	321	323	330	334	348	352	355	354	361	363	365	377	386
40	Meters	334	207	197	197	198	205	206	206	207	207	207	207	207	207
41	Meter Installations	334	375	381	387	392	406	412	418	421	428	436	437	449	455
42	Hydrants Installed	335	418	475	493	508	526	538	554	557	566	569	568	576	583
43															
44															
45	**Miscellaneous Items**														
46	Flocculating Equipment-Installed		579	603	622	642	652	667	670	676	685	687	688	724	754
47	Clarifier Equipment-Installed		540	562	572	579	593	599	602	609	617	623	625	646	649
48	Filter Gallery Piping-Installed		328	337	344	349	363	369	379	384	400	406	404	417	415
49															
50															
51															
52															
53															
54															
55															
56															

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS											
			2005		2006		2007		2008		2009		2010	
			Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1
1	**Source of Supply Plant**													
2	Collecting & Impounding Res.	305	388	394	400	405	413	439	457	466	470	465	475	478
3														
4														
5														
6														
7	**Pumping Plant**													
8	Structures & Improvements	304	442	447	456	464	481	494	516	543	551	536	552	558
9	Electric Pumping Equipment	311	604	611	620	619	639	628	640	666	679	688	707	701
10														
11														
12														
13														
14	**Water Treatment Plant**													
15	Structures & Improvements	304	442	447	456	464	481	494	516	543	551	536	552	558
16	Large Treatment Plant Equip.	320	480	482	499	500	516	533	566	582	614	616	631	638
17	Small Treatment Plant Equip.	320	498	502	520	518	539	559	602	624	666	669	686	693
18														
19														
20														
1														
22	**Transmission Plant**													
23	Steel Reservoirs	330	329	338	348	375	494	537	537	722	722	722	722	722
24	Elevated Steel Tanks	330	524	524	524	596	657	657	680	866	866	866	866	867
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-
26														
27	Cast Iron Mains	331	411	415	442	451	480	484	510	534	578	576	601	601
28	Steel Mains	331	509	508	530	539	528	527	543	606	605	585	593	609
29	Concrete Cylinder Mains	331	436	440	454	459	460	462	468	475	502	502	494	495
30														
31														
32														
33	**Distribution Plant**													
34	Mains-Average All Types	331	462	464	485	494	524	523	550	588	624	608	617	623
35	Cast Iron Mains	331	457	460	483	492	525	528	556	579	625	624	647	648
36	Cement-Asbestos Mains	331	480	483	538	546	599	597	621	632	691	678	638	649
37	Steel Mains	331	459	460	467	477	494	487	514	582	595	559	565	575
38	PVC Mains	331	277	278	321	321	365	361	372	374	419	408	353	363
39	Services Installed	333	404	407	421	459	478	481	501	511	534	534	545	554
40	Meters	334	207	207	235	248	260	262	373	373	373	373	374	376
41	Meter Installations	334	466	467	482	530	549	552	572	573	597	598	612	623
42	Hydrants Installed	335	597	597	613	647	663	669	693	699	732	731	740	721
43														
44														
45	**Miscellaneous Items**													
46	Flocculating Equipment-Installed		801	801	852	852	869	983	1187	1373	1645	1645	1699	1744
47	Clarifier Equipment-Installed		709	709	729	729	760	892	920	944	997	997	991	1001
48	Filter Gallery Piping-Installed		438	438	468	470	500	501	530	543	589	590	613	614
49														
50														
51														
52														
54														
55														
56														

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			2011		2012		2013		2014		2015		2016		2017	
			Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	492	495	501	502	507	505	515	517	526	521	526	532		
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	571	583	597	600	618	608	621	630	642	646	655	659		
9	Electric Pumping Equipment	311	708	760	780	785	800	844	856	900	928	931	990	1013		
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	571	583	597	600	618	608	621	630	642	646	655	659		
16	Large Treatment Plant Equip.	320	642	653	669	680	689	697	713	725	736	737	755	758		
17	Small Treatment Plant Equip.	320	706	712	740	754	764	779	800	813	832	840	861	864		
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	771	771	795	810	778	780	715	742	742	742	742	774		
24	Elevated Steel Tanks	330	1079	1079	1059	1082	1089	1099	1131	1131	1131	1131	1131	1143		
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-		
26																
27	Cast Iron Mains	331	602	610	634	669	691	684	712	743	733	744	754	759		
28	Steel Mains	331	644	659	711	708	724	704	694	708	712	713	697	705		
29	Concrete Cylinder Mains	331	510	517	523	526	547	534	535	547	562	575	591	592		
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	633	644	669	690	698	693	720	733	736	738	747	750		
35	Cast Iron Mains	331	654	660	681	716	733	730	759	781	780	785	795	797		
36	Cement-Asbestos Mains	331	658	683	716	721	712	707	704	721	724	731	741	743		
37	Steel Mains	331	593	606	633	637	638	631	665	665	673	670	678	681		
38	PVC Mains	331	369	389	412	412	391	392	383	383	387	387	388	388		
39	Services Installed	333	568	574	589	600	602	602	603	605	617	616	622	617		
40	Meters	334	379	379	379	379	380	381	381	381	400	400	403	403		
41	Meter Installations	334	635	635	646	673	677	677	688	688	702	702	709	709		
42	Hydrants Installed	335	730	731	757	758	774	784	807	849	877	930	971	972		
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		1823	1848	1904	1973	1978	2015	2041	2078	2167	2177	2192	2192		
47	Clarifier Equipment-Installed		1056	1060	1077	1102	1105	1136	1154	1162	1184	1188	1229	1272		
48	Filter Gallery Piping-Installed		620	620	641	666	677	680	713	728	727	728	735	738		
49																
50																
51																
52																
53																
54																
55																
56																

BULLETIN NO. 185

1912 to January 1, 2017

THE

HANDY-WHITMAN INDEX

Of

Public Utility Construction Costs©

TRENDS OF CONSTRUCTION COSTS

Preliminaries

Compiled and Published by

Whitman, Requardt and Associates, LLP
801 South Caroline Street
Baltimore, Maryland 21231
(410) 235-3450

HANDY-WHITMAN INDEX OF PUBLIC UTILITY CONSTRUCTION COSTS

PRELIMINARY NUMBERS BULLETIN 185

WATER INDEXES 1/1/17

LINE	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5	REGION 6
2	542	448	523	447	484	518
8	672	558	640	549	625	669
9	1075	1075	1075	1075	1075	1075
15	672	558	640	549	625	669
16	774	683	740	688	700	790
17	881	806	856	815	825	901
23	784	784	784	784	784	784
24	1161	1161	1161	1161	1161	1161
27	793	752	779	764	773	815
28	723	653	694	678	667	724
29	601	540	580	545	552	603
34	774	705	740	686	701	764
35	832	800	825	778	792	831
36	751	609	664	591	617	644
37	697	592	652	591	603	701
38	387	337	369	335	341	377
39	638	494	584	507	509	622
40	404	404	404	404	404	404
41	722	584	673	597	609	713
42	980	919	945	928	927	1003
46	2198	2173	2193	2217	2193	2253
47	1302	1199	1287	1221	1254	1317
48	772	628	730	663	706	816

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
AUS Telephone Plant Indices – General Plant
General Plant – Northeastern United States

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AUS Telephone Plant Index

Cost Trend Tables from 1946 to January 1, 2017

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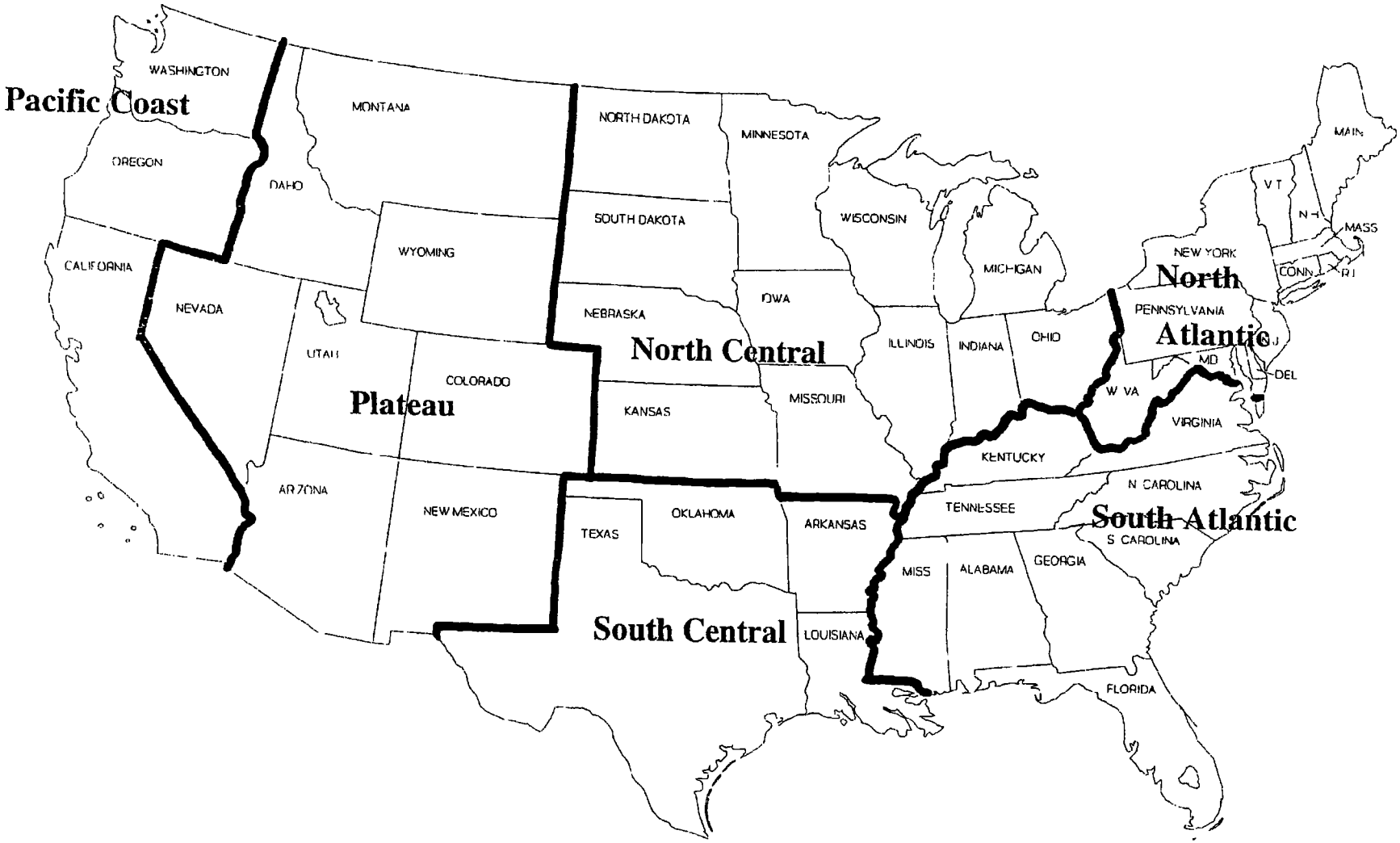
Pacific Coast
WASHINGTON
OREGON
CALIFORNIA
IDAHO
NEVADA
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
Plateau
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
North Central
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
South Central
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISS
ALABAMA
GEORGIA
FLORIDA
S CAROLINA
N CAROLINA
VIRGINIA
W VA
PENNSYLVANIA
NEW YORK
MD
DEL
NJ
CONN
RI
MASS
VT
NH
MAIN
North Atlantic
South Atlantic

FOREWORD

The AUS Telephone Plant Index, which follows this foreword was first introduced in 1977 by Associated Utility Services, Inc., and published as part of the Handy-Whitman Index of Public Utility Construction Costs through 1989. In 1990 AUS Consultants, the successor company to Associated Utility Services, Inc., decided to publish the Telephone Plant Index under the name C.A. Turner Utility Reports publication division. In 2005 the index changed its name from C.A. Turner Telephone Plant Index to AUS Telephone Plant Index.

The 1990 AUS Telephone Plant Index (TPI) was the first nationally available TPI based on the Federal Communication Commission (FCC) Uniform System of Accounts (USOA) Part 32. The prior published TPI, also prepared by AUS staff, was based on the earlier USOA Part 31 Standards.

Telephone Plant Index Description

The TPI consists of a separate cost index series for each of six geographic regions shown on the map at page iv. These regions are designated: North Atlantic, South Atlantic, North Central, South Central, Plateau, and Pacific Coast. The regional designation are the same as those used in the prior issues of the cost index and are based on similarity of characteristics among the contiguous 48 states.

Each cost index series within a region consists of one index labeled "Total Plant Account" and up to 31 individual cost index series for the individual plant account identified in the left hand columns.

The Base Year for each cost index is 1973=100. Some plant accounts will not show an index number of 100 at year 1973 due to a subsequent adjustment for FCC Part 31 to Part 32, changes explained later in this foreword. In a few accounts the item described in the account was not included in the index series until after 1973 and the base year is considered the first year of entry.

The index for most plant accounts begins with a single entry in year 1946 and continues with a single number for each year through 1973. Beginning in 1974 there are two index numbers for each year; one for January 1 and one for July 1. These numbers represent the prevailing wages and material prices and weightings at that point in time.

Index History

An index is a tool for identifying the relative price change of an item, or group of items over an identified period of time. Price indexes have been in use for many years for a variety of reasons. One example is an index developed in the eighteenth century by an Italian named Carli to determine the effect of the discovery of America upon the level of prices in Italy of three commodities between the years 1500 and 1750. In the current century, numerous organizations, including the United States Bureau of Statistic, have developed a variety of indexes ranging from the cost of basic commodities to manufactured goods and building construction cost.

Interest in telephone utility cost indexes has varied over time depending on the need to develop reproduction cost values for utility properties. Previous uses of cost indexes included such things as the determination trended original cost in fair value rate jurisdictions and current cost pricing for FASB-33 financial accounting disclosures. Due to changes in rate regulation proceedings and financial disclosure requirements, the need in these two specific areas has declined. Other areas in which reproduction cost indexes were utilized included insurance valuations, property tax valuations, retirement accounting and cost forecasting, etc.

Most recently, interest in cost indexes for the telecommunication industry has increased due to the possible implementation of price cap regulation. This form of regulation incorporates the use of changes in price levels by regulators to set rates. Under one proposal, customer tariff prices are adjusted to give consideration to productivity improvements, therefore, the development of the construction cost indexes will have an indirect bearing on the level of the company revenue requirements.

Index Design

The telephone plant index was designed as a product which could be utilized by any of the various telephone operating companies to develop the reproduction cost of the company's property at the selected test year date. Due to the variation of many design construction specifics from one company to another, it is impossible to produce an index which will exactly mirror the construction cost changes for each company. In circumstances where companies desire a more specific reproduction cost of their property, a custom index should be prepared or, alternately, the company's property should be inventoried and unit priced. Such unit cost work efforts, of course, will be significantly more expensive and time consuming to complete.

As indicated, the telephone plant index is a standard index which is published on a semi-annual basis. The yearly average index is calculated via a 1-2-1 weighting process which is the sum of 25% of the January index, 50 of the July index, and 25% of the succeeding year's January index.

In general terms, the telephone plant index was constructed around the FCC Part 32 system of accounts to aid companies in ease of application of the published index. Each embedded property account was reviewed to determine the components which comprise the large segment of the property investment in each account. In this manner, the resulting telephone plant index was a reasonable proxy for determining the reproduction cost of the embedded investment of the independent telephone industry.

With the exception of the General Support Asset Group, the FCC Part 32 based indexes were adjusted for all index years 1987 and prior to compensate for the change in overhead capitalization policies effective with the new regulations. That is, under FCC Part 31 regulation, a greater level of overheads were previously incorporated in the plant in service investments contained on the company's books and records. The adjusted indexes for the years 1946 through 1987, when applied to the company's original costs, will produce the applicable reproduction cost under FCC Part 32 accounting treatment. The index adjustment for Part 31 to Part 32 accounting results in the plant accounts not having an index number of 100 at the 1973 base year.

The AUS Telephone Plant Index was designed around thirty-six component indexes representing the basic components of material and labor which make up the construction of the various telephone plant accounts. The components include such items as Buildings, Switching Equipment, Circuit Equipment, Poles, Cable, Wire Vehicles, Tools, Furniture, Installer Labor and Lineman Labor, etc. The components were composited together into account level indexes based upon material and labor weights derived from a study of independent telephone construction cost experience.

Introduction of new technologies into a reproduction cost index required the review of composite weight included in development of the account level index to reflex the new mix of property.

The goal of the telephone plant index was to produce a product which when utilized together with each companies' books and records would produce a reproduction cost value.

The AUS Telephone Plant Index does not reflect replacement cost inasmuch as it was designed to produce the reproduction cost (the cost in today's dollars to reproduce the company's embedded plant in service).

Index Functions

The AUS Telephone Plant Index series was initially prepared to address a very specific function. That is, it was designed to enable companies to produce trended original cost values to the historical original cost of plant in service on the companies' books and records. This trended original cost is a general representation of the cost to reconstruct the property in question at the price level of the selected period. If a company desires a more specific estimate of reconstruction, the property specific indexes can be developed giving consideration to the actual history of the company's wages and material cost in comparison to the labor and material costs. For an even more specific cost estimated to rebuild the plant in serve, engineering estimated can be completed based upon the property inventory and the current unit costs for constructing the various plant categories.

In summary, the index was designed to be applied on a vintage and account level basis to determine the reproduction cost of local distribution companies' plant in service, as of the selected price level.

A tool can be utilized correctly only within the boundaries for which the product was originally designed. Uses above and beyond the scope of the original design may or may not produce reliable results. That is, the use of a generalized index to prepare a reproduction cost will provide general results within the range of reasonableness. If more specific or exact results are required, alternative methods or procedures (i.e., custom indexes or specific detail pricing) should be employed.

An effort has been made to carefully construct an index which produces a reasonable proxy of reproduction cost for the telephone plant or local distribution companies giving consideration to the fact that there are variances in material and labor costs, as well as, construction methods and practices from one company to another. Nevertheless, we believe that there is sufficient similarity in the cost trends to make the AUS Telephone Plant Index a useful tool when carefully applied to a company's historical cost base.

North Atlantic

SCHEDULE No. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973=100

LINE NO	PLANT IN SERVICE DESCRIPTION	FCC Acct	COST INDEX NUMBER																LINE NO
			1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	
1	Total Plant		85	89	91	91	92	95	96	96	94	94	97	97	96	96	97	96	1
2																			2
3																			3
4	Motor Vehicles	2112	57	57	63	67	67	70	74	74	74	77	81	84	87	89	88	87	4
5	Aircraft.....	2113	56	56	62	66	66	69	73	73	73	75	80	83	86	88	86	86	5
6	Special Purpose Vehicles	2114	30	34	38	41	42	46	47	48	49	51	56	60	62	65	66	67	6
7	Garage Work Equipment.	2115	36	38	42	44	46	51	51	52	53	56	61	65	67	69	70	70	7
8	Other Work Equipment.....	2116	50	50	52	54	55	59	59	61	62	64	67	70	71	74	75	77	8
9																			9
10																			10
11	Buildings.....	2121	24	28	32	34	35	37	38	39	41	42	46	49	50	52	53	52	11
12	Furniture..	2122	43	43	46	47	50	56	56	57	57	60	64	68	70	70	71	71	12
13	Office Equipment	2123	67	67	69	69	70	75	74	76	77	79	82	85	87	88	88	89	13
14	General Purpose Computer .. .	2124	67	67	69	69	70	75	74	76	77	79	82	85	87	88	88	89	14
15																			15
16																			16
17	Analog Electronic Switching..... ..	2211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
18	Digital Electronic Switching..	2212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
19																			19
20																			20
21	Electro Mechanical Switching.....	2215	36	48	49	57	62	64	67	66	64	65	68	70	69	72	70	72	21
22																			22
23	Operator Systems..	2220	37	50	51	59	64	67	69	68	66	67	70	72	71	73	71	74	23
24																			24
25																			25
26	Radio System—Analog....																		26
27	Radio Systems—Digital	22311	51	57	62	63	63	66	64	60	58	58	49	49	46	47	36	36	27
28	Circuit Equipment—Analog.....	22312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
29	Circuit Equipment—Digital.....	22321	347	392	417	411	410	423	410	401	348	311	319	317	303	299	312	297	29
30		22322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
31																			31
32	Public Telephone Term Eq.....	2351	148	151	145	145	148	154	143	144	146	158	159	164	164	164	165	165	32
33																			33
34																			34
35	Poles.	2411	33	37	39	41	42	45	47	49	51	50	54	58	59	59	60	61	35
36	Aerial Cable—Metallic..	24211	44	47	49	49	51	58	61	64	64	68	74	72	70	71	72	70	36
37	Aerial Cable—Fiber.. .. .	24212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38	Underground Cable—Metallic....	24221	48	52	54	53	55	64	67	71	69	75	82	78	75	76	78	75	38
39	Underground Cable—Fiber...	24222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
40	Buried Cable—Metallic.	24231	50	54	56	55	57	66	70	74	72	78	85	81	77	78	80	76	40
41	Buried Cable—Fiber	24232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
42	Submarine Cable—Metallic.	24241	43	45	48	48	50	56	59	62	61	65	71	69	68	69	71	70	42
43	Submarine Cable—Fiber..... .	24242	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
44	Intra Building Cable—Metallic ...	24261	43	47	49	48	50	58	61	64	63	68	74	71	69	70	72	70	44
45	Intra Building Cable—Fiber.	24262	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
46	Aerial Wire.	2431	33	36	38	38	40	45	47	50	50	55	58	57	57	59	61	62	46
47	Conduit Systems..	2441	54	55	57	59	60	63	64	64	65	65	67	69	71	72	73	74	47
48																			48
49	Aerial Cable-FTTP (Distribution)...	24213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	Underground Cable-FTTP (Dist)...	24223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	Buried Cable-FTTP (Distribution)	24233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	Submarine Cable-FTTP (Dist.)...	24243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	Intra Building Cable-FTTP (Dist). .	24263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																			54

AUS TELEPHONE INDEX BULLETIN NO. 55

SCHEDULE No. T-1

AUS TELEPHONE PLANT INDEX
NORTH ATLANTIC REGION 1973=100

LINE NO	COST INDEX NUMBER																							LINE NO
	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974 Jan 1	1974 July 1	1975 Jan 1	1975 July 1	1976 Jan 1	1976 July 1	1977 Jan 1	1977 July 1	1978 Jan 1	1978 July 1	1979 Jan 1	1979 July 1	
1	95	94	94	94	95	96	96	97	101	101	102	105	108	113	116	116	117	120	122	123	125	128	131	135	1
2																									2
3																									3
4	87	86	86	85	85	86	88	89	92	97	99	100	102	105	116	116	123	124	131	132	140	143	149	155	4
5	85	85	84	84	84	84	86	88	91	96	99	100	102	109	119	123	128	131	136	140	146	151	157	163	5
6	67	68	70	72	74	77	81	85	89	93	96	100	103	114	130	141	147	151	158	162	171	177	187	195	6
7	71	71	72	73	76	79	82	85	90	94	96	100	114	118	134	139	143	147	153	159	165	172	180	189	7
8	78	79	79	79	81	85	88	93	98	100	100	100	100	111	118	122	119	122	124	130	131	137	141	147	8
9																									9
10																									10
11	53	54	56	57	59	61	64	68	74	84	91	100	107	119	125	128	126	131	132	136	140	148	154	163	11
12	71	71	72	72	73	77	80	83	89	91	93	100	103	114	130	128	129	135	136	144	149	155	160	171	12
13	89	90	90	90	91	92	93	93	96	97	99	100	101	105	109	111	110	112	111	113	114	118	119	123	13
14	89	90	90	90	91	92	93	93	96	97	99	100	100	100	102	103	100	100	98	90	90	90	90	90	14
15																									15
16																									16
17	0	0	0	0	0	0	0	0	0	0	0	104	103	106	110	111	111	113	113	113	115	119	122	125	17
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	105	100	95	95	95	96	96	18
19																									19
20																									20
21	71	76	78	75	72	71	75	81	84	88	98	104	106	110	115	120	124	127	132	136	140	145	151	156	21
22																									22
23	73	77	79	76	72	71	76	81	85	89	98	104	106	108	111	114	117	119	121	122	125	128	132	136	23
24																									24
25																									25
26																									26
27	46	49	52	60	58	63	62	66	78	97	102	104	102	102	102	102	97	98	103	104	106	106	103	103	27
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
29	273	234	228	214	224	210	173	159	163	128	108	104	105	108	111	112	111	111	115	118	118	119	120	122	29
30	0	0	0	0	0	0	0	0	0	0	0	104	104	104	105	105	110	116	121	126	126	127	123	120	30
31																									31
32	165	165	166	130	122	123	120	118	108	107	108	107	106	107	110	109	109	111	112	114	116	119	123	127	32
33																									33
34																									34
35	62	63	65	66	68	71	76	79	83	88	97	107	119	131	144	157	158	160	164	169	176	183	196	208	35
36	70	70	70	73	77	81	84	88	96	97	100	107	114	125	129	126	130	135	140	144	148	152	158	170	36
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38	74	73	72	75	80	84	87	91	100	99	100	107	114	127	130	125	129	134	138	143	145	149	155	168	38
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
40	76	74	73	77	81	85	88	91	101	99	100	107	114	128	131	124	128	133	138	142	144	147	153	167	40
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
42	70	70	71	73	77	81	84	88	95	96	101	107	113	123	128	126	131	136	141	145	150	154	160	171	42
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
44	70	70	70	73	77	81	84	88	96	96	100	107	114	125	129	126	130	136	140	145	148	152	158	170	44
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
46	63	65	66	70	73	75	78	84	91	93	100	107	114	125	130	131	134	139	142	146	145	150	158	172	46
47	74	77	78	79	82	84	84	87	89	94	102	107	111	117	127	130	135	139	144	150	159	163	169	180	47
48																									48
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																									54

AUS TELEPHONE INDEX BULLETIN NO. 55

SCHEDULE No. T-1

AUS TELEPHONE PLANT INDEX
NORTH ATLANTIC REGION 1973=100

LINE NO	PLANT IN SERVICE DESCRIPTION	FCC Acct	COST INDEX NUMBER																LINE NO
			1980		1981		1982		1983		1984		1985		1986		1987		
			Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	
1	Total Plant.		140	146	146	149	150	152	156	159	156	154	156	158	156	154	154	155	1
2																			2
3																			3
4	Motor Vehicles..	2112	162	167	178	186	195	195	201	199	203	204	206	210	215	215	227	220	4
5	Aircraft.	2113	170	180	195	205	215	217	224	223	227	228	230	234	238	237	233	231	5
6	Special Purpose Vehicles	2114	206	220	231	245	254	263	266	270	271	274	274	277	278	281	283	287	6
7	Garage Work Equipment....	2115	200	213	223	234	241	248	250	251	253	257	260	263	264	267	268	270	7
8	Other Work Equipment.	2116	153	165	170	181	183	189	189	189	189	190	192	197	199	202	204	205	8
9																			9
10																			10
11	Buildings..... .. .	2121	176	183	188	193	192	198	200	206	210	218	223	224	228	234	234	239	11
12	Furniture	2122	174	182	187	199	210	213	215	222	224	229	232	238	242	245	248	252	12
13	Office Equipment	2123	125	130	132	136	137	140	140	143	142	142	140	142	143	143	143	146	13
14	General Purpose Computer..	2124	90	90	90	90	87	83	76	69	59	48	48	48	48	47	47	47	14
15																			15
16																			16
17	Analog Electronic Switching	2211	130	140	149	163	168	175	183	188	193	199	202	204	205	208	210	210	17
18	Digital Electronic Switching.. . ..	2212	96	96	97	97	94	90	84	77	67	57	57	57	57	56	56	56	18
19																			19
20																			20
21	Electro Mechanical Switching . . .	2215	167	188	199	213	219	226	232	248	268	277	282	281	283	286	287	287	21
22																			22
23	Operator Systems.	2220	146	157	166	176	180	185	191	197	204	211	213	215	216	218	219	219	23
24																			24
25																			25
26																			26
27	Radio System—Analog...	22311	100	100	101	102	90	91	94	94	79	80	80	81	77	78	82	82	27
28	Radio Systems—Digital	22312	0	0	0	0	0	0	115	115	115	117	119	121	122	124	126	124	28
29	Circuit Equipment—Analog	22321	125	130	129	128	130	132	121	154	153	152	153	152	147	144	145	146	29
30	Circuit Equipment—Digital .. .	22322	114	107	100	93	93	94	95	96	89	82	80	78	68	59	49	39	30
31																			31
32	Public Telephone Term Eq. . .	2351	132	141	145	150	158	167	190	196	201	206	210	212	213	217	219	218	32
33																			33
34																			34
35	Poles.....	2411	220	232	240	249	254	259	263	268	272	273	280	283	287	292	295	297	35
36	Aerial Cable—Metallic	24211	182	193	191	197	202	204	208	213	211	209	219	231	227	223	225	228	36
37	Aerial Cable—Fiber	24212	0	0	0	0	0	0	136	138	132	127	119	111	108	105	108	110	37
38	Underground Cable—Metallic.. .	24221	181	192	187	191	195	196	199	203	197	193	204	217	212	205	206	209	38
39	Underground Cable—Fiber.....	24222	0	0	0	0	0	0	130	131	125	119	110	101	98	94	97	100	39
40	Buried Cable—Metallic	24231	180	192	186	189	192	193	195	199	192	187	198	212	205	198	198	201	40
41	Buried Cable—Fiber....	24232	0	0	0	0	0	0	129	131	124	118	109	100	97	93	96	98	41
42	Submarine Cable—Metallic.	24241	181	192	193	199	205	209	214	219	219	218	227	238	237	235	238	240	42
43	Submarine Cable—Fiber.	24242	0	0	0	0	0	0	147	149	145	141	134	128	126	124	127	130	43
44	Intra Building Cable—Metallic ...	24261	182	193	191	197	202	205	209	214	211	210	220	231	228	224	226	230	44
45	Intra Building Cable—Fiber	24262	0	0	0	0	0	0	136	138	132	127	119	111	108	105	108	111	45
46	Aerial Wire.....	2431	182	191	198	206	210	214	219	225	232	239	243	248	250	252	253	253	46
47	Conduit Systems..	2441	188	196	203	211	219	220	228	240	246	253	257	262	267	271	276	278	47
48																			48
49	Aerial Cable-FTTP (Distribution)...	24213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	Underground Cable-FTTP (Dist.)...	24223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	Buried Cable-FTTP (Distribution).	24233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	Submarine Cable-FTTP (Dist.) .	24243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	Intra Building Cable-FTTP (Dist)	24263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																			54

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LINE NO	COST INDEX NUMBER																							LINE NO
	1988		1989		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		
	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	
1	150	153	158	165	164	165	167	165	165	165	167	168	169	170	174	178	182	182	184	185	186	184	184	181	1
2																									2
3																									3
4	221	222	231	229	236	232	244	241	254	251	258	261	267	271	275	270	279	276	277	271	270	263	273	266	4
5	234	234	234	240	246	254	261	271	274	284	285	291	297	300	304	312	318	322	326	328	327	328	329	330	5
6	289	293	298	309	312	319	325	328	333	337	343	348	348	351	353	360	362	368	370	374	377	382	383	388	6
7	273	279	286	294	298	305	309	316	318	322	324	328	332	336	338	345	349	354	356	359	361	364	366	368	7
8	206	210	215	218	221	228	230	234	235	240	240	243	244	250	250	254	254	258	258	260	260	262	263	265	8
9																									9
10																									10
11	242	254	257	268	268	272	272	274	270	279	283	290	295	306	310	310	311	312	323	329	331	338	341	343	11
12	255	263	269	274	278	284	287	290	291	294	296	299	302	309	309	315	320	322	326	328	330	330	330	333	12
13	147	149	151	153	154	154	152	153	153	156	154	155	155	155	154	156	155	156	155	157	156	157	156	157	13
14	45	43	37	31	30	29	26	24	23	21	21	21	21	21	21	20	17	15	14	14	14	14	13	13	14
15																									15
16																									16
17	204	207	210	212	214	211	212	214	213	213	213	216	215	216	213	212	211	204	204	200	196	194	193	192	17
18	52	50	45	40	39	38	36	33	32	31	31	31	32	32	32	31	28	27	26	26	26	26	25	25	18
19																									19
20																									20
21	278	284	289	291	291	292	296	302	303	304	309	317	316	324	329	327	334	333	336	339	331	336	338	342	21
22																									22
23	213	216	217	218	218	218	220	223	224	224	227	231	231	236	238	236	239	240	239	239	234	237	237	239	23
24																									24
25																									25
26																									26
27	80	80	81	81	81	82	81	82	84	85	86	87	87	87	89	89	91	91	91	93	94	95	95	96	27
28	117	117	117	118	118	118	116	116	117	118	119	120	119	120	120	121	121	122	123	125	125	123	123	124	28
29	140	141	142	144	145	144	145	146	147	147	147	149	150	150	152	149	149	146	146	145	143	143	142	143	29
30	36	35	35	35	35	34	34	34	37	38	39	39	39	39	37	37	37	38	35	36	36	36	36	35	30
31																									31
32	205	209	212	214	216	213	213	215	214	214	213	216	215	216	213	212	211	204	204	200	196	195	194	192	32
33																									33
34																									34
35	278	285	291	295	300	304	310	315	319	327	331	338	352	365	368	369	379	385	400	402	406	413	418	421	35
36	226	237	257	275	273	277	282	277	279	275	281	282	283	282	294	310	319	323	325	328	333	324	322	314	36
37	94	87	85	89	89	89	90	90	89	90	89	89	88	87	88	89	90	91	91	92	93	94	94	95	37
38	210	221	244	265	261	265	270	261	263	256	262	260	260	257	270	289	299	304	305	308	312	299	297	285	38
39	84	75	73	77	76	76	77	77	76	76	75	74	73	72	72	73	74	75	75	76	76	77	77	77	39
40	204	215	240	262	257	261	265	256	257	249	256	253	252	249	262	283	293	298	298	301	306	291	288	275	40
41	82	73	71	75	74	74	75	75	74	74	73	72	71	69	70	71	72	73	73	73	74	74	75	75	41
42	235	244	260	274	274	277	283	278	282	279	285	286	287	288	298	310	319	323	324	327	332	325	325	319	42
43	114	107	106	111	111	111	113	113	113	114	113	114	113	113	114	115	118	119	119	120	121	122	123	123	43
44	227	238	257	275	273	277	282	277	279	275	281	282	282	282	293	309	318	323	324	328	333	324	322	314	44
45	95	87	85	90	89	89	90	91	90	90	89	89	88	87	88	89	91	92	92	93	94	94	95	95	45
46	249	261	270	278	279	283	290	291	293	298	302	305	307	312	320	324	329	332	334	337	341	344	342	342	46
47	269	277	301	309	311	309	316	308	307	310	314	320	325	331	336	340	345	347	350	353	355	358	362	366	47
48																									48
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																									54

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LINE NO	PLANT IN SERVICE DESCRIPTION	Fcc Acct	COST INDEX NUMBER																LINE NO
			2000		2001		2002		2003		2004		2005		2006		2007		
			Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	
1	Total Plant		182	185	188	190	191	193	194	197	201	206	210	213	227	244	244	249	1
2																			2
3																			3
4	Motor Vehicles	2112	275	269	276	266	270	263	264	257	268	266	272	261	262	258	264	257	4
5	Aircraft	2113	334	343	351	359	362	364	369	377	387	393	408	417	424	438	447	450	5
6	Special Purpose Vehicles	2114	388	392	392	392	392	398	400	404	404	413	428	445	449	462	465	472	6
7	Garage Work Equipment	2115	369	372	373	377	376	376	377	378	379	387	393	403	408	416	422	430	7
8	Other Work Equipment	2116	266	267	268	273	271	272	271	273	273	275	276	278	278	275	278	279	8
9																			9
10																			10
11	Buildings	2121	353	359	364	374	377	384	385	385	407	412	425	431	441	443	457	472	11
12	Furniture	2122	335	337	338	341	341	341	344	346	346	350	360	368	372	376	380	386	12
13	Office Equipment	2123	156	157	157	158	159	158	158	157	159	160	158	162	161	161	160	161	13
14	General Purpose Computer	2124	12	11	9	9	7	7	6	4.8	3.4	3 4	3.3	3 3	3 0	2 8	2 6	2 7	14
15																			15
16																			16
17	Analog Electronic Switching	2211	193	193	193	190	189	190	189	190	189	190	190	189	187	193	196	186	17
18	Digital Electronic Switching	2212	25	24	22	23	23	23	21	22	22	22	22	22	22	23	23	23	18
19																			19
20																			20
21	Electro Mechanical Switching	2215	344	348	350	358	366	376	379	386	391	395	403	405	414	421	430	432	21
22																			22
23	Operator Systems	2220	241	242	243	247	251	257	258	261	264	266	271	272	276	282	287	287	23
24																			24
25																			25
26																			26
27	Radio System—Analog	22311	96	96	96	95	95	95	95	95	95	96	95	95	94	97	98	94	27
28	Radio Systems—Digital	22312	125	125	126	127	128	127	125	125	125	126	127	127	128	129	130	130	28
29	Circuit Equipment—Analog	22321	143	144	144	142	143	143	143	144	143	145	145	145	144	148	150	144	29
30	Circuit Equipment—Digital	22322	36	36	36	37	37	38	38	39	38	38	39	39	39	40	40	41	30
31																			31
32	Public Telephone Term Eq	2351	193	193	193	191	190	190	190	191	190	191	190	189	187	193	195	186	32
33																			33
34																			34
35	Poles	2411	421	429	434	446	451	459	463	472	477	490	495	503	502	521	526	529	35
36	Aerial Cable—Metallic	24211	313	322	328	333	335	338	340	349	357	371	379	386	430	486	477	492	36
37	Aerial Cable—Fiber	24212	96	98	100	102	104	105	105	108	110	112	114	116	118	119	121	122	37
38	Underground Cable—Metallic	24221	281	289	295	299	298	299	299	307	314	326	334	340	394	461	448	466	38
39	Underground Cable—Fiber	24222	78	80	82	83	84	86	85	87	89	91	92	94	95	96	98	98	39
40	Buried Cable—Metallic	24231	271	278	284	287	285	289	286	293	300	312	320	326	383	456	441	460	40
41	Buried Cable—Fiber	24232	76	77	79	80	81	83	82	84	85	87	89	90	91	92	93	94	41
42	Submarine Cable—Metallic	24241	320	327	334	338	341	343	346	353	362	372	379	384	417	459	454	466	42
43	Submarine Cable—Fiber	24242	125	127	130	132	134	136	136	138	141	144	146	148	149	150	153	154	43
44	Intra Building Cable—Metallic	24261	313	322	328	333	335	338	340	349	357	370	378	385	429	483	474	489	44
45	Intra Building Cable—Fiber	24262	97	99	101	103	104	106	106	108	110	113	115	117	118	120	121	122	45
46	Aerial Wire	2431	348	355	362	368	372	377	381	391	399	412	419	427	446	466	465	472	46
47	Conduit Systems	2441	375	380	391	395	403	412	418	422	432	442	453	458	474	478	495	493	47
48																			48
49	Aerial Cable-FTTP (Distribution)	24213	0	0	0	0	0	0	0	0	0	100	97	95	92	89	88	87	49
50	Underground Cable-FTTP (Dist.)	24223	0	0	0	0	0	0	0	0	0	100	99	98	98	97	96	96	50
51	Buried Cable-FTTP (Distribution)	24233	0	0	0	0	0	0	0	0	0	100	102	105	104	103	103	102	51
52	Submarine Cable-FTTP (Dist.)	24243	0	0	0	0	0	0	0	0	0	100	99	98	98	97	96	96	52
53	Intra Building Cable-FTTP (Dist.)	24263	0	0	0	0	0	0	0	0	0	100	100	100	100	100	101	103	53
54																			54

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LINE NO	COST INDEX NUMBER																							LINE NO
	2008		2009		2010		2011		2012		2013		2014		2015		2016		2017					
	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July 1	Jan 1	July	Jan 1	July 1	Jan 1	July 1	
1	251	256	245	248	258	260	279	282	282	282	285	283	284	285	289	287	283	282	288						1
2																									2
3																									3
4	263	257	272	273	274	269	272	273	280	279	286	282	291	287	291	295	299	298	305						4
5	461	471	495	480	485	490	497	502	514	520	523	528	532	537	541	543	543	547	548						5
6	476	485	499	504	503	503	507	518	529	541	548	555	557	564	566	570	572	576	577						6
7	435	445	457	457	456	458	462	474	479	485	489	494	497	503	505	509	510	513	514						7
8	281	286	290	286	286	288	288	290	291	294	295	296	304	307	309	315	318	322	322						8
9																									9
10																									10
11	492	497	506	494	506	507	521	518	530	532	542	539	550	552	585	580	586	589	591						11
12	389	402	417	415	418	420	415	429	433	437	433	437	439	450	449	454	454	455	457						12
13	162	171	184	171	169	169	170	171	173	173	164	165	166	166	171	172	172	172	173						13
14	2.7	2.6	2 6	2 1	2.01	1.98	1.97	1.49	0.82	0 66	0.67	0.50	0.57	0.60	0.55	0.63	0.64	0 65	0 73						14
15																									15
16																									16
17	180	179	178	178	177	177	174	175	174	174	174	175	176	176	176	176	177	177	177						17
18	24	24	25	25	25	25	25	25	26	26	26	27	27	27	27	28	28	28	28						18
19																									19
20																									20
21	439	445	456	458	460	469	474	481	486	478	484	491	497	495	499	499	496	496	502						21
22																									22
23	288	292	297	299	300	305	307	311	313	309	312	317	320	319	322	322	320	321	324						23
24																									24
25																									25
26																									26
27	91	90	90	90	89	89	88	89	88	88	88	88	89	89	89	89	89	89	89						27
28	131	132	134	134	135	137	138	138	137	138	138	138	138	138	139	140	140	141	141						28
29	140	139	139	139	138	138	137	138	137	137	137	138	139	139	140	140	141	141	141						29
30	41	41	41	41	40	40	40	41	41	42	42	42	43	43	44	44	44	45	45						30
31																									31
32	180	179	177	178	177	177	174	175	173	174	173	174	175	175	176	176	177	176	177						32
33																									33
34																									34
35	537	547	554	563	570	578	576	587	594	600	603	607	605	616	620	621	629	633	636						35
36	494	507	461	473	506	509	573	582	577	576	582	572	573	573	578	570	555	551	568						36
37	123	124	126	127	128	130	131	133	135	136	137	138	140	142	143	144	146	148	149						37
38	465	481	421	435	475	476	555	562	554	552	556	544	542	540	544	533	513	506	525						38
39	100	100	102	103	103	105	106	108	109	110	111	112	113	114	116	116	118	119	120						39
40	459	475	410	425	467	467	553	560	550	547	552	538	536	533	537	524	501	493	513						40
41	95	96	97	98	99	100	101	103	104	105	106	107	108	109	111	111	113	114	115						41
42	468	479	447	458	484	486	535	541	539	540	545	539	541	542	547	544	534	532	547						42
43	155	157	159	161	163	164	166	168	170	172	173	174	177	179	181	183	185	187	189						43
44	491	504	459	471	504	507	570	578	573	573	578	569	569	570	575	567	553	549	566						44
45	124	125	127	128	129	131	132	134	135	137	138	139	141	142	144	145	147	148	150						45
46	475	488	469	478	496	501	519	528	525	527	531	530	533	538	543	543	540	541	552						46
47	502	507	525	530	516	521	526	532	545	550	549	552	559	565	571	577	581	586	593						47
48																									48
49	82	77	75	73	65	58	55	53	52	50	50	50	50	50	50	50	50	49	48						49
50	94	92	89	87	83	80	75	70	66	62	58	54	54	54	54	53	54	53	48						50
51	92	82	78	74	71	68	66	63	61	59	57	54	54	55	55	55	53	52	53						51
52	94	92	89	87	83	80	75	70	66	62	58	54	54	54	54	53	54	53	48						52
53	104	105	90	75	68	61	54	47	43	39	39	39	39	39	39	38	38	44	44						53
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AUS TELEPHONE INDEX BULLETIN NO. 55

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
United States Bureau of Labor Statistics Cost Indices
General Inflation Indices
Communications Equipment Indices
and
Professional Labor Indices

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AUS Consultants
Bureau of Labor Statistics Indexes

Index	Table	Region	Year	Begin Date	End Date	CPI	1	2 Communic Equipment pcu3342	3 Technical Labor ecu11122l linked CIU20154
Earliest Year							1913	1986	1985
Index	Table	Region					1	2	3
BLS	BLS	All	1913	1/1/1913	12/31/1913		10	7	6
BLS	BLS	All	1914	1/1/1914	12/31/1914		10	7	6
BLS	BLS	All	1915	1/1/1915	12/31/1915		10	7	6
BLS	BLS	All	1916	1/1/1916	12/31/1916		11	8	7
BLS	BLS	All	1917	1/1/1917	12/31/1917		13	10	8
BLS	BLS	All	1918	1/1/1918	12/31/1918		15	11	9
BLS	BLS	All	1919	1/1/1919	12/31/1919		17	12	10
BLS	BLS	All	1920	1/1/1920	12/31/1920		20	14	12
BLS	BLS	All	1921	1/1/1921	12/31/1921		18	13	11
BLS	BLS	All	1922	1/1/1922	12/31/1922		17	12	10
BLS	BLS	All	1923	1/1/1923	12/31/1923		17	12	10
BLS	BLS	All	1924	1/1/1924	12/31/1924		17	12	10
BLS	BLS	All	1925	1/1/1925	12/31/1925		18	13	11
BLS	BLS	All	1926	1/1/1926	12/31/1926		18	13	11
BLS	BLS	All	1927	1/1/1927	12/31/1927		17	12	10
BLS	BLS	All	1928	1/1/1928	12/31/1928		17	12	10
BLS	BLS	All	1929	1/1/1929	12/31/1929		17	12	10
BLS	BLS	All	1930	1/1/1930	12/31/1930		17	12	10
BLS	BLS	All	1931	1/1/1931	12/31/1931		15	11	9
BLS	BLS	All	1932	1/1/1932	12/31/1932		14	10	8
BLS	BLS	All	1933	1/1/1933	12/31/1933		13	9	7
BLS	BLS	All	1934	1/1/1934	12/31/1934		13	9	7
BLS	BLS	All	1935	1/1/1935	12/31/1935		14	10	7
BLS	BLS	All	1936	1/1/1936	12/31/1936		14	10	7
BLS	BLS	All	1937	1/1/1937	12/31/1937		14	10	7
BLS	BLS	All	1938	1/1/1938	12/31/1938		14	10	7
BLS	BLS	All	1939	1/1/1939	12/31/1939		14	10	7
BLS	BLS	All	1940	1/1/1940	12/31/1940		14	10	7
BLS	BLS	All	1941	1/1/1941	12/31/1941		15	11	8
BLS	BLS	All	1942	1/1/1942	12/31/1942		16	12	9
BLS	BLS	All	1943	1/1/1943	12/31/1943		17	13	10
BLS	BLS	All	1944	1/1/1944	12/31/1944		18	14	11
BLS	BLS	All	1945	1/1/1945	12/31/1945		18	14	11
BLS	BLS	All	1946	1/1/1946	12/31/1946		20	16	12
BLS	BLS	All	1947	1/1/1947	12/31/1947		22	18	13
BLS	BLS	All	1948	1/1/1948	12/31/1948		24	20	14
BLS	BLS	All	1949	1/1/1949	12/31/1949		24	20	14
BLS	BLS	All	1950	1/1/1950	12/31/1950		24	20	14
BLS	BLS	All	1951	1/1/1951	12/31/1951		26	22	15

AUS Consultants
Bureau of Labor Statistics Indexes

Index	Table	Region	Year	Begin Date	End Date	CPI	1	2 Communic Equipment pcu3342	3 Technical Labor ecu11122l linked CIU20154
Earliest Year							1913	1986	1985
Index	Table	Region					1	2	3
BLS	BLS	All	1952	1/1/1952	12/31/1952		27	23	16
BLS	BLS	All	1953	1/1/1953	12/31/1953		27	23	16
BLS	BLS	All	1954	1/1/1954	12/31/1954		27	23	16
BLS	BLS	All	1955	1/1/1955	12/31/1955		27	23	16
BLS	BLS	All	1956	1/1/1956	12/31/1956		27	23	16
BLS	BLS	All	1957	1/1/1957	12/31/1957		28	24	17
BLS	BLS	All	1958	1/1/1958	12/31/1958		29	25	18
BLS	BLS	All	1959	1/1/1959	12/31/1959		29	25	18
BLS	BLS	All	1960	1/1/1960	12/31/1960		30	26	19
BLS	BLS	All	1961	1/1/1961	12/31/1961		30	26	19
BLS	BLS	All	1962	1/1/1962	12/31/1962		30	26	19
BLS	BLS	All	1963	1/1/1963	12/31/1963		31	27	20
BLS	BLS	All	1964	1/1/1964	12/31/1964		31	27	20
BLS	BLS	All	1965	1/1/1965	12/31/1965		32	28	21
BLS	BLS	All	1966	1/1/1966	12/31/1966		32	28	21
BLS	BLS	All	1967	1/1/1967	12/31/1967		33	29	22
BLS	BLS	All	1968	1/1/1968	12/31/1968		35	31	23
BLS	BLS	All	1969	1/1/1969	12/31/1969		37	33	24
BLS	BLS	All	1970	1/1/1970	12/31/1970		39	35	25
BLS	BLS	All	1971	1/1/1971	12/31/1971		41	37	26
BLS	BLS	All	1972	1/1/1972	12/31/1972		42	38	27
BLS	BLS	All	1973	1/1/1973	12/31/1973		44	40	28
BLS	BLS	All	1974	1/1/1974	12/31/1974		49	44	31
BLS	BLS	All	1975	1/1/1975	12/31/1975		54	49	34
BLS	BLS	All	1976	1/1/1976	12/31/1976		57	52	36
BLS	BLS	All	1977	1/1/1977	12/31/1977		61	56	38
BLS	BLS	All	1978	1/1/1978	12/31/1978		65	60	40
BLS	BLS	All	1979	1/1/1979	12/31/1979		73	67	45
BLS	BLS	All	1980	1/1/1980	12/31/1980		82	75	50
BLS	BLS	All	1981	1/1/1981	12/31/1981		91	83	55
BLS	BLS	All	1982	1/1/1982	12/31/1982		97	89	59
BLS	BLS	All	1983	1/1/1983	12/31/1983		100	92	61
BLS	BLS	All	1984	1/1/1984	12/31/1984		104	96	63
BLS	BLS	All	1985	1/1/1985	12/31/1985		108	100	65
BLS	BLS	All	1986	1/1/1986	12/31/1986		110	102	66
BLS	BLS	All	1987	1/1/1987	12/31/1987		114	104	69
BLS	BLS	All	1988	1/1/1988	12/31/1988		118	104	72
BLS	BLS	All	1989	1/1/1989	12/31/1989		124	106	76
BLS	BLS	All	1990	1/1/1990	12/31/1990		131	108	80

AUS Consultants
Bureau of Labor Statistics Indexes

Index	Table	Region	Year	Begin Date	End Date	CPI	1	2 Communic Equipment pcu3342	3 Technical Labor ecu11122l linked CIU20154
Earliest Year							1913	1986	1985
Index	Table	Region					1	2	3
BLS	BLS	All	1991	1/1/1991	12/31/1991		136	109	84
BLS	BLS	All	1992	1/1/1992	12/31/1992		140	110	88
BLS	BLS	All	1993	1/1/1993	12/31/1993		145	112	92
BLS	BLS	All	1994	1/1/1994	12/31/1994		148	113	95
BLS	BLS	All	1995	1/1/1995	12/31/1995		152	114	97
BLS	BLS	All	1996	1/1/1996	12/31/1996		157	115	100
BLS	BLS	All	1997	1/1/1997	12/31/1997		161	116	102
BLS	BLS	All	1998	1/1/1998	12/31/1998		163	115	106
BLS	BLS	All	1999	1/1/1999	12/31/1999		167	113	109
BLS	BLS	All	2000	1/1/2000	12/31/2000		172	110	114
BLS	BLS	All	2001	1/1/2001	12/31/2001		177	109	119
BLS	BLS	All	2002	1/1/2002	12/31/2002		180	105	123
BLS	BLS	All	2003	1/1/2003	12/31/2003		184	102	127
BLS	BLS	All	2004	1/1/2004	12/31/2004		189	98	132
BLS	BLS	All	2005	1/1/2005	12/31/2005		195	97	135
BLS	BLS	All	2006	1/1/2006	12/31/2006		202	97	139
BLS	BLS	All	2007	1/1/2007	12/31/2007		207	96	146
BLS	BLS	All	2008	1/1/2008	12/31/2008		215	97	152
BLS	BLS	All	2009	1/1/2009	12/31/2009		215	97	155
BLS	BLS	All	2010	1/1/2010	12/31/2010		218	97	157
BLS	BLS	All	2011	1/1/2011	12/31/2011		225	96	161
BLS	BLS	All	2012	1/1/2012	12/31/2012		230	96	164
BLS	BLS	All	2013	1/1/2013	12/31/2013		233	95	167
BLS	BLS	All	2014	1/1/2014	12/31/2014		237	96	170
BLS	BLS	All	2015	1/1/2015	12/31/2015		237	96	173
BLS	BLS	All	2016	1/1/2016	12/31/2016		240	96	176
BLS	BLS	All	2017	1/1/2017	12/31/2017		243	96	177

Index	Table	Region	Year	Begin	End	1 Switch Gear	2 Relays	3 Battery Systems	4 Power Systems	5 Alarm Systems	6 Motors & Generators	7 Emergency Generators
												Means Ref
						PCU3353	PCU3353	PCU3359		PCU33429	PCU33531	26 32 13.13
				Date	Date	13335313	14335314	12335912	Calculation	03342901	2335312	2600
						30%	30%	40%	Composite			
Earliest Year						1987	1987	1987	1987	1987	1987	1987
Index	Table	Region				1	2	3	4	5	6	7
POW	POW	All	1987	1/1/1987	12/31/1987	103.6	103.9	125.0	112.3	100.1	110.8	83.4
POW	POW	All	1988	1/1/1988	12/31/1988	106.7	106.6	126.7	114.7	101.6	116.4	83.7
POW	POW	All	1989	1/1/1989	12/31/1989	113.5	110.9	133.5	120.7	104.3	123.3	83.9
POW	POW	All	1990	1/1/1990	12/31/1990	118.5	115.4	137.6	125.2	103.4	127.5	84 1
POW	POW	All	1991	1/1/1991	12/31/1991	121.8	120.5	142.7	129.8	101.9	129.7	84.3
POW	POW	All	1992	1/1/1992	12/31/1992	123.6	123.3	146.1	132.5	102.2	131.5	84 8
POW	POW	All	1993	1/1/1993	12/31/1993	125.9	126.9	149.3	135.6	103.2	133.5	85.0
POW	POW	All	1994	1/1/1994	12/31/1994	128 7	128 3	151.2	137.6	104.2	134.2	90.6
POW	POW	All	1995	1/1/1995	12/31/1995	132.4	130.7	154.5	140 7	106.5	137.5	95.1
POW	POW	All	1996	1/1/1996	12/31/1996	133.6	133.6	157.5	143 2	108 3	139.1	95.3
POW	POW	All	1997	1/1/1997	12/31/1997	135.0	137.8	158.3	145.2	109.4	138.6	99.1
POW	POW	All	1998	1/1/1998	12/31/1998	138.2	140.4	164.2	149 3	111.3	139.8	99.6
POW	POW	All	1999	1/1/1999	12/31/1999	141 0	142.8	165.5	151.3	109.4	139.9	99.8
POW	POW	All	2000	1/1/2000	12/31/2000	143.3	144.4	169.9	154 3	108.4	140.4	100.0
POW	POW	All	2001	1/1/2001	12/31/2001	147 6	148 2	178.2	160 0	109.0	141.6	102.9
POW	POW	All	2002	1/1/2002	12/31/2002	149.8	150.0	179.4	161.7	110.4	142 0	103.4
POW	POW	All	2003	1/1/2003	12/31/2003	151.1	152.3	165.1	157.1	110.8	142.4	103.8
POW	POW	All	2004	1/1/2004	12/31/2004	153.7	155.2	165 1	158.7	109.8	145 8	104.3
POW	POW	All	2005	1/1/2005	12/31/2005	160.4	160.0	166.9	162.9	110.6	154.4	104 7
POW	POW	All	2006	1/1/2006	12/31/2006	167.5	167.6	175 6	170.8	113.1	161.8	104.9
POW	POW	All	2007	1/1/2007	12/31/2007	179.4	173.0	182.5	178.7	113.8	169.6	111.0
POW	POW	All	2008	1/1/2008	12/31/2008	187.5	179.3	189 4	185.8	116 0	177.7	123.0
POW	POW	All	2009	1/1/2009	12/31/2009	193.1	184.7	193.4	190.7	116.8	181.8	126 4
POW	POW	All	2010	1/1/2010	12/31/2010	195.1	190.3	191 8	192.3	117 8	185.4	130.9
POW	POW	All	2011	1/1/2011	12/31/2011	192.2	194.5	192.8	193.1	118.4	196.5	130.9
POW	POW	All	2012	1/1/2012	12/31/2012	199.0	196 4	197 1	197.5	119.9	201.2	139 8
POW	POW	All	2013	1/1/2013	12/31/2013	201.5	200.1	195.5	198.7	121.5	203.2	121.9
POW	POW	All	2014	1/1/2014	12/31/2014	200.4	202.7	196 9	199.7	122.2	206.1	106.5
POW	POW	All	2015	1/1/2015	12/31/2015	**199.3**	**205.7**	**195.1**	199 5	**122.4**	**206.4**	**111.9**
POW	POW	All	2016	1/1/2016	12/31/2016	**199.5**	**206.8**	**192.4**	198 9	**122.4**	**204.6**	**111.9**
POW	POW	All	2016	1/1/2016	12/31/2016	**200.0**	**207.8**	**192.2**	199 2	**122.4**	**206.0**	**111.9**
			2010			195.1	190 3	191.8091	192.3	117.8	185.4	130 9
			2011			192.2	194.5	192.8	193.1	118.4	196 5	130.9
			2012			199	196.4	197.1	197.5	119.9	201.2	139 8
			2013			201.5	200.1	195.5	198.7	121.5	203.2	121 9
			2014			200.4	202.7	196.9	199.7	122.2	206.1	106.5
			2015			199 3	205.7	195.1	199.5	122.4	206.4	111.9
			2016			199.4917	206.8333	192.4	198.9	122.4	204.60833	111.9
			2017			200	207.8	192.2	199.2	122.4	206	111 9
			2010			0.0	0.0	0.0		0.0	0.0	0.0
			2011			0.0	0.0	0.0		0.0	0 0	0.0
			2012			0.0	0.0	0.0		0.0	0.0	0.0
			2013			0.0	0.0	0.0		0.0	0.0	0.0
			2014			0.0	0.0	0 0		0.0	0.0	0.0
			2015			0.0	0.0	0.0		0.0	0.0	0.0
			2016			0.0	0.0	0.0		0.0	0.0	0.0

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Depreciation & Obsolescence

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DEPRECIATION AND FUNCTIONAL OBSOLESCENCE

An important step in the appraisal of property using the cost approach is the determination of the depreciation or condition of the property. Depreciation in this appraisal was segregated into normal (mostly physical) depreciation and functional obsolescence. The normal depreciation was determined based on the age of the property and its normal service life; while, functional obsolescence was based on the impact on the property's remaining life caused by factors such as changing technology, service requirements, and competition.

Depreciation - The depreciation was determined based on the property's age and it normal service life using the following formula:

$$\text{Condition} = \frac{\text{Remaining Life}}{\text{Age + Remaining Life}}$$

or

$$\text{Depreciation} = \frac{\text{Age}}{\text{Age + Remaining Life}}$$

Where: Remaining Life = f(Age, Survival Characteristic, Normal Service life)

Functional Obsolescence - The obsolescence inherent in the property was determined using the above described normal service life in comparison to the property's service life is adjusted for functional factors. The obsolescence was quantified base on the difference between the property's normal service life and its functional service life. The following formula was used to calculate the obsolescence:

$$\text{Obsolescence} = \frac{\text{Normal Service Life - Functional Service Life}}{\text{Normal Service Life}}$$

Service Lives - (normal versus functional) - The service life of property is that period of time in which it provides the service to which it was designed and placed into service. In most industrial properties there is a difference between a property's normal or physical life and its functional life. A piece of equipment may physically last for an extended

period; however, as that property ages changing technology, improvements or enhancement in similar equipment, functional and or service requirements change resulting in decreased utility of the existing equipment, and therefore decrease in value to it owner, this additional deterioration over that defined by the equipment's normal life is functional obsolescence.

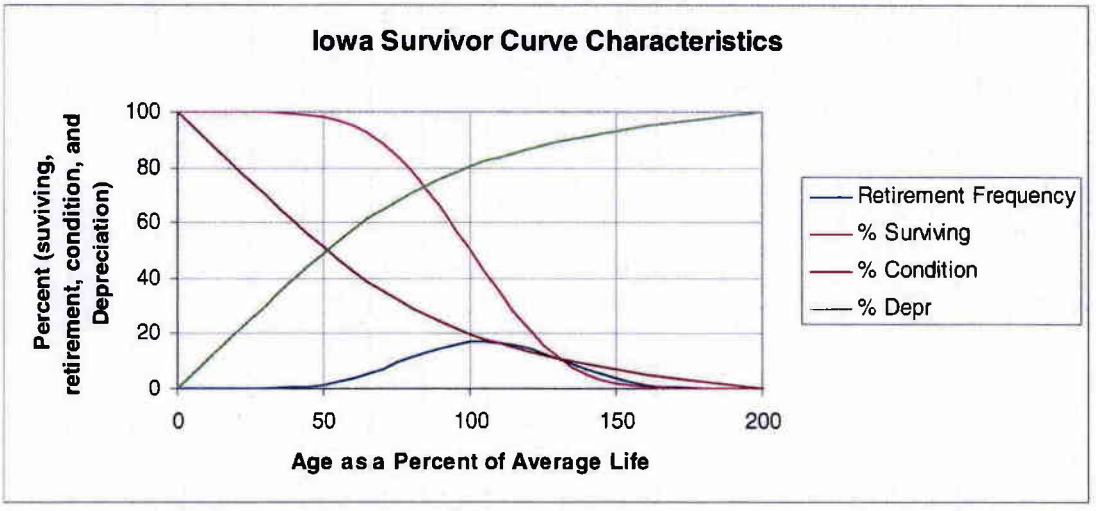
Wastewater Industry Service Lives

The service lives used in the depreciation and functional obsolescence calculations were developed based on the property and its use, AUS Consultants' experience in developing depreciation studies for the water and wastewater industries. The following table details the lives used in the depreciation portion of the replacement cost new less depreciation analysis:

Property Description				Depreciation			
NARUC Account	Account Description	Depreciable / Non-depreciable	Survivor - Retirement Characteristics	Physical Life	Functional Life	Minimum Condition	Economic Obsolescence
							0%
351	Organizations	Non-depreciable	SQ.0	100	100	100%	0%
352	Franchises	Non-depreciable	SQ.0	100	100	100%	0%
353	Land & Land Rights	Non-depreciable	SQ.0	100	100	100%	0%
353.1	Land Improvements	Depreciable	R4.0	45	45	10%	0%
354	Structures & Improvements	Depreciable	R4.0	45	45	10%	0%
354.3	Structures & Improvements - Pump Stations	Depreciable	R4.0	45	45	10%	0%
354 4	Structures & Improvements - Treatment Plants	Depreciable	R4.0	45	45	10%	0%
355	Power Generating Equipment	Depreciable	R3.0	35	35	10%	0%
360	Collection Sewers - Force	Depreciable	R4.0	65	65	10%	0%
361	Collection Sewers - Gravity	Depreciable	R4 0	75	75	10%	0%
362	Special Collection Structures	Depreciable	R4.0	75	75	10%	0%
363	Services to Customers	Depreciable	R3.0	35	35	10%	0%
364	Flow Measuring Devices	Depreciable	R3.0	35	35	10%	0%
365	Flow Measuring Installations	Depreciable	R3.0	35	35	10%	0%
366	Reuse Services	Depreciable	R3.0	45	45	10%	0%
367	Reuse Meters & Meter Installations	Depreciable	R3 0	35	35	10%	0%
370	Receiving Wells	Depreciable	R4 0	45	45	10%	0%
371	Pumping Equipment	Depreciable	R3.0	35	35	10%	0%
374	Reuse Distribution Reseroirs	Depreciable	R4.0	55	55	10%	0%
375	Reuse Transmission & Distribution System	Depreciable	R4.0	65	65	10%	0%
380	Treatment & Disposal Equipment	Depreciable	R3.0	45	45	10%	0%
381	Plant Sewers	Depreciable	R4 0	65	65	10%	0%
382	Outfall Sewer Lines	Depreciable	R4.0	65	65	10%	0%
389	Othe Plant & Miscellaneous Equipment	Depreciable	R3.0	45	45	10%	0%
390.1	Furniture	Depreciable	R3.0	22	22	10%	0%
390 2	Office Equipment	Depreciable	R3 0	12	12	10%	0%
390.3	EDP Equipment	Depreciable	R3.0	8	8	10%	0%
391	Transportation Equipment	Depreciable	R3.0	12	12	10%	0%
392	Stores Equipment	Depreciable	R3.0	35	35	10%	0%
393	Tools, Shop, & Garage Equipment	Depreciable	R3.0	25	25	10%	0%
394	Laboratory Equipment	Depreciable	R3.0	25	25	10%	0%
395	Power Operated Equipment	Depreciable	R3.0	18	18	10%	0%
396	Communications Equipment	Depreciable	R3.0	12	12	10%	0%
396.1	Communications Equipment	Depreciable	R3.0	12	12	10%	0%
396.2	SCADA Systems	Depreciable	R3.0	12	12	10%	0%
397	Miscellaneous Equipment	Depreciable	R3.0	35	35	10%	0%
398	Other Tanigble Plant	Depreciable	R3.0	35	35	10%	0%

Iowa Survivor Curves

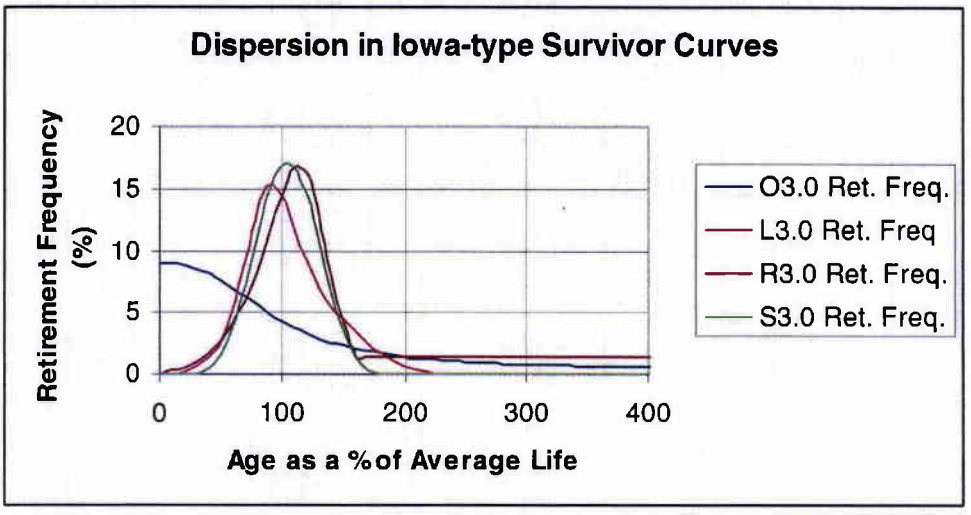
The Iowa Survivor Curves recommended in the McKeesport appraisal are used to determine the remaining life of the property, and therefore its condition, recognizing the properties' service life and age. The Iowa Survivor Curves allows the appraiser to recognize the property being studied (mains, treatment and pumping plant equipment etc placed in a particular year, say1985) is part of a larger group of property, i.e., all the property i.e., mains, treatment and pumping plant equipment, etc. As such, the service lives which we refer to in our appraisal are an average service lives for the group, i.e., the average life of all mains, treatment and pumping plant equipment, etc. The Iowa Survivor curve allows the appraiser to calculate the remaining life, and therefore condition, of a subset of the group (the mains placed in 1985) based on the groups': (1) Iowa Survivor Curve, (2) Service Life and the (3) age of property at the appraisal date. An Iowa Survivor Curves depicts how property from a group survives and retires about that groups' average life.



The above figure depicts a typical Iowa-type survivor curve, an S3.0 Iowa-type survivor curve. In this case the survivor curve has been generalized to a service life of 100% of the property's average life, in this generalized form the survivor curve statistics can be utilized with any individual service life in the age-life service life and depreciation calculations. There are four characteristics displayed in the above chart depicting the manner in which property survives and retires about the group's average life, those characteristics are: the retirement frequency (blue), the percent surviving (red), the percent condition (brown) and the percent depreciated (green). The retirement frequency represents the retirement of individual property items about the group's average service life. As can be seen the retirements are distributes about the group's average life with some items retiring before the average life and some items retiring at or after the group's service life. The group's survivor curve is developed from subtracting the retirements as they occur as the property ages. The depreciation curve depicts how much of the property group's life has been consumed; while, the condition curve depict how much of the property group's life remains. The condition and depreciation curves are complementary in that condition equals 100% minus depreciation and vice versa.

The theory of Iowa Survivor Curves was presented in the 1920s and 30s by Robley Winfrey based on research at Iowa State University (then the Iowa Engineering Experiment Station). Winfrey's research was first published in Bulletin 103 - Life Characteristics of Physical Property and Bulletin 125 - Statistical Analysis of Industrial Property Retirements. (Incidentally, both publications are out of print, I have a copy of Bulletin 125 but not Bulletin 103, I'm still trying to get a copy of that piece of depreciation literature.). Bulletin 125 was updated in 1967 by Professor Harold Cowles of Iowa State University's Department of Industrial Engineering. In conducting his research, Winfrey collected data on industrial property survival and retirement from various sources and analyzed that data as a function of property's age at retirement and ultimately the property groups' service life when all the property in the group was fully retired.

Winfrey discovered the industrial property's survival and retirement fits three basic patterns with relationship to the property's average life:



Symmetrically moded (S-type Iowa Survivor Curves) (green) – The S-type Iowa Survivor Curve is one wherein the property's retirements are symmetrically distributed about the mode. Mode in statistics is defined as the highest frequency, in this case retirement frequency. Thus an S-type Iowa curve is like a normal curve; however, its shape is not identical to a normal distribution function.

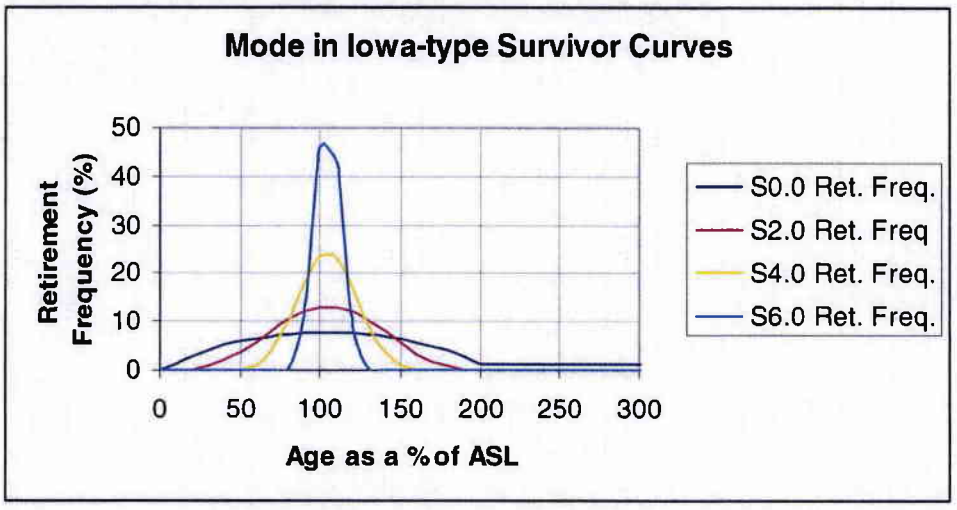
Right moded (R-type Iowa Curves) (brown) – the R-type Iowa curve has its mode skewed to the right of the property's average life; therefore the retirements tend to be distributed later in the property's life and there are less retirements earlier in the property's life.

Left moded (L-type Iowa Curve) (red) – The L-type Iowa curve has its mode skewed to the left of the property's average life; therefore the retirements tend to be distributed earlier in the property's life and there are less retirements later in the property's life.

In the utility industry, the plant, i.e., mains, treatment and pumping plant equipment tends to have a R-type survival/retirement dispersion as it is designed to provide service

over extended periods, requiring little maintenance, and it designers have significant experience in designing and placing such property.

In conjunction with the above described R-, S-, and L-type survival/retirement patterns, Winfrey determine that there were several patterns of the manner in which the retirements' peakedness occur around the average life. In this case, Winfrey described the peakedness of the property retirements with peakedness enumerations of 0, 1, 2, 3, 4, 5, and 6. The low peakedness numbers 0 and 1 represent low levels of retirements being distributed over the property entire life, while high peakedness numbers, 5 and 6 represent retirement patterns where the majority or all the retirement occur tightly grouped around the property's average life. Peakedness numbers 2, 3, and 4 are middle of the road, so to speak, in terms of peakedness.



Origin moded (O-type) survivor curve (blue) – Harold Cowles in his 1967 update of Bulletin 125 introduced the O-type survivor curve with the mode of the curve at the origin or at age equal to zero (0) years. This class of Iowa curves was over looked by Winfrey possibly because it made little intuitive sense that industrial retirement of property would have their maximum retirement frequency at age equal to zero. However, Cowles felt for completeness they should be included. O-type survivor curves do reflect the survival pattern of intangible assets.

Iowa-type survivor curves are parametric, as opposed to formalistic, in that they were derived from empirical survival/retirement data which Winfrey collected. There are Iowa curve equations are presented in Bulletin 125; however in most cases users reference standardized Iowa Survivor Curve tables. The Iowa-type survivor curves used in this appraisal have been generalized to a service life of 100% of the property's average life. By generalizing the service life to 100% of average life these tables can be used to generate survival and retirement statistics for property of any service life.

It should be apparent that Iowa-types survivor curves are valid for any type property as the curves only depict how that property survives and retires about the average life of a group of similar property.

Generalized Iowa-type Survivor Curves

As was discussed earlier, most users of the Iowa-type survivor curves use standardized tables of Iowa curves. The most usable form of these standardized tables are tables which have been generalized to a standard life of 100% of the property's average life. Based on these generalized tables the user can determine the property's remaining life by knowing the Iowa-type survivor curve (mode and peakedness characteristics), the property's (group's) service life, and the specific property's (for which the remaining life is desired) age. The following table reflects how the remaining life, as well as its condition, is determined:

Year	Study Date	Age	Iowa Curve	Service Life	Age % of ASL	Iowa Lookup	Iowa Condition	Remaining Life	Total Life	Condition
				ASL						
		years		years	%			years	years	%
Input		Calc	Input	Input	Calc	Calc	lookup	Calc	Calc	Calc
1970	2006	35.5	R3.0	25	142	R3.0142	0.066388	1.7	37.2	4.47%
1980	2006	25.5	R3.0	25	102	R3.0102	0.192543	4.8	30.3	15.88%
1990	2006	15.5	R3.0	25	62	R3.0062	0.442050	11.1	26.6	41.62%
2000	2006	5.5	R3.0	25	22	R3.0022	0.787294	19.7	25.2	78.16%
2004	2006	1.5	R3.0	25	6	R3.0006	0.941117	23.5	25.0	94.01%
2005	2006	0.5	R3.0	25	2	R3.0002	0.980320	24.5	25.0	98.00%

The above table was develop with reference to the standardized Iowa Survivor curves contained and represent a R3.0 25 year Iowa curve and life table. The standardized Iowa Curves are located in tab database. In order to reference the proper line of the Iowa Curve data the user looks up that data by reference to the property's age as percent of the service life (age % of ASL column) and the Iowa Survivor curve (Iowa Curve column), combining these two criteria the Iowa Lookup column will get the user to the proper Iowa Curve data.

In the above calculation the Iowa-type survivor curve is R3, the service life of the group is 25 years, and its age is defined by property's accounting records which specifies the investment in property by account (A group in service life terms) and by the year of installation of that property. The age is dependent upon the appraisal year (study date) and the year of placement. It is customary to assume that the property placed in any particular placement year was placed continuously during that year and therefore its age is best represented as if that investment was placed in the middle of the year, i.e., July 1; hence, the adoption of the "mid-year" convention where all property is treated as if placed the mid-year.

Service Life and Survival/retirement pattern

The service life and survival/retirement pattern are determined by an analysis of historical survival and retirement experience of the company's property. This historical experience must be adjusted for factor which are known to be impacting the property's service life but may not exhibited their effect on the property's retirement. Here it is important that a distinction is made between industrial property's physical service life and its functional service life. While physically a type of property may be deployed and

remain in use for many years, over those years factors of changing technology, consumers demand and patterns, and even regulation, lessen the property functional life when compared to its physical life. In an industry such as the communications industry, function obsolescence is the primary driver of depreciation.

The following table details the impact of the above described lives on the condition calculations:

Year	Study Date	Age	Iowa Curve	Service Life	Age % of ASL	Iowa Lookup	Iowa Condition	Remaining Life	Total Life	Condition
				ASL						
		years		years	%			years	years	%
Input		Calc	Input	Input	Calc	Calc	lookup	Calc	Calc	Calc
1970	2006	35.5	R3.0	30	118	R3.0118	0.131771	4.0	39.5	10.02%
1979	2006	26.5	R3.0	30	88	R3.0088	0.264919	7.9	34.4	23.07%
1981	2006	24.5	R3.0	25	98	R3.0098	0.211333	5.3	29.8	17.74%
1989	2006	16.5	R3.0	25	66	R3.0066	0.411848	10.3	26.8	38.42%
1990	2006	15.5	R3.0	20	78	R3.0078	0.327281	6.5	22.0	29.69%
2000	2006	5.5	R3.0	20	28	R3.0028	0.731331	14.6	20.1	72.67%
2004	2006	1.5	R3.0	20	8	R3.0008	0.921605	18.4	19.9	92.47%
2005	2006	0.5	R3.0	20	3	R3.0003	0.970499	19.4	19.9	97.49%

Statistical Analyses of Industrial Property Retirements

by

Robley Winfrey

BULLETIN 125
REVISED

ENGINEERING RESEARCH INSTITUTE
IOWA STATE UNIVERSITY • AMES, IOWA

IOWA CURVES

Iowa-type survivor curves are based on a set of empirical data collected (mainly in the 1930s) for the purpose of statistically predicting future service expectancy (remaining service) for physical properties.

The techniques used and methods applied are exactly analogous to those used by the insurance industry for the purpose of predicting human mortality (life expectancy) when determining appropriate insurance premium rates. The only distinction to be made is that the life insurance companies are investigating the life or longevity characteristics of human beings and the studies which developed the Iowa-type survivor curves were developed to predict the longevity or service life experience for physical, inanimate objects. The seminal statistical analyses for industrial property were conducted under the auspices of the Iowa Research Station now known as Iowa State University and were published in Statistical Analyses of Industrial Property Retirements, Bulletin 125, Engineering Research Institute, Iowa State University.

From the preface to the revised 1967 edition of Bulletin 125:

> "With the original publication of Bulletin 125 by the Iowa Engineering Experiment Station in 1935 (now known as the Engineering Research Institute), a significant contribution was made to the practice of industrial property life estimation. This was in the form, first, of a single volume, readily available, which presented in considerable detail the procedures for statistically analyzing historical property retirement data. Secondly, but no less significant, was the presentation of a set of 18 generalized density functions descriptive of industrial property retirement dispersion, mathematically described in terms of the Pearson frequency curve family, but with parameters established empirically from the analysis of a wide range of actual retirement experience.
>
> These curves, the cumulative form of which are commonly referred to as the Iowa-type Survivor Curves, have been used extensively since their introduction and, at the present time, the set is accepted as the standard of industrial property retirement dispersion. Because of the very simple mnemonic coding system which suggests the varying statistical characteristics involved, the Iowa Curves have also become widely used and recognized in the identification or classification of retirement dispersions, even for patterns derived in terms of analytical techniques not using the Curves."

The tables which follow this discussion are the ones used to estimate the remaining life of investment at particular age for an account with a particular service life.

Statistical Analyses of Industrial Property Retirements

by Robley Winfrey

(Revised April, 1967 by Harold A. Cowles, Professor, Department of Industrial Engineering)

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Iowa State University, Ames, Iowa

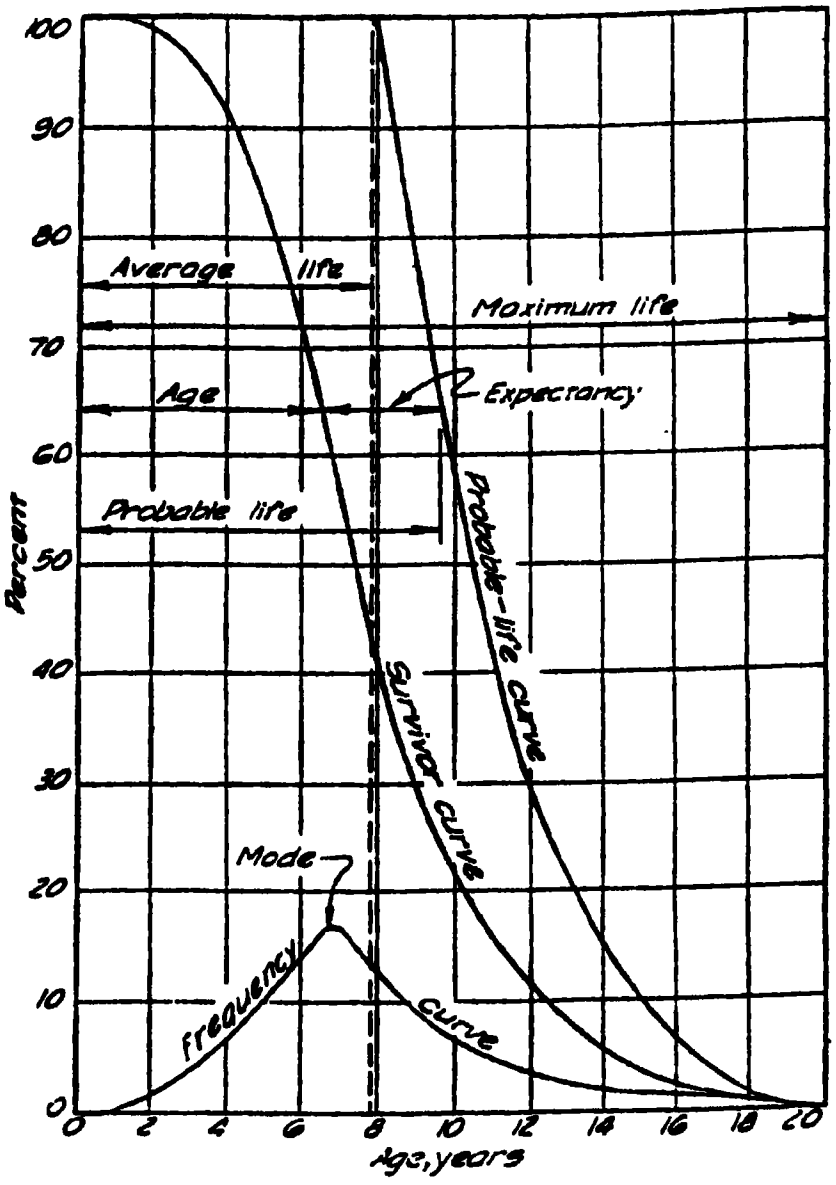


FIG. 1.—A typical survivor curve and its derived curves.

8. The *service life* of a unit is that period of time (or service) extending from the date of its installation to the date of its retirement from service. While the service life of physical property is usually expressed in years it may also be expressed in terms of units of production (screws, wheels, cars, pounds, miles, car-miles), time units of less than a year (months, hours, minutes), or combinations of physical units or services and time (lamp-hours, ton-years).

9. The *probable service life* of an individual unit is that period of time extending from its date of installation to the forecasted date when it probably will be retired from service.

10. The *expectancy* of life of an individual unit is that period of time extending from the observation age (usually the present) to the forecasted date when the unit probably will be retired from service. Age plus expectancy always equals probable life.

11. The *average service life* of a group of individual units is the quotient obtained by dividing the sum of the service lives of all the units by the number of units. The average service life (in years) is equal to the area under the survivor curve in percent-years (or unit-years) divided by 100 percent (or the total number of units).

12. The *probable average service life* of a group of individual units is the average of the probable service lives of the units of the group.

13. The *expectancy* of life of a group of individual units is that period of time extending from the observation age (usually the present) to the average of the forecasted dates when the units probably will be retired. The observation age plus the expectancy always equals the probable average service life.

Note: Service life and average service life are always known quantities since they represent completed service life; probable service life and probable average service life always must be estimated since they are forecasts of uncompleted service.

14. *Maximum life* or *maximum age* is the age of the last unit of a given group to be retired from service; it is also the age at which the survivor curve has a zero ordinate, or zero percent surviving.

15. Property units which are taken out of service for any reason whatsoever are called *retirements*. Retirements may include original units (units of the initial installation) as well as "second-generation" units, that is, replacements (or renewals) which were installed to take the place of the original units as they were removed.

16. *Replacements* are the units put in service to replace retirements.

17. *Renewals* are replacements "in kind" which have exactly the same life characteristics as the retirements.

18. *Installations* are new units placed in service, not as replacement units, but as additions to the property.

19. All renewals, replacements, and installations are *placements*.

20. *Survivor curves* show the number of units of a given group

which are surviving in service at given ages. The ordinates to the curve give at any particular age the percentage (or the actual number) of the original number which are yet surviving in service. The abscissa is measured in years or other suitable service unit. The *original survivor curve* is the curve drawn through the points calculated from the original data without adjustment. Since this original survivor curve is generally irregular it is smoothed to produce a *smoothed survivor curve*, sometimes referred to as an *adjusted curve*.

Survivor curves have in some publications been referred to as *mortality curves*. However, the term *survivor curve* is used in this report because the curves referred to show the *percent surviving*, not the *percent retired*, and because the term *mortality* suggests human beings and not inanimate objects.

21. A *stub survivor curve* is an incomplete survivor curve; that is, one which does not extend to zero percent surviving because of a lack of retirement data on the longer-lived units.

22. A *probable-life curve* shows the probable average life of the survivors at any age from zero to maximum life.

23. If the percent surviving is read at the beginning of each successive age-interval and the differences in these successive readings plotted at ages corresponding to the midpoints of the intervals, the resulting points form a *frequency curve*, or *distribution curve*. Since the ordinates indicate the percentage of the units retired during each interval, the curve shows in what manner the retirements are distributed over the period from zero age to maximum life.

24. The point on the frequency curve having the highest ordinate is called the *mode*. The year in which the mode occurs is called the *modal year*.

25. A *maximum-life cycle* is a period of time corresponding in length to the maximum life of the units. An industrial property may continue to be operated through several maximum-life cycles of some of the units of which it is composed.

26. An *average-life cycle* is a period of time corresponding in length to the *average* life.

27. If a property is continued in service for a long time and maintained with a constant number of like units of substantially the same potential average life, it will reach a *normal condition* or *stabilized condition*, after which the average age of the units in service and the annual renewals will be constant year after year.

28. *Normal renewals* are the annual renewals after the property group has reached a stabilized condition. Normal renewals, in percent of the original number of units, are equal to 100 percent divided by the average life.

29. *Generalized curves* are those whose ordinates are expressed in percent of the total number of units and whose abscissas (age) are expressed in percent of average life.

30. *Type curves* are those theoretical curves derived by the methods described in this report from a study of actual retirements. They depict typical survivor and frequency curves for industrial property. Actual survivor curves are compared with type survivor curves in the process of determining probable average lives.

MORTALITY TABLES AND CURVES OF HUMAN BEINGS

By a study of population and deaths, life insurance companies have arrived at life tables for human beings of different nationalities. From these life tables the normal death rate and life expectancy for people at different ages can be determined as a basis for life insurance premiums and reserves. Life tables can be prepared from the vital statistics for any desired number of years in combination with census returns. By means of mathematical formulas a life table is adjusted to remove any slight irregularities that may exist in the original data.

Table 1 is the United States life table for white males, based upon deaths for the 10 years from 1901 to 1910. Unlike industrial property units whose average lives are continually being affected by many forces, the human average life and distribution of deaths according to age change very little over several generations. The life curve, however, varies considerably for different races as is illustrated in Fig. 2. The deaths at different ages are shown for the United States by the frequency curves in Fig. 3.

This reference to the United States life tables is made to show the similarity between the life characteristics of human beings and industrial properties. The essential differences are three. First, human beings experience a heavy infant mortality which results in a bi-modal frequency curve, one mode occurring between ages 0 and 1, and the other between ages 75 and 76. Second, the mode at the age-interval 75–76 occurs at a much greater percentage of average life than is usually found with physical property employed in industry. Third, the curves for industrial equipment vary in shape over wide limits while human mortality curves vary relatively little. The Makehamized curve in Fig. 3 is one that has been smoothed. (It does not represent the same group of lives as the lower curves of the figure.)

ANALYZING RETIREMENT DATA

The foregoing section discussed the life tables for humans and the accompanying curves. Similar analyses can be made of the behavior of the physical equipment employed in industry when sufficient information is available. The processes employed for analyzing the retirements of industrial property are not so easily handled as are those employed for mortality data of human beings, nor are the results usually as uniform because of the small number of units observed and the more numerous, less uniform causes of retirement of industrial

CHART NO. 9

SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE RIGHT-MODAL IOWA TYPE CURVES

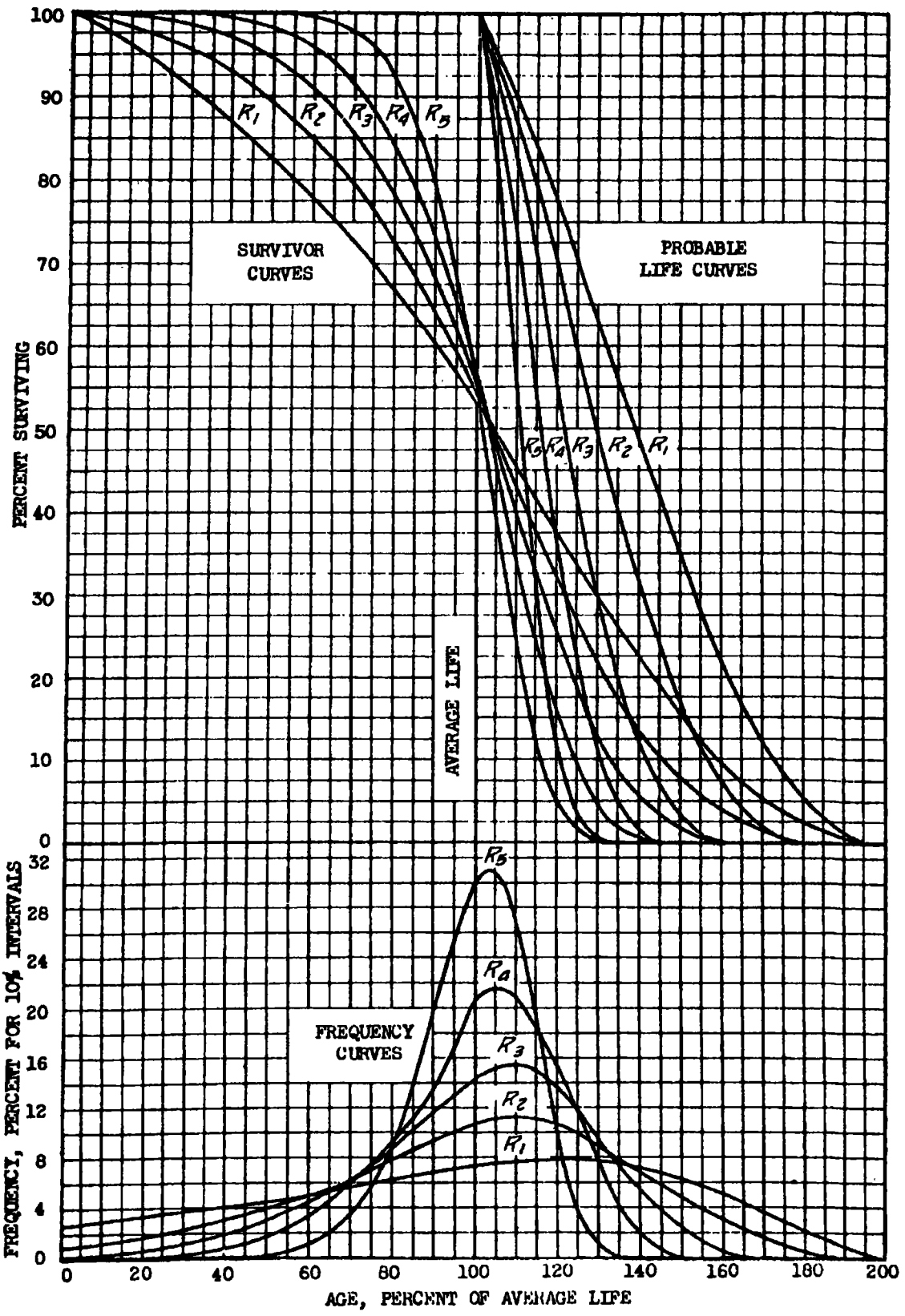


CHART NO. 8

SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE SYMMETRICAL IOWA TYPE CURVES

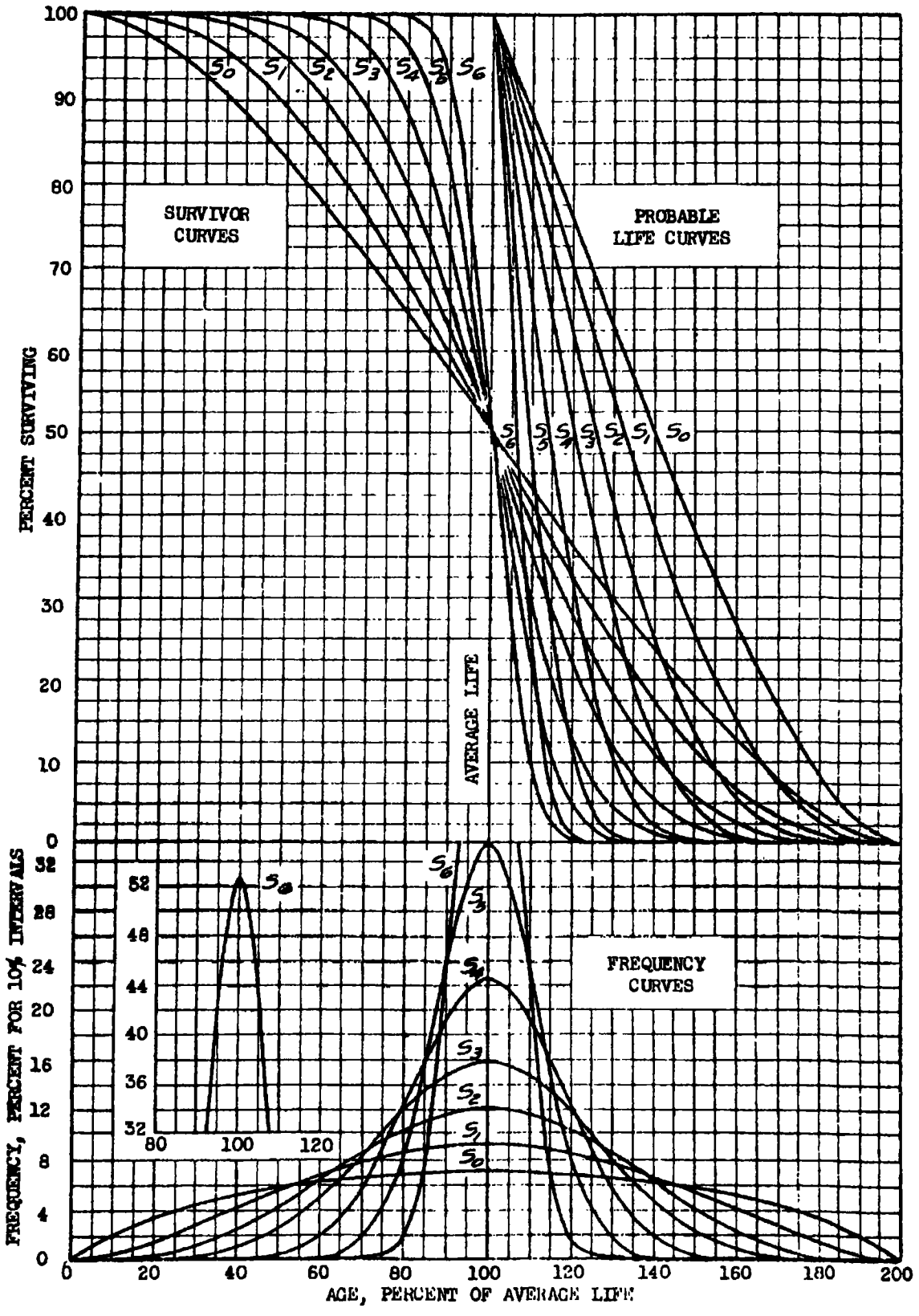


CHART NO. 7

SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE LEFT-MODAL IOWA TYPE CURVES

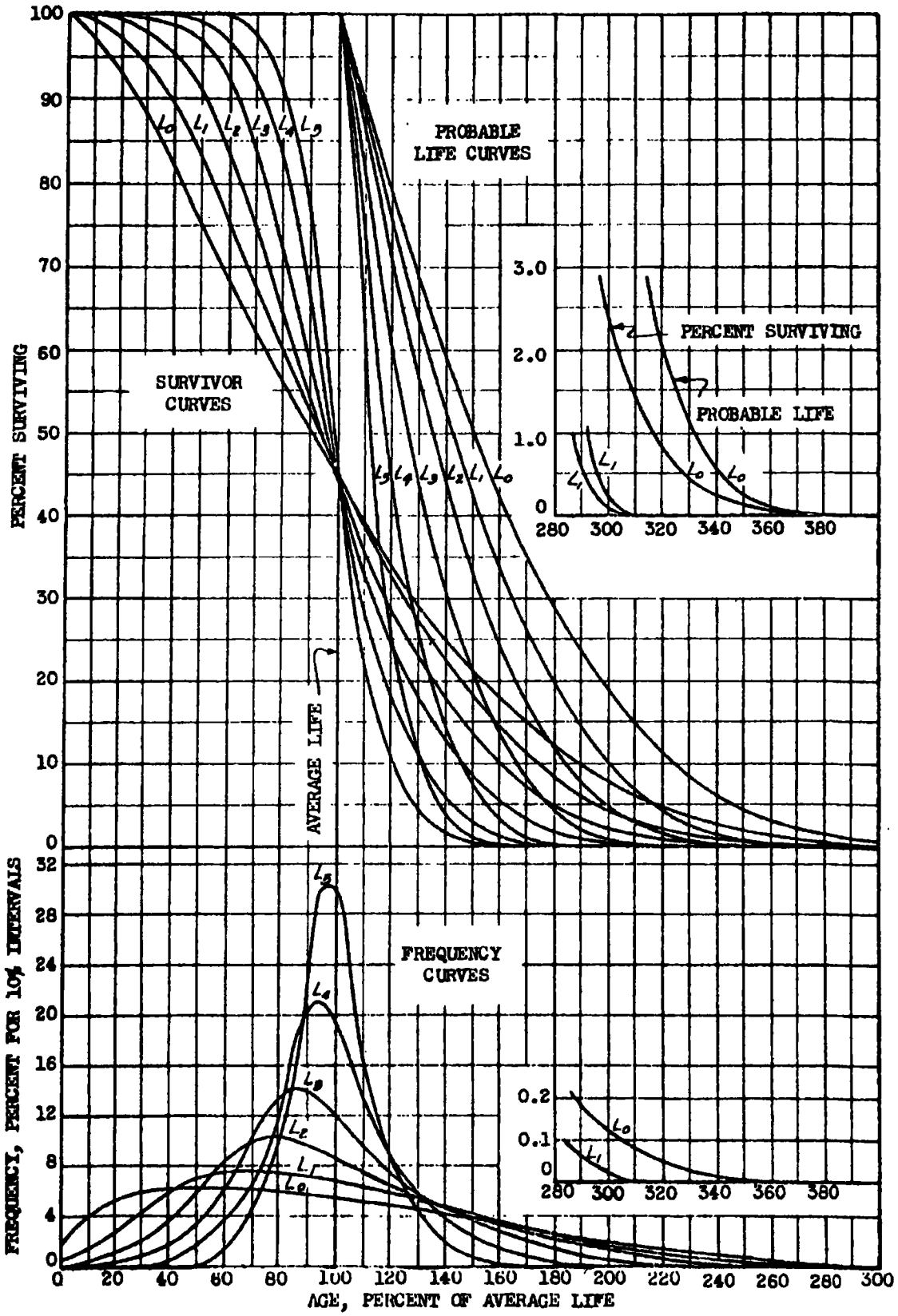
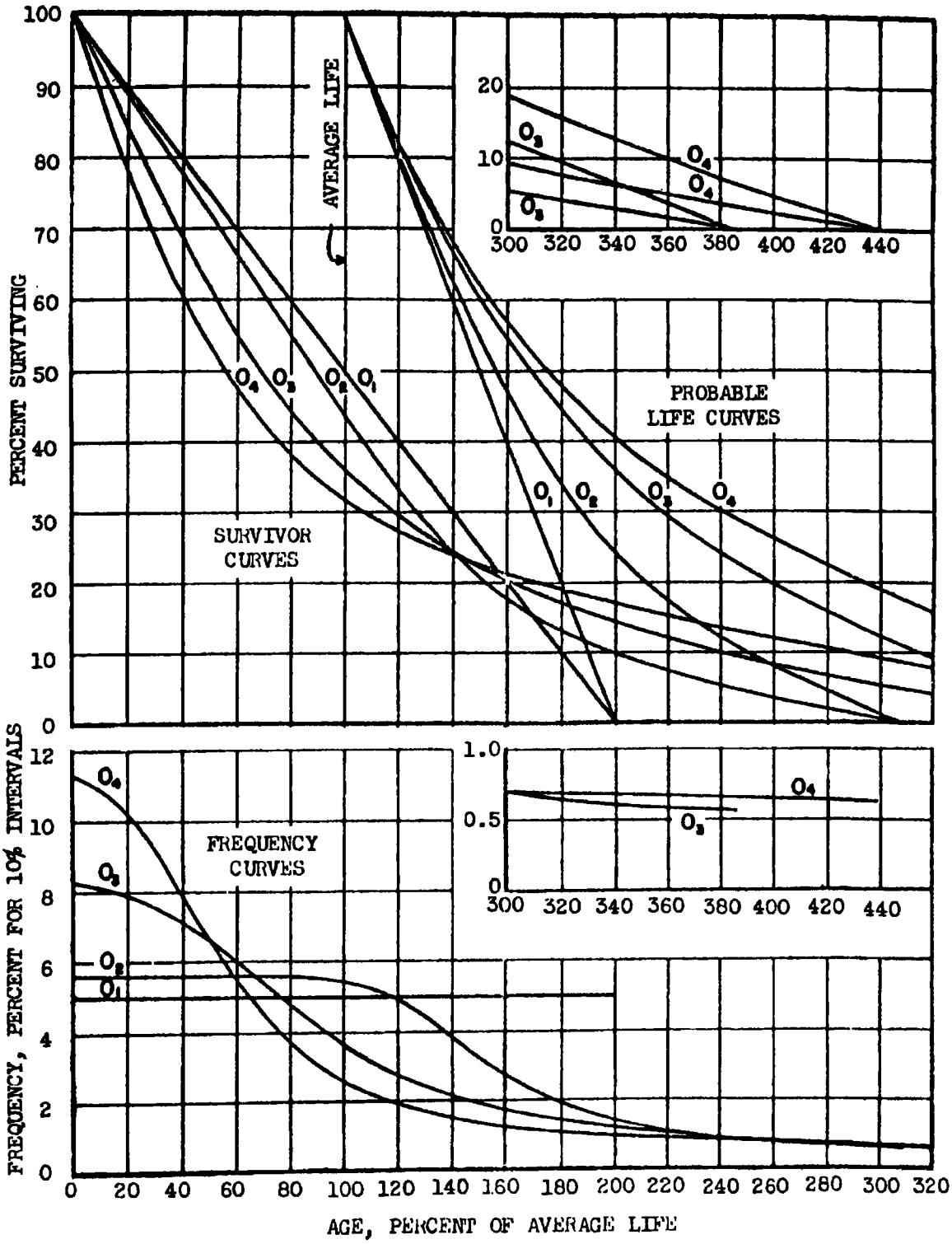


CHART NO. 10

SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE ORIGIN-MODAL TYPE CURVES



Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0000	R2.0	0	0.0948315	100.0000000	100.0000000	0.0000000
R2.0001	R2.0	1	0.0981016	99.9051685	99.0944462	0.9055538
R2.0002	R2.0	2	0.1014623	99.8070669	98.1913567	1.8086433
R2.0003	R2.0	3	0.1049099	99.7056046	97.2907686	2.7092314
R2.0004	R2.0	4	0.1084509	99.6006947	96.3927202	3.6072798
R2.0005	R2.0	5	0.1120825	99.4922438	95.4972458	4.5027542
R2.0006	R2.0	6	0.1158104	99.3801613	94.6043863	5.3956137
R2.0007	R2.0	7	0.1196318	99.2643509	93.7141762	6.2858238
R2.0008	R2.0	8	0.1235532	99.1447191	92.8266525	7.1733475
R2.0009	R2.0	9	0.1275731	99.0211659	91.9418526	8.0581474
R2.0010	R2.0	10	0.1316938	98.8935928	91.0598126	8.9401874
R2.0011	R2.0	11	0.1359167	98.7618990	90.1805687	9.8194313
R2.0012	R2.0	12	0.1402454	98.6259823	89.3041592	10.6958408
R2.0013	R2.0	13	0.1446791	98.4857369	88.4306173	11.5693827
R2.0014	R2.0	14	0.1492214	98.3410578	87.5599813	12.4400187
R2.0015	R2.0	15	0.1538735	98.1918364	86.6922846	13.3077154
R2.0016	R2.0	16	0.1586370	98.0379629	85.8275662	14.1724338
R2.0017	R2.0	17	0.1635142	97.8793259	84.9658604	15.0341396
R2.0018	R2.0	18	0.1685056	97.7158117	84.1072016	15.8927984
R2.0019	R2.0	19	0.1736164	97.5473061	83.2516279	16.7483721
R2.0020	R2.0	20	0.1788426	97.3736897	82.3991718	17.6008282
R2.0021	R2.0	21	0.1841926	97.1948471	81.5498714	18.4501286
R2.0022	R2.0	22	0.1896649	97.0106545	80.7037592	19.2962408
R2.0023	R2.0	23	0.1952619	96.8209896	79.8608723	20.1391277
R2.0024	R2.0	24	0.2009860	96.6257277	79.0212450	20.9787550
R2.0025	R2.0	25	0.2068376	96.4247417	78.1849127	21.8150873
R2.0026	R2.0	26	0.2128210	96.2179041	77.3519096	22.6480904
R2.0027	R2.0	27	0.2189369	96.0050831	76.5222740	23.4777260
R2.0028	R2.0	28	0.2251892	95.7861462	75.6960373	24.3039627
R2.0029	R2.0	29	0.2315780	95.5609570	74.8732357	25.1267643
R2.0030	R2.0	30	0.2381039	95.3293810	74.0539045	25.9460955
R2.0031	R2.0	31	0.2447710	95.0912771	73.2380800	26.7619200
R2.0032	R2.0	32	0.2515831	94.8465061	72.4257956	27.5742044
R2.0033	R2.0	33	0.2585392	94.5949230	71.6170883	28.3829117
R2.0034	R2.0	34	0.2656450	94.3363838	70.8119927	29.1880073
R2.0035	R2.0	35	0.2728977	94.0707388	70.0105457	29.9894543
R2.0036	R2.0	36	0.2803049	93.7978411	69.2127819	30.7872181
R2.0037	R2.0	37	0.2878657	93.5175362	68.4187384	31.5812616
R2.0038	R2.0	38	0.2955808	93.2296705	67.6284504	32.3715496
R2.0039	R2.0	39	0.3034544	92.9340897	66.8419552	33.1580448
R2.0040	R2.0	40	0.3114920	92.6306353	66.0592899	33.9407101
R2.0041	R2.0	41	0.3196878	92.3191433	65.2808571	34.7191429
R2.0042	R2.0	42	0.3280507	91.9994555	64.5055971	35.4944029
R2.0043	R2.0	43	0.3365783	91.6714048	63.7346439	36.2653561
R2.0044	R2.0	44	0.3452769	91.3348265	62.9676700	37.0323300

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0045	R2.0	45	0.3541450	90.9895496	62.2047148	37.7952852
R2.0046	R2.0	46	0.3631840	90.6354046	61.4458170	38.5541830
R2.0047	R2.0	47	0.3723984	90.2722206	60.6910148	39.3089852
R2.0048	R2.0	48	0.3817892	89.8998222	59.9403491	40.0596509
R2.0049	R2.0	49	0.3913574	89.5180330	59.1938582	40.8061418
R2.0050	R2.0	50	0.4011030	89.1266756	58.4515839	41.5484161
R2.0051	R2.0	51	0.4110289	88.7255726	57.7135668	42.2864332
R2.0052	R2.0	52	0.4211368	88.3145437	56.9798470	43.0201530
R2.0053	R2.0	53	0.4314261	87.8934069	56.2504678	43.7495322
R2.0054	R2.0	54	0.4419002	87.4619808	55.5254688	44.4745312
R2.0055	R2.0	55	0.4525547	87.0200806	54.8048959	45.1951041
R2.0056	R2.0	56	0.4633961	86.5675259	54.0887899	45.9112101
R2.0057	R2.0	57	0.4744196	86.1041298	53.3771148	46.6228852
R2.0058	R2.0	58	0.4856272	85.6297102	52.6701531	47.3298469
R2.0059	R2.0	59	0.4970178	85.1440830	51.9677110	48.0322890
R2.0060	R2.0	60	0.5085907	84.6470652	51.2699108	48.7300892
R2.0061	R2.0	61	0.5203457	84.1384745	50.5767999	49.4232001
R2.0062	R2.0	62	0.5322781	83.6181288	49.8884211	50.1115789
R2.0063	R2.0	63	0.5443878	83.0858507	49.2042208	50.7957792
R2.0064	R2.0	64	0.5566711	82.5414629	48.5260449	51.4739551
R2.0065	R2.0	65	0.5691252	81.9847918	47.8521390	52.1478610
R2.0066	R2.0	66	0.5817490	81.4156666	47.1831479	52.8168521
R2.0067	R2.0	67	0.5945339	80.8339176	46.5191188	53.4808812
R2.0068	R2.0	68	0.6074762	80.2393837	45.8600979	54.1399021
R2.0069	R2.0	69	0.6205731	79.6319075	45.2061300	54.7938700
R2.0070	R2.0	70	0.6338167	79.0113344	44.5572619	55.4427381
R2.0071	R2.0	71	0.6471968	78.3775177	43.9135399	56.0864601
R2.0072	R2.0	72	0.6607103	77.7303209	43.2750101	56.7249899
R2.0073	R2.0	73	0.6743469	77.0696106	42.6417151	57.3582849
R2.0074	R2.0	74	0.6880913	76.3952637	42.0137038	57.9862962
R2.0075	R2.0	75	0.7019453	75.7071724	41.3910160	58.6089840
R2.0076	R2.0	76	0.7158861	75.0052271	40.7736988	59.2263012
R2.0077	R2.0	77	0.7299071	74.2893410	40.1617951	59.8382049
R2.0078	R2.0	78	0.7439918	73.5594339	39.5553460	60.4446540
R2.0079	R2.0	79	0.7581263	72.8154421	38.9543939	61.0456061
R2.0080	R2.0	80	0.7722978	72.0573158	38.3589792	61.6410208
R2.0081	R2.0	81	0.7864914	71.2850180	37.7691412	62.2308588
R2.0082	R2.0	82	0.8006802	70.4985266	37.1849198	62.8150802
R2.0083	R2.0	83	0.8148537	69.6978464	36.6063528	63.3936472
R2.0084	R2.0	84	0.8289880	68.8829927	36.0334740	63.9665260
R2.0085	R2.0	85	0.8430577	68.0540047	35.4663181	64.5336819
R2.0086	R2.0	86	0.8570489	67.2109470	34.9049168	65.0950832
R2.0087	R2.0	87	0.8709355	66.3538981	34.3493028	65.6506972
R2.0088	R2.0	88	0.8846855	65.4829626	33.7995038	66.2004962
R2.0089	R2.0	89	0.8982801	64.5982771	33.2555461	66.7444539

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0090	R2.0	90	0.9116889	63.6999970	32.7174568	67.2825432
R2.0091	R2.0	91	0.9248881	62.7883081	32.1852560	67.8147440
R2.0092	R2.0	92	0.9378390	61.8634200	31.6589661	68.3410339
R2.0093	R2.0	93	0.9505158	60.9255810	31.1386020	68.8613980
R2.0094	R2.0	94	0.9628930	59.9750652	30.6241779	69.3758221
R2.0095	R2.0	95	0.9749274	59.0121722	30.1157100	69.8842900
R2.0096	R2.0	96	0.9865956	58.0372448	29.6132040	70.3867960
R2.0097	R2.0	97	0.9978571	57.0506492	29.1166680	70.8833320
R2.0098	R2.0	98	1.0086742	56.0527921	28.6261051	71.3738949
R2.0099	R2.0	99	1.0190200	55.0441179	28.1415110	71.8584890
R2.0100	R2.0	100	1.0288558	54.0250979	27.6628840	72.3371160
R2.0101	R2.0	101	1.0381442	52.9962421	27.1902180	72.8097820
R2.0102	R2.0	102	1.0468449	51.9580979	26.7234991	73.2765009
R2.0103	R2.0	103	1.0549312	50.9112530	26.2627111	73.7372889
R2.0104	R2.0	104	1.0623607	49.8563218	25.8078351	74.1921649
R2.0105	R2.0	105	1.0691033	48.7939611	25.3588469	74.6411531
R2.0106	R2.0	106	1.0751200	47.7248578	24.9157200	75.0842800
R2.0107	R2.0	107	1.0803718	46.6497378	24.4784200	75.5215800
R2.0108	R2.0	108	1.0848422	45.5693660	24.0469079	75.9530921
R2.0109	R2.0	109	1.0884819	44.4845238	23.6211450	76.3788550
R2.0110	R2.0	110	1.0912700	43.3960419	23.2010810	76.7989190
R2.0111	R2.0	111	1.0931697	42.3047719	22.7866659	77.2133341
R2.0112	R2.0	112	1.0941701	41.2116022	22.3778369	77.6221631
R2.0113	R2.0	113	1.0942240	40.1174321	21.9745369	78.0254631
R2.0114	R2.0	114	1.0933342	39.0232081	21.5766909	78.4233091
R2.0115	R2.0	115	1.0914621	37.9298739	21.1842289	78.8157711
R2.0116	R2.0	116	1.0885978	36.8384118	20.7970691	79.2029309
R2.0117	R2.0	117	1.0847301	35.7498140	20.4151239	79.5848761
R2.0118	R2.0	118	1.0798369	34.6650839	20.0383019	79.9616981
R2.0119	R2.0	119	1.0739369	33.5852470	19.6665001	80.3334999
R2.0120	R2.0	120	1.0669980	32.5113101	19.2996221	80.7003779
R2.0121	R2.0	121	1.0590372	31.4443121	18.9375479	81.0624521
R2.0122	R2.0	122	1.0501070	30.3852749	18.5801630	81.4198370
R2.0123	R2.0	123	1.0400660	29.3351679	18.2273769	81.7726231
R2.0124	R2.0	124	1.0290709	28.2951019	17.8789959	82.1210041
R2.0125	R2.0	125	1.0170991	27.2660310	17.5349121	82.4650879
R2.0126	R2.0	126	1.0041568	26.2489319	17.1949849	82.8050151
R2.0127	R2.0	127	0.9902881	25.2447751	16.8590529	83.1409471
R2.0128	R2.0	128	0.9755079	24.2544870	16.5269830	83.4730170
R2.0129	R2.0	129	0.9598532	23.2789791	16.1985951	83.8014049
R2.0130	R2.0	130	0.9433670	22.3191259	15.8737270	84.1262730
R2.0131	R2.0	131	0.9260879	21.3757589	15.5522090	84.4477910
R2.0132	R2.0	132	0.9080550	20.4496710	15.2338660	84.7661340
R2.0133	R2.0	133	0.8893190	19.5416160	14.9185150	85.0814850
R2.0134	R2.0	134	0.8699369	18.6522970	14.6059730	85.3940270

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0135	R2.0	135	0.8499541	17.7823601	14.2960570	85.7039430
R2.0136	R2.0	136	0.8294290	16.9324060	13.9885750	86.0114250
R2.0137	R2.0	137	0.8084200	16.1029770	13.6833420	86.3166580
R2.0138	R2.0	138	0.7869870	15.2945570	13.3801709	86.6198291
R2.0139	R2.0	139	0.7651829	14.5075700	13.0788760	86.9211240
R2.0140	R2.0	140	0.7430681	13.7423871	12.7792740	87.2207260
R2.0141	R2.0	141	0.7207081	12.9993190	12.4811831	87.5188169
R2.0142	R2.0	142	0.6981599	12.2786109	12.1844341	87.8155659
R2.0143	R2.0	143	0.6754730	11.5804510	11.8888620	88.1111380
R2.0144	R2.0	144	0.6527110	10.9049780	11.5943070	88.4056930
R2.0145	R2.0	145	0.6299220	10.2522870	11.3006270	88.6993730
R2.0146	R2.0	146	0.6071579	9.6223450	11.0076849	88.9923151
R2.0147	R2.0	147	0.5844650	9.0151870	10.7153600	89.2846400
R2.0148	R2.0	148	0.5618890	8.4307220	10.4235460	89.5764540
R2.0149	R2.0	149	0.5394630	7.8688330	10.1321560	89.8678440
R2.0150	R2.0	150	0.5172310	7.3293700	9.8411110	90.1588891
R2.0151	R2.0	151	0.4952170	6.8121390	9.5503610	90.4496390
R2.0152	R2.0	152	0.4734520	6.3169220	9.2598670	90.7401331
R2.0153	R2.0	153	0.4519570	5.8434700	8.9696111	91.0303890
R2.0154	R2.0	154	0.4307510	5.3915130	8.6795980	91.3204020
R2.0155	R2.0	155	0.4098480	4.9607620	8.3898460	91.6101540
R2.0156	R2.0	156	0.3892590	4.5509140	8.1003940	91.8996060
R2.0157	R2.0	157	0.3689940	4.1616550	7.8112940	92.1887060
R2.0158	R2.0	158	0.3490550	3.7926610	7.5226200	92.4773800
R2.0159	R2.0	159	0.3294490	3.4436060	7.2344580	92.7655420
R2.0160	R2.0	160	0.3101780	3.1141570	6.9468990	93.0531010
R2.0161	R2.0	161	0.2912410	2.8039790	6.6600590	93.3399410
R2.0162	R2.0	162	0.2726440	2.5127380	6.3740460	93.6259540
R2.0163	R2.0	163	0.2543900	2.2400940	6.0889820	93.9110180
R2.0164	R2.0	164	0.2364840	1.9857040	5.8049920	94.1950080
R2.0165	R2.0	165	0.2189350	1.7492200	5.5221940	94.4778060
R2.0166	R2.0	166	0.2017570	1.5302850	5.2407130	94.7592870
R2.0167	R2.0	167	0.1849660	1.3285280	4.9606590	95.0393410
R2.0168	R2.0	168	0.1685830	1.1435620	4.6821490	95.3178510
R2.0169	R2.0	169	0.1526310	0.9749790	4.4052860	95.5947140
R2.0170	R2.0	170	0.1371620	0.8223480	4.1301220	95.8698780
R2.0171	R2.0	171	0.1221950	0.6851860	3.8568020	96.1431980
R2.0172	R2.0	172	0.1077830	0.5629910	3.5853840	96.4146160
R2.0173	R2.0	173	0.0939780	0.4552080	3.3159460	96.6840540
R2.0174	R2.0	174	0.0808330	0.3612300	3.0485230	96.9514770
R2.0175	R2.0	175	0.0684150	0.2803970	2.7832120	97.2167880
R2.0176	R2.0	176	0.0567860	0.2119820	2.5201260	97.4798740
R2.0177	R2.0	177	0.0460210	0.1551960	2.2592980	97.7407020
R2.0178	R2.0	178	0.0361913	0.1091750	2.0008840	97.9991160
R2.0179	R2.0	179	0.0273739	0.0729837	1.7451020	98.2548980

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5000	R2.5	0	0.0551548	100.0000000	100.0000000	0.0000000
R2.5001	R2.5	1	0.0574713	99.9448452	99.0549097	0.9450903
R2.5002	R2.5	2	0.0598783	99.8873739	98.1116142	1.8883858
R2.5003	R2.5	3	0.0623808	99.8274956	97.1701632	2.8298368
R2.5004	R2.5	4	0.0649805	99.7651148	96.2306089	3.7693911
R2.5005	R2.5	5	0.0676823	99.7001343	95.2930031	4.7069969
R2.5006	R2.5	6	0.0704880	99.6324520	94.3573971	5.6426029
R2.5007	R2.5	7	0.0734014	99.5619640	93.4238472	6.5761528
R2.5008	R2.5	8	0.0764256	99.4885626	92.4924040	7.5075960
R2.5009	R2.5	9	0.0795669	99.4121370	91.5631256	8.4368744
R2.5010	R2.5	10	0.0828257	99.3325701	90.6360693	9.3639307
R2.5011	R2.5	11	0.0862064	99.2497444	89.7112904	10.2887096
R2.5012	R2.5	12	0.0897122	99.1635380	88.7888441	11.2111559
R2.5013	R2.5	13	0.0933485	99.0738258	87.8687897	12.1312103
R2.5014	R2.5	14	0.0971183	98.9804773	86.9511881	13.0488119
R2.5015	R2.5	15	0.1010247	98.8833590	86.0360956	13.9639044
R2.5016	R2.5	16	0.1050710	98.7823343	85.1235743	14.8764257
R2.5017	R2.5	17	0.1092635	98.6772633	84.2136803	15.7863197
R2.5018	R2.5	18	0.1136026	98.5679998	83.3064766	16.6935234
R2.5019	R2.5	19	0.1180954	98.4543972	82.4020252	17.5979748
R2.5020	R2.5	20	0.1227426	98.3363018	81.5003834	18.4996166
R2.5021	R2.5	21	0.1275521	98.2135592	80.6016140	19.3983860
R2.5022	R2.5	22	0.1325226	98.0860071	79.7057791	20.2942209
R2.5023	R2.5	23	0.1376619	97.9534845	78.8129368	21.1870632
R2.5024	R2.5	24	0.1429729	97.8158226	77.9231520	22.0768480
R2.5025	R2.5	25	0.1484576	97.6728497	77.0364828	22.9635172
R2.5026	R2.5	26	0.1541233	97.5243921	76.1529923	23.8470077
R2.5027	R2.5	27	0.1599703	97.3702688	75.2727404	24.7272596
R2.5028	R2.5	28	0.1660032	97.2102985	74.3957863	25.6042137
R2.5029	R2.5	29	0.1722278	97.0442953	73.5221920	26.4778080
R2.5030	R2.5	30	0.1786452	96.8720675	72.6520176	27.3479824
R2.5031	R2.5	31	0.1852608	96.6934223	71.7853222	28.2146778
R2.5032	R2.5	32	0.1920747	96.5081615	70.9221630	29.0778370
R2.5033	R2.5	33	0.1990958	96.3160868	70.0626001	29.9373999
R2.5034	R2.5	34	0.2063245	96.1169910	69.2066917	30.7933083
R2.5035	R2.5	35	0.2137642	95.9106665	68.3544951	31.6455049
R2.5036	R2.5	36	0.2214194	95.6969023	67.5060663	32.4939337
R2.5037	R2.5	37	0.2292928	95.4754829	66.6614609	33.3385391
R2.5038	R2.5	38	0.2373877	95.2461901	65.8207359	34.1792641
R2.5039	R2.5	39	0.2457084	95.0088024	64.9839459	35.0160541
R2.5040	R2.5	40	0.2542592	94.7630940	64.1511440	35.8488560
R2.5041	R2.5	41	0.2630376	94.5088348	63.3223858	36.6776142
R2.5042	R2.5	42	0.2720566	94.2457972	62.4977222	37.5022778
R2.5043	R2.5	43	0.2813111	93.9737406	61.6772060	38.3227940
R2.5044	R2.5	44	0.2908077	93.6924295	60.8608909	39.1391091

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5045	R2.5	45	0.3005543	93.4016218	60.0488248	39.9511752
R2.5046	R2.5	46	0.3105459	93.1010675	59.2410641	40.7589359
R2.5047	R2.5	47	0.3207922	92.7905216	58.4376559	41.5623441
R2.5048	R2.5	48	0.3312959	92.4697294	57.6386509	42.3613491
R2.5049	R2.5	49	0.3420601	92.1384335	56.8441010	43.1558990
R2.5050	R2.5	50	0.3530903	91.7963734	56.0540552	43.9459448
R2.5051	R2.5	51	0.3643885	91.4432831	55.2685661	44.7314339
R2.5052	R2.5	52	0.3759584	91.0788946	54.4876838	45.5123162
R2.5053	R2.5	53	0.3878079	90.7029362	53.7114601	46.2885399
R2.5054	R2.5	54	0.3999405	90.3151283	52.9399471	47.0600529
R2.5055	R2.5	55	0.4123592	89.9151878	52.1731982	47.8268018
R2.5056	R2.5	56	0.4250708	89.5028286	51.4112682	48.5887318
R2.5057	R2.5	57	0.4380798	89.0777578	50.6542120	49.3457880
R2.5058	R2.5	58	0.4513912	88.6396780	49.9020872	50.0979128
R2.5059	R2.5	59	0.4650126	88.1882868	49.1549511	50.8450489
R2.5060	R2.5	60	0.4789476	87.7232742	48.4128661	51.5871339
R2.5061	R2.5	61	0.4932022	87.2443266	47.6758952	52.3241048
R2.5062	R2.5	62	0.5077830	86.7511244	46.9441018	53.0558982
R2.5063	R2.5	63	0.5226945	86.2433414	46.2175550	53.7824450
R2.5064	R2.5	64	0.5379439	85.7206469	45.4963250	54.5036750
R2.5065	R2.5	65	0.5535354	85.1827030	44.7804852	55.2195148
R2.5066	R2.5	66	0.5694743	84.6291676	44.0701108	55.9298892
R2.5067	R2.5	67	0.5857687	84.0596933	43.3652830	56.6347170
R2.5068	R2.5	68	0.6024160	83.4739246	42.6660848	57.3339152
R2.5069	R2.5	69	0.6194267	82.8715086	41.9726019	58.0273981
R2.5070	R2.5	70	0.6368008	82.2520819	41.2849250	58.7150750
R2.5071	R2.5	71	0.6545391	81.6152811	40.6031480	59.3968520
R2.5072	R2.5	72	0.6726418	80.9607420	39.9273682	60.0726318
R2.5073	R2.5	73	0.6911087	80.2881002	39.2576852	60.7423148
R2.5074	R2.5	74	0.7099390	79.5969915	38.5942020	61.4057980
R2.5075	R2.5	75	0.7291259	78.8870525	37.9370279	62.0629721
R2.5076	R2.5	76	0.7486620	78.1579266	37.2862740	62.7137260
R2.5077	R2.5	77	0.7685376	77.4092646	36.6420512	63.3579488
R2.5078	R2.5	78	0.7887430	76.6407270	36.0044770	63.9955230
R2.5079	R2.5	79	0.8092565	75.8519840	35.3736682	64.6263318
R2.5080	R2.5	80	0.8300667	75.0427275	34.7497439	65.2502561
R2.5081	R2.5	81	0.8511477	74.2126608	34.1328259	65.8671741
R2.5082	R2.5	82	0.8724718	73.3615131	33.5230379	66.4769621
R2.5083	R2.5	83	0.8940096	72.4890413	32.9204998	67.0795002
R2.5084	R2.5	84	0.9157238	71.5950317	32.3253360	67.6746640
R2.5085	R2.5	85	0.9375753	70.6793079	31.7376659	68.2623341
R2.5086	R2.5	86	0.9595194	69.7417326	31.1576109	68.8423891
R2.5087	R2.5	87	0.9815073	68.7822132	30.5852881	69.4147119
R2.5088	R2.5	88	1.0034790	67.8007059	30.0208130	69.9791870
R2.5089	R2.5	89	1.0253773	66.7972269	29.4642980	70.5357020

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5090	R2.5	90	1.0471344	65.7718496	28.9158480	71.0841520
R2.5091	R2.5	91	1.0686831	64.7247152	28.3755679	71.6244321
R2.5092	R2.5	92	1.0899420	63.6560321	27.8435540	72.1564460
R2.5093	R2.5	93	1.1108289	62.5660901	27.3198969	72.6801031
R2.5094	R2.5	94	1.1312651	61.4552612	26.8046770	73.1953230
R2.5095	R2.5	95	1.1511522	60.3239961	26.2979729	73.7020271
R2.5096	R2.5	96	1.1704039	59.1728439	25.7998481	74.2001519
R2.5097	R2.5	97	1.1889191	58.0024400	25.3103621	74.6896379
R2.5098	R2.5	98	1.2065949	56.8135209	24.8295610	75.1704390
R2.5099	R2.5	99	1.2233358	55.6069260	24.3574791	75.6425209
R2.5100	R2.5	100	1.2390403	54.3835902	23.8941431	76.1058569
R2.5101	R2.5	101	1.2536021	53.1445499	23.4395671	76.5604329
R2.5102	R2.5	102	1.2669158	51.8909478	22.9937501	77.0062499
R2.5103	R2.5	103	1.2788939	50.6240320	22.5566781	77.4433219
R2.5104	R2.5	104	1.2894273	49.3451381	22.1283281	77.8716719
R2.5105	R2.5	105	1.2984328	48.0557108	21.7086580	78.2913420
R2.5106	R2.5	106	1.3058210	46.7572780	21.2976141	78.7023859
R2.5107	R2.5	107	1.3115058	45.4514570	20.8951299	79.1048701
R2.5108	R2.5	108	1.3154220	44.1399512	20.5011189	79.4988811
R2.5109	R2.5	109	1.3175020	42.8245292	20.1154850	79.8845150
R2.5110	R2.5	110	1.3176890	41.5070272	19.7381129	80.2618871
R2.5111	R2.5	111	1.3159404	40.1893382	19.3688741	80.6311259
R2.5112	R2.5	112	1.3122248	38.8733978	19.0076220	80.9923780
R2.5113	R2.5	113	1.3065191	37.5611730	18.6541979	81.3458021
R2.5114	R2.5	114	1.2988228	36.2546539	18.3084259	81.6915741
R2.5115	R2.5	115	1.2891360	34.9558311	17.9701180	82.0298820
R2.5116	R2.5	116	1.2774830	33.6666951	17.6390679	82.3609321
R2.5117	R2.5	117	1.2638931	32.3892121	17.3150611	82.6849389
R2.5118	R2.5	118	1.2484150	31.1253190	16.9978631	83.0021369
R2.5119	R2.5	119	1.2311139	29.8769040	16.6872311	83.3127689
R2.5120	R2.5	120	1.2120590	28.6457901	16.3829119	83.6170881
R2.5121	R2.5	121	1.1913381	27.4337311	16.0846400	83.9153600
R2.5122	R2.5	122	1.1690731	26.2423930	15.7921439	84.2078561
R2.5123	R2.5	123	1.1452968	25.0733199	15.5051580	84.4948420
R2.5124	R2.5	124	1.1201971	23.9280231	15.2233681	84.7766319
R2.5125	R2.5	125	1.0938761	22.8078260	14.9465010	85.0534990
R2.5126	R2.5	126	1.0664589	21.7139499	14.6742671	85.3257329
R2.5127	R2.5	127	1.0380819	20.6474910	14.4063790	85.5936210
R2.5128	R2.5	128	1.0088780	19.6094091	14.1425540	85.8574460
R2.5129	R2.5	129	0.9789822	18.6005311	13.8825150	86.1174850
R2.5130	R2.5	130	0.9485328	17.6215489	13.6259940	86.3740060
R2.5131	R2.5	131	0.9176611	16.6730161	13.3727360	86.6272640
R2.5132	R2.5	132	0.8864870	15.7553550	13.1224999	86.8775001
R2.5133	R2.5	133	0.8551400	14.8688680	12.8750581	87.1249419
R2.5134	R2.5	134	0.8237340	14.0137280	12.6302040	87.3697960

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5135	R2.5	135	0.7923711	13.1899940	12.3877521	87.6122479
R2.5136	R2.5	136	0.7611500	12.3976229	12.1475360	87.8524640
R2.5137	R2.5	137	0.7301579	11.6364729	11.9094091	88.0905909
R2.5138	R2.5	138	0.6994760	10.9063150	11.6732490	88.3267510
R2.5139	R2.5	139	0.6691670	10.2068390	11.4389530	88.5610470
R2.5140	R2.5	140	0.6392890	9.5376720	11.2064340	88.7935660
R2.5141	R2.5	141	0.6098980	8.8983830	10.9756200	89.0243800
R2.5142	R2.5	142	0.5810320	8.2884851	10.7464550	89.2535450
R2.5143	R2.5	143	0.5527210	7.7074530	10.5188921	89.4811079
R2.5144	R2.5	144	0.5249980	7.1547320	10.2928760	89.7071240
R2.5145	R2.5	145	0.4978830	6.6297340	10.0683579	89.9316421
R2.5146	R2.5	146	0.4713970	6.1318510	9.8452730	90.1547270
R2.5147	R2.5	147	0.4455530	5.6604540	9.6235380	90.3764620
R2.5148	R2.5	148	0.4203759	5.2149010	9.4030380	90.5969620
R2.5149	R2.5	149	0.3958700	4.7945250	9.1836420	90.8163580
R2.5150	R2.5	150	0.3720580	4.3986550	8.9651520	91.0348480
R2.5151	R2.5	151	0.3489550	4.0265970	8.7473331	91.2526670
R2.5152	R2.5	152	0.3265810	3.6776420	8.5298860	91.4701140
R2.5153	R2.5	153	0.3049580	3.3510610	8.3124470	91.6875531
R2.5154	R2.5	154	0.2841100	3.0461030	8.0945830	91.9054170
R2.5155	R2.5	155	0.2640620	2.7619930	7.8757930	92.1242070
R2.5156	R2.5	156	0.2448380	2.4979310	7.6555050	92.3444950
R2.5157	R2.5	157	0.2264680	2.2530930	7.4330760	92.5669240
R2.5158	R2.5	158	0.2089740	2.0266250	7.2078220	92.7921780
R2.5159	R2.5	159	0.1923820	1.8176510	6.9790150	93.0209850
R2.5160	R2.5	160	0.1767130	1.6252690	6.7459320	93.2540680
R2.5161	R2.5	161	0.1619790	1.4485560	6.5078890	93.4921110
R2.5162	R2.5	162	0.1481900	1.2865770	6.2642780	93.7357220
R2.5163	R2.5	163	0.1353470	1.1383870	6.0146450	93.9853550
R2.5164	R2.5	164	0.1234370	1.0030400	5.7587730	94.2412270
R2.5165	R2.5	165	0.1124400	0.8796030	5.4967510	94.5032490
R2.5166	R2.5	166	0.1023100	0.7671630	5.2291050	94.7708950
R2.5167	R2.5	167	0.0929890	0.6648530	4.9568360	95.0431640
R2.5168	R2.5	168	0.0843740	0.5718640	4.6815480	95.3184520
R2.5169	R2.5	169	0.0763160	0.4874900	4.4052840	95.5947160
R2.5170	R2.5	170	0.0685810	0.4111740	4.1301250	95.8698750
R2.5171	R2.5	171	0.0610970	0.3425930	3.8568110	96.1431890
R2.5172	R2.5	172	0.0538920	0.2814960	3.5853870	96.4146130
R2.5173	R2.5	173	0.0469890	0.2276040	3.3159430	96.6840570
R2.5174	R2.5	174	0.0404160	0.1806150	3.0485420	96.9514580
R2.5175	R2.5	175	0.0342080	0.1401990	2.7832260	97.2167740
R2.5176	R2.5	176	0.0283930	0.1059910	2.5201240	97.4798760
R2.5177	R2.5	177	0.0230100	0.0775980	2.2592850	97.7407150
R2.5178	R2.5	178	0.0181160	0.0545880	2.0008610	97.9991390
R2.5179	R2.5	179	0.0136670	0.0364720	1.7451220	98.2548780

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5180	R2.5	180	0.0098240	0.0228050	1.4924140	98.5075860
R2.5181	R2.5	181	0.0065460	0.0129810	1.2434710	98.7565290
R2.5182	R2.5	182	0.0038930	0.0064350	0.9997670	99.0002330
R2.5183	R2.5	183	0.0019010	0.0025420	0.7651460	99.2348540
R2.5184	R2.5	184	0.0006080	0.0006410	0.5514820	99.4485180
R2.5185	R2.5	185	0.0000330	0.0000330	0.5000000	99.5000000
R2.5186	R2.5	186	0.0000000	0.0000000	0.0000000	100.0000000

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R3.0000	R3.0	0	0.0154791	100.0000000	100.0000000	0.0000000
R3.0001	R3.0	1	0.0168400	99.9845209	99.0154038	0.9845962
R3.0002	R3.0	2	0.0182953	99.9676809	98.0319996	1.9680004
R3.0003	R3.0	3	0.0198507	99.9493856	97.0498524	2.9501476
R3.0004	R3.0	4	0.0215111	99.9295349	96.0690317	3.9309683
R3.0005	R3.0	5	0.0232811	99.9080238	95.0896082	4.9103918
R3.0006	R3.0	6	0.0251655	99.8847427	94.1116552	5.8883448
R3.0007	R3.0	7	0.0271702	99.8595772	93.1352463	6.8647537
R3.0008	R3.0	8	0.0292997	99.8324070	92.1604576	7.8395424
R3.0009	R3.0	9	0.0315600	99.8031073	91.1873674	8.8126326
R3.0010	R3.0	10	0.0339584	99.7715473	90.2160540	9.7839460
R3.0011	R3.0	11	0.0364952	99.7375889	89.2465992	10.7534008
R3.0012	R3.0	12	0.0391798	99.7010937	88.2790852	11.7209148
R3.0013	R3.0	13	0.0420189	99.6619139	87.3135939	12.6864061
R3.0014	R3.0	14	0.0450144	99.6198950	86.3502102	13.6497898
R3.0015	R3.0	15	0.0481758	99.5748806	85.3890209	14.6109791
R3.0016	R3.0	16	0.0515060	99.5267048	84.4301109	15.5698891
R3.0017	R3.0	17	0.0550118	99.4751988	83.4735680	16.5264320
R3.0018	R3.0	18	0.0586996	99.4201870	82.5194798	17.4805202
R3.0019	R3.0	19	0.0625744	99.3614874	81.5679340	18.4320660
R3.0020	R3.0	20	0.0666428	99.2989130	80.6190205	19.3809795
R3.0021	R3.0	21	0.0709104	99.2322702	79.6728268	20.3271732
R3.0022	R3.0	22	0.0753794	99.1613598	78.7294426	21.2705574
R3.0023	R3.0	23	0.0800638	99.0859804	77.7889566	22.2110434
R3.0024	R3.0	24	0.0849600	99.0059166	76.8514566	23.1485434
R3.0025	R3.0	25	0.0900774	98.9209566	75.9170332	24.0829668
R3.0026	R3.0	26	0.0954256	98.8308792	74.9857712	25.0142288
R3.0027	R3.0	27	0.1010027	98.7354536	74.0577602	25.9422398
R3.0028	R3.0	28	0.1068191	98.6344509	73.1330843	26.8669157
R3.0029	R3.0	29	0.1128788	98.5276318	72.2118292	27.7881708
R3.0030	R3.0	30	0.1191874	98.4147530	71.2940807	28.7059193
R3.0031	R3.0	31	0.1257477	98.2955656	70.3799210	29.6200790
R3.0032	R3.0	32	0.1325683	98.1698179	69.4694319	30.5305681
R3.0033	R3.0	33	0.1396523	98.0372496	68.5626936	31.4373064
R3.0034	R3.0	34	0.1470041	97.8975973	67.6597862	32.3402138
R3.0035	R3.0	35	0.1546307	97.7505932	66.7607861	33.2392139
R3.0036	R3.0	36	0.1625337	97.5959625	65.8657694	34.1342306
R3.0037	R3.0	37	0.1707211	97.4334288	64.9748087	35.0251913
R3.0038	R3.0	38	0.1791944	97.2627077	64.0879793	35.9120207
R3.0039	R3.0	39	0.1879616	97.0835133	63.2053480	36.7946520
R3.0040	R3.0	40	0.1970244	96.8955517	62.3269858	37.6730142
R3.0041	R3.0	41	0.2063894	96.6985273	61.4529600	38.5470400
R3.0042	R3.0	42	0.2160606	96.4921379	60.5833340	39.4166660
R3.0043	R3.0	43	0.2260437	96.2760773	59.7181711	40.2818289
R3.0044	R3.0	44	0.2363405	96.0500336	58.8575339	41.1424661

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R3.0045	R3.0	45	0.2469616	95.8136931	58.0014839	41.9985161
R3.0046	R3.0	46	0.2579089	95.5667315	57.1500778	42.8499222
R3.0047	R3.0	47	0.2691869	95.3088226	56.3033738	43.6966262
R3.0048	R3.0	48	0.2808028	95.0396357	55.4614301	44.5385699
R3.0049	R3.0	49	0.2927637	94.7588329	54.6243000	45.3757000
R3.0050	R3.0	50	0.3050775	94.4660692	53.7920389	46.2079611
R3.0051	R3.0	51	0.3177452	94.1609917	52.9647021	47.0352979
R3.0052	R3.0	52	0.3307829	93.8432465	52.1423440	47.8576560
R3.0053	R3.0	53	0.3441897	93.5124636	51.3250179	48.6749821
R3.0054	R3.0	54	0.3579797	93.1682739	50.5127802	49.4872198
R3.0055	R3.0	55	0.3721629	92.8102942	49.7056861	50.2943139
R3.0056	R3.0	56	0.3867464	92.4381313	48.9037910	51.0962090
R3.0057	R3.0	57	0.4017400	92.0513849	48.1071558	51.8928442
R3.0058	R3.0	58	0.4171553	91.6496449	47.3158379	52.6841621
R3.0059	R3.0	59	0.4330063	91.2324896	46.5299010	53.4700990
R3.0060	R3.0	60	0.4493046	90.7994833	45.7494102	54.2505898
R3.0061	R3.0	61	0.4660597	90.3501787	44.9744310	55.0255690
R3.0062	R3.0	62	0.4832878	89.8841190	44.2050362	55.7949638
R3.0063	R3.0	63	0.5010013	89.4008312	43.4412990	56.5587010
R3.0064	R3.0	64	0.5192156	88.8998299	42.6832981	57.3167019
R3.0065	R3.0	65	0.5379458	88.3806143	41.9311161	58.0688839
R3.0066	R3.0	66	0.5572013	87.8426685	41.1848378	58.8151622
R3.0067	R3.0	67	0.5770016	87.2854672	40.4445572	59.5554428
R3.0068	R3.0	68	0.5973559	86.7084656	39.7103682	60.2896318
R3.0069	R3.0	69	0.6182804	86.1111097	38.9823709	61.0176291
R3.0070	R3.0	70	0.6397857	85.4928293	38.2606740	61.7393260
R3.0071	R3.0	71	0.6618805	84.8530436	37.5453868	62.4546132
R3.0072	R3.0	72	0.6845751	84.1911631	36.8366242	63.1633758
R3.0073	R3.0	73	0.7078676	83.5065880	36.1345072	63.8654928
R3.0074	R3.0	74	0.7317868	82.7987204	35.4391561	64.5608439
R3.0075	R3.0	75	0.7563066	82.0669336	34.7507062	65.2492938
R3.0076	R3.0	76	0.7814388	81.3106270	34.0692878	65.9307122
R3.0077	R3.0	77	0.8071690	80.5291882	33.3950372	66.6049628
R3.0078	R3.0	78	0.8334932	79.7220192	32.7280932	67.2719068
R3.0079	R3.0	79	0.8603878	78.8885260	32.0685968	67.9314032
R3.0080	R3.0	80	0.8878355	78.0281382	31.4166920	68.5833080
R3.0081	R3.0	81	0.9158049	77.1403027	30.7725229	69.2274771
R3.0082	R3.0	82	0.9442616	76.2244978	30.1362350	69.8637650
R3.0083	R3.0	83	0.9731655	75.2802362	29.5079711	70.4920289
R3.0084	R3.0	84	1.0024595	74.3070707	28.8878751	71.1121249
R3.0085	R3.0	85	1.0320921	73.3046112	28.2760870	71.7239130
R3.0086	R3.0	86	1.0619917	72.2725191	27.6727450	72.3272550
R3.0087	R3.0	87	1.0920782	71.2105274	27.0779829	72.9220171
R3.0088	R3.0	88	1.1222725	70.1184492	26.4919291	73.5080709
R3.0089	R3.0	89	1.1524744	68.9961767	25.9147060	74.0852940

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R3.0090	R3.0	90	1.1825809	67.8437023	25.3464310	74.6535690
R3.0091	R3.0	91	1.2124787	66.6611214	24.7872109	75.2127891
R3.0092	R3.0	92	1.2420444	65.4486427	24.2371471	75.7628529
R3.0093	R3.0	93	1.2711425	64.2065983	23.6963310	76.3036690
R3.0094	R3.0	94	1.2996359	62.9354558	23.1648400	76.8351600
R3.0095	R3.0	95	1.3273778	61.6358199	22.6427441	77.3572559
R3.0096	R3.0	96	1.3542113	60.3084421	22.1301019	77.8698981
R3.0097	R3.0	97	1.3799820	58.9542308	21.6269579	78.3730421
R3.0098	R3.0	98	1.4045148	57.5742488	21.1333439	78.8666561
R3.0099	R3.0	99	1.4276528	56.1697340	20.6492770	79.3507230
R3.0100	R3.0	100	1.4492231	54.7420812	20.1747630	79.8252370
R3.0101	R3.0	101	1.4690599	53.2928581	19.7097900	80.2902100
R3.0102	R3.0	102	1.4869881	51.8237982	19.2543340	80.7456660
R3.0103	R3.0	103	1.5028572	50.3368101	18.8083510	81.1916490
R3.0104	R3.0	104	1.5164928	48.8339529	18.3717880	81.6282120
R3.0105	R3.0	105	1.5277629	47.3174601	17.9445670	82.0554330
R3.0106	R3.0	106	1.5365224	45.7896972	17.5266011	82.4733989
R3.0107	R3.0	107	1.5426388	44.2531748	17.1177840	82.8822160
R3.0108	R3.0	108	1.5460029	42.7105360	16.7179930	83.2820070
R3.0109	R3.0	109	1.5465211	41.1645331	16.3270869	83.6729131
R3.0110	R3.0	110	1.5441080	39.6180120	15.9449101	84.0550899
R3.0111	R3.0	111	1.5387101	38.0739040	15.5712870	84.4287130
R3.0112	R3.0	112	1.5302810	36.5351939	15.2060260	84.7939740
R3.0113	R3.0	113	1.5188141	35.0049129	14.8489180	85.1510820
R3.0114	R3.0	114	1.5043109	33.4860988	14.4997360	85.5002640
R3.0115	R3.0	115	1.4868099	31.9817879	14.1582340	85.8417660
R3.0116	R3.0	116	1.4663680	30.4949780	13.8241530	86.1758470
R3.0117	R3.0	117	1.4430571	29.0286100	13.4972171	86.5027829
R3.0118	R3.0	118	1.4169929	27.5855529	13.1771280	86.8228720
R3.0119	R3.0	119	1.3882911	26.1685600	12.8635780	87.1364220
R3.0120	R3.0	120	1.3571188	24.7802689	12.5562360	87.4437640
R3.0121	R3.0	121	1.3236401	23.4231501	12.2547650	87.7452350
R3.0122	R3.0	122	1.2880390	22.0995100	11.9588110	88.0411890
R3.0123	R3.0	123	1.2505269	20.8114710	11.6680059	88.3319941
R3.0124	R3.0	124	1.2113230	19.5609441	11.3819740	88.6180260
R3.0125	R3.0	125	1.1706541	18.3496211	11.1003320	88.8996680
R3.0126	R3.0	126	1.1287601	17.1789670	10.8226880	89.1773120
R3.0127	R3.0	127	1.0858769	16.0502069	10.5486490	89.4513510
R3.0128	R3.0	128	1.0422470	14.9643300	10.2778220	89.7221780
R3.0129	R3.0	129	0.9981119	13.9220830	10.0098190	89.9901810
R3.0130	R3.0	130	0.9536992	12.9239711	9.7442570	90.2557430
R3.0131	R3.0	131	0.9092329	11.9702719	9.4807680	90.5192320
R3.0132	R3.0	132	0.8649200	11.0610390	9.2190000	90.7810000
R3.0133	R3.0	133	0.8209611	10.1961190	8.9586190	91.0413810
R3.0134	R3.0	134	0.7775309	9.3751580	8.6993200	91.3006800

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R3.0135	R3.0	135	0.7347881	8.5976270	8.4408310	91.5591691
R3.0136	R3.0	136	0.6928700	7.8628390	8.1829081	91.8170919
R3.0137	R3.0	137	0.6518970	7.1699690	7.9253460	92.0746540
R3.0138	R3.0	138	0.6119650	6.5180720	7.6679810	92.3320190
R3.0139	R3.0	139	0.5731500	5.9061070	7.4106960	92.5893040
R3.0140	R3.0	140	0.5355110	5.3329570	7.1534120	92.8465880
R3.0141	R3.0	141	0.4990880	4.7974460	6.8960930	93.1039070
R3.0142	R3.0	142	0.4639030	4.2983580	6.6387510	93.3612490
R3.0143	R3.0	143	0.4299690	3.8344550	6.3814340	93.6185660
R3.0144	R3.0	144	0.3972850	3.4044860	6.1242290	93.8757710
R3.0145	R3.0	145	0.3658450	3.0072010	5.8672540	94.1327460
R3.0146	R3.0	146	0.3356360	2.6413560	5.6106530	94.3893470
R3.0147	R3.0	147	0.3066410	2.3057200	5.3545910	94.6454090
R3.0148	R3.0	148	0.2788620	1.9990790	5.0992460	94.9007540
R3.0149	R3.0	149	0.2522770	1.7202170	4.8448220	95.1551780
R3.0150	R3.0	150	0.2268850	1.4679400	4.5915160	95.4084840
R3.0151	R3.0	151	0.2026930	1.2410550	4.3395140	95.6604860
R3.0152	R3.0	152	0.1797100	1.0383620	4.0890000	95.9110000
R3.0153	R3.0	153	0.1579600	0.8586520	3.8401530	96.1598470
R3.0154	R3.0	154	0.1374690	0.7006920	3.5931400	96.4068600
R3.0155	R3.0	155	0.1182750	0.5632230	3.3480970	96.6519030
R3.0156	R3.0	156	0.1004170	0.4449480	3.1051630	96.8948370
R3.0157	R3.0	157	0.0839420	0.3445310	2.8644800	97.1355200
R3.0158	R3.0	158	0.0688930	0.2605890	2.6261500	97.3738500
R3.0159	R3.0	159	0.0553160	0.1916960	2.3902580	97.6097420
R3.0160	R3.0	160	0.0432485	0.1363800	2.1569580	97.8430420
R3.0161	R3.0	161	0.0327163	0.0931315	1.9263620	98.0736380
R3.0162	R3.0	162	0.0237359	0.0604152	1.6987790	98.3012210
R3.0163	R3.0	163	0.0163033	0.0366793	1.4745100	98.5254900
R3.0164	R3.0	164	0.0103913	0.0203760	1.2542690	98.7457310
R3.0165	R3.0	165	0.0059434	0.0099847	1.0392430	98.9607570
R3.0166	R3.0	166	0.0028646	0.0040413	0.8322900	99.1677100
R3.0167	R3.0	167	0.0010104	0.0011767	0.6413070	99.3586930
R3.0168	R3.0	168	0.0001662	0.0001662	0.4999820	99.5000180
R3.0169	R3.0	169	0.0000000	0.0000000	0.0000000	100.0000000

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0000	R4.0	0	0.0008278	100.0000000	100.0000000	0.0000000
R4.0001	R4.0	1	0.0009632	99.9991722	99.0013161	0.9986839
R4.0002	R4.0	2	0.0011139	99.9982090	98.0022631	1.9977369
R4.0003	R4.0	3	0.0012894	99.9970951	97.0033197	2.9966803
R4.0004	R4.0	4	0.0014858	99.9958057	96.0045939	3.9954061
R4.0005	R4.0	5	0.0017109	99.9943199	95.0060129	4.9939871
R4.0006	R4.0	6	0.0019645	99.9926090	94.0076304	5.9923696
R4.0007	R4.0	7	0.0022536	99.9906445	93.0094681	6.9905319
R4.0008	R4.0	8	0.0025768	99.9883909	92.0115519	7.9884481
R4.0009	R4.0	9	0.0029430	99.9858141	91.0139113	8.9860887
R4.0010	R4.0	10	0.0033541	99.9828711	90.0165749	9.9834251
R4.0011	R4.0	11	0.0038157	99.9795170	89.0195789	10.9804211
R4.0012	R4.0	12	0.0043325	99.9757013	88.0229569	11.9770431
R4.0013	R4.0	13	0.0049095	99.9713688	87.0267496	12.9732504
R4.0014	R4.0	14	0.0055561	99.9664593	86.0310001	13.9689999
R4.0015	R4.0	15	0.0062743	99.9609032	85.0357533	14.9642467
R4.0016	R4.0	16	0.0070753	99.9546289	84.0410605	15.9589395
R4.0017	R4.0	17	0.0079612	99.9475536	83.0469732	16.9530268
R4.0018	R4.0	18	0.0089484	99.9395924	82.0535498	17.9464502
R4.0019	R4.0	19	0.0100383	99.9306440	81.0608521	18.9391479
R4.0020	R4.0	20	0.0112429	99.9206057	80.0689449	19.9310551
R4.0021	R4.0	21	0.0125732	99.9093628	79.0778990	20.9221010
R4.0022	R4.0	22	0.0140372	99.8967896	78.0877886	21.9122114
R4.0023	R4.0	23	0.0156517	99.8827524	77.0986939	22.9013061
R4.0024	R4.0	24	0.0174217	99.8671007	76.1106977	23.8893023
R4.0025	R4.0	25	0.0193634	99.8496790	75.1238899	24.8761101
R4.0026	R4.0	26	0.0214911	99.8303156	74.1383648	25.8616352
R4.0027	R4.0	27	0.0238161	99.8088245	73.1542206	26.8457794
R4.0028	R4.0	28	0.0263576	99.7850084	72.1715622	27.8284378
R4.0029	R4.0	29	0.0291262	99.7586508	71.1904984	28.8095016
R4.0030	R4.0	30	0.0321426	99.7295246	70.2111445	29.7888555
R4.0031	R4.0	31	0.0354223	99.6973820	69.2336187	30.7663813
R4.0032	R4.0	32	0.0389815	99.6619597	68.2580481	31.7419519
R4.0033	R4.0	33	0.0428438	99.6229782	67.2845621	32.7154379
R4.0034	R4.0	34	0.0470247	99.5801344	66.3132954	33.6867046
R4.0035	R4.0	35	0.0515423	99.5331097	65.3443880	34.6556120
R4.0036	R4.0	36	0.0564251	99.4815674	64.3779860	35.6220140
R4.0037	R4.0	37	0.0616894	99.4251423	63.4142370	36.5857630
R4.0038	R4.0	38	0.0673580	99.3634529	62.4532971	37.5467029
R4.0039	R4.0	39	0.0734539	99.2960949	61.4953232	38.5046768
R4.0040	R4.0	40	0.0800018	99.2226410	60.5404782	39.4595218
R4.0041	R4.0	41	0.0870266	99.1426392	59.5889268	40.4110732
R4.0042	R4.0	42	0.0945492	99.0556126	58.6408401	41.3591599
R4.0043	R4.0	43	0.1025982	98.9610634	57.6963892	42.3036108
R4.0044	R4.0	44	0.1111975	98.8584652	56.7557492	43.2442508

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1 Lookup	2 Curve	3 Age %	4 % Ret	5 % Surv	6 % Cond	7 % Depr Resv
R4.0045	R4.0	45	0.1203727	98.7472677	55.8190970	44.1809030
R4.0046	R4.0	46	0.1301480	98.6268950	54.8866129	45.1133871
R4.0047	R4.0	47	0.1405506	98.4967470	53.9584770	46.0415230
R4.0048	R4.0	48	0.1516085	98.3561964	53.0348692	46.9651308
R4.0049	R4.0	49	0.1633424	98.2045879	52.1159720	47.8840280
R4.0050	R4.0	50	0.1757803	98.0412455	51.2019682	48.7980318
R4.0051	R4.0	51	0.1889468	97.8654652	50.2930360	49.7069640
R4.0052	R4.0	52	0.2028656	97.6765184	49.3893561	50.6106439
R4.0053	R4.0	53	0.2175588	97.4736528	48.4911060	51.5088940
R4.0054	R4.0	54	0.2326536	97.2560940	47.5984602	52.4015398
R4.0055	R4.0	55	0.2497578	97.0234404	46.7115922	53.2884078
R4.0056	R4.0	56	0.2665119	96.7736826	45.8306670	54.1693330
R4.0057	R4.0	57	0.2845173	96.5071707	44.9558511	55.0441489
R4.0058	R4.0	58	0.3034000	96.2226534	44.0873008	55.9126992
R4.0059	R4.0	59	0.3231707	95.9192534	43.2251711	56.7748289
R4.0060	R4.0	60	0.3438416	95.5960827	42.3696070	57.6303930
R4.0061	R4.0	61	0.3654260	95.2522411	41.5207481	58.4792519
R4.0062	R4.0	62	0.3879290	94.8868151	40.6787262	59.3212738
R4.0063	R4.0	63	0.4113550	94.4988861	39.8436651	60.1563349
R4.0064	R4.0	64	0.4357090	94.0875311	39.0156770	60.9843230
R4.0065	R4.0	65	0.4609852	93.6518221	38.1948690	61.8051310
R4.0066	R4.0	66	0.4871807	93.1908369	37.3813329	62.6186671
R4.0067	R4.0	67	0.5142860	92.7036562	36.5751538	63.4248462
R4.0068	R4.0	68	0.5422850	92.1893702	35.7764020	64.2235980
R4.0069	R4.0	69	0.5711651	91.6470852	34.9851360	65.0148640
R4.0070	R4.0	70	0.6009006	91.0759201	34.2014031	65.7985969
R4.0071	R4.0	71	0.6314631	90.4750195	33.4252348	66.5747652
R4.0072	R4.0	72	0.6628237	89.8435564	32.6566491	67.3433509
R4.0073	R4.0	73	0.6949434	89.1807327	31.8956490	68.1043510
R4.0074	R4.0	74	0.7277765	88.4857893	31.1422219	68.8577781
R4.0075	R4.0	75	0.7612782	87.7580128	30.3963370	69.6036630
R4.0076	R4.0	76	0.7953930	86.9967346	29.6579499	70.3420501
R4.0077	R4.0	77	0.8300562	86.2013416	28.9269941	71.0730059
R4.0078	R4.0	78	0.8652038	85.3712854	28.2033880	71.7966120
R4.0079	R4.0	79	0.9007626	84.5060816	27.4870250	72.5129750
R4.0080	R4.0	80	0.9366550	83.6053190	26.7777820	73.2222180
R4.0081	R4.0	81	0.9727898	82.6686640	26.0755160	73.9244840
R4.0082	R4.0	82	1.0092020	81.6958742	25.3800550	74.6199450
R4.0083	R4.0	83	1.0464849	80.6866722	24.6912470	75.3087530
R4.0084	R4.0	84	1.0855894	79.6401873	24.0091240	75.9908760
R4.0085	R4.0	85	1.1274805	78.5545979	23.3340089	76.6659911
R4.0086	R4.0	86	1.1729546	77.4271174	22.6665139	77.3334861
R4.0087	R4.0	87	1.2225552	76.2541628	22.0074830	77.9925170
R4.0088	R4.0	88	1.2765531	75.0316076	21.3579230	78.6420770
R4.0089	R4.0	89	1.3349047	73.7550545	20.7189319	79.2810681

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0090	R4.0	90	1.3973417	72.4201498	20.0916240	79.9083760
R4.0091	R4.0	91	1.4632540	71.0228081	19.4770801	80.5229199
R4.0092	R4.0	92	1.5318708	69.5595541	18.8762820	81.1237180
R4.0093	R4.0	93	1.6022349	68.0276833	18.2900851	81.7099149
R4.0094	R4.0	94	1.6732702	66.4254484	17.7191961	82.2808039
R4.0095	R4.0	95	1.7437983	64.7521782	17.1641600	82.8358400
R4.0096	R4.0	96	1.8126111	63.0083799	16.6253510	83.3746490
R4.0097	R4.0	97	1.8785019	61.1957688	16.1029799	83.8970201
R4.0098	R4.0	98	1.9403057	59.3172669	15.5971090	84.4028910
R4.0099	R4.0	99	1.9969244	57.3769612	15.1076440	84.8923560
R4.0100	R4.0	100	2.0473556	55.3800368	14.6343750	85.3656250
R4.0101	R4.0	101	2.0907240	53.3326812	14.1769710	85.8230290
R4.0102	R4.0	102	2.1262794	51.2419572	13.7350060	86.2649940
R4.0103	R4.0	103	2.1534547	49.1156778	13.3079650	86.6920350
R4.0104	R4.0	104	2.1718040	46.9622231	12.8952750	87.1047250
R4.0105	R4.0	105	2.1810722	44.7904191	12.4962990	87.5037010
R4.0106	R4.0	106	2.1811419	42.6093469	12.1103610	87.8896390
R4.0107	R4.0	107	2.1720638	40.4282050	11.7367520	88.2632480
R4.0108	R4.0	108	2.1540241	38.2561412	11.3747400	88.6252600
R4.0109	R4.0	109	2.1273389	36.1021171	11.0235781	88.9764219
R4.0110	R4.0	110	2.0924511	33.9747782	10.6825140	89.3174860
R4.0111	R4.0	111	2.0498882	31.8823271	10.3507971	89.6492029
R4.0112	R4.0	112	2.0002858	29.8324389	10.0276790	89.9723210
R4.0113	R4.0	113	1.9443300	27.8321531	9.7124300	90.2875700
R4.0114	R4.0	114	1.8827472	25.8878231	9.4043380	90.5956620
R4.0115	R4.0	115	1.8162958	24.0050759	9.1027160	90.8972840
R4.0116	R4.0	116	1.7457612	22.1887801	8.8069040	91.1930960
R4.0117	R4.0	117	1.6718969	20.4430189	8.5162840	91.4837160
R4.0118	R4.0	118	1.5954540	18.7711220	8.2302750	91.7697250
R4.0119	R4.0	119	1.5171400	17.1756680	7.9483430	92.0516570
R4.0120	R4.0	120	1.4376240	15.6585280	7.6700060	92.3299940
R4.0121	R4.0	121	1.3575180	14.2209040	7.3948390	92.6051610
R4.0122	R4.0	122	1.2773730	12.8633860	7.1224760	92.8775240
R4.0123	R4.0	123	1.1976880	11.5860130	6.8526120	93.1473880
R4.0124	R4.0	124	1.1188790	10.3883250	6.5850130	93.4149870
R4.0125	R4.0	125	1.0413181	9.2694460	6.3195140	93.6804860
R4.0126	R4.0	126	0.9653040	8.2281280	6.0560060	93.9439940
R4.0127	R4.0	127	0.8910890	7.2628240	5.7944580	94.2055420
R4.0128	R4.0	128	0.8188760	6.3717350	5.5348880	94.4651120
R4.0129	R4.0	129	0.7488360	5.5528590	5.2773810	94.7226190
R4.0130	R4.0	130	0.6811100	4.8040230	5.0220640	94.9779360
R4.0131	R4.0	131	0.6158200	4.1229130	4.7691140	95.2308860
R4.0132	R4.0	132	0.5530780	3.5070930	4.5187400	95.4812600
R4.0133	R4.0	133	0.4930080	2.9540150	4.2715210	95.7284790
R4.0134	R4.0	134	0.4357350	2.4610070	4.0273490	95.9726510

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0135	R4.0	135	0.3814000	2.0252720	3.7864600	96.2135400
R4.0136	R4.0	136	0.3301680	1.6438720	3.5490210	96.4509790
R4.0137	R4.0	137	0.2822160	1.3137040	3.3315155	66.6848450
R4.0138	R4.0	138	0.2377380	1.0314880	3.0849780	96.9150220
R4.0139	R4.0	139	0.1969280	0.7937500	2.8585810	97.1414190
R4.0140	R4.0	140	0.1599700	0.5968220	2.6360510	97.3639490
R4.0141	R4.0	141	0.1270220	0.4368520	2.4174760	97.5825240
R4.0142	R4.0	142	0.0981870	0.3098300	2.2029340	97.7970660
R4.0143	R4.0	143	0.0734960	0.2116430	1.9925030	98.0074970
R4.0144	R4.0	144	0.0529003	0.1381470	1.7862840	98.2137160
R4.0145	R4.0	145	0.0362607	0.0852467	1.5844010	98.4155990
R4.0146	R4.0	146	0.0233463	0.0489860	1.3870900	98.6129100
R4.0147	R4.0	147	0.0138307	0.0256397	1.1948260	98.8051740
R4.0148	R4.0	148	0.0072948	0.0118090	1.0086400	98.9913600
R4.0149	R4.0	149	0.0032339	0.0045142	0.8306070	99.1693930
R4.0150	R4.0	150	0.0010741	0.0012803	0.6657290	99.3342710
R4.0151	R4.0	151	0.0002001	0.0002061	0.5292780	99.4707220
R4.0152	R4.0	152	0.0000060	0.0000060	0.5000830	99.4999170
R4.0153	R4.0	153	0.0000000	0.0000000	0.0000000	100.0000000

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0000	S3.0	0	0.0000000	100.0000000	100.0000000	0.0000000
S3.0001	S3.0	1	0.0000000	100.0000000	99.0000000	1.0000000
S3.0002	S3.0	2	0.0000000	100.0000000	98.0000000	2.0000000
S3.0003	S3.0	3	0.0000000	100.0000000	97.0000000	3.0000000
S3.0004	S3.0	4	0.0000000	100.0000000	96.0000000	4.0000000
S3.0005	S3.0	5	0.0000000	100.0000000	95.0000000	5.0000000
S3.0006	S3.0	6	0.0000009	100.0000000	94.0000000	6.0000000
S3.0007	S3.0	7	0.0000029	99.9999991	93.0000010	6.9999990
S3.0008	S3.0	8	0.0000057	99.9999962	92.0000038	7.9999962
S3.0009	S3.0	9	0.0000124	99.9999905	91.0000086	8.9999914
S3.0010	S3.0	10	0.0000229	99.9999781	90.0000200	9.9999800
S3.0011	S3.0	11	0.0000410	99.9999552	89.0000401	10.9999599
S3.0012	S3.0	12	0.0000706	99.9999142	88.0000773	11.9999227
S3.0013	S3.0	13	0.0001154	99.9998436	87.0001392	12.9998608
S3.0014	S3.0	14	0.0001821	99.9997282	86.0002394	13.9997606
S3.0015	S3.0	15	0.0002785	99.9995461	85.0003939	14.9996061
S3.0016	S3.0	16	0.0004120	99.9992676	84.0006294	15.9993706
S3.0017	S3.0	17	0.0005932	99.9988556	83.0009728	16.9990272
S3.0018	S3.0	18	0.0008402	99.9982624	82.0014629	17.9985371
S3.0019	S3.0	19	0.0011616	99.9974222	81.0021467	18.9978533
S3.0020	S3.0	20	0.0015783	99.9962606	80.0030832	19.9969168
S3.0021	S3.0	21	0.0021086	99.9946823	79.0043373	20.9956627
S3.0022	S3.0	22	0.0027761	99.9925737	78.0059929	21.9940071
S3.0023	S3.0	23	0.0036030	99.9897976	77.0081453	22.9918547
S3.0024	S3.0	24	0.0046177	99.9861946	76.0109024	23.9890976
S3.0025	S3.0	25	0.0058498	99.9815769	75.0143890	24.9856110
S3.0026	S3.0	26	0.0073300	99.9757271	74.0187492	25.9812508
S3.0027	S3.0	27	0.0090951	99.9683971	73.0241404	26.9758596
S3.0028	S3.0	28	0.0111771	99.9593020	72.0307388	27.9692612
S3.0029	S3.0	29	0.0136185	99.9481249	71.0387383	28.9612617
S3.0030	S3.0	30	0.0164585	99.9345064	70.0483513	29.9516487
S3.0031	S3.0	31	0.0197382	99.9180479	69.0598068	30.9401932
S3.0032	S3.0	32	0.0235014	99.8983097	68.0733528	31.9266472
S3.0033	S3.0	33	0.0277939	99.8748083	67.0892544	32.9107456
S3.0034	S3.0	34	0.0326624	99.8470144	66.1077900	33.8922100
S3.0035	S3.0	35	0.0381479	99.8143520	65.1292582	34.8707418
S3.0036	S3.0	36	0.0443048	99.7762041	64.1539688	35.8460312
S3.0037	S3.0	37	0.0511732	99.7318993	63.1822462	36.8177538
S3.0038	S3.0	38	0.0588046	99.6807261	62.2144260	37.7855740
S3.0039	S3.0	39	0.0672397	99.6219215	61.2508540	38.7491460
S3.0040	S3.0	40	0.0765267	99.5546818	60.2918859	39.7081141
S3.0041	S3.0	41	0.0867071	99.4781551	59.3378830	40.6621170
S3.0042	S3.0	42	0.0978231	99.3914480	58.3892121	41.6107879
S3.0043	S3.0	43	0.1099110	99.2936249	57.4462428	42.5537572
S3.0044	S3.0	44	0.1230097	99.1837139	56.5093489	43.4906511

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0045	S3.0	45	0.1371507	99.0607042	55.5788989	44.4211011
S3.0046	S3.0	46	0.1523667	98.9235535	54.6552620	45.3447380
S3.0047	S3.0	47	0.1686792	98.7711868	53.7388029	46.2611971
S3.0048	S3.0	48	0.1861134	98.6025076	52.8298788	47.1701212
S3.0049	S3.0	49	0.2046880	98.4163942	51.9288392	48.0711608
S3.0050	S3.0	50	0.2244149	98.2117062	51.0360251	48.9639749
S3.0051	S3.0	51	0.2453012	97.9872913	50.1517639	49.8482361
S3.0052	S3.0	52	0.2673512	97.7419901	49.2763739	50.7236261
S3.0053	S3.0	53	0.2905626	97.4746389	48.4101572	51.5898428
S3.0054	S3.0	54	0.3149290	97.1840763	47.5534000	52.4466000
S3.0055	S3.0	55	0.3404341	96.8691473	46.7063732	53.2936268
S3.0056	S3.0	56	0.3670616	96.5287132	45.8693328	54.1306672
S3.0057	S3.0	57	0.3947830	96.1616516	45.0425129	54.9574871
S3.0058	S3.0	58	0.4235687	95.7668686	44.2261319	55.7738681
S3.0059	S3.0	59	0.4533825	95.3432999	43.4203882	56.5796118
S3.0060	S3.0	60	0.4841824	94.8899174	42.6254621	57.3745379
S3.0061	S3.0	61	0.5159149	94.4057350	41.8415122	58.1584878
S3.0062	S3.0	62	0.5485287	93.8898201	41.0686789	58.9313211
S3.0063	S3.0	63	0.5819635	93.3412914	40.3070850	59.6929150
S3.0064	S3.0	64	0.6161499	92.7593279	39.5568309	60.4431691
S3.0065	S3.0	65	0.6510201	92.1431780	38.8179989	61.1820011
S3.0066	S3.0	66	0.6864967	91.4921579	38.0906539	61.9093461
S3.0067	S3.0	67	0.7224970	90.8056612	37.3748412	62.6251588
S3.0068	S3.0	68	0.7589350	90.0831642	36.6705899	63.3294101
S3.0069	S3.0	69	0.7957239	89.3242292	35.9779110	64.0220890
S3.0070	S3.0	70	0.8327675	88.5285053	35.2967982	64.7032018
S3.0071	S3.0	71	0.8699665	87.6957378	34.6272311	65.3727689
S3.0072	S3.0	72	0.9072227	86.8257713	33.9691749	66.0308251
S3.0073	S3.0	73	0.9444323	85.9185486	33.3225799	66.6774201
S3.0074	S3.0	74	0.9814892	84.9741163	32.6873822	67.3126178
S3.0075	S3.0	75	1.0182848	83.9926271	32.0635042	67.9364958
S3.0076	S3.0	76	1.0547151	82.9743423	31.4508619	68.5491381
S3.0077	S3.0	77	1.0906649	81.9196272	30.8493540	69.1506460
S3.0078	S3.0	78	1.1260299	80.8289623	30.2588730	69.7411270
S3.0079	S3.0	79	1.1606951	79.7029324	29.6793010	70.3206990
S3.0080	S3.0	80	1.1945553	78.5422373	29.1105120	70.8894880
S3.0081	S3.0	81	1.2275000	77.3476820	28.5523710	71.4476290
S3.0082	S3.0	82	1.2594261	76.1201820	28.0047390	71.9952610
S3.0083	S3.0	83	1.2902269	74.8607559	27.4674680	72.5325320
S3.0084	S3.0	84	1.3198013	73.5705290	26.9404030	73.0595970
S3.0085	S3.0	85	1.3480530	72.2507277	26.4233890	73.5766110
S3.0086	S3.0	86	1.3748846	70.9026747	25.9162619	74.0837381
S3.0087	S3.0	87	1.4002104	69.5277901	25.4188600	74.5811400
S3.0088	S3.0	88	1.4239378	68.1275797	24.9310110	75.0689890
S3.0089	S3.0	89	1.4459896	66.7036419	24.4525449	75.5474551

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0090	S3.0	90	1.4662924	65.2576523	23.9832900	76.0167100
S3.0091	S3.0	91	1.4847698	63.7913599	23.5230711	76.4769289
S3.0092	S3.0	92	1.5013619	62.3065901	23.0717111	76.9282889
S3.0093	S3.0	93	1.5160102	60.8052282	22.6290381	77.3709619
S3.0094	S3.0	94	1.5286632	59.2892180	22.1948710	77.8051290
S3.0095	S3.0	95	1.5392757	57.7605548	21.7690370	78.2309630
S3.0096	S3.0	96	1.5478119	56.2212791	21.3513601	78.6486399
S3.0097	S3.0	97	1.5542393	54.6734672	20.9416640	79.0583360
S3.0098	S3.0	98	1.5585370	53.1192279	20.5397761	79.4602239
S3.0099	S3.0	99	1.5606909	51.5606909	20.1455231	79.8544769
S3.0100	S3.0	100	1.5606909	50.0000000	19.7587349	80.2412651
S3.0101	S3.0	101	1.5585370	48.4393091	19.3792419	80.6207581
S3.0102	S3.0	102	1.5542393	46.8807721	19.0068769	80.9931231
S3.0103	S3.0	103	1.5478119	45.3265328	18.6414750	81.3585250
S3.0104	S3.0	104	1.5392757	43.7787209	18.2828729	81.7171271
S3.0105	S3.0	105	1.5286631	42.2394452	17.9309101	82.0690899
S3.0106	S3.0	106	1.5160103	40.7107821	17.5854299	82.4145701
S3.0107	S3.0	107	1.5013619	39.1947718	17.2462750	82.7537250
S3.0108	S3.0	108	1.4847698	37.6934099	16.9132950	83.0867050
S3.0109	S3.0	109	1.4662919	36.2086401	16.5863359	83.4136641
S3.0110	S3.0	110	1.4459901	34.7423482	16.2652550	83.7347450
S3.0111	S3.0	111	1.4239380	33.2963581	15.9499090	84.0500910
S3.0112	S3.0	112	1.4002102	31.8724201	15.6401500	84.3598500
S3.0113	S3.0	113	1.3748848	30.4722099	15.3358450	84.6641550
S3.0114	S3.0	114	1.3480530	29.0973251	15.0368600	84.9631400
S3.0115	S3.0	115	1.3198011	27.7492721	14.7430561	85.2569439
S3.0116	S3.0	116	1.2902269	26.4294710	14.4543080	85.5456920
S3.0117	S3.0	117	1.2594261	25.1392441	14.1704850	85.8295150
S3.0118	S3.0	118	1.2275000	23.8798180	13.8914710	86.1085290
S3.0119	S3.0	119	1.1945550	22.6523180	13.6171401	86.3828599
S3.0120	S3.0	120	1.1606951	21.4577630	13.3473700	86.6526300
S3.0121	S3.0	121	1.1260300	20.2970679	13.0820510	86.9179490
S3.0122	S3.0	122	1.0906648	19.1710379	12.8210681	87.1789319
S3.0123	S3.0	123	1.0547152	18.0803731	12.5643160	87.4356840
S3.0124	S3.0	124	1.0182848	17.0256579	12.3116800	87.6883200
S3.0125	S3.0	125	0.9814891	16.0073731	12.0630680	87.9369320
S3.0126	S3.0	126	0.9444329	15.0258840	11.8183630	88.1816370
S3.0127	S3.0	127	0.9072221	14.0814511	11.5774790	88.4225210
S3.0128	S3.0	128	0.8699670	13.1742290	11.3403140	88.6596860
S3.0129	S3.0	129	0.8327670	12.3042620	11.1067700	88.8932300
S3.0130	S3.0	130	0.7957240	11.4714950	10.8767610	89.1232390
S3.0131	S3.0	131	0.7589350	10.6757710	10.6501980	89.3498020
S3.0132	S3.0	132	0.7224970	9.9168360	10.4270001	89.5729999
S3.0133	S3.0	133	0.6864971	9.1943390	10.2070690	89.7929310
S3.0134	S3.0	134	0.6510199	8.5078420	9.9903250	90.0096750

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0135	S3.0	135	0.6161500	7.8568220	9.7766990	90.2233011
S3.0136	S3.0	136	0.5819630	7.2406720	9.5661089	90.4338911
S3.0137	S3.0	137	0.5485290	6.6587090	9.3584729	90.6415271
S3.0138	S3.0	138	0.5159150	6.1101800	9.1537210	90.8462790
S3.0139	S3.0	139	0.4841820	5.5942650	8.9517880	91.0482121
S3.0140	S3.0	140	0.4533830	5.1100830	8.7525981	91.2474020
S3.0141	S3.0	141	0.4235690	4.6567000	8.5560840	91.4439160
S3.0142	S3.0	142	0.3947830	4.2331310	8.3621800	91.6378200
S3.0143	S3.0	143	0.3670610	3.8383480	8.1708230	91.8291770
S3.0144	S3.0	144	0.3404340	3.4712870	7.9819520	92.0180480
S3.0145	S3.0	145	0.3149290	3.1308530	7.7955040	92.2044960
S3.0146	S3.0	146	0.2905630	2.8159240	7.6114220	92.3885780
S3.0147	S3.0	147	0.2673510	2.5253610	7.4296480	92.5703520
S3.0148	S3.0	148	0.2453010	2.2580100	7.2501270	92.7498730
S3.0149	S3.0	149	0.2244150	2.0127090	7.0728060	92.9271940
S3.0150	S3.0	150	0.2046880	1.7882940	6.8976320	93.1023680
S3.0151	S3.0	151	0.1861140	1.5836060	6.7245530	93.2754470
S3.0152	S3.0	152	0.1686790	1.3974920	6.5535220	93.4464780
S3.0153	S3.0	153	0.1523660	1.2288130	6.3844900	93.6155100
S3.0154	S3.0	154	0.1371510	1.0764470	6.2174110	93.7825890
S3.0155	S3.0	155	0.1230100	0.9392960	6.0522380	93.9477620
S3.0156	S3.0	156	0.1099110	0.8162860	5.8889290	94.1110710
S3.0157	S3.0	157	0.0978230	0.7063750	5.7274410	94.2725590
S3.0158	S3.0	158	0.0867070	0.6085520	5.5677320	94.4322680
S3.0159	S3.0	159	0.0765270	0.5218450	5.4097620	94.5902380
S3.0160	S3.0	160	0.0672400	0.4453180	5.2534920	94.7465080
S3.0161	S3.0	161	0.0588040	0.3780780	5.0988860	94.9011140
S3.0162	S3.0	162	0.0511730	0.3192740	4.9459060	95.0540940
S3.0163	S3.0	163	0.0443050	0.2681010	4.7945200	95.2054800
S3.0164	S3.0	164	0.0381480	0.2237960	4.6446910	95.3553090
S3.0165	S3.0	165	0.0326620	0.1856480	4.4963870	95.5036130
S3.0166	S3.0	166	0.0277940	0.1529860	4.3495800	95.6504200
S3.0167	S3.0	167	0.0235020	0.1251920	4.2042330	95.7957670
S3.0168	S3.0	168	0.0197375	0.1016900	4.0603190	95.9396810
S3.0169	S3.0	169	0.0164582	0.0819525	3.9178100	96.0821900
S3.0170	S3.0	170	0.0136189	0.0654943	3.7766790	96.2233210
S3.0171	S3.0	171	0.0111777	0.0518754	3.6369070	96.3630930
S3.0172	S3.0	172	0.0090944	0.0406977	3.4984640	96.5015360
S3.0173	S3.0	173	0.0073307	0.0316033	3.3613300	96.6386700
S3.0174	S3.0	174	0.0058498	0.0242726	3.2254840	96.7745160
S3.0175	S3.0	175	0.0046178	0.0184228	3.0909090	96.9090910
S3.0176	S3.0	176	0.0036030	0.0138050	2.9575850	97.0424150
S3.0177	S3.0	177	0.0027755	0.0102020	2.8255000	97.1745000
S3.0178	S3.0	178	0.0021089	0.0074265	2.6946400	97.3053600
S3.0179	S3.0	179	0.0015783	0.0053176	2.5649990	97.4350010

database

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0180	S3.0	180	0.0011617	0.0037393	2.4365660	97.5634340
S3.0181	S3.0	181	0.0008396	0.0025776	2.3093440	97.6906560
S3.0182	S3.0	182	0.0005946	0.0017381	2.1833410	97.8166590
S3.0183	S3.0	183	0.0004116	0.0011435	2.0585660	97.9414340
S3.0184	S3.0	184	0.0002778	0.0007319	1.9350420	98.0649580
S3.0185	S3.0	185	0.0001821	0.0004541	1.8128020	98.1871980
S3.0186	S3.0	186	0.0001156	0.0002720	1.6918880	98.3081120
S3.0187	S3.0	187	0.0000706	0.0001564	1.5723710	98.4276290
S3.0188	S3.0	188	0.0000413	0.0000858	1.4543500	98.5456500
S3.0189	S3.0	189	0.0000229	0.0000446	1.3379620	98.6620380
S3.0190	S3.0	190	0.0000119	0.0000217	1.2234140	98.7765860
S3.0191	S3.0	191	0.0000058	0.0000097	1.1110030	98.8889970
S3.0192	S3.0	192	0.0000025	0.0000040	1.0011880	98.9988120
S3.0193	S3.0	193	0.0000010	0.0000014	0.8946340	99.1053660
S3.0194	S3.0	194	0.0000003	0.0000004	0.7925260	99.2074740
S3.0195	S3.0	195	0.0000001	0.0000001	0.6968450	99.3031550
S3.0196	S3.0	196	0.0000000	0.0000000	0.6112800	99.3887200
S3.0197	S3.0	197	0.0000000	0.0000000	0.5431250	99.4568750
S3.0198	S3.0	198	0.0000000	0.0000000	0.5056800	99.4943200
S3.0199	S3.0	199	0.0000000	0.0000000	0.5000000	99.5000000
S3.0200	S3.0	200	0.0000000	0.0000000	0.0000000	100.0000000

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
Land Appraisal

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Land Appraisal

	Quantity	Units		
Engineer Easement Requirement	1	Hours	75	75
Survey	1	Each	175	175
Develop Easement Document	1	Hours	250	250
Develop Value	0	Hours	125	0
Typical Land Values		Square Ft	0.08	
Negoitaed Easement Value and terms	1		250	250
Execute Easement Agreement	1		250	250
Register Easement	1	Each	75	75
				1075
Summary				
Easement Cost				
Direct				1075
Variable per SQ Ft				0.08
Land Values				
1861 Valley Rd	74900	2.5	Acres	29,960.00
Parkesburg Rd	52900	1.65	Acres	32,060.61
0N Limestone Rd	79000	2.01	Acres	39,303.48
Mean				33,774.70
Use				33,800.00
Per Square Foot				43560
				0.78
Percentage of Value				0.1
				0.08

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Cost Approach
Property Record

AUS Consultants
Suite 201
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Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
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1	2	3	4	5		6
Pennsylvania American Water Company						
Sadsbury Township Wastewater Utility						
Wastewater						
Potential Purchaser: Investor-Owned Utility						
January 1, 2017						
Development of Original Cost (OC)						
361						
(1)		(2)	(3)	(4)	(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
353 Total		Land & Land Rights					$18,343
354 Total		Structures & Improvements					$152,560
355 Total		Power Generating Equipment					$40,000
360 Total		Collection Sewers - Force					$92,500
361 Total		Collection Sewers - Gravity					$5,668,395
363 Total		Services to Customers					$546,316
364 Total		Flow Measuring Devices					$98,731
371 Total		Pumping Equipment					$225,000
Grand Total							$6,841,845
Not Dedicated to Service							
Account	Location	Description	Year	Units	QTY	U/C	OC
361 Total		Collection Sewers - Gravity					$584,547
363 Total		Services to Customers					$54,209
Grand Total							$638,756
Total All Plant							**$7,480,601**

1	2	3	4	5			6
Pennsylvania American Water Company							
Sadsbury Township Wastewater Utility							
Wastewater							
Potential Purchaser: Investor-Owned Utility							
January 1, 2017							
Development of Original Cost (OC)							
361							
(1)		(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
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361 Total		Collection Sewers - Gravity					$584,547
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Grand Total							$638,756

1	2	3	4	5		6

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)
361

(1)		(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
353 SSC		JYF Partners UPI 37-2Q-2	8/4/1999	S.F.	12,522 06		$1
353 SSC		Harry & Athena Lymberis UPI 37-2-42	7/30/1999	S.F.	2,557.06		$1
353 SSC		JYF Partners UPI 37-2-43	7/30/1999	S F	4,089 60		$1
353 SSC		Lawrence VanDyke & Randa Leamy UPI 37-2-45.2	9/3/1999	S F.	3,008.85		$1
353 SSC		Albert Russell Schaible UPI 37-2-45	7/28/1999	S F	3,460 09		$1
353 SSC		Albert Russell Schaible UPI 37-2-46	7/28/1999	S.F	647 13		$1
353 SSC		JYF Partners UPI 37-2-47	7/30/1999	S F.	11,805.95		$1
353 SSC		Herman & Dorothy Iglesias UPI 37-2-48	9/16/1999	S.F.	881.94		$1
353 SSC		Herman & Dorothy Iglesias	9/16/1999	S.F.	1,845.95		$1
353 SSC		Herman & Dorothy Iglesias	9/16/1999	S.F.	5,631.64		$1
353 SSC		JYF Partners	7/30/1999	S.F.	1,415 51		$1
353 SSC		Sadsbury Associates, L P	8/19/1999	S.F.	12,332.35		$1
353 SSC		Frank Wick	8/4/1999	S.F.	12,978 00		$1
353 SSC		Sadsbury Township	9/23/1999	S.F.	52,619 71		$1
353 SSC		AIM Development Corporation	7/28/1999	S.F.	5,660 43		$1
353 SSC		AIM Development Corporation	7/28/1999	S.F.	13,966 58		$1
353 SSC		AIM Development Corporation	7/28/1999	S F.	15 65		$1
353 SSC		Cosmos Development Company	9/19/1999	S F	862 81		$1
353 SSC		Penguin Industries	7/18/1999	S F.	2,136 68		$1
353 SSC		Sadsbury Township	9/23/1999	S.F.	24,468 41		$1
353 SSC		Sadsbury Township	9/23/1999	S.F.	7,565.50		$1
353 SSC		Sadsbury Township	9/23/1999	S.F.	4,049.81		$1
353 SSC		Sadsbury Township	9/23/1999	S.F.	18,645.19		$1
353 SSC		Ann Beatrice McGrail	7/30/1999	S F	28,558 05		$1
353 SSC		Ann Beatrice McGrail	7/30/1999	S.F.	44,318.32		$1
353 SSC		Cignature Hospitality	9/23/1999	S.F.	12,238.00		$9,600
353	Phase 1A – Village of Pomeroy (Nort	Elmer, Jr and Dorothy M. Leamy	11/1/1999	S.F	3,006		$1
353	Phase 1A – Village of Pomeroy (Nort	Randy J and Kathy S. McCarraher	9/1/1999	S.F.	1,804		$1
353	Phase 1A – Village of Pomeroy (Nort	Thomas Rominger	12/11/1999	S F.	522		$1
353	Phase 1A – Village of Pomeroy (Nort	Michael J and Phyllis C. Loftus	12/3/1999	S F	3,006		$1
353	Phase 1A – Village of Pomeroy (Nort	Frank Wolfe	9/13/1999	S.F.	3,125		$1
353	Phase 1A – Village of Pomeroy (Nort	John D Warmijak, III	12/11/1999	S.F.	450		$1
353	Phase 1A – Village of Pomeroy (Nort	Charles F. and Dorothy L. Gay	9/1/1999	S.F.	1,500		$1
353	Phase 1A – Village of Pomeroy (Nort	Verna E. Friedrich	10/29/1999	S.F	3,125		$1
353	Phase 1A – Village of Pomeroy (Nort	Richard F. and Linda E. Arner	9/3/1999	S F.	1,881		$1
353	Phase 1A – Village of Pomeroy (Nort	Joseph L. & Terry L. DiSciulio	9/16/1999	S.F.	2,435		$1
353	Phase 1A – Village of Pomeroy (Nort	Andrew and Leona E Zvodar	9/9/1999	S.F.	1,522		$1
353	Phase 1A – Village of Pomeroy (Nort	Lisa M. Swisher	12/2/1999	S F.	1,646		$1
353	Phase 1A – Village of Pomeroy (Nort	Anthony & Susan Liefield-Tresslet	11/27/1999	S F.	1,650		$1
353	Phase 1A – Village of Pomeroy (Nort	Horace W and Larelda M Lowery	10/13/1999	S F	2,360		$1
353	Phase 1A – Village of Pomeroy (Nort	Ronald J. and Annette Fischer	10/1/1999	S F	2,437		$1
353	Phase 1A – Village of Pomeroy (Nort	Lawrence and Julia VanDyke	8/23/1999	S.F	3,345		$1
353	Phase 1A – Village of Pomeroy (Nort	Andrew O and Verna E. Friedrich	8/23/1999	S F.	5,250		$1
353	Phase 1A – Village of Pomeroy (Nort	Robert and Nancy R. Perry	9/9/1999	S.F.	2,147		$1
353	Phase 1A – Village of Pomeroy (Nort	Pomeroy Partnership	9/16/1999	S.F.	5,912		$1
353	Phase 1A – Village of Pomeroy (Nort	James W. and Dorothy M. Anderson	12/8/1999	S.F.	8,538		$751

1	2	3	4	5		6

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)

361

(1)	(2)	(3)	(4)	(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
353	Phase 1A – Village of Pomeroy (Nort	Alton L. and Mae W Crothers	1/20/2000	S.F.	4,503		$1
353	Phase 1B – Village of Pomeroy (Soutl	William C and Michelle C. White	1/3/2002	S.F.	8,171		$3,946
353	Phase 2A – Springview Manor & Sou	Herman &Dorothy Iglesias	7/27/2005	S.F.	26,910		$1
353	Phase 2A – Springview Manor & Sou	George K Sr., and Ruth Ann Whisler	7/19/2006	S.F.			$3,946
353	Phase 2A – Springview Manor & Sou	Eugene J and Ann M Lafferty	4/4/2006	S.F.	3,750		$1
353	Phase 2A – Springview Manor & Sou	George C and Sandra J. Devine	5/4/2006	S F.	2,754		$1
353	Phase 2A – Springview Manor & Sou	Michael H and Denise D Gallimore	5/7/2005	S.F.	2,596		$1
353	Phase 2A – Springview Manor & Sou	William J. and Beverly K Murray	4/25/2005	S F	2,692		$1
353	Phase 2A – Springview Manor & Sou	Stanly M and Catherine E Kryzanauskas	4/27/2005	S.F.	2,500		$1
353	Phase 2A – Springview Manor & Sou	Craig M and Teresa A Pappas	4/21/2005	S F	2,500		$1
353	Phase 2A – Springview Manor & Sou	Anthony and Sherry Romasco	5/12/2005	S F	2,500		$1
353	Phase 2A – Springview Manor & Sou	Lark and Theresa Kemper	5/12/2005	S.F.	2,500		$1
353	Phase 2A – Springview Manor & Sou	Robert and Emily Harkins	11/21/2005	S.F.	401		$1
353	Phase 2A – Springview Manor & Sou	Frank Geissler	12/15/2004	S.F.	11,643		$1
353	Phase 2A – Springview Manor & Sou	Scott Longacre and	5/12/2005	S F	2,906		$1
353	Phase 2A – Springview Manor & Sou	Joseph M, III and Deborah A Matoni	5/6/2005	S F	2,405		$1
353	Phase 2A – Springview Manor & Sou	Kenneth Allen & Cheryl Ann Davis	4/29/2005	S.F.	400		$1
353	Phase 2A – Springview Manor & Sou	Harry R Firestone	5/11/2005	S F	400		$1
353	Phase 2A – Springview Manor & Sou	John Trego, Sr.	11/15/2005	S.F	2,500		$1
353	Phase 2A – Springview Manor & Sou	H. Brooke Luey	5/12/2005	S F.	2,506		$1
353	Phase 2A – Springview Manor & Sou	Franz Geissler	12/15/2004	S.F.	9,176		$1
353	Phase 2A – Springview Manor & Sou	Richard A and Rose A Whitman	5/11/2005	S F.	6,299		$1
353	Phase 2A – Springview Manor & Sou	Bonnie L. and James A Grannells	5/3/2005	S F	3,891		$1
353	Phase 2A – Springview Manor & Sou	Thomas J. Stoltzfus	5/4/2005	S.F.	5,257		$1
353	Phase 2A – Springview Manor & Sou	Bessie M. Johnson	5/12/2005	S F	7,327		$1
353	Phase 2A – Springview Manor & Sou	James G and Jane D. Roper	5/2/2005	S F.	9,657		$1
353	Phase 2A – Springview Manor & Sou	Charles L. Witherspoon	5/3/2005	S F	12,314		$1
353	Phase 2A – Springview Manor & Sou	Thomas D. and Patricia J. Hines	5/2/2005	S.F.	5,294		$1
353	Phase 2B – Village of Sadsburyville	John H Lymberis and	6/15/2004	S F	8,291		$1
353	Phase 2B – Village of Sadsburyville	Sadsbury Associates, L P	6/22/2004	S F.	637891		$1
353	Phase 2B – Village of Sadsburyville	Sadsburyville Volunteer	12/22/2004	S.F.	4,620		$1
353	Phase 2B – Village of Sadsburyville	Sadsburyville Volunteer	12/28/2004	S F.	6,129		$1
353	Phase 2B – Village of Sadsburyville	John H Lymberis	7/1/2008	S F	3,324		$1
353	Phase 2B – Village of Sadsburyville	Thomas R. and Nancy J. Greenfield	6/10/2008	S.F.	1,820		$1
353	Phase 2B – Village of Sadsburyville	Christopher G. and Heather A Hershey	6/10/2008	S F.	1,114		$1
353	Phase 2B – Village of Sadsburyville	John W. and Kathleen A Coldren	5/29/2008	S F	1,731		$1
353	Phase 3A – Pomeroy Heights (Washi	Charles N Burnett, Jr and	Dec-04	S F	5,400 +/-		$0
353	Phase 3A – Pomeroy Heights (Washi	Angela M Martin	Dec-04	S.F.	1,875 +/-		$0
353	Phase 3A – Pomeroy Heights (Washi	Bakari & Jennifer L Green	Dec-04	S.F.	1,875 +/-		$0
353	Phase 3B – Pomeroy Heights (Reel St	Cosmos Development Company	2/5/2003	S.F.	3,062		$1
353	Phase 3B – Pomeroy Heights (North	Raymond Jr & Camilla A. Berkey	7/24/2008	S F	355		$1
353	Phase 3B – Pomeroy Heights (North	Harmun Development	9/19/2008	S F	1,550		$1
353	Phase 3B – Pomeroy Heights (North	Eric J. Marcella	9/29/2008	S.F.	474		$1
353	Phase 4 – Valley Road	Ann B McGrail	4/7/2010	S F	7,348		$1
353	Phase 4 – Valley Road	Zouhong Yin & Xiquin Quin	4/7/2010	S F	16,588		$1
353	Phase 4 – Valley Road	Steven and Rosemarie Crandall	8/2/2010	S F	21,015		$1

1	2	3	4	5		6
Pennsylvania American Water Company						
Sadsbury Township Wastewater Utility						
Wastewater						
Potential Purchaser: Investor-Owned Utility						
January 1, 2017						
Development of Original Cost (OC)						
361						
(1)		(2)	(3)	(4)	(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols. (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
353	Phase 4 – Valley Road	Ralph T. & Betty J. Garris	3/14/2010	S.F.	2,074		$1
353	Phase 4 – Valley Road	Ralph T. & Betty J. Garris	3/14/2010	S.F.	3,001		$1
353	Phase 4 – Valley Road	Ralph T. & Betty J. Garris	3/14/2010	S.F	215		$1
353	Phase 4 – Valley Road	Ralph T. & Betty J. Garris	3/14/2010	S.F.	4,643		$1
353	Phase 4 – Valley Road	Michael F. and Aliah M. Kinney	1/29/2010	S F	1,250		$1
353	Phase 4 – Valley Road	Wilbur N. and Alice V. Marsh	1/19/2010	S.F.	2,500		$1
353	Phase 4 – Valley Road	Christopher and Kathleen Bowser	7/27/2010	S.F.	2,840		$1
353	Phase 4 – Valley Road	Robert P. & Victoria G Nunemaker	4/29/2010	S F.	1,878		$1
353	Phase 4 – Valley Road	Lynn J. Hannaway	1/15/2010	S.F.	12,557		$1
353	Phase 4 – Valley Road	Valley East Properties, LLC	3/12/2010	S F	23,212		$1
353	Sadsbury Crossing (Carr Subdivision)	David J Carr Sr.	9/24/2001	S.F			$0
353	Quarry Ridge	Cosmos Development Company	12/7/2004	S F	23,122		$1
353	Sadsbury Village	Sadsbury Associates, L P	9/19/2006	S.F.	38,323		$1
353	Octorara Glen	Octorara Glen Community Assoc.	10/7/2008	S F.	6,036		$1
353	Cowan Estates	Cosmos Properties, L.P.	10/24/2014	S.F.	31,886		$1
353	Mast Properties	Harold K. Mast and	3/8/2016	S.F			$1
353 Total		Land & Land Rights					$18,343
354	SSC-Stottsville Pump Station	Erosion & Sediment Control	1999	L S .	1	$1,000 00	$1,000
354	SSC-Stottsville Pump Station	Maintenance & Protection of Traffic	1999	L.S.	1	$2,500 00	$2,500
354	SSC-Stottsville Pump Station	ID-2 Bituminous Wearing Course	1999	S.Y.	40	$5.00	$200
354	SSC-Stottsville Pump Station	Bituminous Concrete Base Course	1999	S.Y.	40	$15.00	$600
354	SSC-Stottsville Pump Station	2A Stone	1999	S.Y.	50	$8.00	$400
354	SSC-Stottsville Pump Station	Sitework	1999	L.S	1	#########	$25,000
354	SSC-Stottsville Pump Station	Fence	1999	L F.	285	$36.00	$10,260
354	SSC-Stottsville Pump Station	10' Diameter Wet Well	1999	L.S.	1	#########	$75,000
354	SSC-Stottsville Pump Station	Sewage Waste Grinder	1999	L.S.	1	#########	$35,000
354	SSC-Stottsville Pump Station	ID-2 Wearing – PennDOT Roadway	1999	S.Y.	40	$5.00	$200
354	SSC-Stottsville Pump Station	ID-2 Binder – PennDOT Roadway	1999	S.Y.	40	$6.00	$240
354	SSC-Stottsville Pump Station	BCBC – PennDOT Roadway	1999	S.Y.	40	$15 00	$600
354	SSC-Stottsville Pump Station	Seeding	1999	S.Y	1,200	$1.30	$1,560
354 Total		Structures & Improvements					$152,560
355	SSC - Stottsville Pump Station	135 KW Natural Gas Generator	1999	L.S .	1	40,000 00	$40,000
355 Total		Power Generating Equipment					$40,000
360	SSC - Segment #1	10" SDR-26 PVCP	1999	L.F	3,400	25 00	$85,000
360	SSC - Segment #1	Concrete Clean-out Manholes	1999	EA.	3	2,500.00	$7,500
360 Total		Collection Sewers - Force					$92,500
361	SSC - Segment #1	15" SDR-35 PVCP	1999	L F	2,800	35 94	$100,632
361	SSC - Segment #1	12" SDR-35 PVCP	1999	L F.	900	37 94	$34,146
361	SSC - Segment #1	12" DIP w/Steel Casing Bore & Jack	1999	L.F.	349	514.13	$179,433
361	SSC - Segment #1	Concrete Manhole w/ Frame & Cover	1999	EA.	14	2,500 00	$35,000
361	SSC - Segment #1	Concrete Manhole w/ Watertight Frame & Cover	1999	EA.	4	2,600.00	$10,400
361	SSC - Segment #2	12" SDR-35 PVCP	1999	L F	1,650	33 48	$55,250
361	SSC - Segment #2	12" DIP w/Conc. Encasement Stream Crossing	1999	L F	64	100 00	$6,400
361	SSC - Segment #2	Concrete Manhole w/ Frame & Cover	1999	EA	4	1,600.00	$6,400
361	SSC - Segment #2	Concrete Manhole w/ Watertight Frame & Cover	1999	EA	5	1,700.00	$8,500
361	SSC - Segment #3	12" SDR-35 PVCP	1999	L.F	2,150	32.36	$69,574

1	2	3	4	5			6

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)

	361						
(1)		(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
361	SSC - Segment #3	8" SDR-35 PVCP	1999	L F	2,800	28 36	$79,408
361	SSC - Segment #3	12" DIP w/Conc. Encasement Stream Crossing	1999	L F	61	104.18	$6,355
361	SSC - Segment #3	8" DIP w/Steel Casing Bore & Jack	1999	L.F.	164	422.20	$69,240
361	SSC - Segment #3	Concrete Manhole w/ Watertight Frame & Cover	1999	EA	23	1,700.00	$39,100
361	SSC - Segment #4	10" SDR-35 PVCP	1999	L.F	2,650	30.79	$81,594
361	SSC - Segment #4	8" SDR-35 PVCP	1999	L.F.	1,000	32.79	$32,790
361	SSC - Segment #4	10" DIP w/Conc. Encasement Stream Crossing	1999	L.F.	102	69.31	$7,070
361	SSC - Segment #4	Concrete Manhole w/ Frame & Cover	1999	EA.	16	1,600.00	$25,600
361	SSC - Segment #4	Concrete Manhole w/ Watertight Frame & Cover	1999	EA.	2	1,700 00	$3,400
361	SSC - Segment #5	8" SDR-35 PVCP	1999	L.F.	2,500	28.78	$71,950
361	SSC - Segment #5	Concrete Manhole w/ Frame & Cover	1999	EA	11	1,600.00	$17,600
361	SSC - Segment #5	Concrete Manhole w/ Watertight Frame & Cover	1999	EA.	2	1,700.00	$3,400
361	Phase 1A - Village of Pomeroy (North)	8" SDR-35 PVCP – 0-10 Ft Deep	2000	L.F.	5,620	71 77	$403,348
361	Phase 1A - Village of Pomeroy (North)	8" SDR-35 PVCP – 10-14 Ft Deep	2000	L.F.	1,681	77.77	$130,731
361	Phase 1A - Village of Pomeroy (North)	8" SDR-35 PVCP – Over 14 Ft Deep	2000	L.F.	559	85 77	$47,946
361	Phase 1A - Village of Pomeroy (North)	Concrete Manhole w/ Frame & Cover– 0-10 Ft Deep	2000	EA	30	1,700.00	$51,000
361	Phase 1A - Village of Pomeroy (North)	Concrete Manhole w/ Frame & Cover– 10-14 Ft Deep	2000	EA.	9	2,200.00	$19,800
361	Phase 1A - Village of Pomeroy (North)	Concrete Manhole w/ Frame & Cover– Over 14 Ft Deep	2000	EA.	4	2,600.00	$10,400
361	Phase 1B - Village of Pomery (South)	8" SDR-35 PVCP – 0-8 Ft Deep	2005	L.F.	174	93.58	$16,283
361	Phase 1B - Village of Pomery (South)	8" SDR-35 PVCP – 8-10 Ft Deep	2005	L.F.	468	96.58	$45,200
361	Phase 1B - Village of Pomery (South)	8" SDR-35 PVCP – 10-12 Ft Deep	2005	L F	639	109.58	$70,022
361	Phase 1B - Village of Pomery (South)	8" SDR-35 PVCP – 12-14 Ft Deep	2005	L.F	207	123.58	$25,581
361	Phase 1B - Village of Pomery (South)	8" SDR-35 PVCP – 14-16 Ft Deep	2005	L F	85	138.58	$11,779
361	Phase 1B - Village of Pomery (South)	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2005	EA	4	1,800.00	$7,200
361	Phase 1B - Village of Pomery (South)	Concrete Manhole w/ Frame & Cover– 8-10 Ft Deep	2005	EA.	2	2,100.00	$4,200
361	Phase 1B - Village of Pomery (South)	Concrete Manhole w/ Frame & Cover– 10-12 Ft Deep	2005	EA.	1	2,500.00	$2,500
361	Phase 1B - Village of Pomery (South)	Concrete Manhole w/ Frame & Cover– 14-16 Ft Deep	2005	EA	2	3,500.00	$7,000
361	Phase 1B - Village of Pomery (South)	Concrete Doghouse Manhole w/ Frame & Cover	2005	EA	1	2,000.00	$2,000
361	Phase 2A – Village of Sadsburyville (	8" SDR-35 PVCP – 0-8 Ft Deep	2007	L F	1,299	81 30	$105,609
361	Phase 2A – Village of Sadsburyville (	8" SDR-35 PVCP – 8-10 Ft Deep	2007	L F.	2,980	91.30	$272,074
361	Phase 2A – Village of Sadsburyville (	8" SDR-35 PVCP – 10-12 Ft Deep	2007	L F.	1,706	101.30	$172,818
361	Phase 2A – Village of Sadsburyville (	8" SDR-35 PVCP – 12-14 Ft Deep	2007	L F.	2,073	110.30	$228,652
361	Phase 2A – Village of Sadsburyville (	8" SDR-35 PVCP – 14-16 Ft Deep	2007	L F.	637	128 30	$81,727
361	Phase 2A – Village of Sadsburyville (	8" DIP – 0-8 Ft Deep	2007	L F.	30	105.30	$3,159
361	Phase 2A – Village of Sadsburyville (	8" DIP – 14-16 Ft Deep	2007	L F	240	138.30	$33,192
361	Phase 2A – Village of Sadsburyville (	8" DIP – Over16 Ft Deep	2007	L F	175	193.30	$33,828
361	Phase 2A – Village of Sadsburyville (	8" DIP w/24" Steel Casing Bore & Jack-Route 30 Bypass	2007	L.F.	185	1,037.81	$191,995
361	Phase 2A – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2007	EA	9	2,525.00	$22,725
361	Phase 2A – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 8-10 Ft Deep	2007	EA	12	2,500 00	$30,000

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)
361

(1)	(2)	(3)	(4)	(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
361	Phase 2A – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 10-12 Ft Deep	2007	EA.	5	2,740 00	$13,700
361	Phase 2A – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 12-14 Ft Deep	2007	EA.	7	3,300 00	$23,100
361	Phase 2A – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 14-16 Ft Deep	2007	EA.	5	3,800.00	$19,000
361	Phase 2A – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– Over16 Ft Deep	2007	EA	2	5,000.00	$10,000
361	Phase 2B – Village of Sadsburyville (	8" SDR-35 PVCP – 0-8 Ft Deep	2009	L.F.	260	121 67	$31,634
361	Phase 2B – Village of Sadsburyville (	8" SDR-35 PVCP – 8-10 Ft Deep	2009	L.F.	766	123.42	$94,540
361	Phase 2B – Village of Sadsburyville (	8" SDR-35 PVCP – 10-12 Ft Deep	2009	L F.	129	76 82	$9,910
361	Phase 2B – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2009	EA	1	2,550.00	$2,550
361	Phase 2B – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 8-10 Ft Deep	2009	EA.	2	2,670 00	$5,340
361	Phase 2B – Village of Sadsburyville (	Concrete Manhole w/ Frame & Cover– 10-12 Ft Deep	2009	EA	1	3,050 00	$3,050
361	Phase 3A – Washington Lane and Lir	8" SDR-35 PVCP – 0-8 Ft Deep	2005	L F.	696	79.84	$55,569
361	Phase 3A – Washington Lane and Lir	8" SDR-35 PVCP – 8-10 Ft Deep	2005	L F	4,193	82.84	$347,348
361	Phase 3A – Washington Lane and Lir	8" SDR-35 PVCP – 10-12 Ft Deep	2005	L.F.	2,097	95 84	$200,977
361	Phase 3A – Washington Lane and Lir	8" SDR-35 PVCP – 12-14 Ft Deep	2005	L.F.	932	109.84	$102,371
361	Phase 3A – Washington Lane and Lir	8" SDR-35 PVCP – 14-16 Ft Deep	2005	L.F.	980	124.84	$122,342
361	Phase 3A – Washington Lane and Lir	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2005	EA	7	1,971 43	$13,800
361	Phase 3A – Washington Lane and Lir	Concrete Manhole w/ Frame & Cover– 8-10 Ft Deep	2005	EA	12	2,625 00	$31,500
361	Phase 3A – Washington Lane and Lir	Concrete Manhole w/ Frame & Cover– 10-12 Ft Deep	2005	EA	7	2,500.00	$17,500
361	Phase 3A – Washington Lane and Lir	Concrete Manhole w/ Frame & Cover– 12-14 Ft Deep	2005	EA	3	3,000 00	$9,000
361	Phase 3A – Washington Lane and Lir	Concrete Manhole w/ Frame & Cover– 14-16 Ft Deep	2005	EA.	2	3,500 00	$7,000
361	Phase 3A – Washington Lane and Lir	Concrete Manhole w/ Frame & Cover– Over16 Ft Deep	2005	EA.	2	4,000 00	$8,000
361	Phase 3A – Washington Lane Extensi	8" SDR-35 PVCP – 6-10 Ft Deep	2009	L F.	337	23.00	$7,751
361	Phase 3A – Washington Lane Extensi	8" SDR-35 PVCP – 10-14 Ft Deep	2009	L F	344	25.00	$8,600
361	Phase 3A – Washington Lane Extensi	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2009	EA.	2	3,101.50	$6,203
361	Phase 3A – Waverly Blvd. Extension	8" SDR-35 PVCP – 6-10 Ft Deep	2011	L F.	160	27.60	$4,416
361	Phase 3A – Waverly Blvd. Extension	8" SDR-35 PVCP – 10-14 Ft Deep	2011	L.F.	680	30.00	$20,400
361	Phase 3A – Waverly Blvd. Extension	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2011	EA.	5	2,371 20	$11,856
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 0-8 Ft Deep Greenbelt Drive	2005	L.F.	375	55.03	$20,636
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 12-14 Ft Deep Greenbelt Drive	2005	L.F.	50	85 10	$4,255
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep Greenbelt Drive	2005	EA	1	1,800.00	$1,800
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– 12-14 Ft Deep Greenbelt Drive	2005	EA.	1	5,000 00	$5,000
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 0-8 Ft Deep	2009	L.F.	1,035	95 63	$98,977
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 8-10 Ft Deep	2009	L F	482	97.38	$46,937
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 10-12 Ft Deep	2009	L F.	213	101.88	$21,701
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 12-14 Ft Deep	2009	L.F.	154	108 13	$16,652

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)

361

(1)	(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols. (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
361	Phase 3B – South of Washington Lan	8" SDR-35 PVCP – 14-16 Ft Deep	2009	L.F	120	122.38	$14,686
361	Phase 3B – South of Washington Lan	8" DIP – 0-8 Ft Deep	2009	L.F.	75	109.39	$8,204
361	Phase 3B – South of Washington Lan	8" DIP – 8-10 Ft Deep	2009	L.F.	13	112.15	$1,458
361	Phase 3B – South of Washington Lan	8" DIP – 10-12 Ft Deep	2009	L.F.	84	117.63	$9,881
361	Phase 3B – South of Washington Lan	8" DIP – 12-14 Ft Deep	2009	L.F.	17	125.41	$2,132
361	Phase 3B – South of Washington Lan	8" DIP – 14-16 Ft Deep	2009	L.F.	111	139 63	$15,499
361	Phase 3B – South of Washington Lan	8" DIP – Over16 Ft Deep	2009	L.F.	154	170 63	$26,277
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2009	EA.	4	2,550.00	$10,200
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– 8-10 Ft Deep	2009	EA.	2	2,660.00	$5,320
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– 10-12 Ft Deep	2009	EA.	1	3,050.00	$3,050
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– 14-16 Ft Deep	2009	EA.	2	3,525.00	$7,050
361	Phase 3B – South of Washington Lan	Concrete Manhole w/ Frame & Cover– Over16 Ft Deep	2009	EA.	1	4,780 00	$4,780
361	Phase 4 – Valley Road	8" SDR-35 PVCP – 0-8 Ft Deep	2011	L F	2,396		$204,259
361	Phase 4 – Valley Road	8" SDR-35 PVCP – 8-10 Ft Deep	2011	L.F.	780		$68,055
361	Phase 4 – Valley Road	8" SDR-35 PVCP – 10-12 Ft Deep	2011	L.F.	180		$16,065
361	Phase 4 – Valley Road	8" SDR-35 PVCP – 12-14 Ft Deep	2011	L.F.	113		$10,312
361	Phase 4 – Valley Road	8" SDR-35 PVCP – 14-16 Ft Deep	2011	L F	60		$5,595
361	Phase 4 – Valley Road	8" SDR-35 PVCP – Over16 Ft Deep	2011	L.F.	50		$4,763
361	Phase 4 – Valley Road	8" DIP w/ 24" Steel Casing Bore & Jack Stream Crossing	2011	L.F		75	$20,850
361	Phase 4 – Valley Road	8" DIP – 8-10 Ft Deep	2011	L F.	0		$0
361	Phase 4 – Valley Road	8" DIP – 10-12 Ft Deep	2011	L F.	0		$0
361	Phase 4 – Valley Road	8" DIP – 12-14 Ft Deep	2011	L F.	15		$1,519
361	Phase 4 – Valley Road	8" DIP – 14-16 Ft Deep	2011	L.F.	25		$2,581
361	Phase 4 – Valley Road	8" DIP – Over16 Ft Deep	2011	L.F.	350		$36,838
361	Phase 4 – Valley Road	Concrete Manhole w/ Frame & Cover– 0-8 Ft Deep	2011	EA	6		$14,400
361	Phase 4 – Valley Road	Concrete Manhole w/ Frame & Cover– 8-10 Ft Deep	2011	EA.	12		$31,200
361	Phase 4 – Valley Road	Concrete Manhole w/ Frame & Cover– 10-12 Ft Deep	2011	EA.	1		$2,800
361	Phase 4 – Valley Road	Concrete Manhole w/ Frame & Cover– 12-14 Ft Deep	2011	EA	2		$6,000
361	Phase 4 – Valley Road	Concrete Manhole w/ Frame & Cover– 14-16 Ft Deep	2011	EA.	0		$0
361	Phase 4 – Valley Road	Concrete Manhole w/ Frame & Cover– Over16 Ft Deep	2011	EA	0		$0
361	Phase 4 – Valley Road	Concrete Doghouse Manhole w/ Frame & Cover	2011	EA	1		$4,000
361	Sadsbury Crossing	8" SDR-35 PVCP	2001	L F	996		$24,960
361	Sadsbury Crossing	Concrete Manhole w/ Frame & Cover	2001	EA.	8		$12,680
361	Quarry Ridge	8" SDR-35 PVCP Phase I	1999	L.F.	1,864		$46,600
361	Quarry Ridge	8" DIP Phase I	1999	L.F.	717		$31,548
361	Quarry Ridge	Concrete Manhole w/ Frame & Cover Phase I	1999	EA	13		$23,220
361	Quarry Ridge	8" SDR-35 PVCP Phase II	2001	L.F	2,275		$56,875
361	Quarry Ridge	8" DIP Phase II	2001	L.F	298		$13,112

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Pennsylvania American Water Company							
Sadsbury Township Wastewater Utility							
Wastewater							
Potential Purchaser: Investor-Owned Utility							
January 1, 2017							
Development of Original Cost (OC)							
361							
(1)		(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols. (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
361	Quarry Ridge	Concrete Manhole w/ Frame & Cover Phase II	2001	EA.	10		$15,000
361	Quarry Ridge	8" SDR-35 PVCP Phase III	2001	L.F	1,966		$49,150
361	Quarry Ridge	8" DIP Phase III	2001	L.F.	216		$9,504
361	Quarry Ridge	Concrete Manhole w/ Frame & Cover Phase III	2001	EA.	11		$16,800
361	Quarry Ridge	8" SDR-35 PVCP Phase IV	2002	L.F.	2,278		$56,950
361	Quarry Ridge	Concrete Manhole w/ Frame & Cover Phase IV	2002	EA.	11		$16,500
361	Sadsbury Village	8" SDR-35 PVCP	2006	L F	5,019		$125,475
361	Sadsbury Village	Concrete Manhole w/ Frame & Cover	2006	EA.	26		$41,500
361	Octorara Glen	8" SDR-35 PVCP	2006	L.F.	3,523		$68,699
361	Octorara Glen	Concrete Manhole w/ Frame & Cover	2006	EA.	23		$59,170
361	Cowan Estates (Capped Sewers)	8" SDR-35 PVCP	2013	L F	1,902		$49,452
361	Cowan Estates (Capped Sewers)	Concrete Manhole w/ Frame & Cover	2013	EA.	18		$36,000
361 Total		Collection Sewers - Gravity					$5,668,395
363	Phase 1A – Village of Pomeroy (Nort	8" x 4" Lateral Wye	2000	EA	115		$2,300
363	Phase 1A – Village of Pomeroy (Nort	8" x 6" Lateral Wye	2000	EA	8		$160
363	Phase 1A – Village of Pomeroy (Nort	4" SDR-35 PVCP Lateral	2000	L.F	1,952		$40,750
363	Phase 1A – Village of Pomeroy (Nort	6" SDR-35 PVCP Lateral	2000	L.F	201		$4,602
363	Phase 1B – Village of Pomeroy (Sout	8" x 6" Lateral Wye	2005	EA.	19		$1,520
363	Phase 1B – Village of Pomeroy (Sout	6" SDR-35 PVCP Lateral	2005	L F.	354		$17,890
363	Phase 2A – Village of Sadsburyville (	8" x 6" Lateral Wye	2007	EA.	48		$3,072
363	Phase 2A – Village of Sadsburyville (	6" SDR-35 PVCP Lateral	2007	L.F	474		$40,935
363	Phase 2B – Village of Sadsburyville (	8" x 6" Lateral Wye	2004	EA.	10		$1,250
363	Phase 2B – Village of Sadsburyville (	6" SDR-35 PVCP Lateral	2004	L.F	250		$7,500
363	Phase 2B – Village of Sadsburyville (	8" x 6" Lateral Wye	2004	EA	12		$5,220
363	Phase 2B – Village of Sadsburyville (	6" SDR-35 PVCP Lateral	2004	L.F.	155		$4,993
363	Phase 3A – Washington Lane and Lir	8" x 6" Lateral Wye	2005	EA	142		$11,360
363	Phase 3A – Washington Lane and Lir	6" SDR-35 PVCP Lateral	2005	L.F.	2,300		$116,420
363	Phase 3A – Washington Lane Extensi	6" SDR-35 PVCP Lateral	2009	L F.	16		$560
363	Phase 3B – South of Washington Lan	8" x 6" Lateral Wye Greenbelt Drive	2007	EA		3	$240
363	Phase 3B – South of Washington Lan	6" SDR-35 PVCP Lateral Greenbelt Drive	2007	L.F		75	$3,780
363	Phase 3B – South of Washington Lan	8" x 6" Lateral Wye - PVC	2009	EA	15		$6,525
363	Phase 3B – South of Washington Lan	8" x 6" Lateral Wye - DIP	2009	EA	6		$6,000
363	Phase 3B – South of Washington Lan	6" SDR-35 PVCP Lateral	2009	L.F.	498		$15,877
363	Phase 4 – Valley Road	8" x 6" Lateral Wye	2011	EA.	28		$1,400
363	Phase 4 – Valley Road	6" SDR-35 PVCP Lateral	2011	L F.	622		$35,610
363	Sadsbury Crossing	6" SDR-35 PVCP Lateral	2001	L.F.	856		$14,261
363	Quarry Ridge	6" SDR-35 PVCP Lateral – Phase I	2000	L.F.	1,271		$19,065
363	Quarry Ridge	6" SDR-35 PVCP Lateral – Phase II	2001	L F.	1,049		$15,735
363	Quarry Ridge	6" SDR-35 PVCP Lateral – Phase III	2001	L.F.	1,327		$19,905
363	Quarry Ridge	6" SDR-35 PVCP Lateral – Phase IV	2002	L.F	1,612		$24,180
363	Sadsbury Village	8" x 6" Lateral Wye	2006	EA.	146		$10,950
363	Sadsbury Village	6" SDR-35 PVCP Lateral	2006	L.F.	5,110		$76,650
363	Octorara Glen	8" x 6" Lateral Wye	2006	EA	44		$7,040
363	Octorara Glen	6" SDR-35 PVCP Lateral	2006	L F	1,352		$22,646
363	Cowan Estates	6" SDR-35 PVCP Lateral	2013	L.F.	330		$7,920
363 Total		Services to Customers					$546,316

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Development of Original Cost (OC)

361

(1)	(2)	(3)	(4)		(5)	(6)
NARUC Account	Location	Description	Service Date	Units	Quantity	Original Cost Per Foot	Original Cost
HEM Input		HEM Input	HEM Input		HEM Input	Unit Cost (Cols (6) & (3))	HEM Input
Account	Location	Description	Year	Units	QTY	U/C	OC
364		Meter Pit w/ Flow Meter (Force Main)	1999	L.S.	1		$25,000
364		Sigma Open Channel Flow w/Manhole & Telemetry	2015	L.F.	1,075		$73,731
364 Total		Flow Measuring Devices					$98,731
371		Gorman Rupp T6A3-B Pump Station	1999	L.S.	1		$225,000
371 Total		Pumping Equipment					$225,000
Grand Total							$6,841,845

Not Dedicated to Service

Account	Location	Description	Year	Units	QTY	U/C	OC
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP 0-6 Ft Deep	2008	L.F.	1,516	15.29	$23,184
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP 6-8 Ft Deep	2008	L.F	2,785	15.57	$43,350
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP 8-10 Ft Deep	2008	L.F	1,450	16.00	$23,200
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP 10-12 Ft Deep	2008	L F	38	20 37	$774
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP 12-14 Ft Deep	2008	L.F.	281	17.85	$5,016
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP 14-16 Ft Deep	2008	L.F.	882	19.65	$17,332
361	Bellaire Business Center – Phase 1A	8" Ductile Iron Pipe	2008	L.F.	22	35.18	$774
361	Bellaire Business Center – Phase 1A	Concrete Manhole w/ Frame & Cover	2008	EA	34	1,941.24	$66,002
361	Bellaire Business Center – Phase 1A	8" DIP w/Steel Casing Bore & Jack	2008	L.F.	133	470 26	$62,544
361	Bellaire Business Center – Phase 1A	8" SDR-35 PVCP @ Wetlands	2008	L.F.	65	49.11	$3,192
361	Meetinghouse Properties, LLC (Morr	8" SDR-35 PVCP	2009	L F	2,037	33.92	$69,090
361	Meetinghouse Properties, LLC (Morr	Concrete Manhole w/ Frame & Cover	2009	EA	12	2,567.92	$30,815
361	Sadbury Park	8" SDR-35 PVCP	2013	L F	1,247	20.23	$25,227
361	Sadbury Park	Concrete Manhole w/ Frame & Cover	2013	EA	7	2,565 71	$17,960
361	Sadbury Park	8" SDR-35 PVCP	2015	L.F.	3,801	25 00	$95,025
361	Sadbury Park	8" DIP	2015	L.F.	538	65.00	$34,970
361	Sadbury Park	Concrete Manhole w/ Frame & Cover	2015	EA	31	2,132 00	$66,092
361 Total		Collection Sewers - Gravity					$584,547
363	Bellaire Business Center – Phase 1A	6" SDR-35 PVCP Lateral	2008	EA	201	51.09	$10,270
363	Meetinghouse Properties, LLC (Morr	6" SDR-35 PVCP Lateral	2009	L F.	210	19 85	$4,169
363	Sadbury Park	6" SDR-35 PVCP Lateral	2015	EA.	64	494 31	$31,636
363	Sadbury Park	6" DIP Lateral	2015	EA.	7	1,162.00	$8,134
363 Total		Services to Customers					$54,209
Grand Total							$638,756
Total All Plant							**$7,480,601**

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Income Approach

AUS Consultants
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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
As of January 1, 2017
Discounted Cash Flow Analysis

Discount Rate	7.05%
Capitalization Rate	5.33%

Period	Age	Revenues	Operating Expenses	Income from Operations	Non-Operating Income (Expense)	Income Before State and Federal Taxes	State and Federal Taxes	After Tax Income	Non Cash Expense (depreciation)	Capital Expenditures	Change in Working Capital	Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
1	0.5	1,234,548	789,484	445,064	(117,074)	327,990	136,083	191,907	135,174	127,200	-	182,690	0.967	176,661	176,661
2	1.5	1,499,976	932,856	567,120	(114,632)	452,488	187,737	264,751	137,869	129,758	14,839	284,654	0.903	257,043	433,704
3	2.5	1,522,476	947,531	574,945	(112,542)	462,403	191,851	270,552	140,619	132,367	2,615	299,344	0.843	252,347	686,051
4	3.5	1,545,313	962,441	582,872	(110,555)	472,317	195,964	276,353	143,425	135,030	2,555	301,862	0.788	237,867	923,918
5	4.5	1,800,290	1,100,442	699,848	(108,439)	591,409	245,376	346,033	146,288	137,746	14,089	401,725	0.736	295,670	1,219,588
6	5.5	1,827,294	1,117,674	709,620	(106,651)	602,969	250,172	352,797	149,208	140,516	2,618	417,278	0.688	287,087	1,506,675
7	6.5	1,854,703	1,135,182	719,521	(104,958)	614,563	254,982	359,581	152,189	143,343	2,568	421,421	0.642	270,552	1,777,227
8	7.5	2,067,994	1,251,266	816,728	(103,176)	713,552	296,053	417,498	155,229	146,227	11,795	503,477	0.600	302,086	2,079,313
9	8.5	2,099,014	1,270,807	828,207	(101,668)	726,539	301,441	425,098	158,330	149,170	2,615	518,092	0.560	290,132	2,369,445
10	9.5	2,193,470	1,324,035	869,435	(100,187)	769,248	319,161	450,087	161,496	152,172	5,721	550,046	0.524	288,224	2,657,669
11	10.5	2,336,046	1,402,828	933,218	(98,745)	834,473	346,223	488,250	164,724	155,235	8,063	605,196	0.489	295,941	2,953,610
12	11.5	2,371,087	1,424,696	946,391	(97,497)	848,894	352,206	496,688	168,020	158,359	2,626	617,386	0.457	282,145	3,235,755
13	12.5	2,406,653	1,446,906	959,747	(96,332)	863,415	358,231	505,184	171,380	161,547	2,592	624,228	0.427	266,545	3,502,300
14	13.5	2,442,753	1,469,468	973,285	(95,248)	878,037	364,298	513,739	174,809	164,800	2,559	631,117	0.399	251,816	3,754,116
15	14.5	2,552,677	1,531,227	1,021,450	(94,171)	927,279	384,728	542,551	178,308	168,118	6,192	668,832	0.372	248,806	4,002,922
16	15.5	2,590,967	1,555,092	1,035,875	(93,244)	942,631	391,098	551,533	181,879	171,504	2,554	679,938	0.348	236,618	4,239,540
17	16.5	2,629,832	1,579,332	1,050,500	(92,393)	958,107	397,519	560,588	185,521	174,960	2,529	687,490	0.325	223,434	4,462,974
18	17.5	2,669,279	1,603,956	1,065,323	(91,616)	973,707	403,991	569,716	189,238	178,484	2,503	695,098	0.304	211,310	4,674,284
19	18.5	2,709,318	1,628,969	1,080,349	(90,913)	989,436	410,517	578,919	193,030	182,079	2,480	702,760	0.284	199,584	4,873,868
20 and beyond	19.5	2,831,237	1,697,454	1,133,783	(90,199)	1,043,584	432,983	610,601	196,898	185,747	6,522	744,616	4.970	3,700,742	8,574,610

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Income Approach

Discounted Cash Flow Analysis
Private Rate Regulated Wastewater Utility
Statement of Net Position
Period 1 through 19 and 20 to perpetuity

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Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser- Investor-Owned Utility
January 1, 2017

Statement of Net Position - Proprietary		Forecast Parameters			Period																	
	2015	1 to 6	7 to 15	16 to 20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Income Statement																								
Operating Revenues																								
Annual Growth in Customers	Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Periodic Customer Growth	5 years	3%							3.0%					3.0%					3.0%					3.0%
Rate Case Adjustments					0.0%	20.0%	0.0%	0.0%	12.0%	0.0%	0.0%	10.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
					1.5%	21.5%	1.5%	1.5%	16.5%	1.5%	1.5%	11.5%	1.5%	4.5%	6.5%	1.5%	1.5%	1.5%	4.5%	1.5%	1.5%	1.5%	1.5%	4.5%
Charges for Services	1,216,303				1,234,548	1,499,976	1,522,476	1,545,313	1,800,290	1,827,294	1,854,703	2,067,994	2,099,014	2,193,470	2,336,046	2,371,087	2,406,653	2,442,753	2,552,677	2,590,967	2,629,832	2,669,279	2,709,318	2,831,237
Operating Expense																								
Operating Expense w/o Depreciation	645,552				654,310	794,987	806,912	819,016	954,154	968,466	982,993	1,096,037	1,112,477	1,162,539	1,238,104	1,256,676	1,275,526	1,294,659	1,352,919	1,373,213	1,393,811	1,414,718	1,435,939	1,500,556
% of Revenues		53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%
Depreciation	188,114				135,174	137,869	140,619	143,425	146,288	149,208	152,189	155,229	158,330	161,496	164,724	168,020	171,380	174,809	178,308	181,879	185,521	189,238	193,030	196,898
Property tax					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Property Tax Rate		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Operating Expense	833,666				788,484	932,856	947,531	962,441	1,100,442	1,117,674	1,135,182	1,251,266	1,270,807	1,324,035	1,402,828	1,424,696	1,446,906	1,469,468	1,531,227	1,555,092	1,579,332	1,603,956	1,628,969	1,697,454
Operating Income	382,637				445,064	567,120	574,945	582,872	699,848	709,620	719,521	816,728	828,207	869,435	933,218	946,391	959,747	973,285	1,021,450	1,035,875	1,050,500	1,065,323	1,080,349	1,133,783
Nonoperating Revenues (Expenses)																								
Interest Income	599				1,235	1,500	1,522	1,545	1,800	1,827	1,855	2,068	2,099	2,193	2,336	2,371	2,407	2,443	2,553	2,591	2,630	2,669	2,709	2,831
Income Interest Rate		2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Interest Expense	(120,617)				(118,309)	(116,132)	(114,064)	(112,100)	(110,239)	(108,478)	(106,813)	(105,244)	(103,767)	(102,380)	(101,081)	(99,868)	(98,739)	(97,691)	(96,724)	(95,835)	(95,023)	(94,285)	(93,622)	(93,030)
Debt Interest Expense		4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%
Total non-operating revenues (expenses)	(120,018)				(117,074)	(114,632)	(112,542)	(110,555)	(108,439)	(106,651)	(104,958)	(103,176)	(101,668)	(100,187)	(98,745)	(97,497)	(96,332)	(95,248)	(94,171)	(93,244)	(92,393)	(91,616)	(90,913)	(90,199)
Income before State & Federal Taxes	262,619				327,990	452,488	462,403	472,317	591,409	602,969	614,563	713,552	726,539	769,248	834,473	848,894	863,415	878,037	927,278	942,631	958,107	973,707	989,436	1,043,584
State & Federal Taxes					136,083	187,737	191,851	195,964	245,376	250,172	254,982	296,053	301,441	319,161	346,223	352,206	358,231	364,298	384,728	391,098	397,519	403,991	410,517	432,983
Tax Rate		41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%	41.49%
After Tax Income					191,907	264,751	270,552	276,353	346,033	352,797	359,581	417,499	425,098	450,087	488,250	496,688	505,184	513,739	542,551	551,533	560,588	569,716	578,919	610,601
Achieved Return					308,981	379,383	383,094	386,908	454,472	458,448	464,539	520,675	526,766	550,274	586,995	594,185	601,516	608,987	636,722	644,777	652,981	661,332	669,832	700,800
Note 4 Capital Assets Business-type Activities																								
Capital Assets not being Depreciated																								
Land																								
Begin Balance					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Addition					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Addition Rate		0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Retirements					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Retirement Rate		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
End Balance	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Right-of-way Easements																								
Begin Balance					25,235	25,487	25,742	25,999	26,259	26,522	26,787	27,055	27,326	27,599	27,875	28,154	28,436	28,720	29,007	29,297	29,590	29,886	30,185	30,487
Addition					252	255	257	260	263	265	268	271	273	276	279	282	284	287	290	293	296	299	302	305
Addition Rate		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Retirements					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Retirement Rate		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
End Balance	25,235				25,487	25,742	25,999	26,259	26,522	26,787	27,055	27,326	27,599	27,875	28,154	28,436	28,720	29,007	29,297	29,590	29,886	30,185	30,487	30,792
Construction in Progress																								
Begin Balance					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Addition					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Addition Rate		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retirements					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Retirement Rate		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
End Balance	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital assets not being Depreciated																								
Begin Balance					25,235	25,487	25,742	25,999	26,259	26,522	26,787	27,055	27,326	27,599	27,875	28,154	28,436	28,720	29,007	29,297	29,590	29,886	30,185	30,487
Addition					252	255	257	260	263	265	268	271	273	276	279	282	284	287	290	293	296	299	302	305
Retirements					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
End Balance	25,235				25,487	25,742	25,999	26,259	26,522	26,787	27,055	27,326	27,599	27,875	28,154	28,436	28,720	29,007	29,297	29,590	29,886	30,185	30,487	30,792
Capital assets being Depreciated																								
Buildings																								
Begin Balance					183,085	184,366	185,657	186,956	188,265	189,583	190,910	192,247	193,592	194,947	196,312	197,687	199,070	200,463	201,866	203,279	204,702	206,135	207,578	209,031
Addition					915	922	928	935	941	948	955	961	968	975	982	988	995	1,002	1,009	1,016	1,024	1,031	1,038	1,045
Addition Rate		0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Retirements					(366)	(369)	(371)	(374)	(377)	(379)	(382)	(384)	(387)	(390)	(393)	(395)	(398)	(401)	(404)	(407)	(408)	(412)	(415)	(418)
Retirement Rate		-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%
End Balance	183,085				184,366	185,657	186,956	188,265	189,583	190,910	192,247	193,592	194,947	196,312	197,687	199,070	200,463	201,866	203,279	204,702	206,135	207,578	209,031	210,494
Machinery & Equipment																								
Begin Balance					278,797	285,767	292,911	300,234	307,740	315,434	323,320	331,403	339,688	348,180	356,885	365,807	374,952	384,326	393,935	403,784	413,879	424,226	434,832	445,703
Addition					5,576	5,715	5,858	6,005	6,155	6,309	6,466	6,628	6,794	6,964	7,138	7,316	7,499	7,687	7,879	8,076	8,278	8,485	8,697	8,914
Addition Rate		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Statement of Net Position - Proprietary	2015	Forecast Parameters 1 to 6	7 to 15	16 to 20	Period 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Retirements					(1,394)	(1,429)	(1,465)	(1,501)	(1,539)	(1,577)	(1,617)	(1,657)	(1,698)	(1,741)	(1,784)	(1,829)	(1,875)	(1,922)	(1,970)	(2,019)	(2,069)	(2,121)	(2,174)	(2,229)
Retirement Rate		-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%
End Balance	278,797				285,767	292,911	300,234	307,740	315,434	323,320	331,403	339,688	348,180	356,885	365,807	374,952	384,326	393,935	403,784	413,879	424,226	434,832	445,703	456,846
Sewer Collection Systems																								
Begin Balance					8,030,470	8 191,079	8,354,900	8,521,999	8 692,439	8,866,288	9,043,613	9,224,485	9,408,974	9,597,154	9,789,097	9,984,878	10,184,575	10,388,267	10,596,032	10,807,952	11,024,111	11,244,594	11,469,486	11,698,875
Addition					120,457	122,866	125,324	127,830	130,387	132,994	135,654	138,367	141,135	143,957	146,836	149,773	152,769	155,824	158,940	162,119	165,362	168,669	172,042	175,483
Addition Rate		1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%
Retirements					(40,152)	(40,955)	(41,775)	(42,610)	(43,462)	(44,331)	(45,218)	(46,122)	(47,045)	(47,986)	(48,945)	(49,924)	(50,923)	(51,941)	(52,980)	(54,040)	(55,121)	(56,223)	(57,347)	(58,494)
Retirement Rate		-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%	-0 50%
End Balance	8,030,470				8,191,079	8,354,900	8,521,999	8,692,439	8,866,288	9,043,613	9,224,485	9,408,974	9,597,154	9,789,097	9,984,878	10,184,575	10,388,267	10,596,032	10,807,952	11,024,111	11,244,594	11,469,486	11,698,875	11,932,852
Total Capital Assets being Depreciated/Capital Assets																								
Begin Balance	-				8,492,352	8,661,212	8,833,468	9,009,189	9,188,444	9,371,805	9,557,843	9,748,135	9,942,254	10,140,281	10,342,294	10,548,372	10,758,597	10,973,056	11,191,833	11,415,015	11,642,692	11,874,955	12,111,896	12,353,609
Addition	-				126,948	129,503	132,110	134,770	137,483	140,251	143,075	145,956	148,897	151,896	154,956	158,077	161,263	164,513	167,828	171,211	174,664	178,185	181,777	185,442
Retirements	-				(41,912)	(42,753)	(43,611)	(44,485)	(45,378)	(46,287)	(47,217)	(48,163)	(49,130)	(50,117)	(51,122)	(52,148)	(53,196)	(54,264)	(55,354)	(56,466)	(57,599)	(58,756)	(59,936)	(61,141)
End Balance	8,492,352				8,661,212	8,833,468	9,009,189	9,188,444	9,371,305	9,557,843	9,748,135	9,942,254	10,140,281	10,342,294	10,548,372	10,758,597	10,973,056	11,191,833	11,415,015	11,642,692	11,874,955	12,111,896	12,353,609	12,600,192
Total Capital Assets																								
Begin Balance					8,517,587	8,686,699	8,859,210	9,035,188	9,214,703	9,397,827	9,584,630	9,775,190	9,969,580	10,167,880	10,370,169	10,576,526	10,787,033	11,001,776	11,220,840	11,444,312	11,672,282	11,904,841	12,142,081	12,384,096
Addition					127,200	129,758	132,367	135,030	137,746	140,516	143,343	146,227	149,170	152,172	155,235	158,359	161,547	164,800	168,118	171,504	174,960	178,484	182,079	185,747
Retirements					(41,912)	(42,753)	(43,611)	(44,485)	(45,378)	(46,287)	(47,217)	(48,163)	(49,130)	(50,117)	(51,122)	(52,148)	(53,196)	(54,264)	(55,354)	(56,466)	(57,599)	(58,756)	(59,936)	(61,141)
End Balance	8,517,587				8,686,699	8,859,210	9,035,188	9,214,703	9,397,827	9 584,630	9,775,190	9,969,580	10,167,880	10,370,169	10,576,526	10,787,033	11,001,776	11,220,840	11,444,312	11,672,282	11,904,841	12,142,081	12,384,096	12,630,984
Less Accumulated Depreciation																								
Buildings																								
Begin Balance					-	(3,296)	(6,614)	(9,956)	(13,321)	(16,709)	(20,122)	(23,558)	(27,019)	(30,504)	(34,013)	(37,546)	(41,105)	(44,688)	(48,296)	(51,929)	(55,588)	(59,273)	(62,984)	(66,721)
Depreciation					(3,662)	(3,687)	(3,713)	(3,739)	(3,765)	(3,792)	(3,818)	(3,845)	(3,872)	(3,899)	(3,926)	(3,954)	(3,981)	(4,009)	(4,037)	(4,066)	(4,094)	(4,123)	(4,152)	(4,181)
Depreciation Rate		-2 0%	-2 0%	-2 0%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%	-2 00%
Depreciation Life		50	50	50																				
Retirements		Cal'd in Plnt			366	369	371	374	377	379	382	384	387	390	393	395	398	401	404	407	408	412	415	418
End Balance	-				(3,296)	(6,614)	(9,956)	(13,321)	(16,709)	(20,122)	(23,558)	(27,019)	(30,504)	(34,013)	(37,546)	(41,105)	(44,688)	(48,296)	(51,929)	(55,588)	(58,273)	(62,984)	(66,721)	(70,484)
Machinery & Equipment																								
Begin Balance					-	(6,572)	(13,308)	(20,212)	(27,289)	(34,543)	(41,978)	(49,599)	(57,411)	(65,418)	(73,625)	(82,038)	(90,661)	(99,499)	(108,558)	(117,843)	(127,361)	(137,117)	(147,117)	(157,367)
Depreciation					(7,966)	(8,165)	(8,369)	(8,578)	(8,793)	(9,012)	(9,238)	(9,469)	(9,705)	(9,948)	(10,197)	(10,452)	(10,713)	(10,981)	(11,255)	(11,537)	(11,825)	(12,121)	(12,424)	(12,734)
Depreciation Rate		-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%	-2 86%
Depreciation Life		35	35	35																				
Retirements		Cal'd in Plnt			1,394	1,429	1,465	1,501	1,539	1,577	1,617	1,657	1,698	1,741	1,784	1,829	1,875	1,922	1,970	2,019	2,069	2,121	2,174	2,229
End Balance	-				(6,572)	(13,308)	(20,212)	(27,289)	(34,543)	(41,978)	(49,599)	(57,411)	(65,418)	(73,625)	(82,038)	(90,661)	(99,499)	(108,558)	(117,843)	(127,361)	(137,117)	(147,117)	(157,367)	(167,872)
Sewer Collection System																								
Begin Balance						(83,394)	(168,456)	(255,218)	(343,716)	(433,984)	(526,057)	(619,972)	(715,765)	(813,473)	(913,136)	(1,014,792)	(1,118,482)	(1,224,245)	(1,332,123)	(1,442,159)	(1,554,395)	(1,668,876)	(1,785,647)	(1,904,754)
Depreciation					(123,546)	(126,017)	(128,537)	(131,108)	(133,730)	(136,404)	(139,133)	(141,915)	(144,753)	(147,649)	(150,601)	(153,614)	(156,686)	(159,819)	(163,016)	(166,276)	(169,602)	(172,994)	(176,454)	(179,983)
Depreciation Rate		-1 54%	1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%	-1 54%
Depreciation Life		35	35	35																				
Retirements		Cal'd in Plnt			40,152	40,955	41,775	42,610	43,462	44,331	45,218	46,122	47,045	47,986	48,945	49,924	50,923	51,941	52,980	54,040	55,121	56,223	57,347	58,494
End Balance	-				(83,394)	(168,456)	(255,218)	(343,716)	(433,984)	(526,057)	(619,972)	(715,765)	(813,473)	(913,136)	(1,014,792)	(1,118,482)	(1,224,245)	(1,332,123)	(1,442,159)	(1,554,395)	(1,668,876)	(1,785,647)	(1,904,754)	(2,026,243)
Total Accumulated Depreciation																								
Begin Balance					-	(93,262)	(188,378)	(285,386)	(384,326)	(485,236)	(588,157)	(693,129)	(800,195)	(909,395)	(1,020,774)	(1,134,376)	(1,250,248)	(1,368,432)	(1,488,977)	(1,611,931)	(1,737,344)	(1,865,266)	(1,995,748)	(2,128,842)
Depreciation					(135,174)	(137,869)	(140,619)	(143,425)	(146,288)	(149,208)	(152,189)	(155,229)	(158,330)	(161,496)	(164,724)	(168,020)	(171,380)	(174,809)	(178,308)	(181,879)	(185,521)	(189,238)	(193,030)	(196,898)
Retirements					41,912	42,753	43,611	44,485	45,378	46,287	47,217	48,163	49,130	50,117	51,122	52,148	53,196	54,264	55,354	56,466	57,599	58,756	59,936	61,141
End Balance	-				(93,262)	(188,378)	(285,386)	(384,326)	(485,236)	(588,157)	(693,129)	(800,195)	(909,395)	(1,020,774)	(1,134,376)	(1,250,248)	(1,368,432)	(1,488,977)	(1,611,931)	(1,737,344)	(1,865,266)	(1,995,748)	(2,128,842)	(2,264,599)
Business Type Activities Capital Assets, Net	8,517,587				8,593,437	8,670,832	8,749 802	8,830,377	8,912,591	8,996,473	9,082,061	9,169,385	9,258,485	9,349,395	9,442,150	9,536,785	9,633,344	9,731,863	9,832,381	9,934,938	10,039,575	10,146,333	10,255,254	10,366,385
Investment																								
Capital																								
Begin Balance					2,555,276	2,508,260	2,463,578	2,421,169	2,380,972	2,342,930	2,306,987	2,273,090	2,241,188	2,211,233	2,183,177	2,156,975	2,132,584	2,109,962	2,089,070	2,069,869	2,052,324	2,036,401	2,022,066	2,009,288
Additions	2,555,276				38,160	38,927	39,710	40,509	41,324	42,155	43,003	43,868	44,751	45,652	46,571	47,508	48,464	49,440	50,435	51,451	52,488	53,545	54,624	55,724
Percent Debt	30%				30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Retirements					(85,176)	(83,609)	(82,119)	(80,706)	(79,366)	(78,098)	(76,900)	(75,770)	(74,706)	(73,708)	(72,773)	(71,899)	(71,086)	(70,332)	(69,636)	(68,996)	(68,411)	(67,880)	(67,402)	(66,976)
Amortization Rate	1/30				1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30	1/30
End Balance	2,555,276				2,508,260	2,463,578	2,421,169	2,380,972	2,342,930	2,306,987	2,273,090	2,241,188	2,211,233	2,183,177	2,156,975	2,132,584	2,109,962	2,089,070	2,069,869	2,052,324	2,036,401	2,022,066	2,009,288	1,998,036
Equity	5,962,311																							
Percent Equity	70%																							
total Capital	8,517,587																							
Current Assets																								
Cash & Cash Equivalent	292,134				61,727	74,999	76,124	77,266	90,015	91,365	92,735	103,400	104,951	109,674	116,802	118,554	120,333	122,138	127,634	129,548	131,492	133,464	135,466	141,562
	0 05 of Revenues				5 0%	5 0%	5 0%	5 0%	5 0%	5 0%	5 0%	5 0%	5 0%	5 0%	5.0%	5 0%	5 0%	5 0%	5 0%	5 0%	5.0%	5 0%	5 0%	5 0%
Account Receivable	974,805				24,691	30,000	30,450	30,906	36,006	36,546	37,094	41,360	41,980	43,869	46,721	47,422	48,133	48,855	51,054	51,819	52,597	53,386	54,186	56,625
	0 02 of Revenues				2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2.0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%
Total Current Assets	1,266,939				86,418	104,999	106,574	108,172	126,021	127,911	129,829	144,760	146,931	153,543	163,523	165,976	168,466	170,993	178,688	181,367	184,089	186,850	189,652	198,187
Current Liabilities																								
Accounts Payable	42,184				24,691	30,000	30,450	30,906	36,006	36,546	37,094	41,360	41,980	43,869	46,721	47,422	48,133	48,855	51,054	51,819	52,597	53,386	54,186	56,625
	0 02 of Revenues				2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2.0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%	2 0%
Notes Payable, current	244,000				85,176	83,609	82,119	80,706	79,366	78,098	76,900	75,770	74,706	73,708	72,773	71,899	71,086	70,332	69,636	68,996	68,411	67,880	67,402	66,976

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser. Investor-Owned Utility
January 1, 2017

Statement of Net Position - Proprietary	Forecast Parameters			Period																	
	2015	1 to 6	7 to 15	16 to 20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Call'd in Long term debt																							
Total Current Liabilities	286,184				109,867	113,609	112,569	111,612	115,372	114,644	113,994	117,130	116,686	117,577	119,494	119,321	119,219	119,187	120,690	120,815	121,008	121,266	121,588	123,601
Net Working Capital					(23,449)	(8,610)	(5,995)	(3,440)	10,649	13,267	15,835	27,630	30,245	35,966	44,029	46,655	49,247	51,806	57,998	60,552	63,081	65,584	68,064	74,586
Change in Working Capital						14,839	2,615	2,555	14,089	2,618	2,568	11,795	2,615	5,721	8,063	2,626	2,592	2,559	6,192	2,554	2,529	2,503	2,480	6,522
Gross Plant	8,517,587				8,686,699	8,859,210	9,035,188	9,214,703	9,397,827	9,584,630	9,775,190	9,969,580	10,167,880	10,370,169	10,576,526	10,787,033	11,001,776	11,220,840	11,444,312	11,672,282	11,904,841	12,142,081	12,384,096	12,630,984
Accumulated Depreciation	-				(93,262)	(188,378)	(285,386)	(384,326)	(485,236)	(588,157)	(693,129)	(800,195)	(909,395)	(1,020,774)	(1,134,376)	(1,250,248)	(1,368,432)	(1,488,977)	(1,611,931)	(1,737,344)	(1,865,266)	(1,995,748)	(2,128,842)	(2,264,599)
Rate Base (Net Plant)	8,517,587				8,593,437	8,670,832	8,749,802	8,830,377	8,912,591	8,996,473	9,082,061	9,169,385	9,258,485	9,349,395	9,442,150	9,536,785	9,633,344	9,731,863	9,832,381	9,934,938	10,039,575	10,146,333	10,255,254	10,366,385
Return on Rate Base	7 23%				7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7 23%	7.23%	7.23%
Required Return	615,822				621,305	626,901	632,611	638,436	644,380	650,445	656,633	662,947	669,388	675,961	682,667	689,510	696,491	703,614	710,881	718,296	725,861	733,580	741,455	749,490
Achieved Return					308,981	379,383	383,094	386,908	454,472	459,448	464,539	520,675	526,766	550,274	586,995	594,185	601,516	608,987	636,722	644,777	652,981	661,332	669,832	700,800
Return Sufficiency (Shortfall)					(312,324)	(247,518)	(249,517)	(251,528)	(189,908)	(190,997)	(192,094)	(142,272)	(142,622)	(125,687)	(95,672)	(95,325)	(94,975)	(94,627)	(74,159)	(73,519)	(72,880)	(72,248)	(71,623)	(48,690)
Revenues					1,234,548	1,499,976	1,522,476	1,545,313	1,800,290	1,827,294	1,854,703	2,067,994	2,099,014	2,193,470	2,336,046	2,371,087	2,406,653	2,442,753	2,552,677	2,590,967	2,629,832	2,669,279	2,709,318	2,831,237
Required Rate Increase					25 3%	16 5%	16 4%	16 3%	10 5%	10 5%	10 4%	6 9%	6 8%	5 7%	4 1%	4 0%	3 9%	3 9%	2 9%	2 8%	2 8%	2 7%	2 6%	1 7%
Proposed Rate Increase					20%	0%	0%	12%	0%	0%	10%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

8,574,610 00

Pennsylvania American Water Company

Sadsbury Township, Pennsylvania Wastewater Utility

Appraisal Work Papers
As of January 1, 2017

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Statement of Net Position - Proprietary	2014	2015		Forecast Parameters 1 to 6	7 to 15	16 to 20
Cash Flows from Operating Activities						
Reciepts from Customers	1,060,594	1,306,248				
Payment to Suppliers	(691,768)	(646,771)				
Net Cash provided by (used in) Operating Activities	368,826	659,477				
Cash Flows from Noncapital Financing Activities						
Transfers to Other Funds	-	(148,622)				
Cash Flow from Capital and Related Financing Activities						
Acquistion of Capital Assets	2,438	(32,789)				
Principal Payments on Debt	(227,000)	(235,000)				
Interest Paid on Long-term Debt	(131,135)	(120,790)				
Net Cash Provided by (used in) Capital and Related Financing Activities	(355,697)	(388,579)				
Cash Flows from Investing Activities						
Interest Received	388	599				
Net Increase in Cash and Cash Equivalents	13,517	122,875				
Cash and Cash Equivalents at January 1, Year	155,742	169,259				
Cash and Cash Equivalents at December 31, Year	169,259	292,134				
Reconcilation of Operating Income to Net Cash Provided by Operating Activities						
Operating Income	404,474	382,637				
Adjustments to Reconcile Operating loss to net cash provided by operating activities						
Depreciation	186,506	188,114				
Cannge in Assets and Liabilities						
Decrease inAccounts Receivable	(212,673)	72,130				
Decrease in prepaid expenses	2,310	2,311				
Due other funds	(13,904)					
Decrease in accounts payable	5,576	(3,530)				
Increase inunearned revenues	(3,463)	17,815				
Total Adjustments	(35,648)	659,477				
Net Cash provided by Operating Activities	368,826	1,042,114				
Note 4: Capital Assets Business-type Activities						
Capital Assets not being Depreciated:						
100 Land/Land Rights						
100 Begin Balance	10,000	10,000				
100 Addition	-	-				
100 Addition Rate	0.00%	0.00%		0.5%	0 5%	0 5%
100 Retirements	-	-				
100 Retirement Rate	0.00%	0.00%		0.0%	0.0%	0 0%
100 End Balance	10,000	10,000	-			
200 Right-of-way Easements						
200 Begin Balance	39,112	39,112				
200 Addition	-	-				
200 Addition Rate				1.0%	1.0%	1.0%
200 Retirements	-	-				
200 Retirement Rate				0.0%	0 0%	0.0%
200 End Balance	39,112	39,112	25,235			
300 Construction in Progress						
300 Begin Balance	2,980	93,914				
300 Addition	99,025	-		0 0%	0 0%	0.0%
300 Addition Rate						
300 Retirements	(8,091)	-				
300 Retirement Rate				0 0%	0 0%	0.0%
300 End Balance	93,914	93,914	-			
Total Capital assets not being Depreciated						
Begin Balance	52,092	143,026	-			
Addition	99,025	-	-			
Retirements	(8,091)	-	-			
End Balance	143,026	143,026	25,235			
Capital assets being Depreciated:						
400 Buildings						
400 Begin Balance	140,000	140,000				
400 Addition	-	-				

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

	Statement of Net Position - Proprietary	2014	2015		Forecast Parameters 1 to 6	7 to 15	16 to 20
400	Addition Rate				0.50%	0 50%	0.50%
400	Retirements	-	-				
400	Retirement Rate				-0.20%	-0 20%	-0.20%
400	End Balance	140,000	140,000	183,085			
500	Machinery & Equipment						
500	Begin Balance	110,863	110,863				
500	Addition	-	32,789				
500	Addition Rate		30%		2.00%	2.00%	2.00%
500	Retirements	-	-				
500	Retirement Rate				-0 50%	-0 50%	-0 50%
500	End Balance	110,863	143,652	278,797			
600	Sewer Collection Systems						
600	Begin Balance	8,521,323	8,521,323				
600	Addition	-	-				
600	Addition Rate				1 50%	1 50%	1.50%
600	Retirements	-	-				
600	Retirement Rate				-0 50%	-0 50%	-0.50%
600	End Balance	8,521,323	8,521,323	8,030,470			
	Total Capital Assets being DepreciatedCapital Assets						
	Begin Balance	8,772,186	8,772,186	-			
	Addition	-	32,789	-			
	Retirements	-	-	-			
	End Balance	8,772,186	8,804,975	8,492,352			
	Total Capital Assets						
	Begin Balance	8,824,278	8,915,212	-			
	Addition	99,025	32,789	-			
	Retirements	(8,091)	-	-			
	End Balance	8,915,212	8,948,001	8,517,587			
	Less Accumulated Depreciation.						
400	Buildings						
400	Begin Balance	(36,633)	(39,433)				
400	Depreciation	(2,800)	(2,800)				
400	Depreciation Rate	-2.0%	-2.0%		-2 0%	-2 0%	-2.0%
400	Depreciation Life		(50)		50	50	50
400	Retirements	-	-		Cal'd in Plnt		
400	End Balance	(39,433)	(42,233)	-			
500	Machinery & Equipment						
500	Begin Balance	(47,617)	(60,896)				
500	Depreciation	(13,279)	(14,919)				
500	Depreciation Rate	-12 0%	-13.5%		-2.86%	-2 86%	-2.86%
500	Depreciation Life		(7 4)		35	35	35
500	Retirements	-	-		Cal'd in Plnt		
500	End Balance	(60,896)	(75,815)	-			
600	Sewer Collection System						
600	Begin Balance	(1,572,556)	(1,742,983)				
600	Depreciation	(170,427)	(170,395)				
600	Depreciation Rate	-2 00%	-2.00%		-1 54%	-1 54%	-1 54%
600	Depreciation Life		(50)		65	65	65
600	Retirements	-	-		Cal'd in Plnt		
600	End Balance	(1,742,983)	(1,913,378)	-			
	Total Accumulated Depreciation						
	Begin Balance	(1,656,806)	(1,843,312)	-			
	Depreciation	(186,506)	(188,114)	-			
	Retirements	-	-	-			
	End Balance	(1,843,312)	(2,031,426)	-			
	Business Type Activities Capital Assets, Net	7,071,900	6,916,575	8,517,587			
	Investment for DCF						
	Financials (1), Original Cost Study (2), or Replacement Cost Study (3)						
	Use	3					
		9	10				

1	2	3	4	5	6	7	8	9	10	11	
		Financials			Original Cost Study			Replacement Cost Study			
	Non Depreciable	Plant	Accum Depr	Net Plant	Plant	Accum Depr	Net Plant	Plant	Accum Depr	Net Plant	
100	Land	10,000	-	10,000							
200	Right-of-way Easements	39,112	-	39,112	18,345	(5,051)	13,294	25,235	-	25,235	353
300	Construction in Progress	93,914	-	93,914						-	

Pennsylvania American Water Company
Sadsbury Township Wastewater Utility
Wastewater
Potential Purchaser: Investor-Owned Utility
January 1, 2017

Statement of Net Position - Proprietary				Forecast Parameters					
	2014	2015		1 to 6	7 to 15	16 to 20			
	143,026	-	143,026	18,345	(5,051)	13,294	25,235	-	25,235
Depreciable									
400 Buildings	140,000	(42,233)	97,767	152,560	(58,115)	94,445	183,085	-	183,085
500 Machinery & Equipment	143,652	(75,815)	67,837	265,000	(127,649)	137,351	278,797	-	278,797
600 Sewer Collection Systems	8,521,323	(1,913,378)	6,607,945	7,044,668	(1,114,969)	5,929,699	8,030,470	-	8,030,470
	8,804,975	(2,031,426)	6,773,549	7,462,228	(1,300,733)	6,161,495	8,492,352	-	8,492,352
	8,948,001	(2,031,426)	6,916,575	7,480,573	(1,305,784)	6,174,789	8,517,587	-	8,517,587

SADSBURY TOWNSHIP
FINANCIAL STATEMENTS
DECEMBER 31, 2015

SADSBURY TOWNSHIP

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Independent Auditor's Report

To the Board of Supervisors
Sadsbury Township
Chester County, Pennsylvania

We have audited the accompanying financial statements of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of Sadsbury Township, Chester County, Pennsylvania, as of and for the year ended December 31, 2015, and the related notes to the financial statements, which collectively comprise Sadsbury Township's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

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

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

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

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities, the business-type activities, each major fund and the aggregate remaining fund information of the Sadsbury Township as of December 31, 2015, and the respective changes in financial position and, where applicable,

cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America (GAAP).

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that management's discussion and analysis on pages MD&A 1 through MD&A 18 and budgetary comparison information on pages 35 through 37 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with evidence sufficient to express an opinion or provide any assurance.

Other Information

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise Sadsbury Township's basic financial statement. The introductory section and the non-major fund budget and actual financial statement is presented for purposes of additional analysis and are not a required part of the basic financial statements.

The non-major fund budget and actual financial statement is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the non-major fund budget and actual financial statement is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The introductory and statistical section have not been subjected to the auditing procedures applied in the audit of the basic financial statements, and, accordingly, we do not express an opinion or provide any assurance on them.

Maiello & Company, LLP.

West Chester, Pennsylvania
October 18, 2016

SADSBURY TOWNSHIP
Management Discussion and Analysis
December 31, 2015

The Management Discussion and Analysis of Sadsbury Township's financial performance provides an overview of the Township's financial activities for the fiscal year ended December 31, 2015. The intent of this discussion and analysis is to look at the Township's financial performance as a whole. Readers should also review the financial statements and related notes.

Management's Discussion and Analysis (MD&A) is an element of the reporting model adopted by the Governmental Accounting Standards Board (GASB) in Statement Number 34, *Basic Financial Statements-and Management's Discussion and Analysis - for State and Local Governments,* presented in the MD&A.

FINANCIAL HIGHLIGHTS

- The Township's assets exceeded its liabilities by $12,398,583 (net position) for the fiscal year. The 2015 increase was $409,490.
- Total net position is comprised of the following:
  1) Capital assets, net of related debt, of $8,759,728 include property and equipment, net of accumulated depreciation, and are reduced by outstanding debt related to the purchase or construction of capital assets. The 2015 decrease was $110,857.
  2) Net position of $522,722 are restricted by constraints imposed from outside the Township such as grantors, laws, or regulations. The 2015 decrease was $593,946.
  3) Unrestricted net assets of $3,116,133 represent the portion available to maintain the Township's continuing obligations to citizens and creditors. The 2015 increase was $1,114,293.
- The Township's governmental activities reported total ending net assets of $7,475,648 this year. The 2015 increase was $196,600.
- At the end of the current fiscal year, unassigned fund balance for the General Fund was $822,065 or 57.0% of total General Fund expenditures, including transfers, and 46.0% of total General Fund revenues, including transfers. The 2015 increase was $289,611.
- This increase in fund balance relates to increased payroll related tax revenue such as earned income taxes and local service taxes, an increase in developer contributions, and a reduction in legal expenses and highway road project costs compared to 2014.

OVERVIEW OF THE FINANCIAL STATEMENTS

The accompanying financial statements have been prepared in accordance with GASB Statement Number 34 and present both government-wide and fund level financial statements using both the accrual and modified accrual basis of accounting, respectively.

Government-Wide Financial Statements

- The first two statements are government-wide financial statements - the Statement of Net Position and the Statement of Activities. These provide both long-term and short-term information about the Township's overall financial status.
- The government-wide statements report information about the Township as a whole using accounting methods similar to those used by private-sector companies. The Statement of Net Position includes all of the government's assets and liabilities. All of the current year's revenues and expenses are accounted for in the Statement of Activities regardless of when cash is received or paid.
- The two government-wide statements report the Township's net position and how they have changed. Net position, the difference between the Township's assets and liabilities, are one way to measure the Township's financial health or position.
- Over time, increases or decreases in the Township's net position are an indication of whether its financial health is improving or deteriorating, respectively.
- To assess the overall health of the Township, a reader needs to consider additional non-financial factors, such as changes in the Township's property tax base and increases in development in the Township.
- The government-wide financial statements of the Township are divided into two categories:

  Governmental Activities - All of the Township's basic services are included here, such as administration and community services. Taxes, charges for services, and state grants finance most of these activities.

  Business-Type Activities - The Township runs a sewer system and charges fees to residents for conveyance of waste through the Township's sewer system.

Fund Level Financial Statements

The remaining statements are fund financial statements that focus on individual parts of the Township's operations in more detail than the government-wide statements. The governmental fund statements tell how the Township's general services were financed in the short-term, as well as, what remains for future spending. Proprietary fund statements offer short-term and long-term financial information about the activities that the Township operates like a business. For this Township, this is the Sewer Fund. Fiduciary fund statements provide information about financial relationships in which the Township acts solely as a trustee or agent for the benefit of others.

- Governmental Funds - Most of the Township's activities are reported in governmental funds, which focus on the determination of financial position and change in financial position, not on income determination. Governmental funds are reported using an accounting basis called modified accrual accounting, which measures cash and all other financial assets that can readily be converted to cash. The governmental fund statements provide a detailed short-term view of the Township's operations and the services it provides. Governmental fund information helps the reader determine whether there are more or fewer financial resources that can be spent in the near future to finance the Township's programs. The relationship (or differences) between governmental activities (reported in the Statement of Net Position and the Statement of Activities) and governmental funds is reconciled in the financial statements.

- Proprietary Funds - These funds are used to account for Township activities that are similar to business operations in the private sector, where the reporting focus is on determining net income, financial position, changes in financial position, and a significant portion of funding through user charges. When the Township charges customers for services it provides—whether to outside customers or to other units in the Township—these services are generally reported in proprietary funds. The Sewer Fund is the Township's proprietary fund and is the same as the business-type activities reported in the government-wide statements.
- Fiduciary Funds - The Township is the trustee, or fiduciary, for some escrow funds. All of the Township's fiduciary activities are reported in a separate Statement of Fiduciary Net Position. We exclude these activities from the Township's other financial statements because the Township cannot use these assets to finance its operations.

The financial statements also include notes that explain some of the information in the financial statements and provide more detailed data.

FINANCIAL ANALYSIS OF THE TOWNSHIP—GOVERNMENT—WIDE STATEMENTS

The Township's total net position was $12,398,583 at December 31, 2015. The Township's total net assets were $11,989,093 at December 31, 2014. This represents an increase of $409,490 which is a 3.4% increase. The following tables present condensed financial information for the net position of the Township as of December 31, 2015 and 2014.

Schedule of Net Position
Year Ended December 31, 2015

	Governmental Activities	Business-type Activities	Total
ASSETS			
Current and other assets	$ 2,672,774	$ 1,341,412	$ 4,014,186
Capital assets, net	4,832,153	6,916,575	11,748,728
Total Assets	$ 7,504,927	$ 8,257,987	$ 15,762,914
LIABILITIES			
Current liabilities	$ 29,279	$ 346,052	$ 375,331
Non-current liabilities		2,989,000	2,989,000
Total Liabilities	29,279	3,335,052	3,364,331
NET POSITION			
Invested in capital assets, net of related debt	4,832,153	3,927,575	8,759,728
Restricted	522,722		522,722
Unrestricted	2,120,773	995,360	3,116,133
Total Net Position	7,475,648	4,922,935	12,398,583
Total Liabilities and Net Position	$ 7,504,927	$ 8,257,987	$ 15,762,914

Schedule of Net Position
Year Ended December 31, 2014

	Governmental Activities	Business-type Activities	Total
ASSETS			
Current and other assets	$ 2,317,192	$ 1,194,085	$ 3,511,277
Capital assets, net	5,022,685	7,071,900	12,094,585
Total Assets	$ 7,339,877	$ 8,265,985	$ 15,605,862
LIABILITIES			
Current liabilities	$ 60,829	$ 566,940	$ 627,769
Non-current liabilities		2,989,000	2,989,000
Total Liabilities	60,829	3,555,940	3,616,769
NET POSITION			
Invested in capital assets, net of related debt	5,022,685	3,847,900	8,870,585
Restricted	1,116,668		1,116,668
Unrestricted	1,139,695	862,145	2,001,840
Total Net Position	7,279,048	4,710,045	11,989,093
Total Liabilities and Net Position	$ 7,339,877	$ 8,265,985	$ 15,605,862

The results of this year's operations as a whole are reported in the Statement of Activities. All expenses are reported in the first column. Specific charges, grants, and revenues that directly relate to specific expense categories are represented to determine the final amount of the Township's activities that are supported by other general revenues. The largest revenues are property taxes, other taxes, and charges for services.

The following tables present condensed financial information for the Statement of Activities in a different format, in order to present total revenues for the years ended December 31, 2015 and 2014.

Changes in Net Position
For The Year Ended December 31, 2015

	Governmental Activities	Business-Type Activities	Total
REVENUES			
Program Services			
Charges for services	$ 593,584	$ 1,216,303	$ 1,809,887
Operating grants and contributions	195,031		195,031
Capital grants and contributions			0
General Revenues			
Real estate taxes	215,163		215,163
Transfer taxes	72,886		72,886
Per capita taxes	6,030		6,030
Earned income taxes	641,165		641,165
Local Services taxes	106,680		106,680
Investment earnings	2,584	599	3,183
Rental income	23,805		23,805
Miscellaneous	13,836		13,836
Total Revenues	1,870,764	1,216,902	3,087,666
EXPENSES			
General government	428,460		428,460
Public safety	506,693		506,693
Solid waste collection	242,083		242,083
Highways and streets	441,186		441,186
Culture and recreation	13,422		13,422
Miscellaneous expenditures	92,049		92,049
Sewer system		954,283	954,283
Total Expenses	1,723,893	954,283	2,678,176
Increase (decrease) in net position before transfers	146,871	262,619	409,490
TRANSFERS	49,729	(49,729)	
Increase (decrease) in net position	196,600	212,890	409,490
Net position - beginning	7,279,048	4,710,045	11,989,093
Net position - ending	$ 7,475,648	$ 4,922,935	$ 12,398,583

Changes in Net Position
For The Year Ended December 31, 2014

	Governmental Activities	Business-Type Activities	Total
REVENUES			
Program Services			
Charges for services	$ 513,487	$ 1,276,730	$ 1,790,217
Operating grants and contributions	134,185		134,185
Capital grants and contributions	363,560	93,372	456,932
General Revenues			
Real estate taxes	214,293		214,293
Transfer taxes	174,941		174,941
Per capita taxes	8,754		8,754
Earned income taxes	671,464		671,464
Local Services taxes	105,487		105,487
Investment earnings	4,214	388	4,602
Rental income	22,252		22,252
Miscellaneous	24,260		24,260
Total Revenues	2,236,897	1,370,490	3,607,387
EXPENSES			
General government	523,237		523,237
Public safety	523,456		523,456
Solid waste collection	242,062		242,062
Highways and streets	390,210		390,210
Culture and recreation	18,228		18,228
Miscellaneous expenditures	117,680		117,680
Sewer system		961,937	961,937
Total Expenses	1,814,873	961,937	2,776,810
Increase (decrease) in net position before transfers	422,024	408,553	830,577
TRANSFERS	44,764	(41,291)	3,473
Increase (decrease) in net position	466,788	367,262	834,050
Net position - beginning	6,812,260	4,342,783	11,155,043
Net position - ending	$ 7,279,048	$ 4,710,045	$ 11,989,093

EXPENSES

The following tables present condensed financial information on the expenses of the Township by function.

Expense Analyses

Expenses - Governmental Activities

The following table illustrates both the gross and net costs of services. Unrestricted grants and contributions are deducted to reflect the amount needed to be funded by other revenue sources. Capital contributions from developers are not included in the analysis.

	For the year ended December 31, 2015		For the year ended December 31, 2014	
	Total Cost of Services	Net Cost (Benefit) of Services	Total Cost of Services	Net Cost (Benefit) of Services
General government	$ 428,460	$ 342,750	$ 523,237	$ 518,412
Public safety	506,693	294,190	523,456	316,567
Solid waste collection	242,083	(90,242)	242,062	(93,258)
Highways and streets	441,186	323,858	390,210	(73,038)
Culture and recreation	13,422	(27,327)	18,228	17,278
Miscellaneous	92,049	92,049	117,680	117,680
Total Expenses	$ 1,723,893	$ 935,278	$ 1,814,873	$ 803,641
Less: Grants, subsidies, and contributions not restricted		0		0
Amount funded by other revenue sources		$ 935,278		$ 803,641

Expenses - Business-Type Activities

The following table reflects condensed financial activities of the sewer system, the only business-type activity of the Township.

	For the year ended December 31, 2015		For the year ended December 31, 2014	
	Total Cost of Services	Net Cost (Benefit) of Services	Total Cost of Services	Net Cost (Benefit) of Services
Sewer system	$ 954,283	$ (262,020)	$ 961,937	$ (408,165)

THE TOWNSHIP FUNDS

General Fund

- At December 31, 2015 and 2014, the Township reported fund balances of $1,256,027 and $904,922, respectively, which represents 87.2% and 56.8% of total expenses. Fund balance as a percent of total expenses increased because of higher taxes as explained below and a reduction in legal expense and highway road project expenses as compared to 2014. The fund balance is allocated as follows:

Non-spendable - prepaid expense	$ 49,288
Restricted	
Parks capital	39,319
Stormwater maintenance	6,215
Assigned - budgetary reserve	339,140
Unassigned	822,065
	$ 1,256,027

REVENUE

General fund revenues totaled $1,791,826 for the year ended December 31, 2015. The following table reflects a comparison of current year revenues with the revenues reflected in the 2015 budget year:

	Actual 2015	% of Total	Budget 2015	Inc/(Dec) from Budget
Taxes	$ 1,076,564	60.1%	$ 1,063,600	$ 12,964
Licenses and permits	78,968	4.4%	73,400	5,568
Fees and fines	18,934	1.1%	27,700	(8,766)
Interest income	978	0.1%	740	238
Rental income	23,805	1.3%	23,800	5
Intergovernmental revenues	28,800	1.6%	473,500	(444,700)
Charges for services	441,076	24.6%	398,200	42,876
Contributions from private sector	59,136	3.3%	46,600	12,536
Miscellaneous	13,836	0.8%	3,800	10,036
Other financing sources	49,729	2.7%	46,100	3,629
	$ 1,791,826	100.0%	$ 2,157,440	$ (365,614)

Intergovernmental revenues were lower than expected due to the 2015 budget including a transportation enhancement grant for $436,000 that was not received. Contributions from private sector was higher than the budget due to increased developer projects in 2015.

EXPENDITURES

General fund expenditures totaled $1,440,721. These expenditures were segregated into various programs depending on the functions of the activity. These programs and the costs associated with each, as well as, comparison to the original 2015 budget, are as follows:

	Actual 2015	% of Total	Budget 2015	Inc/(Dec) from Budget
General government	$ 474,478	32.9%	$ 726,200	$ (251,722)
Public safety	477,774	33.2%	545,300	(67,526)
Public works, solid waste collection	242,083	16.8%	244,600	(2,517)
Public works, highways and streets	148,723	10.3%	140,600	8,123
Culture and recreation	5,614	0.4%	40,400	(34,786)
Special projects	3,600	0.2%	420,000	(416,400)
Miscellaneous	88,449	6.2%	114,300	(25,851)
	$ 1,440,721	100.0%	$ 2,231,400	$ (790,679)

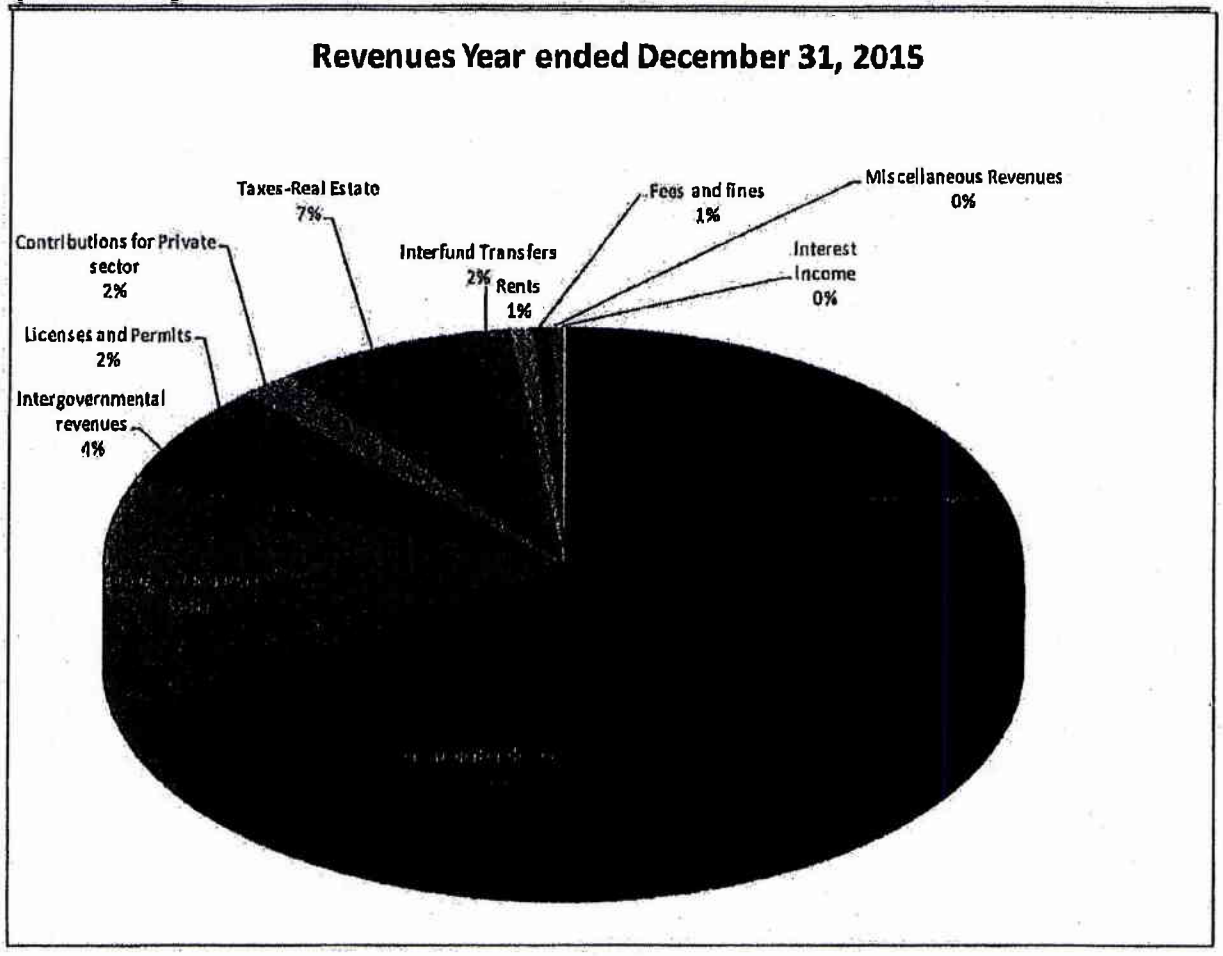
General government was lower than budget because of lower legal fees, engineering fees and administration costs such as payroll and insurance costs. Public safety was lower than budget because of lower payroll costs and gasoline cost by the police department. Culture and recreation were lower because a project that was budgeted did not occur in 2015. Special project costs were lower than budget because a highway project funded by federal and state grants was delayed.

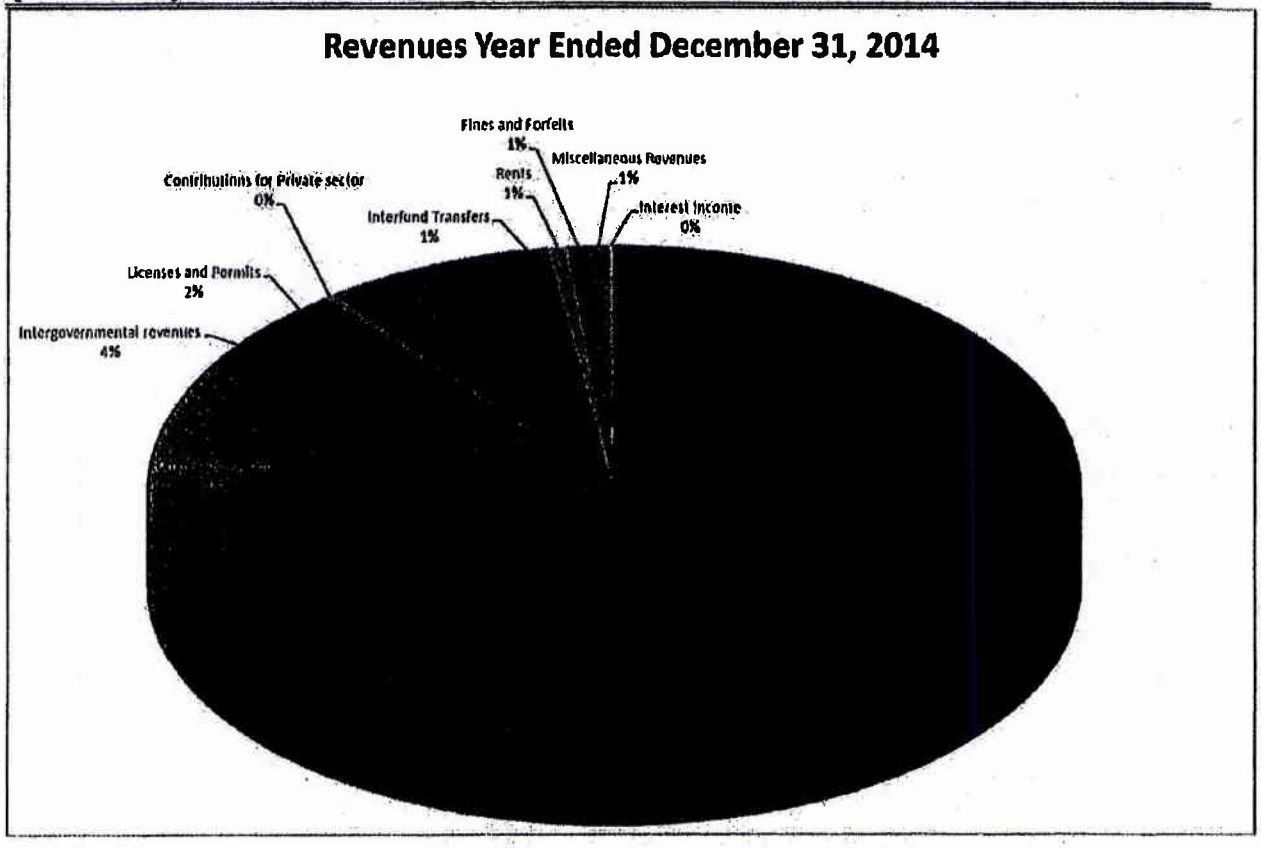
CONDENSED STATEMENT OF ACTIVITIES

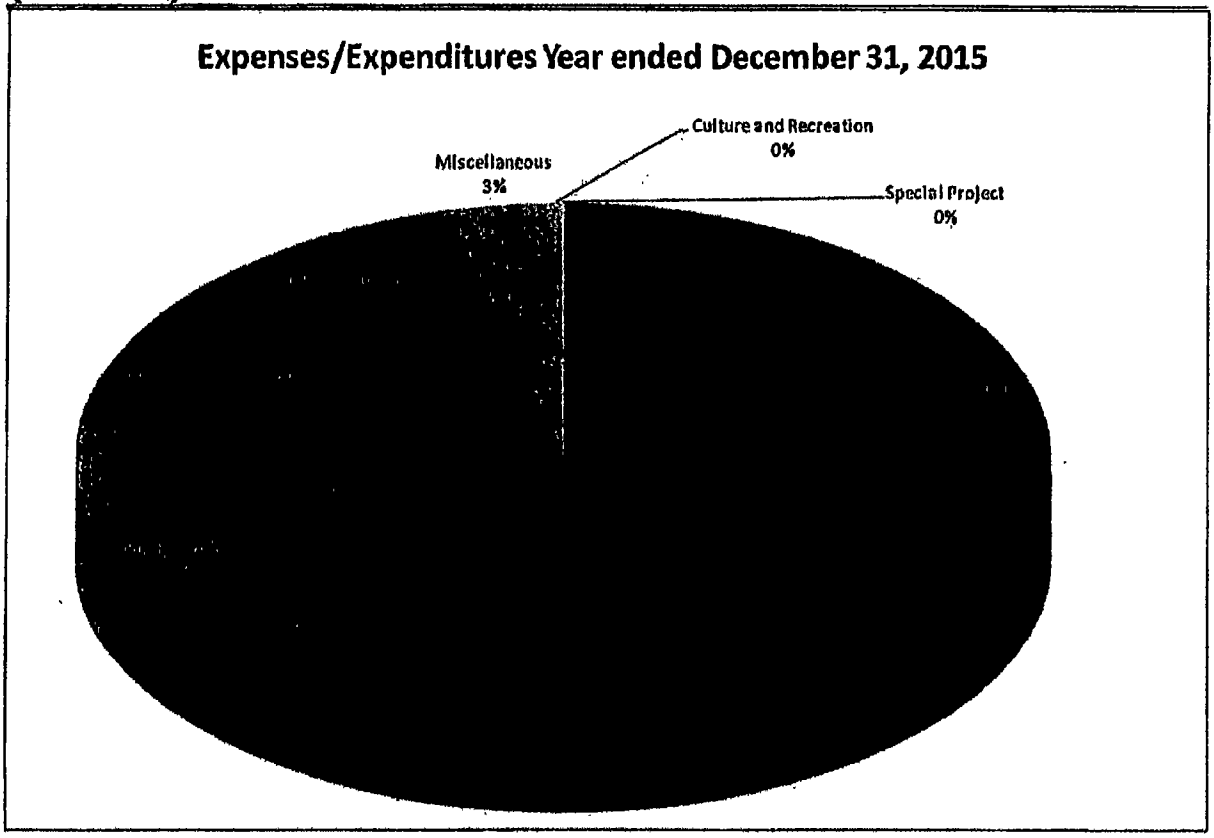
Governmental and Proprietary (Sewer) Fund

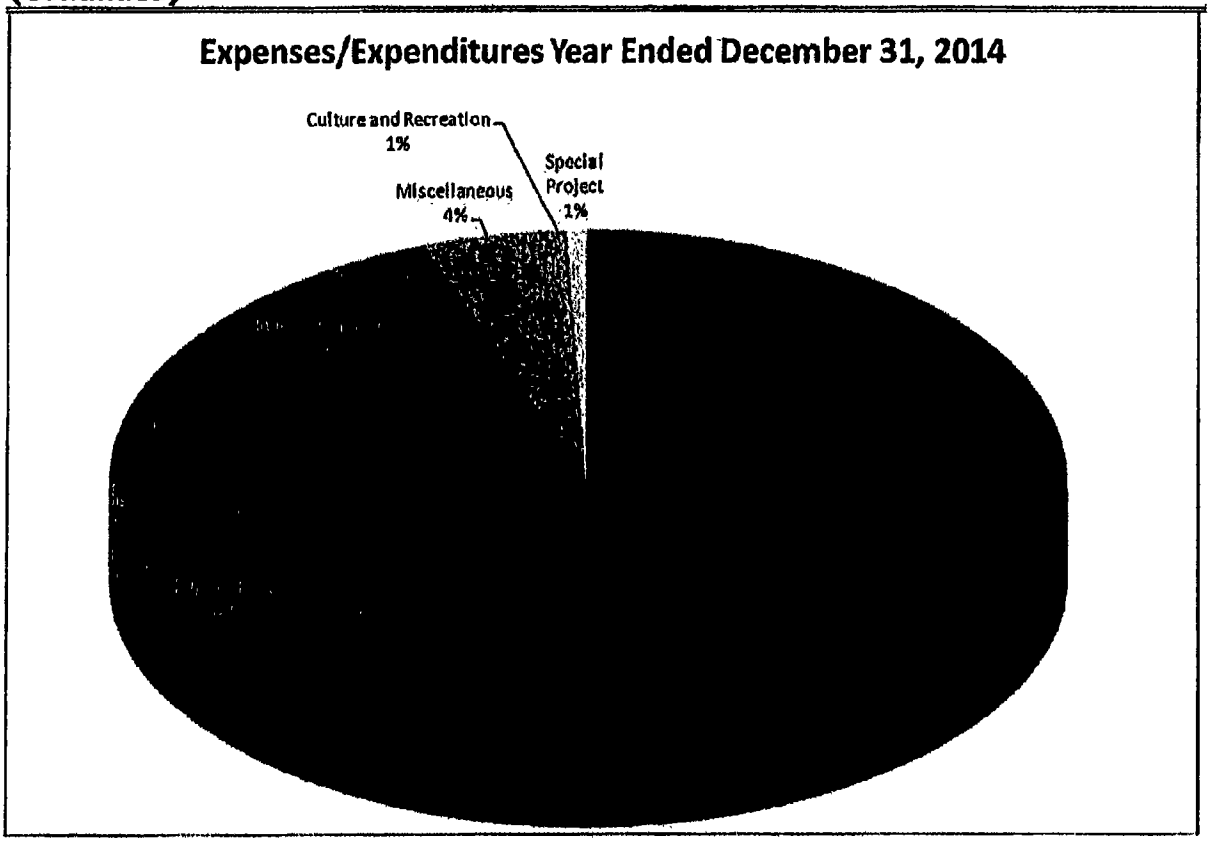
A comparison including graphs of the Township's Governmental and Proprietary (Sewer) Funds revenue and expenditures/expenses for 2015 and 2014 by category (as used for budgeting purposes) is shown below:

		2015	2014
Revenues			
	Taxes-real estate	$ 215,572	$ 211,909
	Taxes levied under Act 511	860,992	968,400
	Licenses and permits	78,968	75,328
	Fees and fines	18,934	21,908
	Interest income	2,584	4,214
	Rental income	23,805	22,252
	Intergovernmental revenues	135,895	126,205
	Charges for service	477,286	416,104
	Contributions for private sector	59,136	10,480
	Miscellaneous revenues	13,836	24,260
	Interfund transfers	49,729	44,764
	Sewer system revenues	1,216,902	1,277,118
Total Revenues		$ 3,153,639	$ 3,202,942
Expenditures/Expenses			
	General Government	$ 474,478	$ 548,915
	Public Safety	477,774	501,927
	Public works-solid waste collection	242,083	242,062
	Public works- highways and streets	241,363	287,426
	Culture and recreation	5,614	14,321
	Special project	3,600	19,316
	Miscellaneous	88,449	117,680
	Sewer system expenses	1,004,012	1,003,228
Total Expenditures/Expenses		$ 2,537,373	$ 2,734,875


Revenues Year ended December 31, 2015
Taxes-Real Estate 7%
Fees and fines 1%
Miscellaneous Revenues 0%
Contributions for Private sector 2%
Interfund Transfers 2%
Interest Income 0%
Rents 1%
Licenses and Permits 2%
Intergovernmental revenues 4%


Revenues Year Ended December 31, 2014
Fines and Forfeits 1%
Miscellaneous Revenues 1%
Rents 1%
Interest Income 0%
Contributions for Private sector 0%
Interfund Transfers 1%
Licenses and Permits 2%
Intergovernmental revenues 4%


Expenses/Expenditures Year ended December 31, 2015
Culture and Recreation
0%
Miscellaneous
3%
Special Project
0%


Expenses/Expenditures Year Ended December 31, 2014
Culture and Recreation 1%
Special Project 1%
Miscellaneous 4%

CAPITAL PROJECTS FUND

At December 31, 2015 and 2014, the Township reported a fund balance of $689,751 and $689,077, which is an increase of $674 and a decrease of $16,057, respectively. During 2015 and 2014, this fund received no transfers from the general fund and transferred $0 and $18,556 respectively, to pay for capital assets.

GENERAL FUND BUDGET

During the fiscal year, the Board of Township Supervisors authorizes revisions to the original budget to accommodate differences from the original budget to the actual expenditures of the Township. Those adjustments are again confirmed at the time the annual audit is accepted. This is done after the end of the fiscal year in accordance with state law. A schedule showing the Township's original and final budget amounts compared with amounts actually paid and received is provided in the financial statements.

The Township applies for federal, state, and local grants and these grants cannot always be anticipated in the budgeting process. Budgeted revenues are adjusted to reflect actual revenues received for all approved grants.

Budgeted expenditures are also adjusted to reflect the actual expenditures made for all approved grants. Transfers between specific categories of expenditures/financing uses occur during the year.

CAPITAL ASSETS

At December 31, 2015 and 2014, the Township had $11,748,728 and $12,094,585, respectively, invested in a broad range of capital assets (net of accumulated depreciation), including land, buildings, sewer, collection system, vehicles, and machinery and equipment. This amount represents a net increase in cost of $167,226, and an increase in accumulated depreciation of $513,083.

The following schedules present the changes in capital assets for the years ended December 31, 2015 and 2014. During this period, the Township had the following significant additions in capital assets.

Schedule of Capital Assets
For The Year Ended December 31, 2015

	Governmental Activities	Business-type Activities	Total
CAPITAL ASSETS			
Land	$ 407,868	$ 49,112	$ 456,980
Buildings	1,607,012	140,000	1,747,012
Machinery and equipment	431,013	143,652	574,665
Vehicles	440,262		440,262
Highways and streets	3,246,507		3,246,507
Storm sewers	1,189,215		1,189,215
Sewer collection system		8,521,323	8,521,323
Construction in progress	411,062	93,914	504,976
Total Capital Assets	7,732,939	8,948,001	16,680,940
ACCUMULATED DEPRECIATION			
Buildings	387,844	42,233	430,077
Machinery and equipment	363,988	75,815	439,803
Vehicles	322,154		322,154
Highways and streets	1,623,104		1,623,104
Storm sewers	203,696		203,696
Sewer collection system		1,913,378	1,913,378
Total Accumulated Depreciation	2,900,786	2,031,426	4,932,212
Capital Assets, Net	$ 4,832,153	$ 6,916,575	$ 11,748,728

Schedule of Capital Assets
For The Year Ended December 31, 2014

	Governmental Activities	Business-type Activities	Total
CAPITAL ASSETS			
Land	$ 407,868	$ 49,112	$ 456,980
Buildings	1,607,012	140,000	1,747,012
Machinery and equipment	402,751	110,863	513,614
Vehicles	440,262		440,262
Highways and streets	3,246,507		3,246,507
Storm sewers	1,158,838		1,158,838
Sewer collection system		8,521,323	8,521,323
Construction in progress	335,264	93,914	429,178
Total Capital Assets	7,598,502	8,915,212	16,513,714
ACCUMULATED DEPRECIATION			
Buildings	344,403	39,433	383,836
Machinery and equipment	337,312	60,896	398,208
Vehicles	278,319		278,319
Highways and streets	1,435,568		1,435,568
Storm sewers	180,215		180,215
Sewer collection system		1,742,983	1,742,983
Total Accumulated Depreciation	2,575,817	1,843,312	4,419,129
Capital Assets, Net	$ 5,022,685	$ 7,071,900	$ 12,094,585

DEBT ADMINISTRATION

As of January 1, 2015, the Township had total outstanding principal on notes of $3,224,000. During the year, the Township made payments against principal in the amount of $235,000, resulting in ending outstanding debt, as of December 31, 2015, of $2,989,000.

Debt Service Schedule
December 31, 2015

	Principal Outstanding Jan. 1, 2015	Additions	Payments	Principal Outstanding Dec. 31, 2015
Guaranteed Sewer Revenue Note Series 1998	$ 719,000	$ 0	$ 47,000	$ 672,000
Guaranteed Sewer Revenue Note Series 2003	1,960,000		187,000	$ 1,773,000
Guaranteed Sewer Revenue Note Series 2009	545,000		1,000	544,000
	$ 3,224,000	$ 0	$ 235,000	$ 2,989,000

More detailed information about our long-term liabilities is included in the Notes to the Financial Statements.

THE TOWNSHIP'S FUTURE

The Township expects to experience growth in the next five years as the economy improves.

FINANCIAL MANAGEMENT

Our financial report is designed to provide our citizens, taxpayers, investors, and creditors with a general overview of the Township's finances and to show the Board's accountability for the money it receives. If you have questions about this report or wish to request additional financial information, please contact Linda Shank, Assistant Secretary/Assistant Treasurer at the Township office.

SADSBURY TOWNSHIP
Statement of Net Position
December 31, 2015

	Governmental Activities	Business-Type Activities	Totals
ASSETS			
Cash and cash equivalents	$ 1,897,069	$ 292,134	$ 2,189,203
Investments			
Accounts receivables	392,581	974,805	1,367,386
Taxes receivable, net	289,486		289,486
Internal balances	1,107	(1,107)	
Prepaid items	49,288	75,580	124,868
Other current assets	43,243		43,243
Capital assets not being depreciated			
Land	407,868	10,000	417,868
Right-of-way easements		39,112	39,112
Construction in progress	411,062	93,914	504,976
Capital assets, net of accumulated depreciation			
Buildings	1,219,168	97,767	1,316,935
Highways and streets	1,623,403		1,623,403
Machinery and equipment	67,025	67,837	134,862
Storm Sewer	985,519		985,519
Vehicles	118,108		118,108
Sewer collection system		6,607,945	6,607,945
Total assets	$ 7,504,927	$ 8,257,987	$ 15,762,914
LIABILITIES			
Accounts payable	$ 25,514	$ 42,184	$ 67,698
Accrued liabilities	3,765		3,765
Interest payable		2,225	2,225
Unearned revenue		301,643	301,643
Long-term liabilities			
Portion due or payable within one year			
Notes payable		244,000	244,000
Portion due or payable after one year			
Notes payable		2,745,000	2,745,000
Total liabilities	29,279	3,335,052	3,364,331
NET POSITION			
Net investment in capital assets	4,832,153	3,927,575	8,759,728
Restricted			
Parks capital	39,319		39,319
Stormwater maintenance	6,215		6,215
Highways and streets	138,524		138,524
Act 209 capital projects	338,664		338,664
Unrestricted	2,120,773	995,360	3,116,133
Total net position	7,475,648	4,922,935	12,398,583
Total liabilities and net position	$ 7,504,927	$ 8,257,987	$ 15,762,914

See accompanying notes to the financial statements.

SADSBURY TOWNSHIP
Statement of Activities
For the Year Ended December 31, 2015

Functions/Programs	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating Grants and Contributions	Program Revenues: Capital Grants and Contributions	Net (Expense) Revenue and Changes in Net Position: Governmental Activities	Net (Expense) Revenue and Changes in Net Position: Business-Type Activities	Net (Expense) Revenue and Changes in Net Position: Totals
Governmental activities							
General government	$ 428,460	$ 74,968	$ 10,742	$ 0	$ (342,750)	$ 0	$ (342,750)
Public safety	506,693	183,325	29,178		(294,190)		(294,190)
Solid waste collection	242,083	331,941	384		90,242		90,242
Highways and streets	441,186	2,500	114,828		(323,858)		(323,858)
Culture and recreation	13,422	850	39,899		27,327		27,327
Miscellaneous	92,049				(92,049)		(92,049)
Total governmental activities	1,723,893	593,584	195,031	0	(935,278)	0	(935,278)
Business activities							
Sewer system	954,283	1,216,303				262,020	262,020
Total primary government	$ 2,678,176	$ 1,809,887	$ 195,031	$ 0	(935,278)	262,020	(673,258)
General revenues							
Taxes							
Real estate taxes					215,163		215,163
Transfer taxes					72,886		72,886
Per capita taxes					6,030		6,030
Earned income taxes					641,165		641,165
Local services taxes					106,680		106,680
Investment earnings					2,584	599	3,183
Rental income					23,805		23,805
Miscellaneous					13,836		13,836
Transfers					49,729	(49,729)	
Total general revenues					1,131,878	(49,130)	1,082,748
Change in net position					196,600	212,890	409,490
Net position - beginning					7,279,048	4,710,045	11,989,093
Net position - ending					$ 7,475,648	$ 4,922,935	$ 12,398,583

See accompanying notes to the financial statements.

SADSBURY TOWNSHIP
Balance Sheet—Governmental Funds
December 31, 2015

	General Fund	Capital Projects Fund	Act 209 Fund	Liquid Fuels Fund	Total Governmental Funds
ASSETS					
Cash and cash equivalents	$ 728,218	$ 689,751	$ 338,664	$ 140,436	$ 1,897,069
Other receivables, net	392,433			148	392,581
Taxes receivable	289,486				289,486
Due from other funds	3,077				3,077
Prepaid expenses	49,288				49,288
Other current assets	43,243				43,243
Total assets	$ 1,505,745	$ 689,751	$ 338,664	$ 140,584	$ 2,674,744
LIABILITIES, DEFERRED INFLOWS OF RESOURCES AND FUND BALANCES					
LIABILITIES					
Accounts payable	$ 25,424	$ 0	$ 0	$ 90	$ 25,514
Payroll and withholding taxes payable	3,765				3,765
Due to other funds				1,970	1,970
Total liabilities	29,189	0	0	2,060	31,249
DEFERRED INFLOWS OF RESOURCES					
Unavailable revenue, property taxes	7,947				7,947
Unavailable revenue, other taxes	72,973				72,973
Unavailable revenue, trash services	139,609				139,609
Total deferred inflows of resources	220,529	0	0	0	220,529
FUND BALANCES					
Nonspendable, prepaid expenses	49,288				49,288
Restricted					
Parks capital	39,319				39,319
Stormwater maintenance	6,215				6,215
Highways and streets				138,524	138,524
Act 209 capital projects			338,664		338,664
Assigned					
Capital projects		689,751			689,751
Budgetary reserve	339,140				339,140
Unassigned	822,065				822,065
Total fund balances	1,256,027	689,751	338,664	138,524	2,422,966
Total liabilities, deferred inflows of resources and fund balances	$ 1,505,745	$ 689,751	$ 338,664	$ 140,584	$ 2,674,744

See accompanying notes to the financial statements.

SADSBURY TOWNSHIP
Reconciliation of Total Governmental Funds Balances
To Net Position of Governmental Activities
December 31, 2015

Total Fund Balances - Governmental Funds		$ 2,422,966
Capital assets used in governmental activities are not current financial resources and therefore are not reported in the fund financial statements but are reported in the governmental activities of the statement of net position. Those assets consist of:		
Land	$ 407,868	
Construction in progress	411,062	
Buildings and improvements, net of accumulated depreciation of $387,844	1,219,168	
Machinery and equipment, net of accumulated depreciation of $363,988	67,025	
Storm sewers, net of accumulated depreciation of $203,696	985,519	
Vehicles, net of accumulated depreciation of $322,154	118,108	
Infrastructure, net of accumulated depreciation of $1,623,104	1,623,403	4,832,153
Taxes receivable will be collected this year but are not available soon enough to pay for the current period's expenditures and therefore are deferred in the funds.		220,529
Total Net Position - Governmental Activities		$ 7,475,648

See accompanying notes to the financial statements.