McNees
Wallace & Nurick LLC

100 Pine Street • PO Box 1166 • Harrisburg, PA 17108-1166
Tel: 717.232.8000 • Fax: 717.237.5300

Adeolu A. Bakare
Direct Dial: 717.237.5290
Direct Fax: 717.260.1744
abakare@mcneeslaw.com

June 30, 2016

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

VIA ELECTRONIC FILING

RE: City of DuBois - Bureau of Water Request for Approval to Increase Water Rates; Docket No. R-2016-_____

Dear Secretary Chiavetta:

On behalf of The City of DuBois – Bureau of Water ("DuBois" or the "Bureau"), please find enclosed for filing with the Pennsylvania Public Utility Commission ("PUC" or "Commission") the following documents and supporting information proposing to implement an overall rate increase of $257,604 per year in the Bureau's water rates:

1. Supplement No. 22 to Tariff Water Pa. P.U.C. No. 4 ("Supplement No. 22") containing an issued date of June 30, 2016, and a proposed effective date of August 29, 2016[1];

2. City of Dubois Statement No. 1: Direct Testimony of John Suplizio, City Manager;

3. City of Dubois Statement No. 2: Direct Testimony of Constance E. Heppenstall, Project Manager, Rate Studies, Gannett Fleming, Inc., Valuation and Rate Division;

4. City of Dubois Statement No. 3: Direct Testimony and Exhibits of John J. Spanos, Senior Vice President, Gannett Fleming Valuation and Rate Consultants, LLC;

[1] The City requests a limited waiver of Section 53.52(b)(2) of the Commission's Regulations, 52 Pa. Code 53.52(b)(2). Section 53.52(b)(2) requires municipal corporations subject to the Commission's jurisdiction to support a base rate case with an operating income statement for a twelve-month period ending within 180 days prior to the filing. In order to align the financial information in the rate filing with the City's Fiscal Year, the City requests a 30-day extension of the 180 day period set forth in Section 53.52(b)(2), as necessary to allow the City to support the proposed rate increase with a historic test year ending December 31, 2015.

5. City of Dubois Statement No. 4: Direct Testimony and Exhibits of Harold Walker III, Manager, Financial Studies, Gannett Fleming Valuation and Rate Consultants, LLC;

6. Notice to customers of the proposed increase;

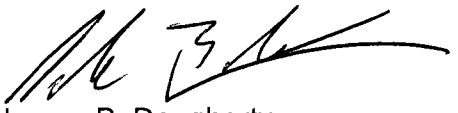
7. News release to be published in a newspaper of general circulation; and

8. Affidavits verifying mailing of individual Notices to all customers, and verifying the factual nature of all information presented in this filing.

Please contact the undersigned if you have any questions. As shown on the attached Certificate of Service, the statutory parties have been duly served with a copy of this filing. Thank you.

Sincerely,

McNEES WALLACE & NURICK LLC

By 
James P. Dougherty
Adeolu A. Bakare

Counsel to the City of Dubois – Bureau of Water

Enclosures
c: Paul Diskin, Bureau of Technical Utility Services (via Hand Delivery and E-Mail)
Certificate of Service

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the participants listed below in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

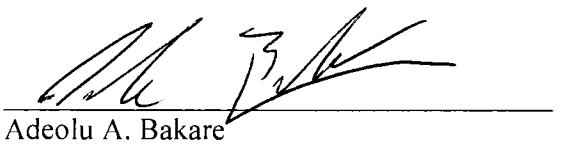
VIA E-MAIL AND HAND DELIVERY

Steven C. Gray, Esq.
Office of Small Business Advocate
Suite 202, Commerce Building
300 North Second Street
Harrisburg, PA 17101
sgray@pa.gov

Christine M. Hoover, Esq.
Office of Consumer Advocate
555 Walnut Street
Forum Place – 5th Floor
Harrisburg, PA 17101-1921
choover@paoca.org

Richard A. Kanaskie, Esq.
Pennsylvania Public Utility Commission
Bureau of Investigation & Enforcement
P.O. Box 3265
Harrisburg, PA 17105-3265
rkanaskie@pa.gov

Thomas T. Niesen, Esq.
Charles Thomas, III, Esq.
Thomas, Long, Niesen & Kennard
212 Locust Street, Suite 500
P.O. Box 9500
Harrisburg, PA 17108-9500
tniesen@thomaslonglaw.com
cet3@thomaslonglaw.com



Adeolu A. Bakare

Counsel to The City of DuBois – Bureau of Water

Dated this 30th day of June, 2016, at Harrisburg, Pennsylvania.

1

CITY OF DUBOIS – BUREAU OF WATER

RATES, RULES AND REGULATIONS

GOVERNING THE FURNISHING OF WATER SERVICE

IN SANDY TOWNSHIP, CLEARFIELD COUNTY, PENNSYLVANIA

Issued: June 30, 2016

Effective: August 29, 2016

By: John "Herm" Suplizio, City Manager
City of DuBois
16 W. Scribner Avenue
P.O. Box 408
DuBois, PA 15801

NOTICE

THIS TARIFF MAKES INCREASES IN EXISTING RATES,
SEE PAGE TWO.

LIST OF CHANGES MADE BY THIS SUPPLEMENT

Increases

Supplement No. 22 increases rates to produce additional revenue of $257,604 for customers that reside outside the City's limits.

Rules and Regulations

Supplement No. 22 implements a new Rule 36 authorizing Special Contracts.

TABLE OF CONTENTS

RULES AND REGULATIONS (Continued)

Discontinuance of Service (Continued)

30. The actual cost but not less than $50.00, payable in advance, will be made for turning on water in restoration of service after discontinuance for any of the reasons specified in preceding rule.

31. A Consumer desiring the discontinuance of water service shall give written notice to the office of the City.

32. The City may, without notice if an emergency reasonably requires it, discontinue water service in order to make necessary repairs or connections or to meet any other emergency; however, the City will give notice of any discontinuance of service if it is reasonably possible to do so.

Temporary Service

33. A Consumer desiring temporary service shall pay in advance Company's estimated net cost of connection and disconnection.

Limitation of Liability of City

34. The City shall not be liable for any damage or injury to any person or property caused by the discontinuance of water service for any of the reasons enumerated in Rule 29 or for the purpose of making necessary repairs or connections or to meet any emergency, or caused by failure of a Consumer to maintain Consumer's Service Line or caused by water escaping from Consumer's Service Line or caused by the total or partial failure of water service or pressure for any cause beyond the control of the City. The City shall be under no liability for damage or injury by fire to any person or property caused by the total or partial failure of water service or pressure for any cause whether within or beyond the control of the City.

Extensions

35. The City will extend its mains of proper size, considering future growth, and additions, within its chartered territory only on public roads, streets, alleys and lanes, upon application, when in the judgment of the City the annual revenue assured is sufficient to pay the annual operating costs and to provide a reasonable return on the investment.

(C)
|
(C)

* * *

(C) Indicates Change

RULES AND REGULATIONS (Continued)

City Facilities, Services and Products (C)

36. The City may furnish, at its sole discretion and upon an Applicant/Customer's request, special, substitute, emergency repairs, or additional facilities, services or products to such Applicant/Customer. When the City provides facilities, services or products not normally supplied to an Applicant/Customer, or when the estimated or actual costs of such individualized, substitute or additional facilities, services or products exceeds the estimated costs of the standard facilities, services or products that normally would be supplied by the City without special charge, the City may require the Applicant/Customer to enter into a special agreement(s) ("Specialized Contracts"), and establish minimum charges and facilities charges. The City may offer to Customers additional services or products that may be applicable to more than one Customer. At a minimum, charges under this Rule 36 shall be established by the City on a case-by-case basis and shall be sufficient to recover all of its appropriate incremental costs of the service and a contribution to its fixed costs.

The City may modify or discontinue the provisions of this Rule 36 at any time, subject to any Commission orders. Unless otherwise ordered by the Commission, any Specialized Contracts in effect prior to any such modification or discontinuance of this Rule 36 shall remain in effect under the terms and conditions specified in the contract.

General

37. The City shall have the right to reserve a sufficient supply of water at all times in its reservoirs and tanks to provide for Emergencies, or may restrict or regulate the quantity of water used by Consumers in case of scarcity, or whenever the public welfare may require it.

38. Any authorized employee of the City shall have access at all reasonable hours to any Premises supplied with water service for the purpose of reading meters, making inspections or repairs or securing information as the City may deem necessary for the proper and efficient conduct of its business.

39. No official or employee of the City shall have authority to bind it by any promise, agreement or representation not provided for in these Rules and Regulations, unless such authority is given in writing signed by an Officer or the Manager of the City. (C)

(C) Indicates Change

RATE SCHEDULE

Metered Rates

Customer Charges

Meter Size	Per Meter Per Month		
5/8" - 3/4"	$ 7.00	(I)	
1"	10.50		
1-1/2"	30.30		* * *
2"	47.80		
3"	78.20		
4"	152.80		
6"	196.00		
8"	262.50	(I)	(C)

Consumption Charges

	Gallons Per Month		(C)	Per 1,000 Gallons
		* * *		
For the first	100,000			$ 7.15 (I)
For all over	100,000		(C)	5.10 (I)

Public Fire Protection

The charge for unmetered fire protection shall be $184.37 per hydrant per year.

(I) Indicates Increase
(C) Indicates Change

2

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission, et al.	**:**	
	:	
v.	**:**	**R-2016-_____**
	:	
City of Dubois – Bureau of Water	**:**	

DIRECT TESTIMONY

OF

JOHN SUPLIZIO
CITY MANAGER

CITY OF DUBOIS- WATER BUREAU

CITY OPERATIONS
2013 RATE CASE SETTLEMENT
OVERVIEW OF FINANCIAL CONDITION

ON BEHALF OF

CITY OF DUBOIS – BUREAU OF WATER

JUNE 30, 2016

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission, et al.	:	
	:	
v.	:	**R-2016-_____**
	:	
City of Dubois – Bureau of Water	:	

DIRECT TESTIMONY OF JOHN SUPLIZIO

Q. State your name and business address.

A. My name is John "Herm" Suplizio. My business address is 16 West Scribner Avenue, DuBois, Pennsylvania, 15801.

Q. By whom are you employed?

A. I am employed by the City of DuBois, Clearfield County, Pennsylvania ("City").

Q. Please state your position with the City, and briefly describe your general duties and responsibilities.

A. My title is City Manager. I am charged with the operations of the City of DuBois. As part of my general duties, I am responsible for managing the City of DuBois - Water Bureau, including the budgeting, forecasting, income analysis, debt service analysis, and all other operational concerns. I am also responsible for the preparation and administration of the City's budget.

Q. Have you presented testimony in rate proceedings before a regulatory agency?

A. Yes, I sponsored testimony in the City's 2013 rate case before the Pennsylvania Public Utility Commission ("PUC" or "Commission").

Q What is your educational background?

A. I graduated from Central Catholic High School in 1978. In 1980, I earned an Associate of Applied Science in Aviation Technology from Williamsport Community College, which became an affiliate of the Pennsylvania State University in 1989 and has since operated as the Pennsylvania College of Technology.

Q. Briefly describe your work experience.

A. From 1980 through 1993, I was the Purchasing Manager for U.S. Air Express, where I was responsible for a $30 million inventory. In 1993, I became the Executive Director of The DuBois Area United Way. In 2000, I was elected the Mayor of DuBois and served till 2010. During my tenure as Mayor, l also served as acting City Manager from the Fall of 2000 through 2002, and June of 2006 through 2010. In 2010, I became the City Manager.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to address the City's operational philosophy, provide an overview of the City's operations, review the City's rate case history and obligations pursuant to the Settlement of the 2013 base rate case, and discuss the City's financial condition.

Q. What is the City's operational philosophy?

A. The City has a public duty to furnish adequate, safe, and reliable water service in accordance with applicable state and federal standards, including the Safe Drinking Water and Clean Streams Law. The City fulfills this duty efficiently and effectively. Additionally, the City prides itself on customer service. During my tenure as City Manager, the City has received no formal complaints from customers regarding water

quality or customer service. It is my intention to maintain these high standards; which cannot be accomplished without additional revenues to meet rising costs of operation.

Q. In view of the fact that the City provides water service both within and outside its municipal boundaries, please explain the services provided to customers outside its boundaries.

A. The City maintains the water lines and valves, while flushing the lines and testing the fire hydrants twice yearly. The City provides water service to four thousand, five hundred one (4,501) customers throughout the whole system. The City provides water service to three thousand, three hundred thirty-eight (3,338) residential customers inside its municipal boundaries, and provides water service to five hundred twenty-eight (528) residential customers in Sandy Township. This does not include residential customers to whom Sandy Township currently resells water that is supplied by the City's sale-for-resale service.

Q. When did the City last increase rates for outside-City customers?

A. The Commission last approved a rate increase for the City on December 5, 2013. This increase became effective on January 1, 2014. Notably, the City's next most recent rate case was approved by the Commission on August 23, 2006, meaning more than seven (7) years passed between the City's most recent two (2) rate filings. While the City appreciates the Commission's approval of the rate increase set forth in the 2013 Settlement, additional rate relief remain necessary to ensure the City fully recovers its cost to serve outside customers.

Q. Did the 2013 Settlement impose any obligations upon the City?

A. Yes. Per the 2013 Settlement, the City is obligated to: (1) Include all testimony and any Cost of Service Study with the initial rate filing; (2) Meet with signatory parties to review the rate filing at least 30 days before filing the next rate case; (3) develop a cost-based methodologies for allocating administrative costs to the water operations and provide such information at a pre-filing meeting; and (4) include all revenues from water service contracts received from natural gas drilling companies in its Annual Reports to the Commission.

Q. Did the City provide testimony and a Cost of Service Study with the 2016 rate filing?

A, Yes, the 2016 rate filing includes Statement No. 1, the Direct Testimony of John "Herm" Suplizio, Statement No. 2, the Direct Testimony of Connie Heppenstall, Statement No. 3, the Direct Testimony of John Spanos, and Statement No. 4, the Direct Testimony of Harold Walker IV. Additionally, Exhibit__(CEH-2) to Statement No. 2 presents the Cost of Service Study supporting the proposed rate increase.

Q. Did the City meet with signatory parties to review the rate filing at least 30 days before filing the next rate case?

A. Yes, the City held a pre-filing meeting on May 31, 2016. I note that certain parties to the 2013 Settlement were unable to attend the May 31 meeting. However, such parties were provided with a copy of the meeting presentation and offered an opportunity to meet separately with the City to review the rate presentation.

Q. At the pre-filing meeting, did the City disclose the bases for allocating administrative costs to the water operations?

A. Yes. The allocations methodologies are discussed in more detail in Ms. Heppenstall's testimony.

Q. Did the City report the volumes and revenues associated with sales of water to natural gas drilling companies in its Annual Reports for 2014 and 2015.

A. Yes. The 2014 Annual Report included sales of 31,317,000 gallons to natural gas drilling companies, resulting in $285,351 of revenue for the City. The 2015 Annual Report included sales of 3,664,000 gallons to natural gas drilling companies, resulting in $27,056 of revenue for the City.

Q. Has the City experienced any contract sales of water to shale gas drillers in 2016?

A. No. I note that the City also did not contract for any sales of water to natural gas drilling companies in 2015. The sales volumes reported for 2015 occurred pursuant to preexisting contracts.

Q. Does the City expect to resume sales of water to natural gas drilling companies?

A. No.

Q. Are you able to quantify the City's financial condition?

A. Yes. Under current rates, the City cannot earn a reasonable rate of return on its water utility assets. Overall, the City earns a 2.85% return on the total water system. For inside-City customers only, the rate of return is 3.70%. For outside-City customers, the rate of return is 0.74%. Although present rates are below cost of service for all customers, the underrecovery from outside-City customers (as shown by the disparity of relative rate of return under present rates) is not only unfair and inequitable, but is a

serious threat to the City's financial and operational viability. The necessity to provide a reasonable rate of return through increased rates is more thoroughly addressed in City of DuBois Statement No. 2, the Direct Testimony of Constance Heppenstall.

Q. Does this complete your Direct Testimony at this time?

A. Yes.

3

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission, et al.	**:**	
	:	
v.	**:**	**R-2016-**
	:	
City of Dubois – Bureau of Water	**:**	

DIRECT TESTIMONY

OF

CONSTANCE E. HEPPENSTALL,
PROJECT MANAGER RATE STUDIES
GANNETT FLEMING, INC.
VALUATION AND RATE DIVISION

REVENUE REQUIREMENTS

ON BEHALF OF

CITY OF DUBOIS – BUREAU OF WATER

June 30, 2016

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission, et al.	**:**	
	:	
v.	**:**	**R-2016-_____**
	:	
City of Dubois – Bureau of Water	**:**	

DIRECT TESTIMONY OF CONSTANCE E. HEPPENSTALL

Q. State your name and business address.

A. My name is Constance E. Heppenstall. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania.

Q. By whom are you employed?

A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC (Gannett Fleming).

Q. Please state your position with Gannett Fleming, and briefly describe your general duties and responsibilities.

A. My title is Project Manager, Rate Studies. My duties and responsibilities include the preparation of accounting and financial data for revenue requirements, the allocation of cost of service to customer classifications, and the design of customer rates in support of public utility rate filings.

Q. Have you presented testimony in rate proceedings before a regulatory agency?

A. Yes. I have testified before the Pennsylvania Public Utility Commission, the Kentucky Public Service Commission and the Arizona Corporation Commission.

Q What is your educational background?

A. I have a Bachelor of Arts Degree in Economics from the University of Virginia, Charlottesville, Virginia and a Master of Science in Industrial Administration from the Carnegie-Mellon University's Tepper School of Business, Pittsburgh, Pennsylvania.

Q. Would you please describe your professional affiliations?

A. I am a member of the American Water Works Association and the National Association of Water Companies. I am also a member of the Pennsylvania Municipal Authorities Association.

Q. Briefly describe your work experience.

A. I joined the Valuation and Rates Division of Gannett Fleming, Inc. in August 2006, as a Rate Analyst. In 2013, I was promoted to the position of Project Manager, Rate Studies. Prior to my employment at Gannett Fleming, Inc., I was a Vice President of PriMuni, LLP where I developed financial analyses to test proprietary software in order to ensure its pricing accuracy in accordance with securities industry's conventions. From 1987 to 2001, I was employed by Commonwealth Securities and Investments, Inc. as a public finance professional where I created and implemented financial models for public finance clients in order to create debt structures to meet clients' needs. From 1986 to 1987, I was a public finance associate with Mellon Capital Markets.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to explain and support the City of DuBois – Water Bureau (the "City") revenue and expense claims, and the original cost measure of value based on the historic and future test years ending December 31, 2015 and 2016, the City’s cost of

service allocation study and the proposed rate design based on the future test year ending December 31, 2016.

REVENUE AND EXPENSE CLAIMS AND ORIGINAL COST MEASURE OF VALUE

Q. Have you prepared an exhibit which presents and supports the City's claims in this proceeding?

A. Yes. Exhibit_(CEH-1), filed in support of the tariff, presents the City's responses to the Pennsylvania Public Utility Commission Tariff Regulations for rate filings required under 52 Pa. Code §53.52, which includes information to be furnished with proposed general rate increase filings less than $1 million.

Q. Please explain the contents of Exhibit_(CEH-1).

A. Exhibit_(CEH-1) contains statements with respect to the specific reasons for the proposed increase in rates, an explanation of the City's revenue request and a summary of the proposed rate of return. The exhibit also includes schedules presenting the number of customers served, the income statement, pro forma revenue and expense statements, the balance sheet, a summary of the original cost measure of value, a comparison of present and proposed rates, and bill comparisons at present and proposed rates.

Q. What is the total revenue requirement for the future test year ending December 31, 2016?

A. The total revenue requirement as shown on the City's operating statement, page 10, column 10 of Exhibit_(CEH-1) is $3,489,635.

Q. What are the components of the total revenue requirement?

A. The revenue requirement consists of operation and maintenance expenses of $2,097,127, depreciation expense of $377,650, and net operating income of $1,014,857.

Q. Please explain the operating statements found on page 10, 11 and 12 of Exhibit_(CEH-1).

A. The operating statements were prepared for the combined inside- and outside-City operations and also for the inside-City and outside-City operations, separately. The statements show the Operating Revenues, Operating Revenue Adjustments, Net Operating Income, Original Cost Measure of Value, and the Rate of Return for the historic test year per books at December 31, 2015, (column 2), the pro forma historic test year (column 5), the pro forma future test year at December 31, 2016, under present rates (column 8), and the pro forma future test year under proposed rates (column 10). Pro forma historic and future test year adjustments are shown in columns 4 and 7, respectively. The proposed revenue increase is shown in column 9.

Q. Please explain the sources of the items on the operating statement.

A. Operating revenues on line 1 are brought forward from the revenue statement on pages 7 and 8 of Exhibit_(CEH-1). Operation and maintenance expenses and depreciation expense on lines 5 and 6 are brought forward from the operating expense statement found on pages 16 and 17 of Exhibit_(CEH-1). Operating and maintenance expenses and depreciation expense are allocated between inside- and outside-City operations based on the cost of service study supplied in Exhibit_(CEH-2). The original cost measure of value on line 16 is brought forward from page 13 of Exhibit_(CEH-1). The original cost measure of value is allocated between inside- and outside-City operations based on the cost of service study supplied in Exhibit_(CEH-2).

MEASURE OF VALUE

Q. Please explain the original cost measure of value on page 13 of Exhibit_(CEH-1).

A. The original cost measure of value as of December 31, 2015, and December 31, 2016, is comprised of the original cost less the ratemaking book reserve for the total utility plant in service. These amounts are set forth in Exhibit_(JJS-1) (historic) and Exhibit_(JJS-2) (future) and explained by Mr. John J. Spanos in City of DuBois Statement No. 3.

Cash working capital, calculated by the rule-of-thumb method, is added to the net utility plant. The total original cost measure of value is $14,975,989 as of December 31, 2015, and $15,622,314 for the future test year as of December 31, 2016. The rate base amounts are brought forward to the operating statement on page 10 to determine the rates of return under present and proposed rates.

RATE OF RETURN

Q. What is the rate of return based on revenues under proposed rates?

A. Page 10 of Exhibit_(CEH-1) shows a combined inside- and outside-City rate of return under proposed rates of 6.50%. It is based on total pro forma revenues of $3,489,635, less operating income deductions of $2,474,777, resulting in income available for return of $1,014,857. The income available for return divided by the original cost measure of value of $115,622,314 results in a rate of return of 6.50%. The rate of return for inside-City operations is 6.50% and for outside-City operations is 6.48%.

Q. Is this a rate of return that the City can support?

A. Yes. The City can support a rate of return of 6.50% as presented in the direct testimony of Mr. Harold Walker, in City of DuBois Statement No. 4.

PRO FORMA REVENUE

Q. Please explain the development of pro forma revenues under present and proposed rates.

A. The summary of pro forma revenues under present and proposed rates for inside-City and outside-City customers is presented on pages 7 and 8 of Exhibit_(CEH-1). The pro forma revenues under present rates for the historic test year are developed by adding the pro forma historic test year revenue adjustments in column 4 to the revenues per books in column 2. The result is the pro forma historic test year revenues as of December 31, 2015, in column 5.

The pro forma revenues under present rates for the future test year are developed by adding the pro forma future test year revenue adjustments in column 7 to the pro forma historic test year revenues in column 5. The result is the pro forma future test year revenues as of December 31, 2016, in column 8. The pro forma revenue adjustments are presented in Appendix A of Exhibit_(CEH-1).

The pro forma revenues under proposed rates in column 11 are developed in Appendix C of Exhibit_(CEH-1). The percent increase and the amount of increase for each customer classification is shown in columns 9 and 10, respectively.

Q. Please explain the pro forma operating revenue adjustments under present rates in Exhibit_(CEH-1), Appendix A.

A. Adjustments R-1 and R-2 annualize revenue for the net gain or loss of customers during the test year, for inside- and outside-City customers, respectively. The change in the number of customers is multiplied by the average annual bill for each classification. One

half of the revenue is reflected in the adjustment assuming that the change in the number of customers occurred at mid-year.

Adjustment R-3 imputes revenues for the number of inside-City public hydrants as of December 31, 2015.

Adjustment R-4 adjusts revenue for outside-City public fire hydrants to present outside-City hydrant rates.

Adjustment R-5 adjusts revenue for outside-City and inside-City for non-reoccurring revenue from the sale of water to Shale Gas Companies of $27,056 which the City received in the first quarter of 2015. The City does not anticipate any future revenue from the sale of water related to Shale Gas.

Q. Please explain the revenue adjustments under present rates for the future test year in Appendix A.

A. Adjustments R6 and R7 annualize revenue for the projected gain in customers based on the annual gain or loss in the number of customers in 2014 and 2015, for inside- and outside-City customers, respectively. The change in the number of customers is multiplied by the average annual bill for each classification.

Q. Describe the development of pro forma revenues under proposed rates.

A. Schedule 1 in Appendix C, develops the pro forma revenues under proposed rates. Column 5 summarizes the application of proposed rates to the consumption analysis set forth on Schedule 2. The revenues under proposed rates in column 6 are determined by applying the adjustment factor to the revenues in column 5. Column 7 summarizes historic test year adjustments R8 through R10 from Schedule 3. These adjustments are the same as adjustments R1 through R3 except that proposed rates are used to determine the adjustment

amount. The total pro forma historic test year revenue under proposed rates, which is the sum of columns 6 and 8, are shown in column 9. Column 11 summarizes future test year adjustments R11 and R12 from Schedule 3. These adjustments are the same as adjustments R6 and R7 except that proposed rates are used to determine the adjustment amount. The total pro forma future test year revenue under proposed rates, which is the sum of columns 9 and 11, are shown in column 12. The revenues in column 12 are brought forward to the revenue schedules on pages 7 and 8, column 11 of the exhibit.

PRO FORMA OPERATION AND MAINTENANCE EXPENSES

Q. Please explain the development of the pro forma operation and maintenance expenses.

A. The operation and maintenance expenses on line 5 of the operating statement on page 10 are brought forward from the pro forma operating expense statement on page 17, line 71. Beginning on page 16, the statement shows the operation and maintenance expenses per books for the twelve months ended December 31, 2015 in column 2, identified by account in column 1. The pro forma adjustments for the historic test year are shown in column 4 and referenced in column 3. The sum of columns 2 and 4 is shown in column 5, which is the pro forma operating expenses as of December 31, 2016. The pro forma adjustments for the future test year are shown in column 7 and referenced in column 6. The sum of columns 5 and 7 is shown in column 8, which is the pro forma operating expenses as of December 31, 2016.

Q. Please explain the pro forma historic test year operation and maintenance expense adjustments.

A. The pro forma historic test year adjustments are set forth in Exhibit_(CEH-1), Appendix B, pages 23-27.

Adjustment E-1 adjusts test year salaries and payroll taxes to reflect the pro forma labor expense for 2016. The regular pay was projected by applying a 2.5% increase to wages. The total pro forma salaries and wages are $681,509. Subtracting the test year amount of $664,099 results in an adjustment of $17,410. Payroll taxes were increased similarly based on 2016 pro forma salaries and wages.

Adjustment E-2 adjusts chemical expense to reflect the projected annual level of chemical usage in 2013 and the current unit cost. The total pro forma chemical cost is $78,107. Subtracting the test year chemical cost of $100,365 results in a negative adjustment of $(22,258).

Adjustment E-3 normalizes estimated rate case expenses for this rate case over a 2.5-year period. The 2.5-year period is based on the recent history of City filings (new rates were put into effect 2.5 years ago) as well as expectations of the City regarding future filings. Estimated rate case expenses include professional consulting fees for revenue requirement, rate base, rate of return, and rate design exhibits, supporting data and testimony as well as legal fees and customer notice expenses.

Adjust E-4 adjusts depreciation expense as of the historic test year. The City's finances are recorded on a cash basis, therefore the per books depreciation expense is $0. The adjustment is the calculated annual depreciation expense of $367,982 per Exhibit _ (JJS-1).

Adjustment E-5 transfers a portion of the City's administrative and general expense to the water revenue requirements. These expenses include the general government expense, administrative expense, finance and treasury department expense (net of clerical billing salaries and bond issuance costs), clerical billing salaries, legal costs, engineering costs, City buildings costs, insurance costs, pension costs, and all of the water fund healthcare deductible transfer.

Q. The City allocated a portion of each of these expenses to the water revenue requirements. How did the City determine the percentages of each cost to be transferred to the Water Fund?

A. For general government expense, which includes the costs of City Council and the Mayor's office, it is estimated that these offices spent at least 10% of time and effort on business related to the water bureau. This was confirmed through a review of City Council minutes for the past year. Therefore 10% of the costs or $2,607, were allocated to the water revenue requirements. Administrative expenses were broken out by salaries, expenses, health insurance and other benefits. The salaries for the City Manager and Public Works director are allocated based on their time spent on water system matters. The allocation percentage of 60% of the City Manager's salary ($109,208) is based on an interview with the City Manager in which he estimates that 60% of his time is spent on matters related to the water system which results in the allocation of his salary as follows: $109,208 X 60% = $65,525. The Public Works Director salary ($79,251) is allocated to water revenue requirements at 60.7% and was based on two years of actual time sheets that were kept by the two individuals who were in the position since 2014 ($79,251 X 60.7% = $48,105). Expenses related to administrative work of the Public Works Director and the City Manager was

based on a composite percentage of 60.3% based on the allocation of the salaries of the City Manager and Public Works Director ($58,712 X 60.3% = $35,403). An additional allocation was used to allocate Health Insurance and Other Benefits includes in the Administrative accounts. This allocation will be discussed further in my testimony.

Finance Salaries are allocated to water revenue requirements at 24% based on the time spent on matters related to the water system. The allocation is a result of the analysis of the City's Finance Officer's timesheets. This same allocation factor was used for Accounting, Auditing, Surety Bond, Treasury and City Building expenses.

Clerical Billing Salaries and Postage are allocated to the water revenue requirement based on the number of water bills divided by the total number of bills for water and sewer or 54%.

The Health Insurance expense included under the Administrative Expense is the cost for insurance to cover the employees in Administrative Expense (City Manager and Public Works Director), Finance and Clerical Billing. Therefore this expense is allocated based on a composite of the allocation for these individuals, or 42.5%.

Engineering expenses including salaries, benefits and contractual services are allocated to water revenue requirements at 47.5%. The allocation percentage was based on two years of actual time sheets that were kept by the City Engineer.

Property and Liability Insurance and Vehicle Insurance expenses were allocated to water revenue requirements based on the insured value of the assets related to the water system.

The City Pension Contribution (net of State Aid) is allocated based on the number of water employees divided by total City employees or 15%. The Water Fund Health Care Deductible Transfer was fully allocated to the water revenue requirements.

The allocations of expenses listed above result in $572,852 of expenses to water revenue requirements.

Q. Are there any additional pro forma operating expense adjustments for the historic test year?

A. Yes. Adjustment E6 normalizes certain costs included in Contractual Services expense. The City performed an herbicide application on water-related property in 2015 which is not performed every year. The adjustment assumes that the herbicide application will occur every two years. In addition the City implemented a Water Shed Inventory Management Plan in 2015. The costs included in expenses for 2015 will be reduced in future years to approximately 1/5 of the cost incurred in 2015.

Q. Does that conclude the pro forma operating expense adjustments for the historic test year?

A. Yes.

Q Please explain the pro forma operating expense adjustments for the future test year.

A. These adjustments are found on page 27 in Appendix B. Adjustment E-7 adjusts pro forma historic test year salaries and wages to reflect the level of labor expense anticipated for 2017. The wages and salaries were increased by 2.5%, the expected increase in salaries for 2017. This wage increase will be concurrent with the anticipated effective date of the proposed rates in this case. Payroll taxes were also adjusted accordingly.

Adjustment E-8 adjusts depreciation expense as of December 31, 2016, from depreciation expense as of December 31, 2015, per Exhibit_ (JJS-2).

COST OF SERVICE ALLOCATION STUDY

Q. Please describe Exhibit_ (CEH-2).

A. Exhibit_(CEH-2), titled "Cost of Service Allocation Study for the Test Year Ended December 31, 2016," is the report on the cost of service study prepared for the City. It sets forth the results of the study based on the estimated conditions for the twelve months ended December 31, 2016. The information in the exhibit includes a description of the methods used in the study, the allocation of cost of service, and the factors on which the allocations were based.

Q. What was the purpose of the cost of service allocation study?

A. The purpose of the study was to allocate the total cost of service to the several customer classifications served both inside and outside the City. The study provides a basis for determining the extent to which the revenues to be derived from each service area and customer classification are aligned with the cost of serving that classification.

Q. Is such a study necessary or required by the Commission? If not, how is it helpful and why does the City include the study?

A. A cost of service study is not required for rate increases under $1 million. However, a cost of service study is useful to further support the revenue requirement for outside-City customers, as well as the increase in rates.

Q. What method of cost allocation was used in the study?

A. The Base-Extra Capacity Method, as described in the 2012 and prior editions of the Water Rates Manual published by the American Water Works Association, was used to allocate the costs.

Q. Why did you use that method?

A. The base-extra capacity method is a recognized method which allocates the cost of providing water service to customer classifications in proportion to the classification's use of commodity, facilities and services. It is generally accepted as a sound method for cost allocation and has been accepted by this Commission.

Q. Is this method described in Exhibit_(CEH-2)?

A. Yes. It is described on pages I-3 and I-4 of the exhibit.

Q. Please outline the procedure which you followed in the cost allocation study.

A. The allocation of costs to customer classifications is presented in Schedule B, pages II-1 through II-3 of Exhibit_(CEH-2). The items of cost, which include operating expenses, depreciation expenses, and income available for return, are identified in column 1 of Schedule B. The cost of each item, shown in column 3, is allocated to the several customer classifications based on the allocation factor referenced in column 2. The development of the allocation factors is presented in Schedule C.

Referring to some of the larger cost items, purchased electric power and treatment chemicals were allocated to customer classifications on the basis of average daily consumption, because they tend to vary with the amount of water consumed. Source of supply and water treatment costs were allocated partly on the basis of average consumption and partly on the basis of maximum day extra demand (*i.e.,* the difference between maximum day and average day demand), inasmuch as the function of the associated facilities is generally to meet maximum day requirements.

Costs associated with transmission mains were allocated partly on the basis of average consumption, partly on the basis of maximum day extra demand and partly on the demand

for fire protection service because these facilities are designed to meet maximum day and fire demand requirements.

Costs associated with distribution mains and storage facilities were allocated partly on the basis of average consumption, partly on the basis of maximum hour extra demand, and partly on the demand for fire protection service because these facilities are designed to meet maximum hour and fire demand requirements.

Fire demand costs were allocated between inside-City and outside-City service areas in proportion to the relative potential demands on the system by hydrants for each service area. The basis for the fire demands by service area is presented in Schedule D on page II-27 in Exhibit_(CEH-2).

Costs associated with meters and services were allocated in proportion to the 5/8-inch meter equivalents and 3/4-inch service equivalents serving each classification. Capital costs associated with fire hydrants were allocated between the inside-City and outside-City service areas on the basis of the number of hydrants in each area. Costs for meter reading, billing, customer accounting and collection were allocated on the number of customers for each classification within each service area.

Administrative and general costs were allocated on the basis of the allocated direct costs excluding those costs requiring little administrative and general expense. Annual depreciation accruals were allocated on the basis of the function of the facilities represented by the depreciation expense for each depreciable plant account. Income available for return was allocated based on the results of allocating the original cost measure of value.

Q. What were the sources of the total cost of service data set forth in the third column of Schedule B?

A. The operating and maintenance expenses, depreciation expense and income available for return were based on data presented in Exhibit_(CEH-1) for submission to the Pennsylvania Public Utility Commission in support of the Company's Supplement No. 22 to Tariff Water-Pa. P.U.C. No. 4.

The total operating expense in the amount of $2,096,298 presented in Schedule B on page II-4 of Exhibit_(CEH-2) is the pro forma amount shown in Exhibit_(CEH-1) of the supporting data filed with the tariff.

The depreciation expense of $377,650 by plant account, shown on page II-4 and II-5 of Exhibit_(CEH-2), was developed from the detail presented in Exhibit_(JJS-2) "Depreciation Study – Calculated Annual Depreciation Accruals Related to Utility Plant at December 31, 2016." The total amount also is the pro forma amount shown in Exhibit_(CEH-1) of the supporting data filed with the tariff.

The original cost less depreciation data shown on pages II-25 of Exhibit_(CEH-2) were calculated from data presented in Exhibit_(JJS-2).

Q. Refer to Schedule C, pages II-7 and II-11 of Exhibit_(CEH-2), and explain how you determined the maximum day and maximum hour factors entered in column 3.

A. The maximum day and maximum hour factors were based on judgment considering the system maximum day ratio, observations of the service areas, field studies conducted by our firm for other Pennsylvania water utilities, including Pennsylvania-American Water and Aqua Pennsylvania, and generally accepted maximum day and hour ratios.

Q. Please explain the allocation of public fire costs.

A. The City did not propose any increase in public fire hydrant rates in this case. The existing public hydrant rates recover approximately 40% of the allocated cost of service. Consequently, costs associated with providing public fire service in excess of the revenues have been reallocated to customer classes, excluding sales for resale classifications, using 5/8-inch meter equivalents.

Q. Why did you use 5/8-inch meter equivalents to reallocate the unrecovered public fire costs?

A. Allocating public fire cost of service based on 5/8-inch meter equivalents is consistent with the recovery of such fixed costs and also recognizes that customers with larger-sized meters tend to have higher property values.

Q. What do the results of the cost allocation study show?

A. Schedule A, on page II-2 of Exhibit_(CEH-2) sets forth the results of the cost allocation study compared to revenues under present and proposed rates. The allocated cost of service for outside-City customers of $1,023,897 exceeds the pro forma revenue for outside-City customers under present rates of $765,455, by $258,442.

PROPOSED RATES

Q. Please explain the proposed rate design.

A. The present rate design for outside-City customers consists of a monthly customer charge of $6.00 and consumption rates with a first block of up to 100,000 gallons per month at $5.15 per thousand gallons and $3.77 per thousand gallons for all usage over 100,000 gallons per month.

The proposed rate schedule for outside-City customers maintains the current rate structure. The 5/8-inch customer charge is set to a rate of $7.00 per month with higher customer charges increasing with meter size. The proposed consumption rates consist of a first block of up to 100,000 gallons per month at $7.15 per thousand gallons and $5.10 per thousand gallons for all usage over 100,000 gallons per month. Refer to Schedule 4, page 34 of Exhibit_(CEH-1) for a comparison of present and proposed rates for outside-City customers.

Q. Do the revenues from proposed rates recover the outside City customers' cost of service?

A. The proposed rate design recovers the outside City customers' cost of service.

Q. What is the proposed increase for an average outside-City residential customer?

A. For an average residential customer with a 5/8-inch meter and usage of 3,800 per month, the bill would increase $8.60 from $25.57 to $34.17 per month. This represents an increase of 33.6%. See Exhibit_(CEH-1) Schedule 5, page 41.

Q. What is the effect of the proposed outside-City rates on commercial and industrial customers?

A. The bill for an average commercial customer with a 5/8-inch meter and 18,250 gallons of usage per month would increase $37.50 from $99.99 to $137.49 per month. This is a 37.5% increase.

The bill for an average industrial customer with a 2-inch meter and 475,000 gallons of usage per month would increase $705.55 from $1,969.75 to $2,675.30 per month. This is a 35.8% increase. See Exhibit_(CEH-1), Schedule 5, pages 42 and 43, respectively.

Q. What is the effect of the proposed rates on sales for resale customers?

A. The proposed rates for the sales for resale classification adopts the same rate structure as proposed for the other classifications. A sales for resale customer's average monthly bill with an 8-inch meter and usage of 630,000 gallons per month would increase $942.40 from $2,738.10 to $3,680.50. This is a 34.4% increase. See Exhibit _(CEH-1) Schedule 5, page 44.

Q. Please discuss the proposed public fire hydrant rates.

A. Public fire hydrant rates were left unchanged since the revenues from existing public fire hydrant rates recover approximately 40% of the cost of service. Therefore no increase is required at the City's proposed revenue level pursuant to Section 1328 of the Public Utility Code, which requires that public fire protection rates not be increased if the revenues under existing rates recover more than 25% of the cost of public fire protection service.

Q. Are rates for inside-City customers increasing also?

A. Yes. The bill under present rates for an inside-City residential customer using 3,800 gallons per month is $30.80 or 20.5% higher than the $25.57 per month that an outside-City customer currently pays. The customer charge for inside-City customers will not be raised. The consumption rates for inside-City customers would increase from $6.00 to $6.30 for the first 100,000 gallons per month and from $3.00 to $4.72 per thousand gallons for usage over 100,000 gallons per month. The proposed rates for 3,300 gallons per month produces an average bill of $28.79 or a 3.6% increase. The overall increase in inside-City revenues from the sale of water over present inside-City rates is 14.9% .

Q. Does this conclude your direct testimony?

A. Yes, it does.

Exhibit_(CEH-1)

CITY OF DUBOIS
BUREAU OF WATER

DuBois, Pennsylvania

RATE STUDY AND DATA
IN SUPPORT OF
PROPOSED SUPPLEMENT NO. 22 TO
TARIFF WATER PA. P.U.C. NO. 4

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Harrisburg, Pennsylvania

Gannett Fleming

Excellence Delivered As Promised

June 30, 2016

City of DuBois
16 W. Scribner Avenue
DuBois, PA 15801

Attention John "Herm" Suplizio, City Manager

Ladies and Gentlemen:

Pursuant to your authorization, we have prepared a water rate study for the City of DuBois based on the level of operations of the City of DuBois Bureau of Water for the twelve-month period ended December 31, 2015 and December 31, 2016. Appropriate ratemaking adjustments for known and measurable changes were made in order to reflect a more current level of cost of service.

On the basis of the supporting data presented in the following report, it is our opinion that the City of DuBois cannot continue to operate its water system without rate relief. An increase in water rates will afford an opportunity to achieve an adequate return on the original cost measure of value of its used and useful property that services outside-City customers.

We recommend that the City file with the Public Utility Commission, Supplement No.22 to Tariff Water-Pa. P.U.C. No. 4, which proposes an increase in water rates for all general classes of service outside the City by approximately 33.7 percent. The overall increase in annual operating revenue from outside-City customers is approximately 32.2 percent.

The following report presents our conclusions in appropriate form for filing with the Pennsylvania Public Utility Commission in response to the data required under Subchapter 53.52 of the Commission's Tariff Regulations at Chapter 53 of Title 52 Pa. Code.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

CONSTANCE E. HEPPENSTALL
Project Manager - Rate Studies

CEH:mlw
060728.200

TABLE OF CONTENTS

TABLE OF CONTENTS, cont.

APPENDICES

CITY OF DUBOIS
BUREAU OF WATER

SPECIFIC REASONS FOR PROPOSED INCREASE IN WATER RATES

Pursuant to Subsection 53.52(a)(1) and (b)(1) of Tariff Regulations

The City of DuBois - Bureau of Water (DuBois or City) submits herewith the data required under 52 PA Code § 53.52 of the Pennsylvania Public Utility Commission Tariff Regulations in support of the proposed rates under Supplement No. 22 to Tariff Water-Pa. P.U.C. No. 4. The supporting data for the tariff revision is for the twelve-month periods ending December 31, 2015 and December 31, 2016, adjusted for ratemaking purposes. The last rate revision was effective January 1, 2014, based on a historic test year ended December 31, 2012 and future test year ending December 31, 2013.

Since the date of the last rate increase, the City has experienced higher levels of operation and maintenance expenses as a result of inflation and labor cost increases and has made additional investments in plant in service, through the end of the future test year. The effect of these increases has reduced the rate of return on rate base Outside City to approximately 0.74%.

The specific reasons for the City's proposal to increase its rates for water service are as follows:

(a) To provide sufficient revenues to enable it to continue to discharge, properly, its public duty to furnish adequate, safe, and reliable water service pursuant to the safe drinking water standards prescribed and enforced by the PA Department of Environmental Protection and the Federal Environmental Protection Agency;

(b) To provide the cash flow necessary to continue to operate, maintain

and renew its facilities properly and meet its financial obligations; and

(c) To afford the opportunity to achieve an adequate rate of return on the original cost invested in the water property.

UTILITY BASIS

Pursuant to 52 PA Code § 53.52 of the Tariff Regulations, the supporting data are presented using the utility basis for ratemaking purposes. The utility basis includes, in addition to operating expenses, a provision for annual depreciation expense and a return on the depreciated original cost of the property (rate base) in place of debt service and renewals and replacements. The rate base and annual depreciation expense are calculated in Exhibit_(JJS-1) and Exhibit_(JJS-2) as of December 31, 2015 and December 31, 2016, respectively.

RATE OF RETURN

Under present and proposed rates, the indicated rates of return for the combined inside-City and outside-City operations are presented below.

	Present Rates	Proposed Rates
Rate of Return	1.08%	6.49%

The rate of return of 6.49% is less than the 6.76% return the City can justify based on a hypothetical capital structure of 50% debt, 50% equity, as set forth below and described in Exhibit_(HW-1).

	Capital Structure	Cost	Weighted Cost
Debt	50%	3.02%	1.51%
Equity	50%	10.50%	5.25%
Total	100%		6.76%

PROPOSED RATES

Under Supplement No. 22 to Tariff Water-Pa. P.U.C. No. 4, the City proposes to increase the customer charge equal to the customer surcharge supported by the cost of service study in Exhibit_(CEH-2) or $7.00 per month for the 5/8-inch meter size. In addition, the City is proposing to raise the consumption charge to $7.15 per thousand for the first 100,000 gallons per month and $5.10 per thousand for all over 100,000 gallons per month. The rates for public fire protection remain unchanged. Refer to pages 7 and 8 for the increases by classification for inside-City and outside-City customers. The revenues under proposed rates are developed in Appendix C. Appendix D provides a comparison of present and proposed rates as well as a comparison of customers' bills at various consumption levels by meter size.

The Pennsylvania Public Utility Commission has jurisdiction and power under Section 1301 of the Public Utility Code to regulate rates for utility service furnished by a municipality to customers beyond its corporate boundaries. The requisite data and information in the following report and related exhibits, in support of the proposed rates, include analyses of the City's entire water system property and its operation. The City also proposes to increase the water consumption rates for customers inside the City. The increase in revenues for inside-City customers is 14.9%.

The data presented in support of proposed Supplement No. 22 to Tariff Water-Pa. P.U.C. No. 4 clearly indicate that the level of revenues from the City's present water rates is inadequate, and immediate rate relief is necessary. It is essential that the rates proposed under Supplement No. 22 to Tariff Water-Pa. P.U.C. No. 4 become effective as soon as possible, in order that the City recover the cost of rendering water service, including a return on the depreciated original cost of the water system's used or useful property, and continue to provide its customers with efficient, safe and reliable service.

CITY OF DUBOIS - BUREAU OF WATER

TOTAL NUMBER OF CUSTOMERS SERVED INSIDE AND OUTSIDE THE CITY

Pursuant to Subsection 53.52 (a)(2) of Tariff Regulations

	As of 12/31/2014		As of 12/31/2015	
	Inside-City	Outside-City	Inside-City	Outside-City
Residential	3,339	516	3,338	519
Commercial	439	170	440	171
Industrial	18	5	18	5
Sales for Resale		1		1
Public Fire Protection		1		1
TOTAL	3,796	693	3,796	697

NUMBER OF CUSTOMERS WHOSE BILLS WILL INCREASE
INSIDE AND OUTSIDE THE CITY

Pursuant to Subsection 53.52 (a)(3) AND (b)(3) of Tariff Regulations

	As of 12/31/2014		As of 12/31/2015	
	Inside-City	Outside-City	Inside-City	Outside-City
Residential	3,339	516	3,338	519
Commercial	439	170	440	171
Industrial	18	5	18	5
Sales for Resale		1		1
Public Fire Protection		-		-
TOTAL	3,796	692	3,796	696

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF THE EFFECT OF THE PROPOSED
TARIFF CHANGES ON THE UTILITY'S CUSTOMERS

Pursuant to Subsection 53.52(a)(4) through (a)(11)
of Tariff Regulations

(a)(4): The proposed tariff changes will increase all customers' rates for outside-City water service. The overall increase in revenues from sale of water is approximately 33.7%.

(a)(5): Refer to page 10 in response to Subsection 53.52(c)(1), for the effect of the proposed tariff changes on the City's revenues and expenses.

(a)(6): The proposed tariff changes will not change the service rendered by the Bureau of Water.

(a)(7): Not applicable.

(a)(8): Not applicable.

(a)(9): Customer polls were not taken to indicate customer acceptance and desire for the proposed tariff changes. The tariff changes are in the public interest as stated in response to Subsection 53.52(a)(1) of the tariff regulations.

(a)(10): The City of DuBois will implement the proposed tariff changes upon the Commission's approval.

(a)(11): Not applicable.

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF OPERATING REVENUES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015 AND DECEMBER 31, 2016
AND THE CALCULATION OF THE PROPOSED REVENUE INCREASE FROM INSIDE-CITY CUSTOMERS BY CUSTOMER CLASSIFICATION

Pursuant To Subsection 53.52 (b)(4) and (c)(5) of Tariff Regulations

Line No.	Customer Classification	Revenues Per Books, 12 Months Ended 31-Dec-15	Historic Test Year Pro Forma Adjustments Under Present Rates Ref.	Historic Test Year Pro Forma Adjustments Under Present Rates Amount	Pro Forma, Present Rates, 31-Dec-15	Future Test Year Pro Forma Adjustments Under Present Rates Ref.	Future Test Year Pro Forma Adjustments Under Present Rates Amount	Pro Forma, Present Rates, 31-Dec-15	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase Percent	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase Amount	Pro Forma, Proposed Rates 31-Dec-16
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	**INSIDE-CITY**										
2	Sales of Water										
3	Residential	$ 1,057,174	R1	$ (165)	$ 1,057,010	R6	$ (987)	$1,056,023	5.1%	$ 53,950	$ 1,109,972
4	Commercial	430,349	R1	$ 522	430,871	R6	1,043	431,914	13.0%	56,021	487,935
5	Industrial	333,167			333,167			333,167	47.1%	156,849	490,016
	Sykesville	199,420			199,420			199,420	22.2%	44,201	243,622
6	Public Fire	0	R3	66,558	66,558			66,558	0.0%	0	66,558
7											
8	Total Sales of Water	2,020,111		66,915	2,087,025		56	2,087,081	14.9%	311,021	2,398,102
9											
10	Other Operating Revenues										
11	Sales and Jobbing	2,131			2,131			2,131			2,131
12	Shale Gas Revenues	19,651	R5	(19,651)	-			-			-
13	Misc. Revenues	31,191			31,191			31,191			31,191
14											
15	Total Other Revenues	52,973		(19,651)	33,322		-	33,322	0.0%	-	33,322
16											
17	Total Inside City	$ 2,073,084		$ 47,264	$ 2,120,347		$ 56	$ 2,120,403	14.7%	$ 311,021	$ 2,431,424

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF OPERATING REVENUES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015 AND DECEMBER 31, 2016
AND THE CALCULATION OF THE PROPOSED REVENUE INCREASE FROM OUTSIDE-CITY CUSTOMERS BY CUSTOMER CLASSIFICATION

Pursuant To Subsection 53.52 (b)(4) and (c)(5) of Tariff Regulations

Line No.	Customer Classification	Revenues Per Books, 12 Months Ended 31-Dec-15	Historic Test Year Pro Forma Adjustments Under Present Rates Ref.	Historic Test Year Pro Forma Adjustments Under Present Rates Amount	Pro Forma, Present Rates, 31-Dec-15	Future Test Year Pro Forma Adjustments Under Present Rates Ref.	Future Test Year Pro Forma Adjustments Under Present Rates Amount	Pro Forma, Present Rates, 31-Dec-15	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase Percent	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase Amount	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Pro Forma, Proposed Rates 31-Dec-16
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	**OUTSIDE-CITY**										
2	Sales of Water										
3	Residential	$ 158,351	R2	$ 155	$ 158,506	R7	$ 311	$158,817	33.0%	$ 52,403	$ 211,221
4	Commercial	186,890	R2	199	187,088	R7	795	187,883	34.5%	64,895	252,779
5	Industrial	117,188			117,188			117,188	35.1%	41,149	158,337
6	Sales for Resale	286,816			286,816			286,816	34.6%	99,157	385,973
7	Public Fire Protection	12,000	R4	2,750	14,750			14,750	0.0%	0	14,750
8											
9	Total Sales of Water	761,245		3,104	764,349		1,106	765,455	33.7%	257,604	1,023,059
10											
11	Other Operating Revenues										
12	Sales and Jobbing	803			803			803		-	803
13	Contract Cust. Revenue	22,594			22,594			22,594			22,594
14	Shale Gas Revenues	7,405	R5	(7,405)	-			0			-
15	Misc. Revenues	11,754			11,754			11,754		-	11,754
16											
17	Total Other Revenues	42,556		(7,405)	35,151		-	35,151	0.0%	-	35,151
18											
19	Total Outside City	803,801		(4,301)	799,500		1,106	800,606	32.2%	257,604	1,058,210
20											
21	Total Inside & Outside City	$ 2,876,885		$ 42,962	$ 2,919,847		$ 1,162	$ 2,921,009	19.5%	$ 568,625	$ 3,489,635

CITY OF DUBOIS - BUREAU OF WATER

NUMBER OF CUSTOMERS WHOSE BILLS WILL BE DECREASED

Pursuant to Subsection 53.52(b)(5) of Tariff Regulations

Under the proposed rates, no customers' bills will be decreased for water service.

CALCULATION OF TOTAL REVENUE DECREASE
UNDER THE PROPOSED RATES PROJECTED TO AN ANNUAL BASIS

Pursuant to Subsection 53.52(b)(6) of Tariff Regulations

Under the proposed rates, operating revenues for water service will not decrease.

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF THE CALCULATION OF THE RATE OF RETURN UNDER PRESENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015
AND DECEMBER 31, 2016, AND THE ANTICIPATED RATE OF RETURN UNDER PROPOSED RATES
FOR INSIDE-CITY AND OUTSIDE-CITY CUSTOMERS

Pursuant To Subsection 53.52 (b)(2) and (c)(1) of Tariff Regulations

Line No.	Description	12 Months Ended 31-Dec-15	Pro Forma Test Year Adjustments Ref.	Pro Forma Test Year Adjustments Amount	Pro Forma Present Rates, 31-Dec-15	Pro Forma Future Test Year Adjustments Ref.	Pro Forma Future Test Year Adjustments Amount	Pro Forma Present Rates, 31-Dec-16	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Pro Forma 31-Dec-16
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Operating Revenue	$ 2,876,885	p. 7-8	$ 42,962	$ 2,919,847	p. 7-8	$ 1,162	$ 2,921,009	$ 568,625	$ 3,489,635
2										
3	Operating Revenue Deductions:									
4	Operation and Maintenance									
5	Expenses	1,471,452	p. 16	608,433	2,079,885	p. 16	18,114	2,097,999		2,097,999
6	Depreciation	-	p. 16	367,982	367,982	p. 16	9,668	377,650		377,650
7										
8	Total Operating									
9	Revenue Deductions	1,471,452		976,415	2,447,867		27,782	2,475,649	-	2,475,649
10										
11										
12	Net Operating Income									
13	Available for Return	$ 1,405,433		$ (933,453)	$ 471,980		$ (26,620)	$ 445,360	$ 568,625	$ 1,013,986
14										
15										
16	Original Cost Measure of Value	$ 14,976,043	p. 13	$ -	$ 14,976,043	p. 13	$ 646,380	$ 15,622,423	$ -	$ 15,622,423
17										
18	Rate of Return				3.15%			2.85%		6.49%

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF THE CALCULATION OF THE RATE OF RETURN UNDER PRESENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015 AND DECEMBER 31, 2016, AND THE ANTICIPATED RATE OF RETURN UNDER PROPOSED RATES FOR INSIDE-CITY CUSTOMERS

Pursuant To Subsection 53.52 (b)(2) and (c)(1) of Tariff Regulations

Line No.	Description	12 Months Ended 31-Dec-15	Pro Forma Test Year Adjustments Ref.	Pro Forma Test Year Adjustments Amount	Pro Forma Present Rates, 31-Dec-15	Pro Forma Future Test Year Adjustments Ref.	Pro Forma Future Test Year Adjustments Amount	Pro Forma Present Rates, 31-Dec-16	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Pro Forma 31-Dec-16
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Operating Revenue	$ 2,073,084	p. 7	$ 47,264	$ 2,120,347	p. 7	$ 56	$ 2,120,403	$ 311,021	$ 2,431,424
2										
3	Operating Revenue Deductions:									
4	Operation and Maintenance									
5	Expenses	1,009,550	p. 16	417,440	1,426,990	p. 16	12,428	1,439,418		1,439,418
6	Depreciation	-	p. 16	261,915	261,915	p. 16	6,881	268,796		268,796
7										
8	Total Operating									
9	Revenue Deductions	1,009,550		679,355	1,688,905		19,309	1,708,214	-	1,708,214
10										
11										
12	Net Operating Income									
13	Available for Return	$ 1,063,534		$ (632,092)	$ 431,442		$ (19,253)	$ 412,189	$ 311,021	$ 723,210
14										
15										
16	Original Cost Measure of Value	$ 10,668,129	p. 13	$ -	$ 10,668,129	p. 13	$ 460,447	$ 11,128,575	$ -	$ 11,128,575
17										
18	Rate of Return				4.04%			3.70%		6.50%

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF THE CALCULATION OF THE RATE OF RETURN UNDER PRESENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015 AND DECEMBER 31, 2016, AND THE ANTICIPATED RATE OF RETURN UNDER PROPOSED RATES FOR OUTSIDE-CITY CUSTOMERS

Pursuant To Subsection 53.52 (b)(2) and (c)(1) of Tariff Regulations

Line No.	Description	12 Months Ended 31-Dec-15	Pro Forma Test Year Adjustments Ref.	Pro Forma Test Year Adjustments Amount	Pro Forma Present Rates, 31-Dec-15	Pro Forma Future Test Year Adjustments Ref.	Pro Forma Future Test Year Adjustments Amount	Pro Forma Present Rates, 31-Dec-16	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Increase	Under Proposed Rates, Supplement No. 22 to Tariff Water Pa-PUC No. 4 Pro Forma 31-Dec-16
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Operating Revenue	$ 803,801	p. 8	$ 3,104	$ 806,905	p. 8	$ 1,106	$ 800,606	$ 257,604	$ 1,058,210
2										
3	Operating Revenue Deductions:									
4	Operation and Maintenance									
5	Expenses	461,902	p. 16	190,993	652,895	p. 16	5,686	658,581		658,581
6	Depreciation	-	p. 16	106,067	106,067	p. 16	2,787	108,854		108,854
7										
8	Total Operating									
9	Revenue Deductions	461,902		297,060	758,962		8,473	767,434	-	767,434
10										
11										
12	Net Operating Income									
13	Available for Return	$ 341,899		$ (293,956)	$ 47,943		$ (7,367)	$ 33,171	$ 257,604	$ 290,776
14										
15										
16	Original Cost Measure of Value	$ 4,307,914	p. 13	$ -	$ 4,307,914	p. 13	$ 185,934	$ 4,493,847	$ -	$ 4,493,848
17										
18	Rate of Return				1.11%			0.74%		6.47%

CITY OF DUBOIS - BUREAU OF WATER

ORIGINAL COST MEASURE OF VALUE AS OF DECEMBER 31, 2015
AND DECEMBER 31, 2016*

Pursuant to Subsection 53.52 (C)(1) of Tariff Regulations

	As of 12/31/2015	As of 12/31/2016
Original Cost of Utility Plant In Service	$ 19,973,973	$ 20,982,073
Less: Accumulated Depreciation	(5,257,916)	(5,621,900)
Net Utility Plant	14,716,057	15,360,173
Add:		
Cash Working Capital	259,932	262,141
Total Original Cost Measure of Value	$ 14,975,989	$ 15,622,314

* See Exhibit_(JJS-1) and Exhibit_(JJS-2),

CITY OF DUBOIS - BUREAU OF WATER

BALANCE SHEET AS OF 12/31/2014 (CASH BASIS)

Pursuant to Subsection 53.52 (C)(2) of Tariff Regulations

ASSETS	As of 12/31/2014
Current Assets:	
Cash	$ 197,041
Interfund Receivable	0
Total Current Assets	197,041
Total Assets	$ 197,041
LIABILITIES AND NET ASSETS	
Current Liabilities:	
Interfund Payables	$ 150,553
Total Current Liabilities	150,553
Total Liabilities	150,553
Net Assets, Unrestricted	46,488
Total Liabilities and Net Assets	$ 197,041

CITY OF DUBOIS - BUREAU OF WATER

SUMMARY BY DETAILED PLANT ACCOUNTS OF THE BOOK VALUE OF WATER UTILITY PLANT IN SERVICE AS OF DECEMBER 31, 2015 AND DECEMBER 31, 2016

Pursuant to Subsection 53.52(c)(3) of Tariff Regulations

Refer to Exhibit_(JJS-1) titled, "Depreciation Study - Calculated Annual Depreciation Accruals Related to Utility Plant at December 31, 2015" for the book value of water utility plant by plant account for the historic test year.

Refer to Exhibit_(JJS-2) titled, "Depreciation Study - Calculated Annual Depreciation Accruals Related to Utility Plant at December 31, 2016" for the book value of water utility plant by plant account for the future test year.

DEPRECIATION RESERVE PER BOOKS AS OF DECEMBER 31, 2015 AND DECEMBER 31, 2016 APPLICABLE TO WATER UTILITY PLANT IN SERVICE

Pursuant to Subsection 53.52(c)(4) of Tariff Regulations

Refer to Exhibit_(JJS-1) titled, "Depreciation Study - Calculated Annual Depreciation Accruals Related to Utility Plant at December 31, 2015" for the depreciation reserve applicable to water utility plant in service for the historic test year.

Refer to Exhibit_(JJS-2) titled, "Depreciation Study - Calculated Annual Depreciation Accruals Related to Utility Plant at December 31, 2016" for the depreciation reserve applicable to water utility plant in service for the future test year.

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF PRO FORMA OPERATING EXPENSES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015

Pursuant To Subsection 53.52 (c)(5) of Tariff Regulations

Line No.	Account		Per Books, 12 Months Ended 31-Dec-15	Historic Test Year Pro Forma Adjustments App. B	Historic Test Year Pro Forma Adjustments Amount	Pro Forma, 31-Dec-15	Future Test Year Pro Forma Adjustments App. B	Future Test Year Pro Forma Adjustments Amount	Pro Forma, 31-Dec-16
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
1									
2	**OPERATION AND MAINTENANCE EXPENSES**								
3									
4									
5	**Water Treatment**								
6									
7	448.120	Wages - Supervision	$ 51,856	E1	$ 2,105	$ 53,961	E8	$ 1,349	$ 55,310
8	448.140	Wages - Plant Labor	215,523	E1	5,388	220,911	E8	5,523	226,434
9	448.141	Wages - Summer Help	7,507			7,507			7,507
10	448.156	Health Insurance - WTP	130,227	E7	24	130,250			130,250
11	448.158	Life Insurance Premium - WTP	638			638			638
12	448.159	Vacation - WTP	31,079			31,079			31,079
13	448.162	Unemployment Comp - WTP	2,259			2,259			2,259
14	448.183	Overtime	43,534			43,534			43,534
15	448.191	Uniforms	750			750			750
16	448.192	Training	405			405			405
17	448.211	Fica - WTP	20,889	E1	522	21,412	E8	535	21,947
18	448.212	Medicare - WTP	4,885	E1	122	5,007	E8	125	5,133
19	448.222	Chemicals	100,365	E2	(22,258)	78,107			78,107
20	448.231	Vehicle Gas & Oil	1,884			1,884			1,884
21	448.245	Operating Supplies	20,739			20,739			20,739
22	448.322	Telephone	3,026			3,026			3,026
23	448.354	Worker's Comp - WTP	26,413			26,413			26,413
24	448.361	Electric	44,637			44,637			44,637
25	448.362	Gas Heat	13,429			13,429			13,429
26	448.365	Sludge Removal	210			210			210
27	448.373	Building Repairs & Maintenance	16,177			16,177			16,177
28	448.450	Contractual Services	101,288	E6	(51,082)	50,206			50,206
29	448.452	Water Analysis	6,709			6,709			6,709
30	449.245	Water Tank Expenses	1,200			1,200			1,200
31	449.322	Telephone	856			856			856
32	449.361	Electric	17,838			17,838			17,838
33	449.361	Heat	1,668			1,668			1,668
34	449.373	Building Repairs & Maintenance	595			595			595
35	**Total Water Treatment**		$ 866,587		$ (65,179)	$ 801,408		$ 7,532	$ 808,940
36									
37	**Transmission and Distribution**								
38									
39									
40	450.140	Wages - Maintenance of Mains	$ 139,883	E1	$ 3,497	$ 143,380	E8	$ 3,585	$ 146,965
41	450.142	Wages - Maintenance of Meters	29,955	E1	749	30,703	E8	768	31,471
42	450.156	Health Insurance - Trans/Dist	58,237	E7	4,077	62,314			62,314
43	450.158	Life Insurance Premium - Trans/Dist	293			293			293
44	450.159	Vacation - Trans/Dist	18,132			18,132			18,132
45	450.162	Unemployment Comp - Trans/Dist	901			901			901
46	450.183	Overtime	34,397			34,397			34,397
47	450.191	Uniforms	550			550			550
48	450.192	Training / Registration	1,330			1,330			1,330
49	450.211	FICA	13,147	E1	329	13,475	E8	337	13,812
50	450.212	Medicare	3,075	E1	77	3,152	E8	79	3,230
51	450.231	Vehicle Gas & Oil	15,823			15,823			15,823
52	450.245	Operating Supplies	132,852			132,852			132,852
53	450.354	Worker's Comp - Trans/Dist	22,592			22,592			22,592
54	450.371	Water Tank Exp. - Highland & Patt	928			928			928
55	450.452	Contractual Services	132,771			132,771			132,771
56	**Total Transmission and Distribution**		$ 604,865		$ 8,728	$ 613,593		$ 4,768	$ 618,361

CITY OF DUBOIS - BUREAU OF WATER

STATEMENT OF PRO FORMA OPERATING EXPENSES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2015

Pursuant To Subsection 53.52 (c)(5) of Tariff Regulations

Line No.	Account	Per Books, 12 Months Ended 31-Dec-15	Historic Test Year Pro Forma Adjustments App. B	Historic Test Year Pro Forma Adjustments Amount	Pro Forma, 31-Dec-15	FutureTest Year Pro Forma Adjustments App. B	FutureTest Year Pro Forma Adjustments Amount	Pro Forma, 31-Dec-16
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
57								
58								
59	**Administrative and General Expenses**							
60	Administrative and General Expense	$ -	E1,E5,E7	$ 584,682	$ 584,682	E8	$ 5,814	$ 590,496
61	Rate Case Expense	-	E3	80,202	80,202			80,202
62	**Total Administrative and General Expenses**	-		664,884	664,884		5,814	670,698
63								
64								
65	**Total Operation and Maintenance Exp.**	$ 1,471,452		$ 608,433	$ 2,079,885		$ 18,114	$ 2,097,999
66								
67								
68	**Depreciation Expense**	-	E4	367,982	367,982	E9	9,668	377,650
69								
70								
71	**Total Expenses**	$ 1,471,452		$ 976,415	$ 2,447,867		$ 27,782	$ 2,475,649
72								

APPENDIX A

PRO FORMA REVENUE ADJUSTMENTS UNDER PRESENT RATES

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING REVENUE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

R1 To adjust Inside-City Operating Revenues for the gain in the number of customers during the twelve months ended 12/31/2015

Customer Classification	Number of Customers 31-Dec-14	31-Dec-15	Customer Gain/(Loss)	Average Annual Bill, Present Rates	Annualized Revenue Adjustment (Half Year)	
(1)	(2)	(3)	(4)	(6)	(7)	
Residential	3,339	3,338	(1)	$ 329.03	$ (165)	(165)
Commercial	439	440	1	1,043.16	522	$ 522
Industrial	18	18	-		-	-
			-		-	-
Total	3,796	3,796	-		357	

R2 To annualize Outside-City Operating Revenues for the gain or loss in the customers during the twelve months ended 12/31/2015

Customer Classification	Number of Customers 31-Dec-14	31-Dec-15	Customer Gain/(Loss)	Annual Bill, Present Rates	Average Revenue Adjustment (Half Year)	
(1)	(2)	(3)	(4)	(6)	(7)	
Residential	525	528	3	$ 103.55	$ 155	$ 155
Commercial	170	171	1	397.70	199	199
Industrial	5	5	-		-	-
Sales for Resale	1	1	-		-	-
Total	701	705	4		354	

R3 To impute revenue for Inside-City public fire at present Outside City hydrant rates.

	Number of Hydrants	Annual Rate	Imputed Revenue	
Public Fire	361	$ 184.37	$ 66,558	66,558

R4 To adjust revenue for Outside-City public fire to present Outside City hydrant rates.

	Number of Hydrants	Annual Rate	Imputed Revenue	
Public Fire	80	$ 184.37	$ 14,750	
Less Current Revenue Billed			12,000	
Adjustment			2,750	2,750

R5 To adjust for reduced revenue from Shale Gas Companies.

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING REVENUE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation			Adjustment Increase (Decrease)
	Shale Gas Revenues - 2015	$	27,056	
	Projected Shale Gas Revenues - 2016	$	-	
	Adjustment			$ (27,056)
	Total Historic Test Year, Pro Forma Operating Revenue Adjustments Under Present Rates			$ 42,962

CITY OF DUBOIS - BUREAU OF WATER
FUTURE TEST YEAR

PRO FORMA OPERATING REVENUE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

R6 To adjust Inside-City Operating Revenues for the projected gain in the number of customers during the twelve months ended 12/31/2016

Customer Classification	Increase in Number of Customers 31-Dec-14	31-Dec-15	Average Customer Gain/(Loss)	Average Annual Bill, Present Rates	Annualized Revenue Adjustment	
Residential	(5)	(1)	(3)	$ 329.03	$ (987)	$ (987)
Commercial	1	1	1	1,043.16	1,043	1,043
Industrial	-	-	-		-	-
Public	-	-	-		-	-
Total	(4)	-	(2)		56	

R7 To adjust Outside-City Operating Revenues for the projected gain in the number of customers during the twelve months ended 12/31/2016.

Customer Classification	Increase in Number of Customers 31-Dec-14	31-Dec-15	Average Customer Gain/(Loss)	Annual Bill, Present Rates	Average Annualized Revenue Adjustment	
Residential	2	3	3	$ 103.55	$ 311	$ 311
Commercial	3	1	2	397.70	795	795
Industrial	-	-	-	-	-	-
Sales for Resale		-	-		-	-
Total		5	4		1,106	

Total Future Test Year, Pro Forma Operating Revenue Adjustments Under Present Rates $ 1,162

APPENDIX B

PRO FORMA OPERATING EXPENSE ADJUSTMENTS

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING EXPENSE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation					Adjustment Increase (Decrease)
E1	To adjust actual test year salaries and wages to reflect the change in wage rates and number of employees as of January 1, 2016					
	Account	Test Year 12/31/2015	Pro Forma 2016**		Increase (Decrease)	
	Water Treatment					
	448.120 Wages - Supervision	$ 51,856	$ 53,961	***	$ 2,105	$ 2,105
	448.140 Wages - Plant Labor	215,523	220,911		5,388	5,388
						-
	Transmission and Distribution					
	450.140 Wages - Maintenance of Mains	139,883	143,380		3,497	3,497
	450.142 Wages - Maintenance of Meters	29,955	30,703		749	749
	Administration (See Adjustment E5)					
	Salary - Manager	65,525	67,163		1,638	
	Salary - Public Works Director	48,105	49,308		1,203	
	Finance Salaries	36,134	37,038		903	
	Clerical Billing Salaries	16,425	16,835		411	
	Treasury Salaries	17,216	17,646		430	
	Salary - Engineering	43,476	44,563		1,087	5,672
	Total Labor	**$ 664,099**	**$ 681,509**		**$ 17,411**	
	Payroll Taxes					
	448.211 FICA WTP	20,889	21,412		522	522
	448.212 Medicare WTP	4,885	5,007		122	122
	450.211 FICA - Maint of Mains	13,147	13,475		329	329
	450.212 Medicare - Maint. Of Mains	3,075	3,152		77	77

** Based on wage rates effective 1/1/2016.
*** Reflects replacement of WTP Supervisor with one individual who will supervise both water and sewer treatment plants.

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING EXPENSE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

E2 To adjust chemical expense to reflect the projected annual usage of chemicals required at the treatment plant and current unit prices.

Chemical	Projected Quantity	Units	Current Unit Cost	Units	Pro Forma Cost
Sodium Floride	320	50 lb. bags	39.00	50lb bags	$ 12,480
Light Soda Ash	2,592	50 lb. bags	11.45	50lb bags	29,678
Polyaluminum Chlor	132	550 lb. Drums	203.50	30 Gallon Drums	26,862
Gas Chlorine	9	2000 lb. Cylinders	479.00	2000lb Cylinders	4,311
Permanganate	2	275 Gallon Tote	2,387.87	55lb drums	4,776
Total Pro Forma					78,107
Less Test Year Chemical Expense					100,365
Adjustment					$ (22,258)

E3 To normalize operating expenses for the estimated cost of this rate case over 2 1/2 years.

Revenue Requirement, Rate Base, Depreciation, Rate of Return, Rate Design and Application	$ 75,000	
Legal Fees	125,000	
Customer Notice and Postage	505	
Total	200,505	
Normalized Amount (2.5-year amortization)		$ 80,202
Less: Test Year Rate Case Expense		-
Adjustment		$ 80,202

E4 To adjust depreciation expense as of December 31, 2015 (See Exhibit_(JJS-1))

Annual Depreciation Expense as of December 31, 2015		$ 367,982
Less: Depreciation Expense Per Books		-
Adjustment		$ 367,982

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING EXPENSE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

E5 To transfer a portion of City Customer Accounting, Engineering and Administration to the Water Revenue Requirements.

	2015 Per Books	Percentage to Water	Allocated to Bureau of Water	
Government Expense For Mayor and Council (net of postage and EIT Error)	23,666	10.0% (a)	$ 2,367	
Administrative Expense:				
Salary - Manager	109,208	60.0% (a)	65,525	
Salary - Public Works Director	79,251	60.7% (b)	48,105	
Expenses	58,712	60.3% (c)	35,403	
Health Insurance	168,266	42.5% (h)	71,495	
Other Benefits	35,162	42.5% (h)	14,940	
Finance Salaries (Less Clerical Salaries)	200,415	24.0% (b)	48,100	
Less Reimbursed Salary	(49,856)	24.0% (b)	(11,966)	
	150,559		36,134	
Accounting and Auditing and Surety Bonds	26,474	24.0% (b)	6,354	
Clerical Billing Salaries	30,416	54.0% (e)	16,425	
Treasury Salaries	71,733	24.0% (b)	17,216	
Treasury Health Insurance	19,272	24.0% (b)	4,625	
Treasury Other Benefits	9,621	24.0% (b)	2,309	
Treasury Other Expense	20,922	24.0% (b)	5,021	
Legal	23,000	10.0% (a)	2,300	
Engineering				
Salary - Engineering	91,529	47.5% (b)	43,476	
Health Insurance	24,943	47.5% (b)	11,848	
FICA, UC, Benefits	9,826	47.5% (b)	4,667	
Contracted Services and Other Expense	27,859	47.5% (b)	13,233	
City Buildings	213,227	24.0% (d)	51,174	
Postage	37,321	54.0% (e)	20,154	
Property and Liability Insurance	135,065	17.6% (f)	23,771	
Vehicle Insurance	34,524	58.0% (g)	20,024	
Pension Contribution (Net of State Aid)	225,233	15.0% (d)	33,785	
Water Fund HealthCare Deductible Transfer	22,500	100.0%	22,500	
Transfer to Water Fund	1,798,849		572,852	$ 572,852

(a) Based on interview with City Manager and review of Council minutes.
(b) Based on hours spent on Water system divided by total hours per time sheets.
(c) Based on weighting of salaries for the Manager and Public Works Director.
(d) Based on number of Water System employees divided by Total Employees.
(e) Based on number of Water bills divided by total Water and Sewer Bills.
(f) Based on Insurable Value of Water assets as a percentage of total assets.
(g) Based on value of Water related vehicles insured as a percentage of total value of vehicles insured.
(h) Based on a composit allocation of Administrative, Finance and Clerical Billing Salary allocations.

E6 To normalize certain Contractual Services expenses:

Herbicide Application of $40,300 Normalized over two years	$ 20,150	
Less: Test Year Expense	(40,300)	
Water Shed Inventory Management Plan ($30,000 + $8,665 = $38,665) Normalized Over 5 years	7,733	
Less: Test Year Expense	(38,665)	
Total Adjustment		$ (51,082)

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING EXPENSE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

E7 To adjust actual test year Health Insurance to reflect percentage change in Health Insurance as of January 1, 2016.

Account	Test Year 12/31/2015	Pro Forma 2016	Increase (Decrease)	
Water Treatment				
448.156 Health Insurance - WTP	$ 130,227	$ 139,342 *		
Less Insurance for Reduction in Employee		(9,092)		
Net Insuranuce	130,227	130,250	23.8	24
Transmission and Distribution				
450.156 Health Insurance - Trans/Dist	58,237	62,314	4,077	4,077
Administration				
401.215 Health Insurance - Administration	71,495 **	76,500	5,005	
403.215 Health Insurance - Treasurer Dept	4,625	4,949	324	
408.215 Health Insurance - Engineering Dept	11,848	12,677	829	
Total Administration			6,158	6,158

*Reflects replacement of WTP Supervisor with one individual who will supervise both water and sewer treatment plants.
** See E5 adjiustment.

Total Test Year, Pro Forma Operating Expense Adjustments	$ 976,415

CITY OF DUBOIS - BUREAU OF WATER
FUTURE TEST YEAR

PRO FORMA OPERATING EXPENSE ADJUSTMENTS
UNDER PRESENT RATES

Adj. Ref.	Explanation				Adjustment Increase (Decrease)
E8	To adjust Pro Forma 2016 salaries and wages to reflect the change in wage rates as of January 1, 2017.				
	Account	Pro Forma 2016	Pro Forma FTY	Increase (Decrease)	
	Water Treatment				
	448.120 Wages - Supervision	$ 53,961	$ 55,310	$ 1,349	$ 1,349
	448.140 Wages - Plant Labor	220,911	$ 226,434	5,523	5,523
	Transmission and Distribution				
	450.140 Wages - Maintenance of Mains	$ 143,380	$ 146,965	$ 3,585	$ 3,585
	450.142 Wages - Maintenance of Meters	30,703	$ 31,471	768	768
	Administration				
	Salary - Manager	$ 67,163	$ 68,842	$ 1,679	
	Salary - Public Works Director	49,308	50,541	1,233	
	Finance Salaries	37,038	37,963	926	
	Clerical Billing Salaries	16,835	17,256	421	
	Treasury Salaries	17,646	18,087	441	
	Salary - Engineering	44,563	45,677	1,114	5,814
	Total Labor	**$ 681,509**	**$ 698,547**	**$ 17,038**	
	Payroll Taxes				
	448.211 FICA WTP	21,412	$ 21,947	$ 535	$ 535
	448.212 Medicare WTP	5,007	5,133	125	125
	450.211 FICA - Maint of Mains	13,475	13,812	337	337
	450.212 Medicare - Maint. Of Mains	3,152	3,230	79	79

E9	To adjust depreciation expense as of December 31, 2016 (See Exhibit_(JJS-2))		
	Annual Depreciation Expense as of December 31, 2016	$ 377,650	
	Less: Annual Depreciation Expense as of December 31, 2015	(367,982)	
	Adjustment		$ 9,668
	Total Test Year, Pro Forma Operating Expense Adjustments		$ 27,782

APPENDIX C

PRO FORMA REVENUES UNDER PRESENT
AND PROPOSED RATES

CITY OF DUBOIS - BUREAU OF WATER

SUMMARY OF APPLICATION OF PRESENT AND PROPOSED RATES TO CONSUMPTION ANALYSIS AS OF 12/31/2015
AND PRO FORMA REVENUES UNDER PROPOSED RATES AS OF 12/31/2016

Customer Classification	Revenues Per Books, 12/31/205	Application of Present Rates to Bill Analysis	Adjustment Factor	Application of Proposed Rates to Bill Analysis	Adjusted Revenues Under Proposed Rates	Historic Test Year Pro Forma Adjustments Under Proposed Rates		Pro Forma, Proposed Rates, 12/31/2015	Future Test Year Pro Forma Adjustments Under Proposed Rates		Pro Forma, Proposed Rates, 12/31/2016
						Ref.	Amount		Ref.	Amount	
(1)	(2)	(3)	(4)=(2)/(3)	(5)	(6)=(5)x(4)	(7)	(8)	(9)=(6)+(8)	(10)	(11)	(12)
INSIDE-CITY											
Residential	$ 1,057,174	$ 1,034,849	1.021574	$ 1,087,547	$ 1,111,009			$ 1,111,009	R10	$ (1,037)	$ 1,109,972
Commercial	430,349	421,261	1.021574	475,901	486,168	R7	589	486,757	R10	1,178	487,935
Industrial	333,167	326,131	1.021574	479,668	490,016			490,016			490,016
Sykesville	199,420	195,209	1.021574	238,477	243,622			243,622			243,622
Public Fire						R9	66,558	66,558			66,558
Total Inside	2,020,111	1,977,450		2,281,592	2,330,814		67,147	2,397,961		141	2,398,102
OUTSIDE-CITY											
Residential	$ 158,351	$ 155,007	1.021574	$ 206,255	$ 210,704	R8	$ 103	$ 210,808	R11	$ 413	$ 211,221
Commercial	186,890	182,943	1.021574	246,261	251,574	R8	134	251,708	R11	1,071	252,779
Industrial	117,188	114,714	1.021574	154,993	158,337			158,337			158,337
Sales for Resale	286,816	280,759	1.021574	377,823	385,973			385,973			385,973
Public Fire	12,000	12,000	1.000000	14,750	14,750			14,750			14,750
Total Outside	761,245	745,423		1,000,081	1,021,338		237	1,021,575		$ 1,484	1,023,059
Total	$ 2,781,356	$ 2,722,873		$ 3,281,673	$ 3,352,153		$ 67,384	$ 3,419,537		$ 1,625	$ 3,421,162

CITY OF DUBOIS - BUREAU OF WATER
INSIDE THE CITY

APPLICATION OF PRESENT RATES AND PROPOSED RATES TO CONSUMPTION ANALYSIS
YEAR ENDED DECEMBER 31, 2015

Rate Block 1000 Gallons	Number Of Bills	Total Consumption	Present Rate	Present Revenue	Proposed Rates	Proposed Revenue
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Residential - Monthly			
Water Fund Surcharge						
5/8	37,597		$ 8.00	$ 300,776	$ 8.00	$ 300,776
1	145		12.00	1,740	12.00	1,740
1 1/2	0		35.00	0	35.00	0
2	0		55.00	0	55.00	0
3	0		90.00	0	90.00	0
4	0		175.00	0	175.00	0
6	0		225.00	0	225.00	0
8	0		300.00	0	300.00	0
Subtotal	37,742			302,516		302,516
Consumption						
Up to 100,000 Gallons	0	116,934	6.0000	701,604	6.3000	736,684
Over 100,000 Gallons	0	10,243	3.0000	30,729	4.7200	48,347
Subtotal	0	127,177		732,333		785,031
Total	37,742	127,177		$ 1,034,849		$ 1,087,547
			Commercial - Monthly			
Water Fund Surcharge						
5/8	3,705		$ 8.00	$ 29,640	$ 8.00	$ 29,640
1	407		12.00	4,884	12.00	4,884
1 1/2	238		35.00	8,330	35.00	8,330
2	360		55.00	19,800	55.00	19,800
3	89		90.00	8,010	90.00	8,010
4	35		175.00	6,125	175.00	6,125
6	12		225.00	2,700	225.00	2,700
8			300.00	0	300.00	0
Subtotal	4,846			79,489		79,489
Consumption						
Up to 100,000 Gallons	0	45,003	6.0000	270,018	6.3000	283,519
Over 100,000 Gallons	0	23,918	3.0000	71,754	4.7200	112,893
Subtotal	0	68,921		341,772		396,412
Total	4,846	68,921		$ 421,261		$ 475,901

CITY OF DUBOIS - BUREAU OF WATER
INSIDE THE CITY

APPLICATION OF PRESENT RATES AND PROPOSED RATES TO CONSUMPTION ANALYSIS
YEAR ENDED DECEMBER 31, 2015

Rate Block 1000 Gallons	Number Of Bills	Total Consumption	Present Rate	Present Revenue	Proposed Rates	Proposed Revenue
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Industrial - Monthly			
Water Fund Surcharge						
5/8	37		$ 8.00	$ 296	$ 8.00	$ 296
1	48		12.00	576	12.00	576
1 1/2	0		35.00	0	35.00	0
2	73		55.00	4,015	55.00	4,015
3	12		90.00	1,080	90.00	1,080
4	25		175.00	4,375	175.00	4,375
6			225.00	0	225.00	0
8			300.00	0	300.00	0
Subtotal	195			10,342		10,342
Consumption						
Up to 100,000 Gallons	0	8,763	6.0000	52,578	6.3000	55,207
Over 100,000 Gallons	0	87,737	3.0000	263,211	4.7200	414,119
Subtotal	0	96,500		315,789		469,326
Total	195	96,500		$ 326,131		$ 479,668
			Sykesville			
Customer Charge	12	0	$ 168.00	2,016	$ 196.00	2,352
All Usage	0	47,702	4.0500	193,193	4.9500	236,125
Total	12	47,702		195,209		238,477
Total - Inside	42,795	340,300		$ 1,977,450		$ 2,281,592

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE THE CITY

APPLICATION OF PRESENT RATES AND PROPOSED RATES TO CONSUMPTION ANALYSIS
YEAR ENDED DECEMBER 31, 2015

Rate Block 1000 Gallons	Number Minimum Bills	Total Consumption	Present Rate	Present Revenue	Proposed Rate	Proposed Revenue
(1)	(2)	(3)	(4)	(5)	(8)	(9)
			Residential - Monthly			
Customer Charges						
5/8	5,820	0	$ 6.00	$ 34,920	$ 7.00	$ 40,740
1	84	0	9.00	756	10.50	882
1 1/2	36	0	26.00	936	30.30	1,091
2	36	0	41.00	1,476	47.80	1,721
3		0	67.00	0	78.20	0
4	12	0	131.00	1,572	152.80	1,834
6			168.00	0	196.00	0
8			225.00	0	262.50	0
Subtotal	5,988	0		39,660		46,267
Consumption						
Up to 100,000 gallons	0	21,557	5.1500	111,019	7.1500	154,133
Over 100,000 gallons	0	1,148	3.7700	4,328	5.1000	5,855
Subtotal	0	22,705		115,347		159,987
Total	5,988	22,705		$ 155,007		$ 206,255
			Commercial - Monthly			
Customer Charges						
5/8	1,318	0	$ 6.00	$ 7,908	$ 7.00	$ 9,226
1	180	0	9.00	1,620	10.50	1,890
1 1/2	160	0	26.00	4,160	30.30	4,848
2	108	0	41.00	4,428	47.80	5,162
3	36	0	67.00	2,412	78.20	2,815
4	12	0	131.00	1,572	152.80	1,834
6	12	0	168.00	2,016	196.00	2,352
8	2	0	225.00	450	262.50	525
10	12	0	225.00	2,700	262.50	3,150
Subtotal	1,840	0		27,266		31,802
Consumption						
Up to 100,000 gallons		21,086	5.1500	108,593	7.1500	150,765
Over 100,000 gallons	0	12,489	3.7700	47,084	5.1000	63,694
Subtotal	0	33,575		155,677		214,459
Total	1,840	33,575		$ 182,943		$ 246,261

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE THE CITY

APPLICATION OF PRESENT RATES AND PROPOSED RATES TO CONSUMPTION ANALYSIS
YEAR ENDED DECEMBER 31, 2015

Rate Block 1000 Gallons	Number Minimum Bills	Total Consumption	Present Rate	Present Revenue	Proposed Rate	Proposed Revenue
(1)	(2)	(3)	(4)	(5)	(8)	(9)
			Industrial - Monthly			
Customer Charges						
5/8			$ 6.00	$ -	$ 7.00	$ -
1	12	0	9.00	108	10.50	126
1 1/2			26.00	0	30.30	0
2	36	0	41.00	1,476	47.80	1,721
3			67.00	0	78.20	0
4			131.00	0	152.80	0
6	12	0	168.00	2,016	196.00	2,352
8			225.00	0	262.50	0
Subtotal	60	0		3,600		4,199
Consumption						
Up to 100,000 gallons	0	2,631	5.1500	13,550	7.1500	18,812
Over 100,000 gallons	0	25,879	3.7700	97,564	5.1000	131,983
Subtotal	0	28,510		111,114		150,795
Total	60	28,510		$ 114,714		$ 154,993
			Sales for Resale -Monthly - Sandy Township			
Customer Charges						
5/8		0	$ 6.00	$ -	$ 7.00	$ -
1			9.00	0	10.50	0
1 1/2			26.00	0	30.30	0
2	18	0	41.00	738	47.80	860
3			67.00	0	78.20	0
4	11	0	131.00	1,441	152.80	1,681
6	42	0	168.00	7,056	196.00	8,232
8	36	0	225.00	8,100	262.50	9,450
Subtotal	107	0		17,335		20,223
Consumption						
Up to 100,000 gallons	0	6,788	5.1500	34,958	7.1500	48,534
Over 100,000 gallons	0	60,601	3.7700	228,466	5.1000	309,065
Subtotal	0	67,389		263,424		357,599
Total	107	67,389		$ 280,759		$ 377,823
			Public Fire - Quarterly			
Hydrant	80	0	$ 184.37	$ 14,750	$ 184.37	$ 14,750
Total	80	0		14,750		14,750
Total - Outside	8,075	152,179		$ 748,173		$ 1,000,081

CITY OF DUBOIS - BUREAU OF WATER

APPLICATION OF PRESENT RATES AND PROPOSED RATES TO CONSUMPTION ANALYSIS
YEAR ENDED DECEMBER 31, 2015

Rate Block 1000 Gallons	Number Of Bills	Total Consumption	Present Rate	Revenue	Proposed Rates	Proposed Revenue
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Contract Customers - Monthly				
		Union Township				
All Usage	12	10,364	2.1800	22,594	2.1800	22,594
Total Contract		10,364		22,594		22,594

CITY OF DUBOIS - BUREAU OF WATER
HISTORIC TEST YEAR

PRO FORMA OPERATING REVENUE ADJUSTMENTS
UNDER PROPOSED RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

R8 To annualize Inside-City Operating Revenues for the net gain or loss in the number of customers during the twelve months ended 12/31/2015

Customer Classification	Number of Customers 31-Dec-14	31-Dec-15	Customer Gain/(Loss)	Average Annual Bill, Proposed Rates	Annualized Revenue Adjustment (Half Year)	
(1)	(2)	(3)	(4)	(6)	(7)	
Residential	3,339	3,338	(1)	$ 345.78	$ (173)	(173)
Commercial	439	440	1	1,178.46	589	$ 589
Industrial	18	18	-		-	-
Total	3,796	3,796	-		416	

R9 To annualize Outside-City Operating Revenues for the net gain or loss in the number of customers during the twelve months ended 12/31/2015

Customer Classification	Number of Customers 31-Dec-14	31-Dec-15	Customer Gain/(Loss)	Average Annual Bill, Proposed Rates	Annualized Revenue Adjustment (Half Year)	
(1)	(2)	(3)	(4)	(6)	(7)	
Residential	525	528	3	$ 137.78	$ 103	$ 103
Commercial	170	171	1	535.35	134	134
Industrial	5	5	-		-	-
Sales for Resale	1	1	-		-	-
Total	701	705	4		237	

R10 To impute revenue for Inside-City public fire at present Outside City hydrant rates.

	Number of Hydrants	Annual Rate	Imputed Revenue	
Public Fire	361	$ 184.37	$ 66,558	$ 66,558

Total Historic Test Year, Pro Forma Operating Revenue Adjustments Under Proposed Rates $ 67,211

CITY OF DUBOIS - BUREAU OF WATER
FUTURE TEST YEAR

PRO FORMA OPERATING REVENUE ADJUSTMENTS
UNDER PROPOSED RATES

Adj. Ref.	Explanation	Adjustment Increase (Decrease)

R11 To adjust Inside-City Operating Revenues for the projected gain in the number of customers during the twelve months ended 12/31/2016.

Customer Classification	Change in Number of Customers 31-Dec-14	31-Dec-15	Average Customer Gain/(Loss)	Average Annual Bill, Proposed Rates	Annualized Revenue Adjustment	
Residential	(5)	(1)	(3)	$ 345.78	$ (1,037)	$ (1,037)
Commercial	1	1	1	1,178.46	1,178	1,178
Industrial	-	-	-		-	-
						-
Total	(4)	-	(2)		141	

R12 To adjust Outside-City Operating Revenues for the projected gain in the number of customers during the twelve months ended 12/31/2016.

Customer Classification	Change in Number of Customers 31-Dec-14	31-Dec-15	Average Customer Gain/(Loss)	Average Annual Bill, Proposed Rates	Annualized Revenue Adjustment	
Residential	2	3	3	$ 137.78	$ 413	$ 413
Commercial	3	1	2	535.35	1,071	1,071
Industrial	-	-	-		-	-
Sales for Resale	-	-	-		-	-
Total	5	4	5		1,484	

Total Future Test Year, Pro Forma Operating Revenue Adjustments Under Proposed Rates	$ 1,625

APPENDIX D

COMPARISON OF PRESENT AND PROPOSED RATES

CITY OF DUBOIS - BUREAU OF WATER
INSIDE-CITY
COMPARISON OF PRESENT AND PROPOSED RATES

	Present	Proposed	Increase
Monthly Customer Charge			
5/8-3/4	$ 8.00	$ 8.00	0.0%
1	12.00	12.00	0.0%
1 1/2	35.00	35.00	0.0%
2	55.00	55.00	0.0%
3	90.00	90.00	0.0%
4	175.00	175.00	0.0%
6	225.00	225.00	0.0%
8	300.00	300.00	0.0%
Consumption Charge per Month	Per Thousand Gallons		
First 100,000 gallons	$ 6.00	$ 6.30	5.0%
Over 100,000 gallons	3.00	4.72	57.3%
Contract Customers			
Sykesville	$ 4.05	$ 4.95	22.2%
Union Township	2.18	2.18	0.0%

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE-CITY
COMPARISON OF PRESENT AND PROPOSED RATES

Monthly Customer Charge	Present	Proposed	Increase
5/8-3/4	$ 6.00	$ 7.00	16.7%
1	9.00	10.50	16.7%
1 1/2	26.00	30.30	16.5%
2	41.00	47.80	16.6%
3	67.00	78.20	16.7%
4	131.00	152.80	16.6%
6	168.00	196.00	16.7%
8	225.00	262.50	16.7%

Consumption Charge	Per Thousand	Per Thousand	
Consumption Charge per Month			
First 100,000 gallons	$ 5.15	$ 7.15	38.8%
Over 100,000 gallons	3.77	5.10	35.3%

Public Fire - Annual Charge:	Present	Proposed	Increase
Per Fire Hydrant, Annually	$ 184.37	$ 184.37	0.0%

CITY OF DUBOIS - BUREAU OF WATER
INSIDE CITY
COMPARISON OF BILLS UNDER PRESENT AND PROPOSED RATES

RESIDENTIAL MONTHLY- 5/8 INCH METER

Usage Gallons	Present Rates	Proposed Rates	Dollar Increase	Percentage Increase
-	$ 8.00	$ 8.00	$ -	0.0%
1,000	14.00	14.30	0.30	2.1%
2,000	20.00	20.60	0.60	3.0%
3,000	26.00	26.90	0.90	3.5%
3,300 *	27.80	28.79	0.99	3.6%
4,000	32.00	33.20	1.20	3.8%
5,000	38.00	39.50	1.50	3.9%
6,000	44.00	45.80	1.80	4.1%
7,000	50.00	52.10	2.10	4.2%
8,000	56.00	58.40	2.40	4.3%
9,000	62.00	64.70	2.70	4.4%
10,000	68.00	71.00	3.00	4.4%
11,000	74.00	77.30	3.30	4.5%
12,000	80.00	83.60	3.60	4.5%
13,000	86.00	89.90	3.90	4.5%
14,000	92.00	96.20	4.20	4.6%
15,000	98.00	102.50	4.50	4.6%

* Average Usage.

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE CITY
COMPARISON OF BILLS UNDER PRESENT AND PROPOSED RATES

RESIDENTIAL MONTHLY- 5/8 INCH METER

Usage Gallons	Present Rates	Proposed Rates	Dollar Increase	Percentage Increase
-	$ 6.00	$ 7.00	$ 1.00	16.7%
1,000	11.15	14.15	3.00	26.9%
2,000	16.30	21.30	5.00	30.7%
3,000	21.45	28.45	7.00	32.6%
3,800 *	25.57	34.17	8.60	33.6%
4,000	26.60	35.60	9.00	33.8%
5,000	31.75	42.75	11.00	34.6%
6,000	36.90	49.90	13.00	35.2%
7,000	42.05	57.05	15.00	35.7%
8,000	47.20	64.20	17.00	36.0%
9,000	52.35	71.35	19.00	36.3%
10,000	57.50	78.50	21.00	36.5%
11,000	62.65	85.65	23.00	36.7%
12,000	67.80	92.80	25.00	36.9%
13,000	72.95	99.95	27.00	37.0%
14,000	78.10	107.10	29.00	37.1%
15,000	83.25	114.25	31.00	37.2%

* Average Usage.

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE CITY
COMPARISON OF BILLS UNDER PRESENT AND PROPOSED RATES

COMMERCIAL MONTHLY- 5/8 INCH METER

Quarterly Usage Gallons		Present Rates	Proposed Rates	Dollar Increase	Percentage Increase
-		$ 6.00	$ 7.00	$ 1.00	16.7%
1,000		11.15	14.15	3.00	26.9%
2,000		16.30	21.30	5.00	30.7%
3,000		21.45	28.45	7.00	32.6%
4,000		26.60	35.60	9.00	33.8%
5,000		31.75	42.75	11.00	34.6%
6,000		36.90	49.90	13.00	35.2%
7,000		42.05	57.05	15.00	35.7%
8,000		47.20	64.20	17.00	36.0%
9,000		52.35	71.35	19.00	36.3%
10,000		57.50	78.50	21.00	36.5%
11,000		62.65	85.65	23.00	36.7%
12,000		67.80	92.80	25.00	36.9%
13,000		72.95	99.95	27.00	37.0%
14,000		78.10	107.10	29.00	37.1%
15,000		83.25	114.25	31.00	37.2%
18,250	*	99.99	137.49	37.50	37.5%
20,000		109.00	150.00	41.00	37.6%
25,000		134.75	185.75	51.00	37.8%
30,000		160.50	221.50	61.00	38.0%
35,000		186.25	257.25	71.00	38.1%
40,000		212.00	293.00	81.00	38.2%
45,000		237.75	328.75	91.00	38.3%
50,000		263.50	364.50	101.00	38.3%
55,000		289.25	400.25	111.00	38.4%
60,000		315.00	436.00	121.00	38.4%

* Average Usage

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE CITY
COMPARISON OF BILLS UNDER PRESENT AND PROPOSED RATES

INDUSTRIAL MONTHLY - 2 INCH METER

Quarterly Usage Gallons		Present Rates	Proposed Rates	Dollar Increase	Percentage Increase
-		$ 41.00	$ 47.80	$ 6.80	16.6%
10,000		92.50	119.30	26.80	29.0%
20,000		144.00	190.80	46.80	32.5%
30,000		195.50	262.30	66.80	34.2%
50,000		298.50	405.30	106.80	35.8%
100,000		556.00	762.80	206.80	37.2%
150,000		744.50	1,017.80	273.30	36.7%
200,000		933.00	1,272.80	339.80	36.4%
250,000		1,121.50	1,527.80	406.30	36.2%
300,000		1,310.00	1,782.80	472.80	36.1%
400,000		1,687.00	2,292.80	605.80	35.9%
475,000	*	1,969.75	2,675.30	705.55	35.8%
500,000		2,064.00	2,802.80	738.80	35.8%
600,000		2,441.00	3,312.80	871.80	35.7%
700,000		2,818.00	3,822.80	1,004.80	35.7%
800,000		3,195.00	4,332.80	1,137.80	35.6%
900,000		3,572.00	4,842.80	1,270.80	35.6%
1,000,000		3,949.00	5,352.80	1,403.80	35.5%

* Average Usage

CITY OF DUBOIS - BUREAU OF WATER
OUTSIDE CITY
COMPARISON OF BILLS UNDER PRESENT AND PROPOSED RATES

SALES FOR RESALE MONTHLY - 8 INCH METER

Quarterly Usage Gallons		Present Rates	Proposed Rates	Dollar Increase	Percentage Increase
-		$ 225.00	$ 262.50	$ 37.50	16.7%
100,000		740.00	977.50	237.50	32.1%
200,000		1,117.00	1,487.50	370.50	33.2%
300,000		1,494.00	1,997.50	503.50	33.7%
400,000		1,871.00	2,507.50	636.50	34.0%
500,000		2,248.00	3,017.50	769.50	34.2%
600,000		2,625.00	3,527.50	902.50	34.4%
630,000	*	2,738.10	3,680.50	942.40	34.4%
700,000		3,002.00	4,037.50	1,035.50	34.5%
800,000		3,379.00	4,547.50	1,168.50	34.6%
900,000		3,756.00	5,057.50	1,301.50	34.7%
1,000,000		4,133.00	5,567.50	1,434.50	34.7%
1,100,000		4,510.00	6,077.50	1,567.50	34.8%
1,200,000		4,887.00	6,587.50	1,700.50	34.8%
1,300,000		5,264.00	7,097.50	1,833.50	34.8%
1,400,000		5,641.00	7,607.50	1,966.50	34.9%
1,439,000		5,788.03	7,806.40	2,018.37	34.9%
1,500,000		6,018.00	8,117.50	2,099.50	34.9%
1,750,000		6,960.50	9,392.50	2,432.00	34.9%
2,000,000		7,903.00	10,667.50	2,764.50	35.0%
2,250,000		8,845.50	11,942.50	3,097.00	35.0%

* Average Usage

Exhibit_(CEH-2)

CITY OF DUBOIS - BUREAU OF WATER

DuBois, Pennsylvania

COST OF SERVICE ALLOCATION STUDY

FOR THE TEST YEAR ENDED

DECEMBER 31, 2016

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Harrisburg, Pennsylvania

Gannett Fleming

Excellence Delivered As Promised

June 30, 2016

City of DuBois
16 W. Scribner Avenue
DuBois, PA 15801

Attention Mr. John "Herm" Suplizio
City Manager

Gentlemen:

Pursuant to your request, we have conducted cost of service allocation study based on the revenue requirements estimated for the test year ended December 31, 2016.

The attached report presents the results of the allocation study, as well as supporting schedules which set forth the detailed cost allocation calculations. Schedule A presents a comparison of the cost of service by customer classification with the pro forma revenues produced by each classification under present and proposed rates.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

CONSTANCE E. HEPPENSTALL
Project Manager, Rate Studies

CEH:mlw

Attachment

060728.100

Gannett Fleming Valuation and Rate Consultants, LLC
P.O. Box 67100 • Harrisburg, PA 17106-7100 | 207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.4590
www.gfvrc.com

CONTENTS

PART I. INTRODUCTION

CITY OF DUBOIS - BUREAU OF WATER

COST OF SERVICE ALLOCATION STUDY
FOR THE TEST YEAR ENDED DECEMBER 31, 2016

PART I. INTRODUCTION

PLAN OF REPORT

The report sets forth the results of the cost of service allocation studies based on the estimated revenue requirements as of December 31, 2016, for the City of DuBois - Bureau of Water. Part I, Introduction, contains statements with respect to the basis of the study, the procedures employed, and a summary of the results of the study. Part II, Cost of Service by Customer Classification, presents detailed schedules of the allocation of costs to specific customer classifications, as well as the bases for the allocations. Schedule A in Part II summarizes the cost allocation and the revenues produced under present and proposed rates.

BASIS OF STUDY

The purpose of the cost allocation study was to determine the relative cost of service responsibilities of the several customer classifications for Inside-City and Outside-City service areas based on considerations of quantity of water consumed, variability of rate of consumption, and costs associated with customer metering, billing and accounting. The allocation studies incorporated generally-accepted principles and procedures for allocating the several categories of cost to customer classifications in proportion to each classification's use of facilities, commodities and services required in providing water service.

ALLOCATION PROCEDURES

The allocation studies were based on the Base-Extra Capacity Method for allocating costs to customer classifications. The method is described in the 2012 edition and prior editions of the Water Rates Manual published by the American Water Works Association. The four basic categories of cost responsibility are base, extra capacity, customer, and fire protection costs. The following discussion presents a brief description of these costs and the manner in which they were allocated.

Base Costs are costs that tend to vary with the quantity of water used, plus costs associated with supplying, treating, pumping, and distributing water to customers under average load conditions, without the elements necessary to meet peak demands. Base costs were allocated to customer classifications on the basis of average daily usage.

Extra Capacity Costs are costs associated with meeting usage requirements in excess of the average. They include operating and capital costs for additional plant and system capacity beyond that required for average use. The extra capacity costs in this study are subdivided into costs necessary to meet maximum day extra demand and costs to meet maximum hour extra demand. The extra capacity costs were allocated to customer classifications on the bases of each classification's maximum day and hour usage in excess of average usage.

Customer Costs are costs associated with serving customers regardless of their usage or demand characteristics. Customer costs include the operating and capital costs related to meters and services, meter reading costs, and billing and collecting costs. The customer costs were allocated on the bases of the capital cost of meters and services, and the number of customers.

Fire Protection Costs are costs associated with providing the facilities to meet the potential peak demand of fire protection service. The extra capacity costs assigned to fire protection service were allocated to Inside and Outside Public Fire Protection on the basis of the total relative demands of the Inside- and Outside-City hydrants sized to provide fire protection.

RESULTS OF STUDY

The results of the cost of service allocation study are set forth in Part II. The data summarized in Schedule A, Comparison of Cost of Service with Revenues Under Present and Proposed Rates for the Test Year Ended December 31, 2016, constitute the principal results of the cost allocation studies and subsequent rate designs, as shown in Exhibit_(CEH-1), page 38.

The cost of service by customer classification shown in column 2 of Schedule A is developed in Schedule B, Projected Cost of Service for the Twelve Months Ended December 31, 2016, Allocated to Customer Classifications. The allocation of the total cost of service to the several customer classifications for Inside-City and Outside-City service areas was performed by applying the allocation factors referenced in column 2 of Schedule B to the cost of service set forth in column 3. The bases for the allocation factors are presented in Schedule C.

Schedule D presents the basis for allocating demand related costs of fire service to private and public fire protection classifications.

PART II. COST OF SERVICE BY CUSTOMER CLASSIFICATION

CITY OF DUBOIS
BUREAU OF WATER

COMPARISON OF COST OF SERVICE WITH REVENUES UNDER PRESENT AND PROPOSED RATES
FOR THE TEST YEAR ENDED DECEMBER 31, 2016

Customer Classification	Cost of Service		Revenues, Present Rates		Revenues, Proposed Rates		Proposed Increase	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent Increase
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Inside the City								
Residential	$ 1,109,442	32.4%	$ 1,056,023	37.0%	$ 1,109,972	32.4%	$ 53,950	5.1%
Commercial/Public	483,371	14.1%	431,914	15.1%	487,935	14.3%	56,021	13.0%
Industrial	495,725	14.5%	333,167	11.7%	490,016	14.3%	156,849	47.1%
Sykesville	243,153	7.1%	199,420	7.0%	243,622	7.1%	44,201	22.2%
Public Fire Service	66,558	1.9%	66,558	2.3%	66,558	1.9%	-	0.0%
Total - Inside City	2,398,250	70.0%	2,087,081	73.1%	2,398,102	70.0%	311,021	14.9%
Outside the City								
Residential	211,229	6.2%	158,817	5.6%	211,221	6.3%	52,403	33.0%
Commercial/Public	253,487	7.4%	187,883	6.6%	252,779	7.4%	64,895	34.5%
Industrial	159,460	4.7%	117,188	4.1%	158,337	4.6%	41,149	35.1%
Other Water Utilities	385,459	11.3%	286,816	10.1%	385,973	11.3%	99,157	34.6%
Public Fire Service	14,750	0.4%	14,750	0.5%	14,750	0.4%	-	0.0%
Total - Outside City	1,024,384	30.0%	765,455	26.9%	1,023,059	30.0%	257,604	33.7%
Total Sales	3,422,633	100.0%	2,852,536	100.0%	3,421,162	100.0%	568,625	19.9%
Other Revenues - Inside-City	33,322		33,322		33,322		-	
Other Revenues - Outside-City	35,151		35,151		35,151		-	
Total	$ 3,491,106		$ 2,921,009		$ 3,489,635		$ 568,625	19.5%

CITY OF DUBOIS - BUREAU OF WATER
PROJECTED COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2016
ALLOCATED TO RESIDENTIAL, COMMERCIAL, INDUSTRIAL, OTHER WATER UTILITIES AND FIRE SERVICE CUSTOMER CLASSIFICATIONS

ACCOUNT	FACTOR REF	COST OF SERVICE	INSIDE-CITY					OUTSIDE - CITY				
			RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SYKESVILLE	PUBLIC FIRE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER UTILITITIES	PUBLIC FIRE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
OPERATION AND MAINTENANCE EXPENSES												
Water Treatment												
448.12 Wages - Supervision	2	55,310	16,112	8,025	9,712	4,806	66	2,920	3,988	2,876	6,787	17
448.14 Wages - Plant Labor	2	226,434	65,960	32,856	39,762	19,677	272	11,956	16,326	11,775	27,783	68
448.14 Wages - Summer Help	2	7,507	2,187	1,089	1,318	652	9	396	541	390	921	2
448.16 Health Insurance - WTP	2	130,250	37,942	18,899	22,872	11,319	156	6,877	9,391	6,773	15,982	39
448.16 Life Insurance Premium - WTP	2	638	186	93	112	55	1	34	46	33	78	0
448.16 Vacation - WTP	2	31,079	9,053	4,510	5,458	2,701	37	1,641	2,241	1,616	3,813	9
448.16 Unemployment Comp - WTP	2	2,259	658	328	397	196	3	119	163	117	277	1
448.18 Overtime	2	43,534	12,681	6,317	7,645	3,783	52	2,299	3,139	2,264	5,342	13
448.19 Uniforms	2	750	218	109	132	65	1	40	54	39	92	0
448.19 Training	2	405	118	59	71	35	0	21	29	21	50	0
448.21 Fica - WTP	2	21,947	6,393	3,185	3,854	1,907	26	1,159	1,582	1,141	2,693	7
448.21 Medicare - WTP	2	5,133	1,495	745	901	446	6	271	370	267	630	2
448.22 Chemicals	1	78,107	20,058	10,896	15,247	7,537	141	3,632	5,413	4,507	10,646	31
448.23 Vehicle Gas & Oil	2	1,884	549	273	331	164	2	99	136	98	231	1
448.25 Operating Supplies	2	20,739	6,041	3,009	3,642	1,802	25	1,095	1,495	1,078	2,545	6
448.32 Telephone	2	3,026	882	439	531	263	4	160	218	157	371	1
448.35 Worker's Comp - WTP	2	26,413	7,694	3,832	4,638	2,295	32	1,395	1,904	1,373	3,241	8
448.36 Electric	1	44,637	11,463	6,227	8,713	4,307	80	2,076	3,093	2,576	6,084	18
448.36 Gas Heat	2	13,429	3,912	1,949	2,358	1,167	16	709	968	698	1,648	4
448.37 Sludge Removal	1	210	54	29	41	20	0	10	15	12	29	0
448.37 Building Repairs & Maintenance	2	16,177	4,712	2,347	2,841	1,406	19	854	1,166	841	1,985	5
448.45 WTP Pump	2	50,206	14,625	7,285	8,816	4,363	60	2,651	3,620	2,611	6,160	15
448.45 Water Analysis	2	6,709	1,954	973	1,178	583	8	354	484	349	823	2
449.25 Operating Supplies	2	1,200	350	174	211	104	1	63	87	62	147	0
449.32 Telephone	2	856	249	124	150	74	1	45	62	44	105	0
449.36 Electric	2	17,838	5,196	2,588	3,132	1,550	21	942	1,286	928	2,189	5
449.36 Heat	2	1,668	486	242	293	145	2	88	120	87	205	1
449.37 Building Repairs & Maintenance	2	595	173	86	104	52	1	31	43	31	73	0
Total Water Treatment		808,940	231,402	116,689	144,460	71,477	1,045	41,937	57,980	42,766	100,929	255

CITY OF DUBOIS - BUREAU OF WATER
PROJECTED COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2016
ALLOCATED TO RESIDENTIAL, COMMERCIAL, INDUSTRIAL, OTHER WATER UTILITIES AND FIRE SERVICE CUSTOMER CLASSIFICATIONS

ACCOUNT	FACTOR REF	COST OF SERVICE	INSIDE-CITY					OUTSIDE - CITY				
			RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SYKESVILLE	PUBLIC FIRE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER UTILITITIES	PUBLIC FIRE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Transmission and Distribution												
450.12 Salary	10	-	-	-	-	-	-	-	-	-	-	-
450.14 Wages - Maintenance of Mains	6	146,965	38,860	18,022	20,335	10,055	19,123	7,039	8,962	6,019	14,195	4,354
450.14 Wages - Maintenance of Meters	8	31,471	16,714	5,127	667	264	-	3,065	2,600	488	2,546	-
450.16 Health Insurance - Trans/Dist	10	62,314	19,417	8,088	7,341	3,608	6,655	3,527	4,038	2,274	5,851	1,514
450.16 Life Insurance Premium - Trans/Dist	10	293	91	38	34	17	31	17	19	11	27	7
450.16 Vacation - Trans/Dist	10	18,132	5,650	2,353	2,136	1,050	1,936	1,026	1,175	662	1,703	441
450.16 Unemployment Comp - Trans/Dist	10	901	281	117	106	52	96	51	58	33	85	22
450.18 Overtime	10	34,397	10,718	4,465	4,052	1,992	3,674	1,947	2,229	1,255	3,230	836
450.19 Uniforms	10	550	171	71	65	32	59	31	36	20	52	13
450.19 Training / Registration	10	1,330	414	173	157	77	142	75	86	49	125	32
450.21 FICA	10	13,812	4,304	1,793	1,627	800	1,475	782	895	504	1,297	336
450.21 Medicare	10	3,230	1,007	419	381	187	345	183	209	118	303	79
450.23 Vehicle Gas & Oil	10	15,823	4,931	2,054	1,864	916	1,690	896	1,025	578	1,486	385
450.25 Operating Supplies	10	132,852	41,397	17,244	15,650	7,692	14,189	7,519	8,609	4,849	12,475	3,228
450.35 Worker's Comp - Trans/Dist	10	22,592	7,040	2,933	2,661	1,308	2,413	1,279	1,464	825	2,121	549
450.37 Water Tank Exp. - Highland & Platt	5	928	302	130	134	66	35	55	65	40	94	8
450.45 Contractual Services	10	132,771	41,371	17,234	15,640	7,687	14,180	7,515	8,604	4,846	12,467	3,226
Total Transmission and Distribution		618,361	192,668	80,261	72,850	35,803	66,043	35,006	40,073	22,570	58,057	15,029
Administrative and General Expenses												
Government Expense	13	2,367	741	324	341	168	118	133	160	103	251	27
Administrative Salaries	13	175,434	54,928	23,982	25,298	12,473	8,737	9,894	11,894	7,614	18,614	2,000
Other Expenses	13	145,153	45,447	19,842	20,931	10,320	7,229	8,187	9,841	6,300	15,401	1,655
Clerical Billing Salaries	11	17,256	12,739	1,657	66	3	3	2,074	645	24	41	3
Legal	13	2,300	720	314	332	164	115	130	156	100	244	26
Engineering Salaries	13	45,677	14,302	6,244	6,587	3,248	2,275	2,576	3,097	1,982	4,846	521
Engineering Expense	13	30,072	9,416	4,111	4,336	2,138	1,498	1,696	2,039	1,305	3,191	343
City Buildings	13	51,174	16,023	6,995	7,379	3,638	2,548	2,886	3,470	2,221	5,430	583
Insurance	13	44,624	13,972	6,100	6,435	3,173	2,222	2,517	3,026	1,937	4,735	509
Pension Contribution (Net of State Aid)	14	33,785	10,612	4,642	4,963	2,449	1,460	1,909	2,301	1,490	3,625	334
Water Fund HealthCare Deductible Transfer	14	22,500	7,067	3,092	3,305	1,631	972	1,271	1,532	992	2,414	223
Postage	11	20,154	14,877	1,935	77	4	4	2,422	754	28	48	4
Rate Case Expense	18	80,202	-	-	-	-	-	15,776	19,096	12,311	30,164	2,855
Total Administrative and General Expenses		670,698	200,843	79,236	80,049	39,411	27,180	51,472	58,011	36,407	89,004	9,083
TOTAL OPERATION AND MAINTENANCE EXPENSES		2,097,999	624,914	276,187	297,359	146,691	94,267	128,416	156,065	101,743	247,990	24,368
DEPRECIATION EXPENSE												
COLLECTING AND IMPOUNDING RESERVOIRS	1	7,262	1,865	1,013	1,418	701	13	338	503	419	990	3
WELLS AND SPRINGS	2	105,786	30,815	15,350	18,576	9,193	127	5,586	7,627	5,501	12,980	32
OTHER WATER SOURCE STRUCTURES	1	-	-	-	-	-	-	-	-	-	-	-
PURIFICATION BUILDINGS	2	15,684	4,569	2,276	2,754	1,363	19	828	1,131	816	1,924	5
DISTRIBUTION RESERVOIRS AND STANDPIPES	5	27,238	8,861	3,813	3,941	1,948	1,021	1,610	1,896	1,163	2,751	234
MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	2	9,679	2,819	1,404	1,700	841	12	511	698	503	1,188	3
OTHER POWER PRODUCTION EQUIPMENT	2	1,523	444	221	267	132	2	80	110	79	187	0

CITY OF DUBOIS - BUREAU OF WATER
PROJECTED COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2016
ALLOCATED TO RESIDENTIAL, COMMERCIAL, INDUSTRIAL, OTHER WATER UTILITIES AND FIRE SERVICE CUSTOMER CLASSIFICATIONS

ACCOUNT	FACTOR REF	COST OF SERVICE	INSIDE-CITY					OUTSIDE - CITY				
			RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SYKESVILLE	PUBLIC FIRE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER UTILITITIES	PUBLIC FIRE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
ELECTRIC PUMPING EQUIPMENT	2	984	287	143	173	86	1	52	71	51	121	0
PURIFICATION SYSTEM	2	32,515	9,472	4,718	5,710	2,826	39	1,717	2,344	1,691	3,990	10
MAINS AND ACCESSORIES - DISTRIBUTION	4	19,317	4,908	2,111	2,183	1,076	4,018	890	1,049	645	1,522	914
MAINS AND ACCESSORIES - TRANSMISSION	3	37,614	10,370	5,164	6,251	3,096	1,689	1,873	2,565	1,851	4,367	387
SERVICES	9	2,590	1,870	267	14	2	-	307	107	7	16	-
METERS	8	56,984	30,264	9,283	1,208	479	-	5,550	4,707	883	4,610	-
FIRE HYDRANTS	7	3,819	-	-	-	-	3,110	-	-	-	-	709
OFFICE FURNITURE AND EQUIPMENT	13	1,652	517	226	238	117	82	93	112	72	175	19
TRANSPORTATION EQUIPMENT	13	37,199	11,647	5,085	5,364	2,645	1,853	2,098	2,522	1,614	3,947	424
TOOLS AND WORK EQUIPMENT	13	12,405	3,884	1,696	1,789	882	618	700	841	538	1,316	141
COMMUNICATION EQUIPMENT	13	5,399	1,690	738	779	384	269	305	366	234	573	62
OTHER TANGIBLE PLANT	13	-	-	-	-	-	-	-	-	-	-	-
TOTAL DEPRECIATION EXPENSE		377,650	124,283	53,508	52,364	25,769	12,872	22,538	26,649	16,068	40,656	2,943
UTILITY OPERATING INCOME AVAILABLE FDR RETURN - INSIDE	16A	723,357	305,546	138,885	150,097	74,072	54,758	-	-	-	-	-
UTILITY OPERATING INCOME AVAILABLE FOR RETURN - OUTSIDE	16B	292,100	-	-	-	-	-	55,324	69,082	45,159	110,034	12,502
TOTAL COST OF SERVICE		3,491,106	1,054,743	468,580	499,820	246,532	161,898	206,278	251,796	162,969	398,679	39,812
LESS INSIDE OTHER WATER REVENUES	17	33,322	14,452	6,421	6,851	3,379	2,219	-	-	-	-	-
LESS OUTSIDE OTHER WATER REVENUES	18	35,151	-	-	-	-	-	6,914	8,369	5,396	13,220	1,251
TOTAL COST OF SERVICE RELATED TO SALES OF WATER		3,422,633	1,040,291	462,159	492,969	243,153	159,678	199,363	243,426	157,574	385,459	38,561
REALLOCATION OF PUBLIC FIRE - INSIDE	19		69,152	21,213	2,756	-	(93,121)					
REALLOCATION OF PUBLIC FIRE - OUTSIDE	20							11,865	10,060	1,886	-	(23,811)
TOTAL		3,422,633	1,109,442	483,371	495,725	243,153	66,558	211,229	253,487	159,460	385,459	14,750

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 1. ALLOCATION OF COSTS WHICH VARY WITH THE AMOUNT OF WATER CONSUMED.

Factors are based on the pro forma future test year average daily consumption for each customer classification.

Customer Classification	Average Daily Consumption, 1000 Gallons	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	348.0	0.2568
Commercial	188.9	0.1395
Industrial	264.4	0.1952
Sykesville	130.7	0.0965
Public Fire Protection	2.4	0.0018
Outside - City		
Residential	63.0	0.0465
Commercial	93.8	0.0693
Industrial	78.1	0.0577
Other Water Utilities	184.6	0.1363
Public Fire Protection	0.5	0.0004
Total	1,354	1.0000

FACTOR 2. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM DAY EXTRA CAPACITY FUNCTIONS.

Factors are based on the weighting of the factors for average daily consumption (Factor 1) and the factors derived from maximum day extra capacity demand for each customer classification, as follows:

	Average Daily Consumption		Maximum Day Extra Capacity		
Customer Classification	Allocation Factor 1	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)=(2)x 0.6667	(4)	(5)=(4)x 0.3333	(6)=(3)+(5)
Inside - City					
Residential	0.2568	0.1711	0.3604	0.1202	0.2913
Commercial	0.1395	0.0930	0.1564	0.0521	0.1451
Industrial	0.1952	0.1301	0.1366	0.0455	0.1756
Sykesville	0.0965	0.0643	0.0678	0.0226	0.0869
Public Fire Protection	0.0018	0.0012			0.0012
Outside - City					
Residential	0.0465	0.0311	0.0652	0.0217	0.0528
Commercial	0.0693	0.0462	0.0776	0.0259	0.0721
Industrial	0.0577	0.0385	0.0405	0.0135	0.0520
Other Water Utilities	0.1363	0.0909	0.0955	0.0318	0.1227
Public Fire Protection	0.0004	0.0003			0.0003
Total	1.0000	0.6667	1.0000	0.3333	1.0000

The derivation of the maximum day extra capacity factors in column 4 and the basis for the column 3 and column 5 weightings are presented on the following page.

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 2. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM DAY EXTRA CAPACITY FUNCTIONS, cont.

Customer Classification	Average Daily Consumption, 1000 Gallons	Maximum Day Extra Capacity Factor*	Maximum Day Extra Capacity Rate of Flow, 1000 Gallons Per Day	Allocation Factor
(1)	(2)	(3)	(4)=(2)x(3)	(5)
Inside - City				
Residential	348	1.00	348.0	0.3604
Commercial	189	0.80	151.1	0.1564
Industrial	264	0.50	132.0	0.1366
Sykesville	131	0.50	65.5	0.0678
Outside - City				
Residential	63	1.00	63.0	0.0652
Commercial	94	0.80	75.0	0.0776
Industrial	78	0.50	39.1	0.0405
Other Water Utilities	185	0.50	92.3	0.0955
Total	1,351		966.0	1.0000

The weighting of the factors is based on the maximum day ratio of 1.50, based on a review of maximum day ratios.

	Maximum Day Ratio	Weight
Average Day	1.00	0.6667
Maximum Day Extra Capacity	0.50	0.3333
Total	1.50	1.0000

* Ratio of maximum day to average day minus 1.0.

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 3. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE, MAXIMUM DAY EXTRA CAPACITY AND FIRE PROTECTION FUNCTIONS.

Factors are based on the weighting of the average daily consumption, the maximum day extra capacity demand, and the fire protection demand for each customer classification.

	Average Daily Consumption			Max Day Extra Capacity		Fire Protection		
Customer Classification	1000 Gals.	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)	(4)=(3)x 0.6308	(5)	(6)=(5)x 0.3154	(7)	(8)=(7)x 0.0538	(9)=(4)+ (6)+(8)
Inside - City								
Residential	348.0	0.2568	0.1621	0.3604	0.1136			0.2757
Commercial	188.9	0.1395	0.0880	0.1564	0.0493			0.1373
Industrial	264.4	0.1952	0.1231	0.1366	0.0431			0.1662
Sykesville	130.7	0.0965	0.0609	0.0678	0.0214			0.0823
Public Fire Protection	2.4	0.0018	0.0011			0.8144	0.0438	0.0449
Outside - City								
Residential	63.0	0.0465	0.0292	0.0652	0.0206			0.0498
Commercial	93.8	0.0693	0.0437	0.0776	0.0245			0.0682
Industrial	78.1	0.0577	0.0364	0.0405	0.0128			0.0492
Other Water Utilities	184.6	0.1363	0.0860	0.0955	0.0301			0.1161
Public Fire Protection	0.5	0.0004	0.0003			0.1856	0.0100	0.0103
	1,354	1.0000	0.6308	1.0000	0.3154	1.0000	0.0538	1.0000

CITY OF DUBOIS - BUREAU OF WATER

ACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 3. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM DAY EXTRA CAPACITY AND FIRE PROTECTION FUNCTIONS, cont.

The weighting of the factors is based on the potential demand of general and fire protection service. The bases for the potential demand of general service are a maximum day to average day of 1.50 and the average daily send-out during the test year ending 12/31/15 of 2.1 mgd. The system demand for the fire protection is 1,000 gpm for 3 hours.

	Ratio	Rate of Flow, (GPD)	Weight
Average Day	1.00	2,109,127	0.6308
Maximum Day Extra Capacity	0.50	1,054,564	0.3154
Subtotal	1.50	3,163,691	0.9462
Fire Protection		180,000	0.0538
Total		3,343,691	1.0000

The public and private fire protection allocation factors in column 7 on the previous page are based on relative potential demands. (See Schedule D).

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM HOUR EXTRA CAPACITY FUNCTIONS.

Factors are based on the weighting of the average hourly consumption, the maximum hour extra capacity demand, and the fire protection demand for each customer classification.

	Average Hourly Consumption			Max Hour Extra Capacity		Fire Protection		
Customer Classification	1000 Gals.	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)	(4)=(3)x 0.3727	(5)	(6)=(5)x 0.3728	(7)	(8)=(7)x 0.2545	(9)=(4) +(6)+(8)
Inside - City								
Residential	14.50	0.2567	0.0957	0.4249	0.1584			0.2541
Commercial	7.87	0.1394	0.0520	0.1538	0.0573			0.1093
Industrial	11.02	0.1953	0.0728	0.1077	0.0402			0.1130
Sykesville	5.45	0.0966	0.0359	0.0532	0.0198			0.0557
Public Fire Protection	0.10	0.0018	0.0007			0.8144	0.2073	0.2080
Outside - City								
Residential	2.63	0.0466	0.0174	0.0771	0.0287			0.0461
Commercial	3.91	0.0693	0.0258	0.0764	0.0285			0.0543
Industrial	3.25	0.0576	0.0215	0.0318	0.0119			0.0334
Other Water Utilities	7.69	0.1363	0.0508	0.0751	0.0280			0.0788
Public Fire Protection	0.02	0.0004	0.0001			0.1856	0.0472	0.0473
	56.4	1.0000	0.3727	1.0000	0.3728	1.0000	0.2545	1.0000

The maximum hour extra capacity factors in column 5 are determined on the following page:
The public and private fire protection allocation factors in column 7 are based on relative potential demands.(See Schedule D)

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM HOUR EXTRA CAPACITY FUNCTIONS, cont.

The weighting of the factors is based on the potential demand of general and fire protection service. The bases for the potential demand of general service are a maximum hour to average hour of 2.00 and the average daily send-out during the test year ending 12/31/15 of 2.1 mgd. The system demand for the fire protection is 1,000 gpm.

	Ratio	Rate of Flow, (GPM)	Weight
Average Hour	1.00	1,465	0.3727
Maximum Hour Extra Capacity	1.00	1,465	0.3728
Subtotal	2.00	2,930	0.7455
Fire Protection		1,000	0.2545
Total		3,930	1.0000

Customer Classification	Average Hourly Consumption 1000 Gals	Maximum Hour Extra Capacity Factor	Maximum Hour Extra Capacity Rate, 1000 gal/hr	Maximum Hour Extra Capacity Allocation Factor
(1)	(2)	(3)	(4)=(2)x(3)	(5)
Inside - City				
Residential	14.50	3.0	43.50	0.4249
Commercial/Public	7.87	2.0	15.74	0.1538
Industrial	11.02	1.0	11.02	0.1077
Sykesville	5.45	1.0	5.45	0.0532
Outside - City				
Residential	2.63	3.0	7.89	0.0771
Commercial	3.91	2.0	7.82	0.0764
Industrial	3.25	1.0	3.25	0.0318
Other Water Utilities	7.69	1.0	7.69	0.0751
Total	56.32		102.36	1.0000

The public and private fire protection allocation factors in column 7 on the previous page are based on relative potential demands. (See Schedule D).

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 5. ALLOCATION OF COSTS ASSOCIATED WITH STORAGE FACILITIES.

Factors are based on the weighting of the average hourly consumption, the maximum hour extra capacity demand, and the fire protection demand for each customer classification.

Customer Classification	Average Hourly Consumption			Maximum Hour Extra Capacity		Fire Protection		
	1000 Gals.	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)	(4)=(3)x 0.4775	(5)	(6)=(5)x 0.4775	(7)	(8)=(7)x 0.0450	(9)=(4) +(6)+(8)
Inside - City								
Residential	14.50	0.2567	0.1224	0.4249	0.2029			0.3253
Commercial	7.87	0.1394	0.0666	0.1538	0.0734			0.1400
Industrial	11.02	0.1953	0.0933	0.1077	0.0514			0.1447
Sykesville	5.45	0.0966	0.0461	0.0532	0.0254			0.0715
Public Fire Protection	0.10	0.0018	0.0009			0.8144	0.0366	0.0375
Outside - City								
Residential	2.6	0.0466	0.0223	0.0771	0.0368			0.0591
Commercial	3.9	0.0693	0.0331	0.0764	0.0365			0.0696
Industrial	3.3	0.0576	0.0275	0.0318	0.0152			0.0427
Other Water Utilities	7.7	0.1363	0.0651	0.0751	0.0359			0.1010
Public Fire Protection	0.0	0.0004	0.0002			0.1856	0.0084	0.0086
Total	56.4	1.0000	0.4775	1.0000	0.4775	1.0000	0.0450	1.0000

The weighting of the factors is based on the ratio of the capacity required for a 9-hour demand of fire flow, as related to total storage capacity. The calculation is shown on the following page.

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont

FACTOR 5. ALLOCATION OF COSTS ASSOCIATED WITH STORAGE FACILITIES.

The weighting of the factors is based on the ratio of the capacity required for a 3-hour demand of fire flow, as related to total storage capacity.

$$\text{Fire Protection Weight} = \frac{1{,}000 \text{ GPM} \times 60 \text{ Min.} \times 3 \text{ Hours}}{4{,}000{,}000 \text{ Gallons}} = 0.0450$$

General Service Weight = 1.0000 - 0.0450 = 0.9550

The weighting of the average hourly consumption and maximum hour extra demand for general service is based on the maximum hour ratio, as follows.

	Maximum Hour Ratio	Percent	Weight
Average Hour	1.00	50.00	0.4775
Extra Capacity Maximum Hour	1.00	50.00	0.4775
Total	2.00	100.00	0.9550

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 6. ALLOCATION OF COSTS ASSOCIATED WITH TRANSMISSION AND DISTRIBUTION MAINS.

Factors are based on the weighting of the maximum daily consumption with fire, Factor 3, and the maximum hour consumption, Factor 4, for each customer classification, as follows:

	Maximum Daily Consumption w/ Fire		Maximum Hourly Consumption		
Customer Classification	Allocation Factor 3	Weighted Factor	Allocation Factor 4	Weighted Factor	Allocation Factor
(1)	(2)	(3)=(2)X 0.4773	(4)	(5)=(4)X 0.5227	(6)=(3)+(5)
Inside - City					
Residential	0.2757	0.1316	0.2541	0.1328	0.2644
Commercial	0.1373	0.0655	0.1093	0.0571	0.1226
Industrial	0.1662	0.0793	0.1130	0.0591	0.1384
Sykesville	0.0823	0.0393	0.0557	0.0291	0.0684
Public Fire Protection	0.0449	0.0214	0.2080	0.1087	0.1301
Outside - City					
Residential	0.0498	0.0238	0.0461	0.0241	0.0479
Commercial	0.0682	0.0326	0.0543	0.0284	0.0610
Industrial	0.0492	0.0235	0.0334	0.0175	0.0410
Other Water Utilities	0.1161	0.0554	0.0788	0.0412	0.0966
Public Fire Protection	0.0103	0.0049	0.0473	0.0247	0.0296
Total	1.0000	0.4773	1.0000	0.5227	1.0000

The weighting of the factors is based on the footage of mains, designated as either transmission mains or distribution mains, as follows:

	Footage of Mains	Weight
Transmission Mains (10 inch and larger)	127,835	0.4773
Distribution Mains (under 10 inch)	140,000	0.5227
Total	267,835	1.0000

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 7. ALLOCATION OF COSTS ASSOCIATED WITH FIRE HYDRANTS.

Fire hydrant costs are assigned directly to public fire protection, in each service area based on the number of hydrants.

Customer Classification	Number of Hydrants	Allocation Factor
(1)	(2)	(3)
Inside - City		
Public Fire Protection	351	0.8144
Outside - City		
Public Fire Protection	80	0.1856
Total	431	1.0000

FACTOR 8. ALLOCATION OF COSTS ASSOCIATED WITH METERS.

Factors are based on the relative cost of meters by size and customer classification, as developed on the following pages and summarized below.

Customer Classification	5/8" Dollar Equivalents	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	3,156	0.5311
Commercial	968	0.1629
Industrial	126	0.0212
Sykesville	50	0.0084
Outside - City		
Residential	579	0.0974
Commercial	491	0.0826
Industrial	92	0.0155
Other Water Utilities	481	0.0809
Total	5,943	1.0000

CITY OF DUBOIS - BUREAU OF WATER

BASIS FOR ALLOCATING METER COSTS TO CUSTOMER CLASSIFICATIONS

INSIDE - CITY

Meter Size	5/8" Equivalent	Residential		Commercial/Public		Industrial		Sykesville		Total	
		Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting
(1)	(2)	(3)	(4)=(2)x(3)	(5)	(6)=(2)x(5)	(7)	(8)=(2)x(7)	(9)	(10)=(2)x(9)	(11)	(12)=(11)x(2)
5/8"x3/4"	1.00	3,126	3,126	313	313	3	3	0	0	3,442	3,442
3/4"	1.50	0	0	0	0	0	0	0	0	0	0
1"	2.50	12	30	34	85	4	10	0	0	50	125
1-1/2"	5.00	0	0	20	100	0	0	0	0	20	100
2"	8.00	0	0	30	240	6	48	0	0	36	288
3"	15.00	0	0	7	105	1	15	0	0	8	120
4"	25.00	0	0	3	75	2	50	0	0	5	125
6"	50.00		0	1	50	0	0	1	50	2	100
8"	80.00		0	0	0	0	0	0	0	0	0
Total		3,138	3,156	408	968	16	126	1	50	3,563	4,300

CITY OF DUBOIS - BUREAU OF WATER

BASIS FOR ALLOCATING METER COSTS TO CUSTOMER CLASSIFICATIONS

OUTSIDE - CITY

Meter Size	5/8" Equivalent	Residential		Commercial/Public		Industrial		Other Water Utilities		Total	
		Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting
(1)	(2)	(3)	(4)=(2)x(3)	(5)	(6)=(2)x(5)	(7)	(8)=(2)x(7)	(9)	(10)=(2)x(9)	(11)	(12=(2)x(11)
5/8"x 3/4"	1.00	497	497	116	116	0	0	0	0	613	613
3/4"	1.50	0	0	0	0	0	0	0	0	0	0
1"	2.50	7	18	15	38	1	3	0	0	23	58
1-1/2"	5.00	3	15	13	65	0	0	0	0	16	80
2"	8.00	3	24	9	72	3	24	2	16	17	136
3"	15.00	0	0	3	45	1	15	0	0	4	60
4"	25.00	1	25	1	25	0	0	1	25	3	75
6"	50.00	0	0	1	50	1	50	4	200	6	300
8" and up	80.00	0	0	1	80	0	0	3	240	4	320
Total		511	579	159	491	6	92	10	481	686	1,642

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 9. ALLOCATION OF COSTS ASSOCIATED WITH SERVICES.

Factors are based on the relative cost of services by size and customer classification, as developed on the following pages and summarized below.

Customer Classification	3/4" Dollar Equivalents	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	3,139	0.7222
Commercial	448	0.1031
Industrial	23	0.0053
Sykesville	3	0.0007
Outside - City		
Residential	516	0.1187
Commercial	179	0.0412
Industrial	12	0.0028
Other Water Utilities	26	0.0060
Total	4,346	1.0000

CITY OF BETHLEHEM - BUREAU OF WATER

BASIS FOR ALLOCATING SERVICE COSTS TO CUSTOMER CLASSIFICATIONS

INSIDE - CITY

Service Size	3/4" Dollar Equivalent	Residential		Commercial/Public		Industrial		Sykesville		Total	
		Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Meters	Weighting	Number of Services	Weighting
(1)	(2)	(3)	(4)=(2)x(3)	(5)	(6)=(2)x(5)	(7)	(8)=(2)x(7)	(9)	(10)=(2)x(9)	(11)	(12)=(2)x(11)
3/4"	1.00	3,126	3,126	313	313	3	3	0	0	3,442	3,442
1"	1.06	12	13	34	36	4	4	0	0	50	53
1-1/2"	1.28	0	0	20	26	0	0	0	0	20	26
2"	1.50	0	0	30	45	6	9	0	0	36	54
3"	2.37	0	0	7	17	1	2	0	0	8	19
4"	2.50	0	0	3	8	2	5	0	0	5	13
6"	2.79	0	0	1	3	0	0	1	3	2	9
8"	3.11	0	0	0	0	0	0	0	0	0	0
10"	4.12	0	0	0	0	0	0	0	0	0	0
12"	4.65	0	0	0	0	0	0	0	0	0	0
Total		3,138	3,139	408	448	16	23	1	3	3,563	3,616

CITY OF BETHLEHEM - BUREAU OF WATER

BASIS FOR ALLOCATING SERVICE COSTS TO CUSTOMER CLASSIFICATIONS

OUTSIDE - CITY

Service Size	3/4" Dollar Equiv.	Residential		Commercial/Public		Industrial		Other Water Utilities		Total	
		Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting
(1)	(2)	(3)	(4)=(2)x(3)	(5)	(6)=(2)x(5)	(7)	(8)=(2)x(7)	(9)	(10)=(2)x(9)	(11)	(12)=(2)x(11)
3/4"	1.00	497	497	116	116	0	0	0	0	613	613
1"	1.06	7	7	15	16	1	1	0	0	23	24
1-1/2"	1.28	3	4	13	17	0	0	0	0	16	20
2"	1.50	3	5	9	14	3	6	2	3	17	26
3"	2.37	0	0	3	7	1	2	0	0	4	9
4"	2.50	1	3	1	3	0	0	1	3	3	8
6"	2.79	0	0	1	3	1	3	4	11	6	17
8"	3.11	0	0	1	3	0	0	3	9	4	12
10"	4.12	0	0	0	0	0	0	0	0	0	0
12"	4.65	0	0	0	0	0	0	0	0	0	0
Total		511	516	159	179	6	12	10	26	686	729

::

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont

FACTOR 10. ALLOCATION OF TRANSMISSION AND DISTRIBUTION COSTS

Factors are based on transmission and distribution expenses other than those being allocated, as follows:

Customer Classification (1)	Transmission and Distribution Expenses (2)	Allocation Factor (3)
Inside - City		
Residential	$55,876	0.3116
Commercial	23,279	0.1298
Industrial	21,136	0.1178
Sykesville	10,385	0.0579
Public Fire Protection	19,158	0.1068
Outside - City		
Residential	10,159	0.0566
Commercial	11,626	0.0648
Industrial	6,547	0.0365
Other Water Utilities	16,835	0.0939
Public Fire Protection	4,362	0.0243
Total	$179,364	1.0000

FACTOR 11. ALLOCATION OF BILLING AND COLLECTING COSTS

Factors are based on the pro forma number of customers.

Customer Classification (1)	Pro Forma Number of Customers (2)	Allocation Factor (3)
Inside - City		
Residential	3,138	0.7382
Commercial	408	0.0960
Industrial	16	0.0038
Sykesville	1	0.0002
Public Fire Protection	1	0.0002
Outside - City		
Residential	511	0.1202
Commercial	159	0.0374
Industrial	6	0.0014
Other Water Utilities	10	0.0024
Public Fire Protection	1	0.0002
Total	4,251	1.0000

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont

FACTOR 12. ALLOCATION OF METER READING COSTS.

Factors are based on the pro forma number of meters by customer classification, as follows:

Customer Classification	Pro Forma Number of Customers	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	3,138	0.7385
Commercial	408	0.0960
Industrial	16	0.0038
Sykesville	1	0.0002
Outside - City		
Residential	511	0.1203
Commercial	159	0.0374
Industrial	6	0.0014
Other Water Utilities	10	0.0024
Total	4,249	1.0000

FACTOR 13. ALLOCATION OF ADMINISTRATIVE AND GENERAL EXPENSES.

Factors are based on the allocation of all other operation and maintenance expenses excluding power purchased and chemicals.

Customer Classification	Operation & Maintenance Expenses	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	420,112	0.3131
Commercial	183,389	0.1367
Industrial	193,451	0.1442
Sykesville	95,423	0.0711
Public Fire Protection	66,874	0.0498
Outside - City		
Residential	75,723	0.0564
Commercial	90,932	0.0678
Industrial	58,294	0.0434
Other Water Utilities	142,317	0.1061
Public Fire Protection	15,243	0.0114
Total	$1,341,757	1.0000

FACTOR 14. ALLOCATION OF LABOR RELATED TAXES AND BENEFITS.

Factors are based on the allocation of operation and maintenance direct labor expense to customer classifications as developed on the following page and summarized below.

Customer Classification	Direct Labor Expense	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	$221,802	0.3141
Commercial	97,002	0.1374
Industrial	103,744	0.1469
Sykesville	51,179	0.0725
Public Fire Protection	30,485	0.0432
Outside - City		
Residential	39,922	0.0565
Commercial	48,054	0.0681
Industrial	31,169	0.0441
Other Water Utilities	75,734	0.1073
Public Fire Protection	6,965	0.0099
Total	$706,055	1.0000

FACTOR 15. FACTOR IS NOT USED IN THIS ALLOCATION

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 16, 16A AND 16B. ALLOCATION OF INCOME AVAILABLE FOR RETURN.

The factors are based on the allocation of the original cost measure of value rate base Inside an Outside-City as shown on the following pages and summarized below:

Customer Classification	Original Cost Measure of Value	Factor 16 Allocation Factor	Factor 16A Allocation Factor	Factor 16B Allocation Factor
(1)	(2)	(3)	(3)	(3)
Inside - City				
Residential	$4,700,468	0.3009	0.4224	
Commercial	2,136,763	0.1368	0.1920	
Industrial	2,309,669	0.1478	0.2075	
Sykesville	1,139,785	0.0730	0.1024	
Public Fire Protection	841,890	0.0539	0.0757	
Outside - City				
Residential	851,700	0.0545		0.1894
Commercial	1,062,705	0.0680		0.2365
Industrial	694,620	0.0445		0.1546
Other Water Utilities	1,692,678	0.1083		0.3767
Public Fire Protection	192,144	0.0123		0.0428
Total	$15,622,423	1.0000	1.0000	1.0000

FACTOR 17. ALLOCATION OF INSIDE - CITY OTHER WATER REVENUES.

The factors are based on the allocation of the total Inside - City cost of service, excluding those items being allocated.

Customer Classification	Inside - City Total Cost of Service	Allocation Factor
(1)	(2)	(3)
Inside - City		
Residential	$1,054,743	0.4337
Commercial	468,580	0.1927
Industrial	499,820	0.2056
Sykesville	246,532	0.1014
Public Fire Protection	161,898	0.0666
Total	$2,431,572	1.0000

CITY OF DUBOIS - BUREAU OF WATER
PROJECTED COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2016
ALLOCATED TD RESIDENTIAL, COMMERCIAL, INDUSTRIAL, OTHER WATER UTILITIES AND FIRE SERVICE CUSTOMER CLASSIFICATIONS

ACCOUNT	FACTOR REF	COST OF SERVICE	INSIDE-CITY					OUTSIDE - CITY				
			RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SYKESVILLE	PUBLIC FIRE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER UTILITITIES	PUBLIC FIRE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(8)	(9)	(10)	(11)	(12)
RATE BASE												
311.12 RESERVOIR LAND	1	127,354	32,705	17,766	24,860	12,290	229	5,922	8,826	7,348	17,358	51
311.13 OTHER SOURCE OF SUPPLY	2	1,153	336	167	202	100	1	61	83	60	141	0
311.14 TRANSMISSION AND DISTRIBUTION LAND AND R/W	4	252,488	64,157	27,597	28,531	14,064	52,518	11,640	13,710	8,433	19,896	11,943
311.50 DISTRIBUTION RESERVOIR AND STANDPIPE LAND	5	46,765	15,213	6,547	6,767	3,344	1,754	2,764	3,255	1,997	4,723	402
312.11 COLLECTING AND IMPOUNDING RESERVOIRS	1	638,975	164,089	89,137	124,728	61,661	1,150	29,712	44,281	36,869	87,092	256
312.13 WELLS AND SPRINGS	2	4,102,294	1,194,998	595,243	720,363	356,489	4,923	216,601	295,775	213,319	503,351	1,231
312.15 OTHER WATER SOURCE STRUCTURES	2	-	-	-	-	-	-	-	-	-	-	-
312.30 PURIFICATION BUILDINGS	2	329,833	96,080	47,859	57,919	28,662	396	17,415	23,781	17,151	40,471	99
312.50 DISTRIBUTION RESERVOIRS AND STANDPIPES	5	1,204,919	391,960	168,689	174,352	86,152	45,184	71,211	83,862	51,450	121,697	10,362
312.63 MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	2	458,202	133,474	66,485	80,460	39,818	550	24,193	33,036	23,827	56,221	137
314.00 OTHER POWER PRODUCTION EQUIPMENT	2	29,103	8,478	4,223	5,110	2,529	35	1,537	2,098	1,513	3,571	9
316.00 ELECTRIC PUMPING EQUIPMENT	2	23,127	6,737	3,356	4,061	2,010	28	1,221	1,667	1,203	2,838	7
320.00 PURIFICATION SYSTEM	2	832,415	242,482	120,783	146,172	72,337	999	43,952	60,017	43,286	102,137	250
322.00 MAINS AND ACCESSORIES - DISTRIBUTION	4	1,827,748	464,431	199,773	206,535	101,806	380,172	84,259	99,247	61,047	144,027	86,452
322.00 MAINS AND ACCESSORIES - TRANSMISSION	3	3,559,071	981,236	488,660	591,518	292,912	159,802	177,242	242,729	175,106	413,208	36,658
323.00 SERVICES	9	74,868	54,070	7,719	397	52	-	8,887	3,085	210	449	-
324.00 METERS	8	1,136,023	603,342	185,058	24,084	9,543	-	110,649	93,835	17,608	91,904	-
325.00 FIRE HYDRANTS	7	190,219	-	-	-	-	154,914	-	-	-	-	35,305
328.00 OFFICE FURNITURE AND EQUIPMENT	13	11,794	3,693	1,612	1,701	839	587	665	800	512	1,251	134
329.00 TRANSPORTATION EQUIPMENT	13	294,765	92,291	40,294	42,505	20,958	14,679	16,625	19,985	12,793	31,275	3,360
332.00 TOOLS AND WORK EQUIPMENT	13	169,195	52,975	23,129	24,398	12,030	8,426	9,543	11,471	7,343	17,952	1,929
333.00 COMMUNICATION EQUIPMENT	13	49,862	15,612	6,816	7,190	3,545	2,483	2,812	3,381	2,164	5,290	568
TOTAL PLANT IN SERVICE		15,360,173	4,618,358	2,100,914	2,271,853	1,121,139	828,830	836,909	1,044,925	683,239	1,664,854	189,154
CASH WORKING CAPITAL	13	262,250	82,110	35,850	37,816	18,646	13,060	14,791	17,781	11,382	27,825	2,990
TOTAL RATE BASE		15,622,423	4,700,468	2,136,763	2,309,669	1,139,785	841,890	851,700	1,062,705	694,620	1,692,678	192,144

CITY OF DUBOIS - BUREAU OF WATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 18. ALLOCATION OF REGULATORY COMMISSION EXPENSES AND OUTSIDE - CITY OTHER WATER REVENUES.

The factors are based on the allocation of the total outside - city cost of service, excluding those items being allocated.

Customer Classification (1)	Outside - City Total Cost of Service (2)	Allocation Factor (3)
Outside - City		
Residential	$135,178	0.1967
Commercial	163,618	0.2381
Industrial	105,500	0.1535
Other Water Utilities	258,481	0.3761
Public Fire Protection	24,455	0.0356
Total	$687,233	1.0000

FACTOR 19. ALLOCATION OF REALLOCATED PUBLIC FIRE TO INSIDE-CITY CUSTOMERS

The factors are based on the allocation of inside - city meter equivalents

Customer Classification (1)	5/8" Dollar Equivalents (2)	Allocation Factor (3)
Inside - City		
Residential	3,156	0.7426
Commercial	968	0.2278
Industrial	126	0.0296
Total	4,250	1.0000

FACTOR 20. ALLOCATION OF REALLOCATED PUBLIC FIRE TO OUTSIDE-CITY CUSTOMERS

The factors are based on the allocation of Outside - City meter equivalents

Customer Classification (1)	5/8" Dollar Equivalents (2)	Allocation Factor (3)
Outside-City		
Residential	579	0.4983
Commercial	491	0.4225
Industrial	92	0.0792
Total	1,162	1.0000

CITY OF DUBOIS - BUREAU OF WATER

BASIS FOR ALLOCATION OF DEMAND-RELATED COSTS OF FIRE SERVICE TO PUBLIC FIRE PROTECTION

Description	Restrictive Diameter(s) Squared	Number of Units	Relative Demand	Percent of Total Fire Protection	Percent of Service Area Fire Protection
(1)	(2)	(3)	(4)	(5)	
INSIDE CITY					
Public Fire Protection Service Nozzles					
4" 2-2 1/2",1-4 1/2"	16.00	351	5,616		
Total Public Fire Protection		351	5,616	0.8144	1.0000
Total Inside City Fire Protection		351	5,616	0.8144	1.0000
OUTSIDE CITY					
Public Fire Protection Service Nozzles					
4" 2-2 1/2",1-4 1/2"	16.00	80	1,280		
Total Public Fire Protection		80	1,280	0.1856	1.0000
Total Outside City Fire Protection		80	1,280	0.1856	1.0000
Total Fire Protection		431	6,896	1.0000	

4

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission, et al.	:	
	:	
v.	:	R-2016-_____
	:	
City of Dubois – Bureau of Water	:	

DIRECT TESTIMONY
AND EXHIBITS

OF

JOHN J. SPANOS
SENIOR VICE PRESIDENT
GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

DEPRECIATION

ON BEHALF OF

CITY OF DUBOIS – BUREAU OF WATER

June 30, 2016

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

RE: THE CITY OF DUBOIS – BUREAU OF WATER

DIRECT TESTIMONY OF JOHN J. SPANOS

Q. Please state your name and address.

A. John J. Spanos. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania.

Q. With what firm are you associated?

A. I am associated with the firm of Gannett Fleming, Inc.

Q. How long have you been associated with Gannett Fleming?

A. I have been associated with the firm since college graduation in June 1986.

Q. What is your position in the firm?

A. I am Senior Vice President of the Valuation and Rate Division.

Q. What is your educational background?

A. I have two Bachelor of Science degrees, one in Industrial Management and one in Mathematics from Carnegie-Mellon University and a Master of Business Administration from York College of Pennsylvania.

Q. Are you a member of any professional societies?

A. Yes. I am a member of the Society of Depreciation Professionals and the American Gas Association/Edison Electric Institute Industry Accounting Committee.

Q. Have you taken the certification examination for depreciation professionals?

A. Yes. I passed the certification examination of the Society of Depreciation Professionals in September 1997, and was recertified in August 2003, January 2008 and January 2013.

Q. Will you outline your experience in the field of depreciation?

A. I have thirty years of depreciation experience which includes expert testimony in over 230 cases before approximately 40 regulatory Commissions, including this Commission. Please refer to Appendix A for my qualifications.

Q. What is the purpose of your testimony?

A. I was asked by the City of DuBois – Bureau of Water to prepare depreciation studies with regard to plant in service as of December 31, 2015 and December 31, 2016.

Q. Have you prepared exhibits presenting the results of your studies?

A. Yes. Exhibit (JJS-1) presents the results of the depreciation study as of December 31, 2015 and Exhibit (JJS-2) presents the results of the depreciation study as of December 31, 2016.

Q. Please describe Exhibit (JJS-1) and (JJS-2).

A. Exhibit (JJS-1), titled "2015 Depreciation Study - Calculated Annual Depreciation Accruals Related to Water Plant as of December 31, 2015," includes the results of the depreciation study as related to the original cost at December 31, 2015. The report also includes the detailed depreciation calculations. Exhibit (JJS-2), titled "2016 Depreciation Study – Calculated Annual Depreciation Accruals Related to Water Plant as of December 31, 2016," includes the results of the depreciation study as related to the estimated original cost at December 31, 2016. The report also includes explanatory text, statistics related to the estimation of service life, and the detailed depreciation calculations.

Q. What was the purpose of your depreciation study?

A. The purpose of the depreciation study was to estimate the annual depreciation accruals related to water plant in service for ratemaking purposes and, using Commission-approved procedures, to determine the City of DuBois's book reserve and depreciation accrual rates as of December 31, 2016.

Q. What group procedure is being used in this proceeding for depreciable accounts?

A. The average service life procedure is used in the current proceeding for all depreciable accounts and installation years. The average service life procedure also was used by the Company in the past.

Q. How was the book reserve used in the calculation of annual depreciation?

A. The total book reserve was allocated by account to each vintage within the account to determine original cost less accrued depreciation by vintage. The total annual accrual is the sum of the results of dividing the original costs less accrued depreciation by the vintage composite remaining lives.

Q. How was the book reserve at December 31, 2016 estimated?

A. The book reserve at December 31, 2016, by account, was projected by adding estimated accruals and subtracting estimated retirements from the book reserve at December 31, 2015. Annual accruals were estimated using the annual accruals calculated as of December 31, 2015. For the purpose of calculating the annual accruals, the projected book reserve by account was allocated to vintages based on calculated accrued depreciation at December 31, 2016.

Q. Has a service life study of the City of DuBois's water utility property been performed?

A. Yes. A service life study was performed in 2016 as part of this study. The service life study is the basis for the service lives I used to calculate annual accruals.

Q. Briefly outline the procedure used in performing the service life study.

A. The service life study consisted of assembling and compiling historical data from the records related to the water utility plant of the City of DuBois; statistically analyzing such data to obtain historical trends of survivor characteristics; obtaining supplementary information from management and operating personnel concerning Company practices and plans as they relate to plant operations; and interpreting the above data to form judgments of service life characteristics.

Iowa type survivor curves were used to describe the estimated survivor characteristics of the mass property groups. Individual service lives were used for major individual units of plant, such as the treatment facility. The life span concept was recognized by coordinating the lives of associated plant installed in subsequent years with the probable retirement date defined by the life estimated for the major unit.

Q. What statistical data were employed in the historical analyses performed for the purpose of estimating service life characteristics?

A. The data consisted of the entries made to record retirements and other transactions related to the water plant during the period 1991-2015. These entries were classified by depreciable group, type of transaction, the year in which the transaction took place, and the year in which the plant was installed. Types of transactions included in the data were plant additions, retirements, transfers, and balances.

Q. What was the source of these data?

A. They were assembled from Company records related to its utility plant in service.

Q. Were the methods used in the service life study the same as those used in other depreciation studies for water utility plant presented before this Commission?

A. Yes. The methods are the same ones that have been presented previously for other water companies before the Pennsylvania Public Utility Commission, and that have been accepted by the Commission in its past orders concerning water utilities.

Q. What approach did you use to estimate the lives of significant structures such as treatment plants?

A. I used the life span technique to estimate the lives of significant structures. In this technique, the survivor characteristics of the structures are described by the use of interim survivor curves and estimated probable retirement dates. The interim survivor curve describes the rate of retirement related to the replacement of elements of the structure such as plumbing, heating, doors, windows, roofs, etc. that occur during the life of the facility. The probable retirement date provides the rate of final retirement for each year of installation for the structures by truncating the interim survivor curve for each installation year at its attained age at the date of probable retirement. The use of interim survivor curves truncated at the date of probable retirement provides a consistent method for estimating the lives of the several years of installation inasmuch as concurrent retirement of all years of installation will occur when the structure is retired.

Q. Has your firm used this approach in other proceedings before this Commission?

A. Yes, we have used the life span technique on many occasions before the Commission.

Q. What are the bases for the probable retirement year that you have estimated for the treatment facility?

A. The bases of the probable retirement year is the life span for the treatment facility which is based on judgment, and incorporates consideration of the age, use, size, nature of construction, management outlook and typical life spans experienced and used by other water utilities for similar structures. The life span results in a probable retirement date that is many years in the future. As a result, the retirement of this structure is not yet subject to specific management plans. Such plans would be premature. At the appropriate time, a study of the economics of rehabilitation and continued use or retirement of the structure will be performed and the results incorporated in the estimation of the structure's life span.

Q. Are the factors considered in your estimates of service life presented in Exhibit (JJS-2)?

A. Yes. A discussion of the factors considered in the estimation of service lives is presented by account on pages I-2 and I-3 of Exhibit (JJS-2).

Q. Please outline the contents of Exhibit (JJS-2).

A. Exhibit (JJS-2) is presented in two parts. Part I, Methods Used in Study, includes an introduction; the estimation of survivor curves; and the calculation of annual depreciation.

Part II, Results of Study, presents a description of the results, summaries of the depreciation calculations, graphs and tables which relate to the service life study, and the detailed depreciation calculations.

Table 1, page II-3, presents the estimated survivor curve, the original cost as of December 31, 2016, and the book reserve and calculated annual depreciation for each account or subaccount of Water Plant. Table 2, page II-4, sets forth the bringforward of the book reserve for the twelve months ended December 31, 2016.

The section beginning on page III-2 presents the results of the retirement rate analyses prepared as the historical bases for the service life estimates. The tabulations on pages IV-2 through IV-22 present the calculation of annual depreciation by vintage by account for each depreciable group of utility plant.

Q. Please outline the contents of Exhibit (JJS-1).

A. Exhibit (JJS-1) includes a description of the results, a summary of the depreciation calculations, and the detailed depreciation calculations as of December 31, 2015. The descriptions and explanations presented in Exhibit (JJS-2) are also applicable to the depreciation calculations presented in Exhibit (JJS-1). The graphs and tables related to service life presented in Exhibit (JJS-2), also support the service life estimates used in Exhibit (JJS-1), inasmuch as the estimates are the same for both test years. The summary tables and detailed depreciation calculations as of December 31, 2015, are organized and presented in the same manner as those at December 31, 2016.

Q. Please use an example to illustrate the manner in which the study is presented in Exhibit (JJS-1) and (JJS-2).

A. I will use Account 322, Mains and Accessories, as my example, inasmuch as it is one of the largest depreciable groups and represents 33 percent of the original cost of depreciable utility plant as of December 31, 2016.

The retirement rate method was used to analyze the survivor characteristics of this group. The life table for the 1991-2015 experience band is presented on pages III-27 through III-29 of Exhibit (JJS-2). The life table, or original survivor curve, is plotted along with the estimated smooth survivor curve, the 110-R3, on page III-26.

The calculation of the annual depreciation related to the original cost at December 31, 2016 of utility plant is presented on pages IV-11 and IV-12 of Exhibit (JJS-2). The calculation is based on the 110-R3 survivor curve, the attained age, and the allocated book reserve. The tabulations set forth the installation year, the original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual. The totals are brought forward to Table 1 on page II-3 in Exhibit (JJS-2).

Q. Does this complete your testimony at this time?

A. Yes, it does.

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY

	Year	Jurisdiction	Docket No.	Client Utility	Subject
01.	1998	PA PUC	R-00984375	City of Bethlehem – Bureau of Water	Original Cost and Depreciation
02.	1998	PA PUC	R-00984567	City of Lancaster	Original Cost and Depreciation
03.	1999	PA PUC	R-00994605	The York Water Company	Depreciation
04.	2000	D.T.&E.	DTE 00-105	Massachusetts-American Water Company	Depreciation
05.	2001	PA PUC	R-00016114	City of Lancaster	Original Cost and Depreciation
06.	2001	PA PUC	R-00017236	The York Water Company	Depreciation
07.	2001	PA PUC	R-00016339	Pennsylvania-American Water Company	Depreciation
08.	2001	OH PUC	01-1228-GA-AIR	Cinergy Corp – Cincinnati Gas & Elect Co.	Depreciation
09.	2001	KY PSC	2001-092	Cinergy Corp – Union Light, Heat & Power Co.	Depreciation
10.	2002	PA PUC	R-00016750	Philadelphia Suburban Water Company	Depreciation
11.	2002	KY PSC	2002-00145	Columbia Gas of Kentucky	Depreciation
12.	2002	NJ BPU	GF02040245	NUI Corporation/Elizabethtown Gas Co.	Depreciation
13.	2002	ID PUC	IPC-E-03-7	Idaho Power Company	Depreciation
14.	2003	PA PUC	R-0027975	The York Water Company	Depreciation
15.	2003	IN URC	R-0027975	Cinergy Corp – PSI Energy, Inc.	Depreciation
16.	2003	PA PUC	R-00038304	Pennsylvania-American Water Co.	Depreciation
17.	2003	MO PSC	WR-2003-0500	Missouri-American Water Co.	Depreciation
18.	2003	FERC	ER-03-1274-000	NSTAR-Boston Edison Company	Depreciation
19.	2003	NJ BPU	BPU 03080683	South Jersey Gas Company	Depreciation
20.	2003	NV PUC	03-10001	Nevada Power Company	Depreciation
21.	2003	LA PSC	U-27676	CenterPoint Energy – Arkla	Depreciation
22.	2003	PA PUC	R-00038805	Pennsylvania Suburban Water Company	Depreciation
23.	2004	AB En/Util Bd	1306821	EPCOR Distribution, Inc.	Depreciation
24.	2004	PA PUC	R-00038168	National Fuel Gas Distribution Corp (PA)	Depreciation
25.	2004	PA PUC	R-00049255	PPL Electric Utilities	Depreciation
26.	2004	PA PUC	R-00049165	The York Water Company	Depreciation
27.	2004	OK Corp Cm	PUC 200400187	CenterPoint Energy – Arkla	Depreciation
28.	2004	OH PUC	04-680-EI-AIR	Cinergy Corp. – Cincinnati Gas and Electric Company	Depreciation
29.	2004	RR Com of TX	GUD#	CenterPoint Energy – Entex Gas Services Div.	Depreciation
30.	2004	NY PUC	04-G-1047	National Fuel Gas Distribution Gas (NY)	Depreciation
31.	2004	AR PSC	04-121-U	CenterPoint Energy – Arkla	Depreciation
32.	2005	IL CC	05-	North Shore Gas Company	Depreciation
33.	2005	IL CC	05-	Peoples Gas Light and Coke Company	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
34.	2005	KY PSC	2005-00042	Union Light Heat & Power	Depreciation
35.	2005	IL CC	05-0308	MidAmerican Energy Company	Depreciation
36.	2005	MO PSC	GF-2005	Laclede Gas Company	Depreciation
37.	2005	KS CC	05-WSEE-981-RTS	Westar Energy	Depreciation
38.	2005	RR Com of TX	GUD #	CenterPoint Energy – Entex Gas Services Div.	Depreciation
39.	2005	FERC		Cinergy Corporation	Accounting
40.	2005	OK CC	PUD 200500151	Oklahoma Gas and Electric Co.	Depreciation
41.	2005	MA Dept Telecom & Ergy	DTE 05-85	NSTAR	Depreciation
42.	2005	NY PUC	05-E-934/05-G-0935	Central Hudson Gas & Electric Co.	Depreciation
43.	2005	AK Reg Com	U-04-102	Chugach Electric Association	Depreciation
44.	2005	CA PUC	A05-12-002	Pacific Gas & Electric	Depreciation
45.	2006	PA PUC	R-00051030	Aqua Pennsylvania, Inc.	Depreciation
46.	2006	PA PUC	R-00051178	T.W. Phillips Gas and Oil Co.	Depreciation
47.	2006	NC Util Cm.		Pub. Service Co. of North Carolina	Depreciation
48.	2006	PA PUC	R-00051167	City of Lancaster	Depreciation
49.	2006	PA PUC	R00061346	Duquesne Light Company	Depreciation
50.	2006	PA PUC	R-00061322	The York Water Company	Depreciation
51.	2006	PA PUC	R-00051298	PPL GAS Utilities	Depreciation
52.	2006	PUC of TX	32093	CenterPoint Energy – Houston Electric	Depreciation
53.	2006	KY PSC	2006-00172	Duke Energy Kentucky	Depreciation
54.	2006	SC PSC		SCANA	
55.	2006	AK Reg Com	U-06-6	Municipal Light and Power	Depreciation
56.	2006	DE PSC	06-284	Delmarva Power and Light	Depreciation
57.	2006	IN URC	IURC43081	Indiana American Water Company	Depreciation
58.	2006	AK Reg Com	U-06-134	Chugach Electric Association	Depreciation
59.	2006	MO PSC	WR-2007-0216	Missouri American Water Company	Depreciation
60.	2006	FERC	ISO82, ETC. AL	TransAlaska Pipeline	Depreciation
61.	2006	PA PUC	R-00061493	National Fuel Gas Distribution Corp. (PA)	Depreciation
62.	2007	NC Util Com.	E-7 SUB 828	Duke Energy Carolinas, LLC	Depreciation
63.	2007	OH PSC	08-709-EL-AIR	Duke Energy Ohio Gas	Depreciation
64.	2007	PA PUC	R-00072155	PPL Electric Utilities Corporation	Depreciation
65.	2007	KY PSC	2007-00143	Kentucky American Water Company	Depreciation
66.	2007	PA PUC	R-00072229	Pennsylvania American Water Company	Depreciation
67.	2007	KY PSC	2007-0008	NiSource – Columbia Gas of Kentucky	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
68.	2007	NY PSC	07-G-0141	National Fuel Gas Distribution Corp (NY)	Depreciation
69.	2008	AK PSC	U-08-004	Anchorage Water & Wastewater Utility	Depreciation
70.	2008	TN Reg Auth	08-00039	Tennessee-American Water Company	Depreciation
71.	2008	DE PSC	08-96	Artesian Water Company	Depreciation
72.	2008	PA PUC	R-2008-2023067	The York Water Company	Depreciation
73.	2008	KS CC	08-WSEE1-RTS	Westar Energy	Depreciation
74.	2008	IN URC	43526	Northern Indiana Public Service Co.	Depreciation
75.	2008	IN URC	43501	Duke Energy Indiana	Depreciation
76.	2008	MD PSC	9159	NiSource – Columbia Gas of Maryland	Depreciation
77.	2008	KY PSC	2008-000251	Kentucky Utilities	Depreciation
78.	2008	KY PSC	2008-000252	Louisville Gas & Electric	Depreciation
79.	2008	PA PUC	2008-20322689	Pennsylvania American Water Co.-Wastewater	Depreciation
80.	2008	NY PSC	08-E887/08-00888	Central Hudson	Depreciation
81.	2008	WV TC	VE-080416/VG-8080417	Avista Corporation	Depreciation
82.	2008	IL CC	ICC-09-166	Peoples Gas, Light and Coke Co.	Depreciation
83.	2009	IL CC	ICC-09-167	North Shore Gas Company	Depreciation
84.	2009	DC PSC	1076	Potomac Electric Power Company	Depreciation
85.	2009	KY PSC	2009-00141	NiSource – Columbia Gas of Kentucky	Depreciation
86.	2009	FERC	ER08-1056-002	Entergy Services	Depreciation
87.	2009	PA PUC	R-2009-2097323	Pennsylvania American Water Co.	Depreciation
88.	2009	NC Util Cm	E-7, Sub 090	Duke Energy Carolinas, LLC	Depreciation
89.	2009	KY PSC	2009-00202	Duke Energy Kentucky	Depreciation
90.	2009	VA St. CC	PUE-2009-00059	Aqua Virginia, Inc.	Depreciation
91.	2009	PA PUC	2009-2132019	Aqua Pennsylvania, Inc.	Depreciation
92.	2009	MS PSC	09-	Entergy Mississippi	Depreciation
93.	2009	AK PSC	09-08-U	Entergy Arkansas	Depreciation
94.	2009	TX PUC	37744	Entergy Texas	Depreciation
95.	2009	TX PUC	37690	El Paso Electric Company	Depreciation
96.	2009	PA PUC	R-2009-2106908	The Borough of Hanover	Depreciation
97.	2009	KS CC	10-KCPE-415-RTS	Kansas City Power & Light	Depreciation
98.	2009	PA PUC	R-2009-	United Water Pennsylvania	Depreciation
99.	2009	OH PUC		Aqua Ohio Water Company	Depreciation
100.	2009	WI PSC	3270-DU-103	Madison Gas & Electric Co.	Depreciation
101.	2009	MO PSC	WR-2010	Missouri American Water Co.	Depreciation
102.	2009	AK Reg Cm	U-09-097	Chugach Electric Association	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
103.	2010	IN URC	43969	Northern Indiana Public Service Co.	Depreciation
104.	2010	WI PSC	6690-DU-104	Wisconsin Public Service Corp.	Depreciation
105.	2010	PA PUC	R-2010-2161694	PPL Electric Utilities Corp.	Depreciation
106.	2010	KY PSC	2010-00036	Kentucky American Water Company	Depreciation
107.	2010	PA PUC	R-2009-2149262	Columbia Gas of Pennsylvania	Depreciation
108.	2010	MO PSC	GR-2010-0171	Laclede Gas Company	Depreciation
109.	2010	SC PSC	2009-489-E	South Carolina Electric & Gas Co.	Depreciation
110.	2010	NJ BD OF PU	ER09080664	Atlantic City Electric	Depreciation
111.	2010	VA St. CC	PUE-2010-00001	Virginia American Water Company	Depreciation
112.	2010	PA PUC	R-2010-2157140	The York Water Company	Depreciation
113.	2010	MO PSC	ER-2010-0356	Greater Missouri Operations Co.	Depreciation
114.	2010	MO PSC	ER-2010-0355	Kansas City Power and Light	Depreciation
115.	2010	PA PUC	R-2010-2167797	T.W. Phillips Gas and Oil Co.	Depreciation
116.	2010	PSC SC	2009-489-E	SCANA – Electric	Depreciation
117.	2010	PA PUC	R-2010-22010702	Peoples Natural Gas, LLC	Depreciation
118.	2010	AK PSC	10-067-U	Oklahoma Gas and Electric Co.	Depreciation
119.	2010	IN URC		Northern Indiana Public Serv. Co. - NIFL	Depreciation
120.	2010	IN URC		Northern Indiana Public Serv. Co. - Kokomo	Depreciation
121.	2010	PA PUC	R-2010-2166212	Pennsylvania American Water Co - WW	Depreciation
122.	2010	NC Util Cn.	W-218,SUB310	Aqua North Carolina, Inc.	Depreciation
123.	2011	OH PUC	11-4161-WS-AIR	Ohio American Water Company	Depreciation
124.	2011	MS PSC	EC-123-0082-00	Entergy Mississippi	Depreciation
125.	2011	CO PUC	11AL-387E	Black Hills Colorado	Depreciation
126.	2011	PA PUC	R-2010-2215623	Columbia Gas of Pennsylvania	Depreciation
127.	2011	PA PUC	R-2010-2179103	Lancaster, City of – Bureau of Water	Depreciation
128.	2011	IN URC	43114 IGCC 4S	Duke Energy Indiana	Depreciation
129.	2011	FERC	IS11-146-000	Enbridge Pipelines (Southern Lights)	Depreciation
130.	2011	Il CC	11-0217	MidAmerican Energy Corporation	Depreciation
131.	2011	OK CC	201100087	Oklahoma Gas & Electric Co.	Depreciation
132.	2011	PA PUC	2011-2232243	Pennsylvania American Water Company	Depreciation
133.	2011	FERC	2011-2232243	Carolina Gas Transmission	Depreciation
134.	2012	WA UTC	UE-120436/UG-120437	Avista Corporation	Depreciation
135.	2012	AK Reg Cm	U-12-009	Chugach Electric Association	Depreciation
136.	2012	MA PUC	DPU 12-25	Columbia Gas of Massachusetts	Depreciation
137.	2012	TX PUC	40094	El Paso Electric Company	Depreciation
138.	2012	ID PUC	IPC-E-12	Idaho Power Company	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
139.	2012	PA PUC	R-2012-2290597	PPL Electric Utilities	Depreciation
140.	2012	PA PUC	R-2012-2311725	Hanover, Borough of – Bureau of Water	Depreciation
141.	2012	KY PSC	2012-00222	Louisville Gas and Electric Company	Depreciation
142.	2012	KY PSC	2012-00221	Kentucky Utilities Company	Depreciation
143.	2012	PA PUC	R-2012-2285985	Peoples Natural Gas Company	Depreciation
144.	2012	DC PSC	Case 1087	Potomac Electric Power Company	Depreciation
145.	2012	OH PSC	12-1682-EL-AIR	Duke Energy Ohio (Electric)	Depreciation
146.	2012	OH PSC	12-1685-GA-AIR	Duke Energy Ohio (Gas)	Depreciation
147.	2012	PA PUC	R-2012-2310366	Lancaster, City of – Sewer Fund	Depreciation
148.	2012	PA PUC	R-2012-2321748	Columbia Gas of Pennsylvania	Depreciation
149.	2012	FERC	ER-12-2681-000	ITC Holdings	Depreciation
150.	2012	MO PSC	ER-2012-0174	Kansas City Power and Light	Depreciation
151.	2012	MO PSC	ER-2012-0175	KCPL Greater Missouri Operations Co.	Depreciation
152.	2012	MO PSC	GO-2012-0363	Laclede Gas Company	Depreciation
153.	2012	MN PUC	G007,001/D-12-533	Integrys – MN Energy Resource Group	Depreciation
153.	2012	TX PUC		Aqua Texas	Depreciation
155.	2012	PA PUC	2012-2336379	York Water Company	Depreciation
156.	2013	NJ BPU	ER12121071	PHI Service Co.– Atlantic City Electric	Depreciation
157.	2013	KY PSC	2013-00167	Columbia Gas of Kentucky	Depreciation
158.	2013	VA St CC	2013-00020	Virginia Electric and Power Co.	Depreciation
159.	2013	IA Util Bd	2013-0004	MidAmerican Energy Corporation	Depreciation
160.	2013	PA PUC	2013-2355276	Pennsylvania American Water Co.	Depreciation
161.	2013	NY PSC	13-E-0030, 13-G-0031, 13-S-0032	Consolidated Edison of New York	Depreciation
162.	2013	PA PUC	2013-2355886	Peoples TWP LLC	Depreciation
163.	2013	TN Reg Auth	12-0504	Tennessee American Water	Depreciation
164.	2013	ME PUC	2013-168	Central Maine Power Company	Depreciation
165.	2013	DC PSC	Case 1103	PHI Service Co. – PEPCO	Depreciation
166.	2013	WY PSC	2003-ER-13	Cheyenne Light, Fuel and Power Co.	Depreciation
167.	2013	FERC	ER13- -0000	Kentucky Utilities	Depreciation
168.	2013	FERC	ER13- -0000	MidAmerican Energy Company	Depreciation
169.	2013	FERC	ER13- -0000	PPL Utilities	Depreciation
170.	2013	PA PUC	R-2013-2372129	Duquesne Light Company	Depreciation
171.	2013	NJ BPU	ER12111052	Jersey Central Power and Light Co.	Depreciation
172.	2013	PA PUC	R-2013-2390244	Bethlehem, City of – Bureau of Water	Depreciation
173.	2013	OK CC	UM 1679	Oklahoma, Public Service Company of	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
174.	2013	IL CC	13-0500	Nicor Gas Company	Depreciation
175.	2013	WY PSC	20000-427-EA-13	PacifiCorp	Depreciation
176.	2013	UT PSC	13-035-02	PacifiCorp	Depreciation
177.	2013	OR PUC	UM 1647	PacifiCorp	Depreciation
178.	2013	PA PUC	2013-2350509	Dubois, City of	Depreciation
179.	2014	IL CC	14-0224	North Shore Gas Company	Depreciation
180.	2014	FERC	ER14-	Duquesne Light Company	Depreciation
181.	2014	SD PUC	EL14-026	Black Hills Power Company	Depreciation
182.	2014	WY PSC	20002-91-ER-14	Black Hills Power Company	Depreciation
183.	2014	PA PUC	2014-2428304	Hanover, Borough of – Municipal Water Works	Depreciation
184.	2014	PA PUC	2014-2406274	Columbia Gas of Pennsylvania	Depreciation
185.	2014	IL CC	14-0225	Peoples Gas Light and Coke Company	Depreciation
186.	2014	MO PSC	ER-2014-0258	Ameren Missouri	Depreciation
187.	2014	KS CC	14-BHCG-502-RTS	Black Hills Service Company	Depreciation
188.	2014	KS CC	14-BHCG-502-RTS	Black Hills Utility Holdings	Depreciation
189.	2014	KS CC	14-BHCG-502-RTS	Black Hills Kansas Gas	Depreciation
190.	2014	PA PUC	2014-2418872	Lancaster, City of – Bureau of Water	Depreciation
191.	2014	WV PSC	14-0701-E-D	First Energy – MonPower/PotomacEdison	Depreciation
192	2014	VA St CC	PUC-2014-00045	Aqua Virginia	Depreciation
193.	2014	VA St CC	PUE-2013	Virginia American	Depreciation
194.	2014	OK CC	PUD201400229	Oklahoma Gas and Electric	Depreciation
195.	2014	OR PUC	UM1679	Portland General Electric	Depreciation
196.	2014	IN URC	Cause No. 44576	Indianapolis Power & Light	Depreciation
197.	2014	MA DPU	DPU. 14-150	NSTAR Gas	Depreciation
198.	2014	CT PURA	14-05-06	Connecticut Light and Power	Depreciation
199.	2014	MO PSC	ER-2014-0370	Kansas City Power & Light	Depreciation
200.	2014	KY PSC	2014-00371	Kentucky Utilities Company	Depreciation
201.	2014	KY PSC	2014-00372	Louisville Gas and Electric Company	Depreciation
202.	2015	PA PUC	R-2015-2462723	United Water Pennsylvania Inc.	Depreciation
203.	2015	PA PUC	R-2015-2468056	Columbia Gas of Pennsylvania	Depreciation
204.	2015	NY PSC	15-E-0283/15-G-0284	New York State Electric and Gas Corporation	Depreciation
205.	2015	NY PSC	15-E-0285/15-G-0286	Rochester Gas and Electric Corporation	Depreciation
206.	2015	MO PSC	WR-2015-0301/SR-2015-0302	Missouri American Water Company	Depreciation
207.	2015	OK CC	PUD 201500208	Oklahoma, Public Service Company of	Depreciation
208.	2015	WV PSC	15-0676-W-42T	West Virginia American Water Company	Depreciation
209.	2015	PA PUC	2015-2469275	PPL Electric Utilities	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
210.	2015	IN URC	Cause No. 44688	Northern Indiana Public Service Company	Depreciation
211.	2015	OH PSC	14-1929-EL-RDR	First Energy-Ohio Edison/Cleveland Electric/ Toledo Edison	Depreciation
212.	2015	NM PRC	15-00127-UT	El Paso Electric	Depreciation
213.	2015	TX PUC	PUC-44941; SOAH 473-15-5257	El Paso Electric	Depreciation
214.	2015	WI PSC	3370-DU-104	Madison Gas and Electric Company	Depreciation
215.	2015	OK CC	PUD 201500273	Oklahoma Gas and Electric	Depreciation
216.	2015	KY PSC	Doc. No. 2015-00418	Kentucky American Water Company	Depreciation
217.	2015	NC UC	Doc. No. G-5, Sub 565	Public Service Company of North Carolina	Depreciation
218.	2016	WA UTC		Puget Sound Energy	Depreciation
219.	2016	NY PSC	Case No. 16-W-0130	Suez Water New York, Inc.	Depreciation
220.	2016	MO PSC	ER-2016-0156	KCPL – Greater Missouri	Depreciation
221.	2016	WI PSC		Wisconsin Public Service Commission	Depreciation
222.	2016	KY PSC	Case No. 2016-00026	Kentucky Utilities Company	Depreciation
223.	2016	KY PSC	Case No. 2016-00027	Louisville Gas and Electric Company	Depreciation
224.	2016	OH PUC		Aqua Ohio	Depreciation
225.	2016	MD PSC	Case 9417	Columbia Gas of Maryland	Depreciation
226.	2016	KY SCP	2016-00162	Columbia Gas of Kentucky	Depreciation
227.	2016	DE PSC		Delmarva Power and Light Co. – Gas	Depreciation
228.	2016	DE PSC		Delmarva Power and Light Co. – Electric	Depreciation
229.	2016	NY PSC	Case 16-G-0257	National Fuel Gas Distribution Corp – NY Div	Depreciation
230.	2016	PA PUC	R-2016-2537349	Metropolitan Edison Company	Depreciation
231.	2016	PA PUC	R-2016-2537352	Pennsylvania Electric Company	Depreciation
232.	2016	PA PUC	R-2016-2537355	Pennsylvania Power Company	Depreciation
233.	2016	PA PUC	R-2016-2537359	West Penn Power Company	Depreciation
234.	2016	PA PUC	R-2016-2529660	Columbia Gas of PA	Depreciation
235.	2016	KY PSC	Case No. 2016-00063	Kentucky Utilities / Louisville Gas & Electric Co	Depreciation

EXHIBIT_(JJS-1)

CITY OF DUBOIS

2015 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2015

Prepared by:

Gannett Fleming

Excellence Delivered As Promised

CITY OF DUBOIS - BUREAU OF WATER
DuBois, Pennsylvania

2015 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WATER PLANT
AS OF DECEMBER 31, 2015

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC
Harrisburg, Pennsylvania

Gannett Fleming

Excellence Delivered As Promised

June 23, 2016

City of DuBois - Bureau of Water
16 W. Scribner Avenue
DuBois, PA 15801

Ladies and Gentlemen:

Pursuant to your request, we have determined the annual depreciation accruals applicable to water plant at December 31, 2015. Summaries of the original cost, book reserve and annual accruals are presented in Tables 1 and 2 beginning on page I-3.

A description of the methods and procedures upon which the study was based is set forth in a companion report "2016 Depreciation Study - Calculated Annual Depreciation Accruals Related to Water Plant as of December 31, 2016."

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
Senior Vice President

JJS:mlw

060728.100

TABLE OF CONTENTS

PART I. RESULTS OF STUDY

CITY OF DUBOIS – BUREAU OF WATER
DEPRECIATION STUDY

PART I. RESULTS OF STUDY

DESCRIPTION OF SUMMARY TABULATIONS

The results of the depreciation study are summarized in Table 1, which sets forth the calculated annual depreciation and the ratemaking book depreciation reserve related to Water Plant in Service. Table 2 represents the bringforward of the book depreciation reserve for the City of DuBois as of December 31, 2015.

DETAILED TABULATIONS OF DEPRECIATION CALCULATIONS

The supporting data for the depreciation calculations are presented in account sequence in the section beginning on page II-2. The original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual are shown for each vintage of each account or subaccount.

TABLE 1. SUMMARY OF ESTIMATED SURVIVOR CURVE, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2015

	DEPRECIABLE GROUP	SURVIVOR CURVE	ORIGINAL COST AS OF DECEMBER 31, 2015	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DEPRECIABLE PLANT							
312.11	COLLECTING AND IMPOUNOING RESERVOIRS	110-R2.5	994,117.42	347,885	646,232	7,269	0.73	88.9
312.13	WELLS AND SPRINGS	45-S2.5	4,760,322.39	552,349	4,207,973	105,786	2.22	39.8
312.15	OTHER WATER SOURCE STRUCTURES	50-R3	2,094.00	2,094	0	0	-	-
312.30	PURIFICATION BUILDINGS	65-S1.5 *	1,111,388.86	765,663	345,726	15,909	1.43	21.7
312.50	OISTRIBUTION RESERVOIRS ANO STANDPIPES	60-R4	1,653,683.66	421,479	1,232,205	27,251	1.65	45.2
312.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	55-R2.5	471,982.59	79,787	392,196	8,357	1.77	46.9
314.00	OTHER POWER PRODUCTION EQUIPMENT	35-R2	120,660.00	90,013	30,647	1,546	1.28	19.8
316.00	ELECTRIC PUMPING EQUIPMENT	40-R2.5	101,681.77	77,559	24,123	993	0.98	24.3
320.00	PURIFICATION SYSTEM	40-L2	1,580,482.98	715,036	865,447	33,000	2.09	26.2
322.00	MAINS AND ACCESSORIES	110-R3	5,915,071.02	1,282,702	4,632,369	49,576	0.84	93.4
323.00	SERVICES	65-S2.5	216,096.00	138,613	77,483	2,618	1.21	29.6
324.00	METERS	28-L3	1,455,835.89	262,744	1,193,092	57,107	3.92	20.9
325.00	FIRE HYDRANTS	70-R3	149,061.00	75,769	73,292	2,186	1.47	33.5
328.00	OFFICE FURNITURE AND EQUIPMENT	15-SQ	19,778.37	11,498	8,280	1,319	6.67	6.3
329.00	TRANSPORTATION EQUIPMENT	12-L2.5	520,607.67	187,891	332,717	37,937	7.29	8.8
332.00	TOOLS AND WORK EQUIPMENT	25-SQ	359,132.95	177,548	181,585	12,396	3.45	14.6
333.00	COMMUNICATION EQUIPMENT	15-SQ	70,984.06	26,054	44,930	4,732	6.67	9.5
335.00	OTHER TANGIBLE PLANT	50-SQ	43,232.00	43,232	0	0	-	-
	TOTAL DEPRECIABLE PLANT		**19,546,212.63**	**5,257,916**	**14,288,297**	**367,982**	**1.88**	**38.8**
	NONDEPRECIABLE PLANT							
311.12	RESERVOIR LAND		127,354.00					
311.13	OTHER SOURCE OF SUPPLY		1,153.00					
311.14	TRANSMISSION AND DISTRIBUTION LAND AND RIGHTS OF WAY		252,488.36					
311.50	OISTRIBUTION RESERVOIR AND STANDPIPE LAND		46,765.00					
	TOTAL NONDEPRECIABLE PLANT		**427,760.36**					
	TOTAL WATER PLANT		**19,973,972.99**	**5,257,916**	**14,288,297**	**367,982**		

* LIFE SPAN PROCEDURE WAS USED. CURVE SHOWN IS INTERIM SURVIVOR CURVE.

CITY OF DUBOIS - BUREAU OF WATER

TABLE 2. BRINGFORWARD OF THE RATEMAKING BOOK RESERVE FROM DECEMBER 31, 2012 TO DECEMBER 31, 2015

	DEPRECIABLE GROUP (1)	BOOK RESERVE AS OF DECEMBER 31, 2012 (2)	+	ACCRUALS FOR 36 MONTHS (3)	-	RETIREMENTS FOR 36 MONTHS (4)	=	BOOK RESERVE AS OF DECEMBER 31, 2015 (5)
	DEPRECIABLE PLANT							
312.11	COLLECTING AND IMPOUNDING RESERVOIRS	326,114		21,771				347,885
312.13	WELLS AND SPRINGS	244,548		307,801				552,349
312.15	OTHER WATER SOURCE STRUCTURES	2,094		0				2,094
312.30	PURIFICATION BUILDINGS	715,983		49,680				765,663
312.50	DISTRIBUTION RESERVOIRS AND STANDPIPES	339,621		81,858				421,479
312.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	57,983		21,804				79,787
314.00	OTHER POWER PRODUCTION EQUIPMENT	85,198		4,815				90,013
316.00	ELECTRIC PUMPING EQUIPMENT	74,538		3,021				77,559
320.00	PURIFICATION SYSTEM	602,220		118,116		5,300		715,036
322.00	MAINS AND ACCESSORIES	1,139,028		151,770		8,096		1,282,702
323.00	SERVICES	130,510		8,103				138,613
324.00	METERS	91,102		171,642				262,744
325.00	FIRE HYDRANTS	68,749		7,020				75,769
328.00	OFFICE FURNITURE AND EQUIPMENT	7,547		3,951				11,498
329.00	TRANSPORTATION EQUIPMENT	133,254		80,437		25,800		187,891
332.00	TOOLS AND WORK EQUIPMENT	140,786		36,762				177,548
333.00	COMMUNICATION EQUIPMENT	11,870		14,184				26,054
335.00	OTHER TANGIBLE PLANT	43,232		0				43,232
	TOTAL DEPRECIABLE PLANT	**4,214,377**		**1,082,735**		**39,196**		**5,257,916**

PART II. DETAILED DEPRECIATION CALCULATIONS

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.11 COLLECTING AND IMPOUNDING RESERVOIRS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 110-R2.5						
1901	57,916.80	45,122	57,917			
1924	43,529.40	29,248	37,736	5,793	36.09	161
1925	10,119.00	6,744	8,701	1,418	36.69	39
1926	1,251.00	827	1,067	184	37.30	5
1927	142.00	93	120	22	37.92	1
1935	610.00	371	479	131	43.05	3
1936	160,139.00	96,492	124,496	35,643	43.72	815
1937	8,863.00	5,286	6,820	2,043	44.39	46
1940	1,184.00	684	883	301	46.45	6
1948	837.00	440	568	269	52.15	5
1954	626.00	304	392	234	56.63	4
1996	433,471.00	71,284	91,972	341,499	91.91	3,716
2010	275,429.22	12,970	16,734	258,695	104.82	2,468
	994,117.42	269,865	347,885	646,232		7,269

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 88.9 0.73

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.13 WELLS AND SPRINGS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 45-S2.5						
2009	2,288,050.61	329,983	329,959	1,958,092	38.51	50,846
2010	443,276.12	54,177	54,173	389,103	39.50	9,851
2011	1,027,564.76	102,756	102,749	924,816	40.50	22,835
2012	715,995.01	55,690	55,686	660,309	41.50	15,911
2013	55,908.16	3,106	3,106	52,802	42.50	1,242
2014	185,750.59	6,191	6,190	179,561	43.50	4,128
2015	43,777.14	486	486	43,291	44.50	973
	4,760,322.39	552,389	552,349	4,207,973		105,786
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					39.8	2.22

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.15 OTHER WATER SOURCE STRUCTURES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 50-R3						
1901	1,219.00	1,219	1,219			
1927	875.00	875	875			
	2,094.00	2,094	2,094			
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					0.0	0.00

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.30 PURIFICATION BUILDINGS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
INTERIM SURVIVOR CURVE.. IOWA 65-S1.5						
PROBABLE RETIREMENT YEAR.. 6-2044						
1969	988,399.00	645,840	714,984	273,415	20.75	13,177
1998	108,262.00	42,636	47,201	61,061	26.29	2,323
2008	14,727.86	3,142	3,478	11,250	27.51	409
	1,111,388.86	691,618	765,663	345,726		15,909

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 21.7 1.43

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.50 DISTRIBUTION RESERVOIRS AND STANDPIPES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 60-R4						
1996	1,114,044.00	359,090	370,529	743,515	40.66	18,286
2010	539,639.66	49,377	50,950	488,690	54.51	8,965
	1,653,683.66	408,467	421,479	1,232,205		27,251

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 45.2 1.65

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.63 MISCELLANEOUS STRUCTURES AND IMPROVEMENTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R2.5						
1964	20,663.00	15,084	16,244	4,419	14.85	298
1973	37,473.00	23,805	25,636	11,837	20.06	590
2009	273,285.17	30,160	32,479	240,806	48.93	4,921
2010	25,494.16	2,387	2,571	22,923	49.85	460
2014	96,667.26	2,496	2,688	93,979	53.58	1,754
2015	18,400.00	157	169	18,231	54.53	334
	471,982.59	74,089	79,787	392,196		8,357

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 46.9 1.77

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 314.00 OTHER POWER PRODUCTION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 35-R2						
1996	58,559.00	26,770	45,838	12,721	19.00	670
1998	62,101.00	25,799	44,175	17,926	20.46	876
	120,660.00	52,569	90,013	30,647		1,546

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 19.8 1.28

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 316.00 ELECTRIC PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R2.5						
1955	10,688.00	9,758	10,688			
1956	90.00	82	90			
1996	81,665.00	35,075	62,843	18,822	22.82	825
1998	3,370.00	1,312	2,351	1,019	24.43	42
2009	5,868.77	886	1,587	4,282	33.96	126
	101,681.77	47,113	77,559	24,123		993

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 24.3 0.98

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 320.00 PURIFICATION SYSTEM

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-L2						
1965	5,616.50	3,791	4,518	1,098	13.00	84
1969	527,932.68	343,156	408,980	118,953	14.00	8,497
1991	21,877.99	10,742	12,803	9,075	20.36	446
1993	32,828.04	15,306	18,242	14,586	21.35	683
1995	27,367.25	11,994	14,295	13,072	22.47	582
1996	4,470.97	1,890	2,253	2,218	23.09	96
1998	58,237.46	22,654	26,999	31,238	24.44	1,278
2000	3,233.34	1,138	1,356	1,877	25.92	72
2002	133,165.05	41,581	49,557	83,608	27.51	3,039
2003	132,288.33	38,562	45,959	86,329	28.34	3,046
2006	297,257.62	67,477	80,420	216,838	30.92	7,013
2007	100,353.99	20,522	24,459	75,895	31.82	2,385
2008	64,789.80	11,776	14,035	50,755	32.73	1,551
2011	19,676.23	2,184	2,603	17,073	35.56	480
2013	99,544.01	6,197	7,385	92,159	37.51	2,457
2014	13,397.32	502	599	12,798	38.50	332
2015	38,446.40	481	573	37,873	39.50	959
	1,580,482.98	599,953	715,036	865,447		33,000

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 26.2 2.09

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 322.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 110-R3						
1901	163,663.20	133,654	162,163	1,500	20.17	74
1920	3,120.00	2,272	2,757	363	29.90	12
1921	2,419.56	1,749	2,122	298	30.50	10
1922	1,903.59	1,365	1,656	248	31.10	8
1923	14,287.24	10,167	12,336	1,951	31.72	62
1924	52,586.76	37,126	45,045	7,542	32.34	233
1925	5,088.85	3,564	4,324	765	32.96	23
1926	6,850.57	4,758	5,773	1,078	33.60	32
1927	1,873.76	1,291	1,566	308	34.24	9
1928	132.88	91	110	23	34.88	1
1929	2,933.10	1,985	2,408	525	35.54	15
1930	1,450.57	973	1,181	270	36.20	7
1931	1,947.09	1,294	1,570	377	36.87	10
1932	696.85	459	557	140	37.54	4
1933	287.94	188	228	60	38.23	2
1934	164.86	107	130	35	38.91	1
1935	2,547.89	1,630	1,978	570	39.61	14
1937	1,508.49	946	1,148	360	41.02	9
1938	3,006.69	1,866	2,264	743	41.73	18
1939	710.81	437	530	181	42.45	4
1940	48.73	30	36	13	43.17	
1942	18.91	11	13	6	44.64	
1944	1,305.46	758	920	385	46.12	8
1945	369.21	212	257	112	46.88	2
1946	2,238.45	1,269	1,540	698	47.63	15
1947	11,908.91	6,669	8,092	3,817	48.40	79
1948	5,586.33	3,090	3,749	1,837	49.16	37
1949	10,103.00	5,516	6,693	3,410	49.94	68
1950	3,059.45	1,649	2,001	1,058	50.71	21
1951	5,239.12	2,786	3,380	1,859	51.50	36
1952	8,666.69	4,547	5,517	3,150	52.29	60
1953	4,519.14	2,338	2,837	1,682	53.08	32
1954	6,163.84	3,145	3,816	2,348	53.87	44
1955	27,147.00	13,652	16,564	10,583	54.68	194
1956	9,950.65	4,932	5,984	3,967	55.48	72
1957	6,969.50	3,402	4,128	2,842	56.30	50
1958	8,992.82	4,324	5,246	3,747	57.11	66
1959	6,337.89	3,000	3,640	2,698	57.93	47
1960	18,829.17	8,771	10,642	8,187	58.76	139
1961	8,770.47	4,019	4,876	3,894	59.59	65
1962	56,523.97	25,477	30,911	25,613	60.42	424
1963	49,454.34	21,913	26,587	22,867	61.26	373
1964	26,499.79	11,539	14,000	12,500	62.10	201
1965	2,358.27	1,009	1,224	1,134	62.95	18

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 322.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 110-R3						
1966	4,819.77	2,024	2,456	2,364	63.80	37
1967	3,653.83	1,506	1,827	1,827	64.66	28
1968	2,886.76	1,167	1,416	1,471	65.52	22
1969	226,425.15	89,789	108,941	117,484	66.38	1,770
1970	36,241.20	14,085	17,089	19,152	67.25	285
1971	28,947.35	11,021	13,372	15,575	68.12	229
1972	24,549.72	9,150	11,102	13,448	69.00	195
1973	19,744.92	7,202	8,738	11,007	69.88	158
1974	17,003.08	6,066	7,360	9,643	70.76	136
1975	14,888.52	5,191	6,298	8,591	71.65	120
1976	21,979.44	7,485	9,082	12,897	72.54	178
1977	27,582.27	9,167	11,122	16,460	73.44	224
1978	24,104.26	7,814	9,481	14,623	74.34	197
1979	34,017.86	10,750	13,043	20,975	75.24	279
1980	28,992.26	8,924	10,828	18,164	76.14	239
1981	31,882.49	9,550	11,587	20,295	77.05	263
1982	31,177.76	9,078	11,014	20,164	77.97	259
1983	23,862.15	6,751	8,191	15,671	78.88	199
1984	20,179.49	5,540	6,722	13,457	79.80	169
1985	69,612.55	18,529	22,481	47,132	80.72	584
1986	43,831.20	11,297	13,707	30,124	81.65	369
1987	25,546.82	6,368	7,726	17,821	82.58	216
1988	32,302.86	7,779	9,438	22,865	83.51	274
1989	29,005.17	6,740	8,178	20,827	84.44	247
1990	40,463.51	9,057	10,989	29,475	85.38	345
1992	41,446.71	8,568	10,396	31,051	87.26	356
1993	58,405.79	11,570	14,038	44,368	88.21	503
1994	67,020.42	12,697	15,405	51,615	89.16	579
1998	2,120,473.30	328,292	398,318	1,722,155	92.97	18,524
2007	353,555.78	26,775	32,486	321,070	101.67	3,158
2008	111,116.70	7,435	9,021	102,096	102.64	995
2009	151,650.94	8,796	10,672	140,979	103.62	1,361
2010	8,599.07	422	512	8,087	104.60	77
2011	14,305.05	575	698	13,607	105.58	129
2012	133,596.62	4,178	5,069	128,528	106.56	1,206
2013	878,203.32	19,637	23,825	854,378	107.54	7,945
2014	414,388.27	5,574	6,763	407,625	108.52	3,756
2015	150,366.85	669	812	149,555	109.51	1,366
	5,915,071.02	1,057,198	1,282,702	4,632,369		49,576

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 93.4 0.84

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 323.00 SERVICES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 65-S2.5						
1920	411.00	370	411			
1921	422.00	379	422			
1922	315.00	282	315			
1925	66.00	58	66			
1926	12.00	11	12			
1927	22.00	19	22			
1928	54.00	47	54			
1929	658.00	573	655	3	8.36	
1930	29.00	25	29			
1931	11.00	10	11			
1932	2.00	2	2			
1934	87.00	74	85	2	9.56	
1936	42.00	35	40	2	10.07	
1937	2.00	2	2			
1938	189.00	158	181	8	10.61	1
1939	522.00	435	497	25	10.89	2
1940	32.00	26	30	2	11.18	
1941	489.00	403	461	28	11.47	2
1942	255.00	209	239	16	11.77	1
1943	3.00	2	2	1	12.08	
1944	9.00	7	8	1	12.39	
1945	35.00	28	32	3	12.72	
1946	134.00	107	122	12	13.05	1
1947	698.00	554	634	64	13.39	5
1948	1,938.00	1,528	1,747	191	13.74	14
1949	410.00	321	367	43	14.10	3
1950	2,748.00	2,136	2,443	305	14.47	21
1951	1,366.00	1,054	1,205	161	14.85	11
1952	1,431.00	1,095	1,252	179	15.24	12
1953	816.00	620	709	107	15.64	7
1954	904.00	681	779	125	16.05	8
1955	1,653.00	1,234	1,411	242	16.47	15
1956	104.00	77	88	16	16.91	1
1957	439.00	322	368	71	17.35	4
1958	716.00	520	595	121	17.81	7
1959	1,184.00	851	973	211	18.29	12
1960	1,216.00	865	989	227	18.77	12
1961	720.00	507	580	140	19.27	7
1962	1,669.00	1,161	1,328	341	19.78	17
1963	5,321.00	3,659	4,185	1,136	20.30	56
1964	1,902.00	1,292	1,478	424	20.84	20
1965	1,320.00	885	1,012	308	21.40	14
1966	3,382.00	2,239	2,561	821	21.96	37
1967	4,331.00	2,828	3,234	1,097	22.55	49

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 323.00 SERVICES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 65-S2.5						
1968	1,362.00	877	1,003	359	23.15	16
1969	12,188.00	7,733	8,844	3,344	23.76	141
1970	6,380.00	3,986	4,559	1,821	24.39	75
1971	7,336.00	4,511	5,159	2,177	25.03	87
1972	3,159.00	1,910	2,184	975	25.69	38
1973	29,204.00	17,356	19,849	9,355	26.37	355
1974	25,187.00	14,701	16,812	8,375	27.06	309
1975	3,662.00	2,098	2,399	1,263	27.76	45
1976	6,869.00	3,859	4,413	2,456	28.48	86
1982	6,744.00	3,307	3,782	2,962	33.13	89
1983	12,099.00	5,780	6,610	5,489	33.95	162
1984	8,759.00	4,071	4,656	4,103	34.79	118
1985	7,430.00	3,356	3,838	3,592	35.64	101
1986	15,661.00	6,867	7,854	7,807	36.50	214
1987	5,244.00	2,229	2,549	2,695	37.37	72
1988	19,420.00	7,989	9,137	10,283	38.26	269
1989	7,323.00	2,911	3,329	3,994	39.16	102
	216,096.00	121,232	138,613	77,483		2,618

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 29.6 1.21

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 324.00 METERS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 28-L3						
2008	967,233.00	256,665	182,563	784,670	20.57	38,146
2009	488,602.89	112,726	80,181	408,422	21.54	18,961
	1,455,835.89	369,391	262,744	1,193,092		57,107
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					20.9	3.92

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R3						
1901	5,970.00	5,892	5,847	123	0.92	123
1920	152.00	140	139	13	5.65	2
1921	134.00	123	122	12	5.91	2
1922	232.00	212	210	22	6.16	4
1923	153.00	139	138	15	6.43	2
1924	615.00	556	552	63	6.69	9
1925	156.00	141	140	16	6.95	2
1926	156.00	140	139	17	7.22	2
1927	61.00	54	54	7	7.49	1
1930	61.00	54	54	7	8.34	1
1931	232.00	203	201	31	8.64	4
1932	183.00	160	159	24	8.94	3
1935	233.00	200	198	35	9.91	4
1936	244.00	208	206	38	10.25	4
1937	386.00	327	324	62	10.61	6
1938	487.00	411	408	79	10.97	7
1940	667.00	555	551	116	11.74	10
1941	251.00	207	205	46	12.15	4
1942	94.00	77	76	18	12.56	1
1944	156.00	126	125	31	13.43	2
1946	340.00	270	268	72	14.36	5
1947	908.00	716	711	197	14.84	13
1948	500.00	390	387	113	15.34	7
1949	1,464.00	1,133	1,124	340	15.85	21
1950	873.00	669	664	209	16.37	13
1951	378.00	287	285	93	16.91	5
1952	983.00	738	732	251	17.46	14
1953	835.00	620	615	220	18.03	12
1954	302.00	222	220	82	18.60	4
1955	219.00	159	158	61	19.19	3
1956	712.00	511	507	205	19.79	10
1957	908.00	643	638	270	20.41	13
1958	1,534.00	1,073	1,065	469	21.03	22
1959	3,822.00	2,639	2,619	1,203	21.67	56
1960	1,448.00	986	978	470	22.32	21
1961	933.00	627	622	311	22.98	14
1962	1,383.00	916	909	474	23.65	20
1963	617.00	403	400	217	24.33	9
1964	2,659.00	1,709	1,696	963	25.02	38
1966	462.00	288	286	176	26.43	7
1967	1,610.00	986	978	632	27.14	23
1968	388.00	234	232	156	27.87	6
1969	1,152.00	681	676	476	28.61	17
1970	3,320.00	1,928	1,913	1,407	29.35	48

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R3						
1971	3,458.00	1,971	1,956	1,502	30.11	50
1972	1,155.00	646	641	514	30.87	17
1973	5,389.00	2,953	2,930	2,459	31.64	78
1974	3,982.00	2,138	2,122	1,860	32.42	57
1975	3,310.00	1,740	1,727	1,583	33.20	48
1976	3,529.00	1,815	1,801	1,728	33.99	51
1977	1,508.00	759	753	755	34.79	22
1978	4,694.00	2,307	2,289	2,405	35.60	68
1979	7,137.00	3,424	3,398	3,739	36.42	103
1980	4,964.00	2,323	2,305	2,659	37.24	71
1981	8,166.00	3,725	3,696	4,470	38.07	117
1982	2,045.00	908	901	1,144	38.91	29
1983	3,905.00	1,688	1,675	2,230	39.75	56
1984	3,273.00	1,375	1,364	1,909	40.60	47
1985	2,721.00	1,109	1,101	1,620	41.46	39
1986	3,657.00	1,446	1,435	2,222	42.32	53
1987	4,378.00	1,677	1,664	2,714	43.19	63
1988	15,687.00	5,811	5,767	9,920	44.07	225
1989	17,067.00	6,108	6,061	11,006	44.95	245
1990	10,663.00	3,680	3,652	7,011	45.84	153
	149,061.00	76,356	75,769	73,292		2,186

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 33.5 1.47

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 328.00 OFFICE FURNITURE AND EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
2006	4,382.01	2,775	2,775	1,607	5.50	292
2007	15,396.36	8,725	8,723	6,673	6.50	1,027
	19,778.37	11,500	11,498	8,280		1,319
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					6.3	6.67

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 329.00 TRANSPORTATION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 12-L2.5						
2006	24,421.13	14,816	18,657	5,764	4.72	1,221
2007	22,252.04	12,795	16,112	6,140	5.10	1,204
2009	63,258.57	30,470	38,368	24,891	6.22	4,002
2010	38,917.58	16,410	20,664	18,254	6.94	2,630
2011	26,513.90	9,390	11,824	14,690	7.75	1,895
2012	61,037.28	17,141	21,584	39,453	8.63	4,572
2013	161,269.17	32,926	41,460	119,809	9.55	12,545
2014	122,938.00	15,265	19,222	103,716	10.51	9,868
	520,607.67	149,213	187,891	332,717		37,937

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 8.8 7.29

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 332.00 TOOLS AND WORK EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 25-SQUARE						
1999	13,625.00	8,992	10,259	3,366	8.50	396
2000	134,000.00	83,080	94,784	39,216	9.50	4,128
2003	13,350.00	6,675	7,615	5,735	12.50	459
2004	71,974.00	33,108	37,772	34,202	13.50	2,533
2007	5,924.07	2,014	2,298	3,626	16.50	220
2010	12,607.16	2,774	3,165	9,442	19.50	484
2011	102,702.72	18,486	21,090	81,613	20.50	3,981
2013	4,950.00	495	565	4,385	22.50	195
	359,132.95	155,624	177,548	181,585		12,396

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 14.6 3.45

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 333.00 COMMUNICATION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
2009	485.63	210	210	276	8.50	32
2010	70,498.43	25,850	25,844	44,654	9.50	4,700
	70,984.06	26,060	26,054	44,930		4,732

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 9.5 6.67

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 335.00 OTHER TANGIBLE PLANT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AT DECEMBER 31, 2015

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 50-SQUARE						
1901	43,232.00	43,232	43,232			
	43,232.00	43,232	43,232			
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					0.0	0.00

EXHIBIT_(JJS-2)

CITY OF DUBOIS

2016 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2016

Prepared by:

Gannett Fleming

Excellence Delivered As Promised

CITY OF DUBOIS - BUREAU OF WATER
DuBois, Pennsylvania

2016 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WATER PLANT
AS OF DECEMBER 31, 2016

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC
Harrisburg, Pennsylvania

Gannett Fleming

Excellence Delivered As Promised

June 23, 2016

City of DuBois - Bureau of Water
16 W. Scribner Avenue
DuBois, PA 15801

Ladies and Gentlemen:

Pursuant to your request, we have determined the annual depreciation accruals applicable to water plant. The results of our study as of December 31, 2016, are presented in the attached report. The results of our study as of December 31, 2015, are presented in our report "2015 Depreciation Study - Calculated Annual Depreciation Accruals Related to Water Plant as of December 31, 2015." The same methods, procedures and estimates are used in both studies.

The attached report sets forth a description of the methods and procedures upon which the studies were based, the estimation of survivor curves, and the calculated annual depreciation as of December 31, 2016. Summaries of the original cost, book reserve and annual accruals are presented in Tables 1 and 2 set forth on pages II-3 and II-4.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
Senior Vice President

JJS:mlw

060728.100

TABLE OF CONTENTS

PART I. METHODS USED IN STUDY

CITY OF DUBOIS - BUREAU OF WATER
DEPRECIATION STUDY

PART I. METHODS USED IN STUDY

INTRODUCTION OF REPORT

The report presents the methods used in and the results of the depreciation study conducted for the City of DuBois - Bureau of Water related to the original cost of water plant in service as of December 31, 2016. Part I, Methods Used in Study, contains statements with respect to the basis of the study, the development of original cost, the bringforward of the ratemaking book depreciation reserve, and the method of calculating annual depreciation. Part II, Results of Study, contains the tabulations of the remaining life annual depreciation accruals as of December 31, 2016.

BASIS OF THE STUDY

The purpose of the depreciation study was to determine the annual depreciation accruals applicable to the cost of water plant in service as of December 31, 2016. The straight line remaining life method, using attained ages, estimated survivor curves, and the ratemaking book depreciation reserve, was the basis for the calculation of annual depreciation. The calculated accrued depreciation using the average service life procedure was used to allocate the ratemaking book depreciation reserve to plant accounts and vintages.

The survivor curve estimates were based on judgment which incorporated (1) consideration of the character, use and location of the property and the observed features at the time of visible inspection; (2) probable future events and management plans; and

(3) a general knowledge of water property lives. The use of Iowa type survivor curves is a generally accepted method of estimating average service life when the actual lives of individual property units are dispersed. When the majority of the units within a property group were expected to experience a common retirement date, the life span procedure was used.

DEVELOPMENT OF ORIGINAL COST

The original cost as of December 31, 2016, represents a bringforward of the original cost as of December 31, 2012. The bringforward consisted of adjusting the December 31, 2012, balance for subsequent activity including additions and retirements. The original cost of additions during the period December 31, 2012 through December 31, 2015, was developed from accounting records. The original cost of additions during the future test year were based on the City's capital budget. The original cost of retirements was identified based on the location of the facility, the cost of the replacement, the vintages of past survivors, and combinations of these factors.

RATEMAKING BOOK RESERVE

The ratemaking book depreciation reserve represents a bringforward of the book depreciation reserve as of December 31, 2012, using the depreciation accruals booked each year by the City. The bringforward consisted of adjusting the December 31, 2012 book depreciation reserve to reflect subsequent accruals and retirements. The bringforward of the book reserve from December 31, 2015 to December 31, 2016 utilized the annual accrual rates developed at December 31, 2015. The depreciation accruals for the future test year were based on the annual depreciation accrual rates calculated in the historic test year and the annual average plant balances.

CALCULATION OF ANNUAL DEPRECIATION

The annual depreciation accruals as of December 31, 2016, are based on the straight line remaining life method using the average service life procedure. For the purpose of calculating the remaining life accruals as of December 31, 2016, the book reserve is allocated among vintages in proportion to the calculated accrued depreciation as of December 31, 2016.

The remaining life annual accrual for each vintage is determined by dividing future book accruals (original cost less book reserve) by the composite remaining life for the surviving original cost of the vintage. The composite remaining life is derived by weighting the individual vintage remaining lives in accordance with the following equation:

$$Composite\ Remaining\ Life = \frac{\Sigma(\frac{Book\ Cost}{Life}\ x\ Remaining\ Life)}{\Sigma\frac{Book\ Cost}{Life}}.$$

The book costs and lives of the several vintages which are summed in the foregoing equation are defined by the estimated survivor curve.

The composite remaining life for the account is calculated by dividing the sum of the future book accruals by the sum of the remaining life accruals.

PART II. RESULTS OF STUDY

PART II. RESULTS OF STUDY

SUMMARY OF RESULTS

The results of the depreciation study are summarized in Table 1, which sets forth the calculated annual depreciation and the ratemaking book depreciation reserve related to Water Plant in Service. Table 2 presents the bringforward of the ratemaking book depreciation reserve from December 31, 2015 to December 31, 2016.

DETAILED TABULATIONS OF DEPRECIATION CALCULATIONS

The supporting data for the depreciation calculations are presented in account sequence in the section beginning on page IV-2. The original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual are shown for each vintage of each account or subaccount.

TABLE 1. SUMMARY OF ESTIMATED SURVIVOR CURVE, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2016

	DEPRECIABLE GROUP	SURVIVOR CURVE	ORIGINAL COST AS OF DECEMBER 31, 2016	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DEPRECIABLE PLANT							
312.11	COLLECTING AND IMPOUNDING RESERVOIRS	110-R2.5	994,117.42	355,142	638,975	7,262	0.73	88.0
312.13	WELLS AND SPRINGS	45-S2.5	4,760,322.39	658,028	4,102,294	105,786	2.22	38.8
312.15	OTHER WATER SOURCE STRUCTURES	50-R3	2,094.00	2,094	0	0	-	-
312.30	PURIFICATION BUILDINGS	65-S1.5 *	1,111,388.86	781,556	329,833	15,684	1.41	21.0
312.50	DISTRIBUTION RESERVDIRS AND STANDPIPES	60-R4	1,653,683.66	448,765	1,204,919	27,238	1.65	44.2
312.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	55-R2.5	544,282.59	86,081	458,202	9,679	1.78	47.3
314.00	OTHER POWER PRODUCTION EQUIPMENT	35-R2	120,660.00	91,557	29,103	1,523	1.26	19.1
316.00	ELECTRIC PUMPING EQUIPMENT	40-R2.5	101,681.77	78,555	23,127	984	0.97	23.5
320.00	PURIFICATIDN SYSTEM	40-L2	1,580,482.98	748,068	832,415	32,515	2.06	25.6
322.00	MAINS AND ACCESSORIES	110-R3	6,715,871.02	1,329,052	5,386,819	56,931	0.85	94.6
323.00	SERVICES	65-S2.5	216,096.00	141,228	74,868	2,590	1.20	28.9
324.00	METERS	28-L3	1,455,835.89	319,813	1,136,023	56,984	3.91	19.9
325.00	FIRE HYDRANTS	70-R3	269,061.00	78,842	190,219	3,819	1.42	49.8
328.00	OFFICE FURNITURE AND EQUIPMENT	15-SQ	24,778.37	12,984	11,794	1,652	6.67	7.1
329.00	TRANSPDRTATIDN EQUIPMENT	12-L2.5	520,607.67	225,843	294,765	37,199	7.15	7.9
332.00	TOOLS AND WORK EQUIPMENT	25-SQ	359,132.95	189,938	169,195	12,405	3.45	13.6
333.00	COMMUNICATION EQUIPMENT	15-SQ	80,984.06	31,122	49,862	5,399	6.67	9.2
335.00	DTHER TANGIBLE PLANT	50-SQ	43,232.00	43,232	0	0	-	-
	TOTAL DEPRECIABLE PLANT		**20,554,312.63**	**5,621,900**	**14,932,413**	**377,650**	**1.84**	**39.5**
	NONDEPRECIABLE PLANT							
311.12	RESERVDIR LAND		127,354.00					
311.13	OTHER SDURCE OF SUPPLY		1,153.00					
311.14	TRANSMISSIDN AND DISTRIBUTION LAND AND RIGHTS OF WAY		252,488.36					
311.50	DISTRIBUTION RESERVOIR AND STANDPIPE LAND		46,765.00					
	TOTAL NONDEPRECIABLE PLANT		**427,760.36**					
	TOTAL WATER PLANT		**20,982,072.99**	**5,621,900**	**14,932,413**	**377,650**		

* LIFE SPAN PROCEDURE WAS USED. CURVE SHOWN IS INTERIM SURVIVOR CURVE.

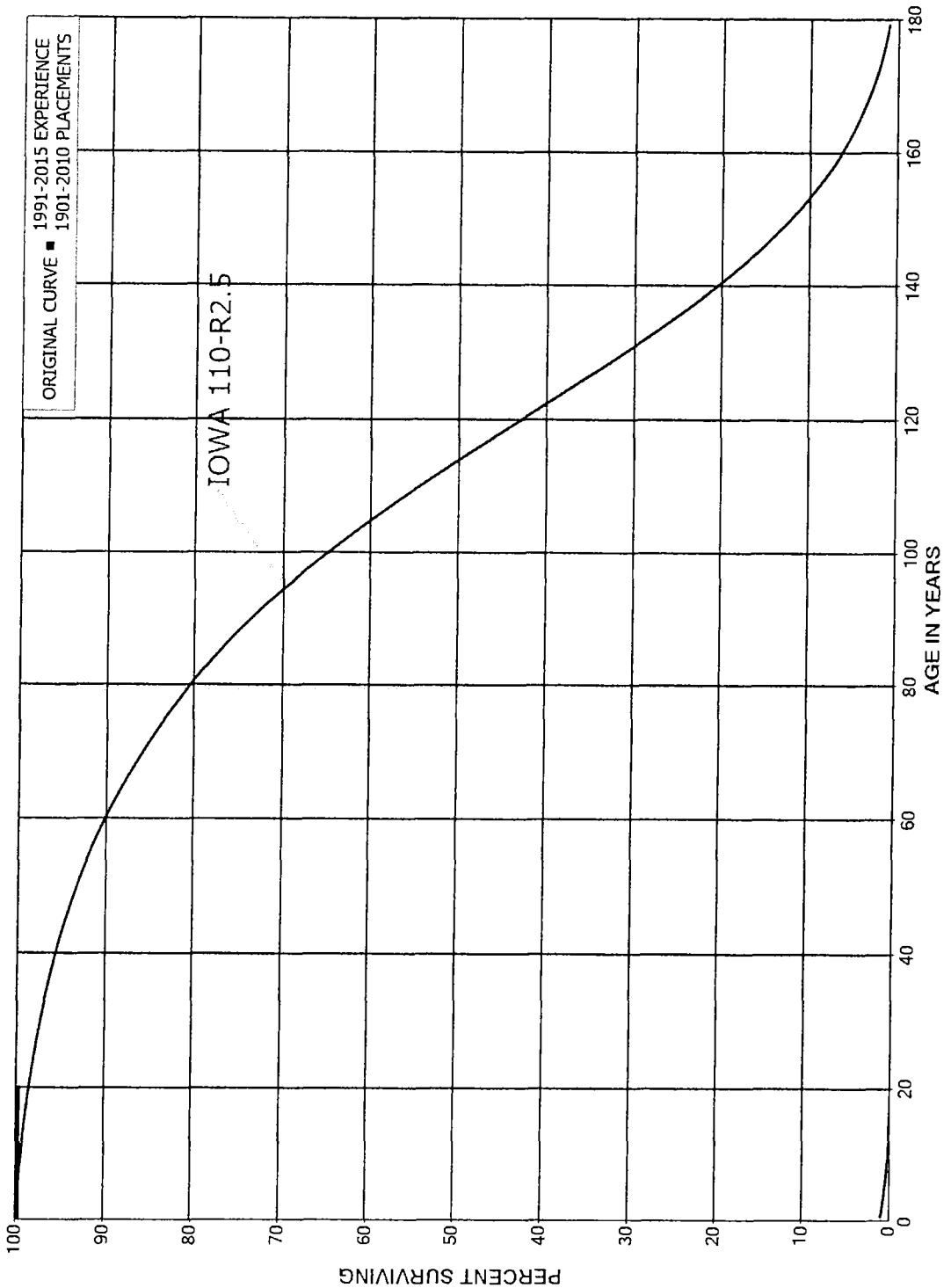
CITY OF DUBOIS - BUREAU OF WATER

TABLE 2. BRINGFORWARD OF THE RATEMAKING BOOK RESERVE FROM DECEMBER 31, 2015 TO DECEMBER 31, 2016

	DEPRECIABLE GROUP (1)	BOOK RESERVE AS OF DECEMBER 31, 2015 (2)	+	PROJECTED 2016 EXPENSE (3)	-	PROJECTED 2016 RETIREMENTS (4)	=	BOOK RESERVE AS OF DECEMBER 31, 2016 (5)
	DEPRECIABLE PLANT							
312.11	COLLECTING AND IMPOUNDING RESERVOIRS	347,885		7,257				355,142
312.13	WELLS AND SPRINGS	552,349		105,679				658,028
312.15	OTHER WATER SOURCE STRUCTURES	2,094		0				2,094
312.30	PURIFICATION BUILDINGS	765,663		15,893				781,556
312.50	DISTRIBUTION RESERVOIRS AND STANDPIPES	421,479		27,286				448,765
312.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	79,787		8,994		2,700		86,081
314.00	OTHER POWER PRODUCTION EQUIPMENT	90,013		1,544				91,557
316.00	ELECTRIC PUMPING EQUIPMENT	77,559		996				78,555
320.00	PURIFICATION SYSTEM	715,036		33,032				748,068
322.00	MAINS AND ACCESSORIES	1,282,702		53,050		6,700		1,329,052
323.00	SERVICES	138,613		2,615				141,228
324.00	METERS	262,744		57,069				319,813
325.00	FIRE HYDRANTS	75,769		3,073				78,842
328.00	OFFICE FURNITURE AND EQUIPMENT	11,498		1,486				12,984
329.00	TRANSPORTATION EQUIPMENT	187,891		37,952				225,843
332.00	TOOLS AND WORK EQUIPMENT	177,548		12,390				189,938
333.00	COMMUNICATION EQUIPMENT	26,054		5,068				31,122
335.00	OTHER TANGIBLE PLANT	43,232		0				43,232
	TOTAL DEPRECIABLE PLANT	**5,257,916**		**373,384**		**9,400**		**5,621,900**

PART III. SERVICE LIFE STATISTICS

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 312.11 COLLECTING AND IMPOUNDING RESERVOIRS
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.11 COLLECTING AND IMPOUNDING RESERVOIRS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1901-2010 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	708,900		0.0000	1.0000	100.00
0.5	708,900		0.0000	1.0000	100.00
1.5	708,900		0.0000	1.0000	100.00
2.5	708,900		0.0000	1.0000	100.00
3.5	708,900		0.0000	1.0000	100.00
4.5	708,900		0.0000	1.0000	100.00
5.5	433,471		0.0000	1.0000	100.00
6.5	433,471		0.0000	1.0000	100.00
7.5	433,471		0.0000	1.0000	100.00
8.5	433,471		0.0000	1.0000	100.00
9.5	433,471		0.0000	1.0000	100.00
10.5	433,471		0.0000	1.0000	100.00
11.5	433,471		0.0000	1.0000	100.00
12.5	433,471		0.0000	1.0000	100.00
13.5	433,471		0.0000	1.0000	100.00
14.5	433,471		0.0000	1.0000	100.00
15.5	433,471		0.0000	1.0000	100.00
16.5	433,471		0.0000	1.0000	100.00
17.5	433,471		0.0000	1.0000	100.00
18.5	433,471		0.0000	1.0000	100.00
19.5					100.00
20.5					
21.5					
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5					
33.5					
34.5					
35.5					
36.5	626		0.0000		
37.5	626		0.0000		
38.5	626		0.0000		

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.11 COLLECTING AND IMPOUNDING RESERVOIRS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-2010 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	626		0.0000		
40.5	626		0.0000		
41.5	626		0.0000		
42.5	1,463		0.0000		
43.5	1,463		0.0000		
44.5	1,463		0.0000		
45.5	1,463		0.0000		
46.5	1,463		0.0000		
47.5	1,463		0.0000		
48.5	1,463		0.0000		
49.5	1,463		0.0000		
50.5	2,647		0.0000		
51.5	2,647		0.0000		
52.5	2,647		0.0000		
53.5	11,510		0.0000		
54.5	171,649		0.0000		
55.5	172,259		0.0000		
56.5	172,259		0.0000		
57.5	172,259		0.0000		
58.5	172,259		0.0000		
59.5	172,259		0.0000		
60.5	172,259		0.0000		
61.5	171,633		0.0000		
62.5	171,633		0.0000		
63.5	171,775		0.0000		
64.5	173,026		0.0000		
65.5	183,145		0.0000		
66.5	231,511		0.0000		
67.5	230,674		0.0000		
68.5	230,674		0.0000		
69.5	230,674		0.0000		
70.5	230,674		0.0000		
71.5	230,674		0.0000		
72.5	230,674		0.0000		
73.5	230,674		0.0000		
74.5	230,674		0.0000		
75.5	229,490		0.0000		
76.5	229,490		0.0000		
77.5	229,490		0.0000		
78.5	220,627		0.0000		

CITY OF DUBOIS - BUREAU OF WATER

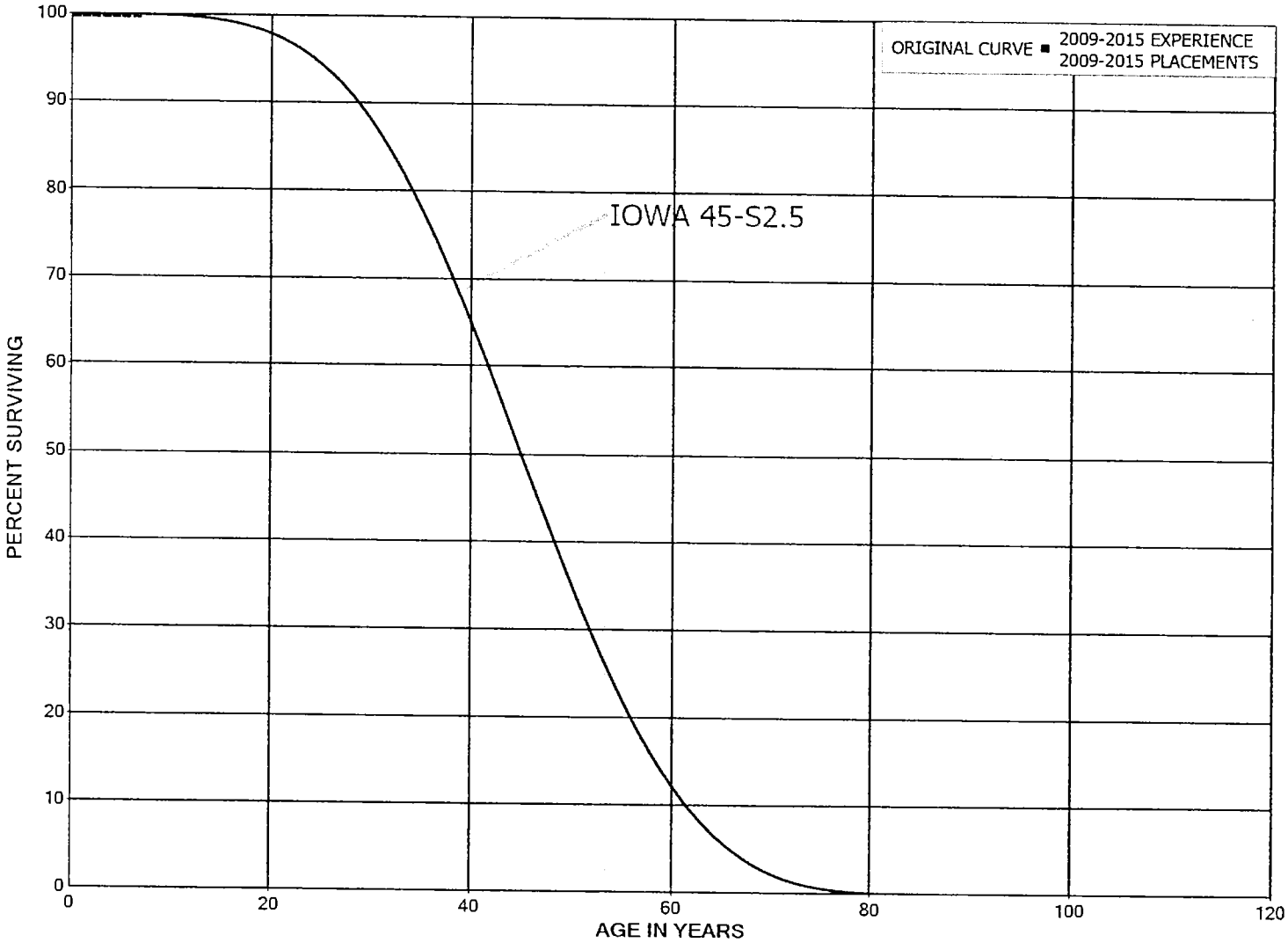
ACCOUNT 312.11 COLLECTING AND IMPOUNDING RESERVOIRS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-2010 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	60,488		0.0000		
80.5	59,878		0.0000		
81.5	59,878		0.0000		
82.5	59,878		0.0000		
83.5	59,878		0.0000		
84.5	59,878		0.0000		
85.5	59,878	4,837	0.0808		
86.5	55,041		0.0000		
87.5	55,041		0.0000		
88.5	54,899		0.0000		
89.5	118,000		0.0000		
90.5	107,881		0.0000		
91.5	64,352		0.0000		
92.5	64,352		0.0000		
93.5	64,352		0.0000		
94.5	64,352		0.0000		
95.5	64,352		0.0000		
96.5	64,352		0.0000		
97.5	64,352		0.0000		
98.5	64,352		0.0000		
99.5	64,352		0.0000		
100.5	64,352		0.0000		
101.5	64,352		0.0000		
102.5	64,352		0.0000		
103.5	64,352		0.0000		
104.5	64,352		0.0000		
105.5	64,352		0.0000		
106.5	64,352		0.0000		
107.5	64,352		0.0000		
108.5	64,352	6,435	0.1000		
109.5	57,917		0.0000		
110.5	57,917		0.0000		
111.5	57,917		0.0000		
112.5	57,917		0.0000		
113.5	57,917		0.0000		
114.5					

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 312.13 WELLS AND SPRINGS
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

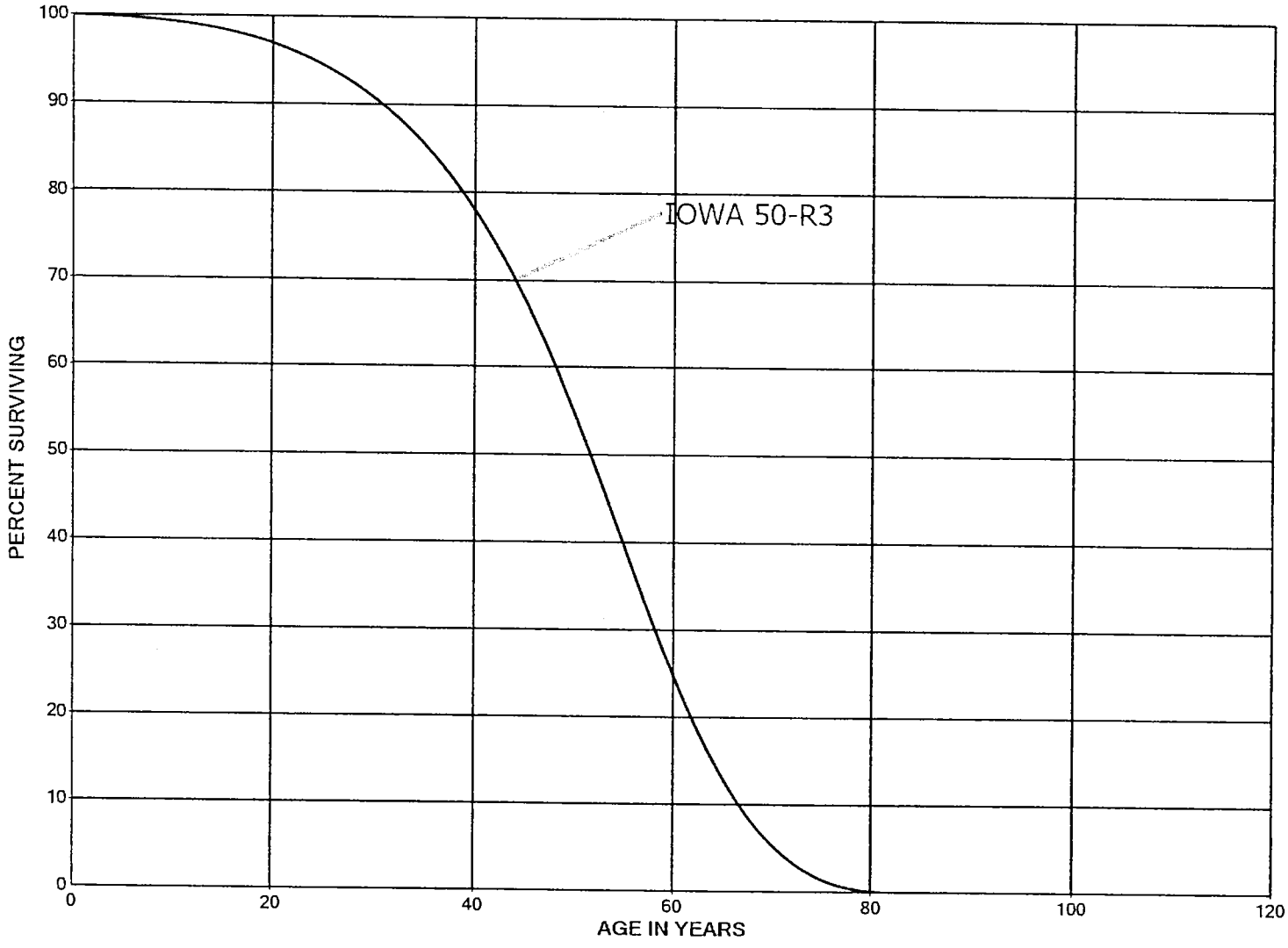
ACCOUNT 312.13 WELLS AND SPRINGS

ORIGINAL LIFE TABLE

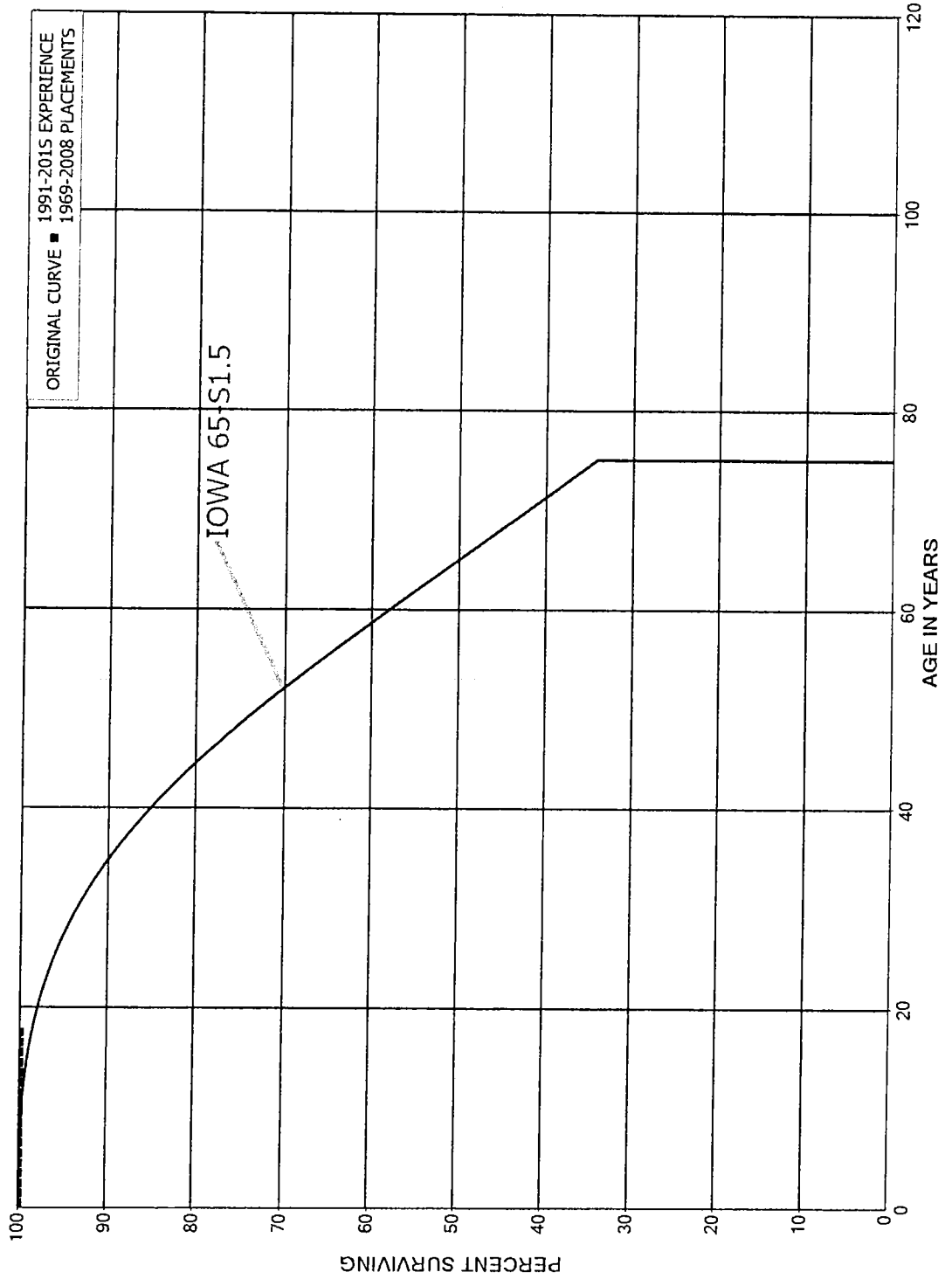
PLACEMENT BAND 2009-2015 EXPERIENCE BAND 2009-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	4,760,322		0.0000	1.0000	100.00
0.5	4,716,545		0.0000	1.0000	100.00
1.5	4,530,795		0.0000	1.0000	100.00
2.5	4,474,887		0.0000	1.0000	100.00
3.5	3,758,891		0.0000	1.0000	100.00
4.5	2,731,327		0.0000	1.0000	100.00
5.5	2,288,051		0.0000	1.0000	100.00
6.5					100.00

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 312.15 OTHER WATER SOURCE STRUCTURES
SMOOTH SURVIVOR CURVE



CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 312.30 PURIFICATION BUILDINGS
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.30 PURIFICATION BUILDINGS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1969-2008 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	122,990		0.0000	1.0000	100.00
0.5	122,990		0.0000	1.0000	100.00
1.5	122,990		0.0000	1.0000	100.00
2.5	122,990		0.0000	1.0000	100.00
3.5	122,990		0.0000	1.0000	100.00
4.5	122,990		0.0000	1.0000	100.00
5.5	122,990		0.0000	1.0000	100.00
6.5	122,990		0.0000	1.0000	100.00
7.5	108,262		0.0000	1.0000	100.00
8.5	108,262		0.0000	1.0000	100.00
9.5	108,262		0.0000	1.0000	100.00
10.5	108,262		0.0000	1.0000	100.00
11.5	108,262		0.0000	1.0000	100.00
12.5	108,262		0.0000	1.0000	100.00
13.5	108,262		0.0000	1.0000	100.00
14.5	108,262		0.0000	1.0000	100.00
15.5	108,262		0.0000	1.0000	100.00
16.5	108,262		0.0000	1.0000	100.00
17.5					100.00
18.5					
19.5					
20.5					
21.5	988,399		0.0000		
22.5	988,399		0.0000		
23.5	988,399		0.0000		
24.5	988,399		0.0000		
25.5	988,399		0.0000		
26.5	988,399		0.0000		
27.5	988,399		0.0000		
28.5	988,399		0.0000		
29.5	988,399		0.0000		
30.5	988,399		0.0000		
31.5	988,399		0.0000		
32.5	988,399		0.0000		
33.5	988,399		0.0000		
34.5	988,399		0.0000		
35.5	988,399		0.0000		
36.5	988,399		0.0000		
37.5	988,399		0.0000		
38.5	988,399		0.0000		

CITY OF DUBOIS - BUREAU OF WATER

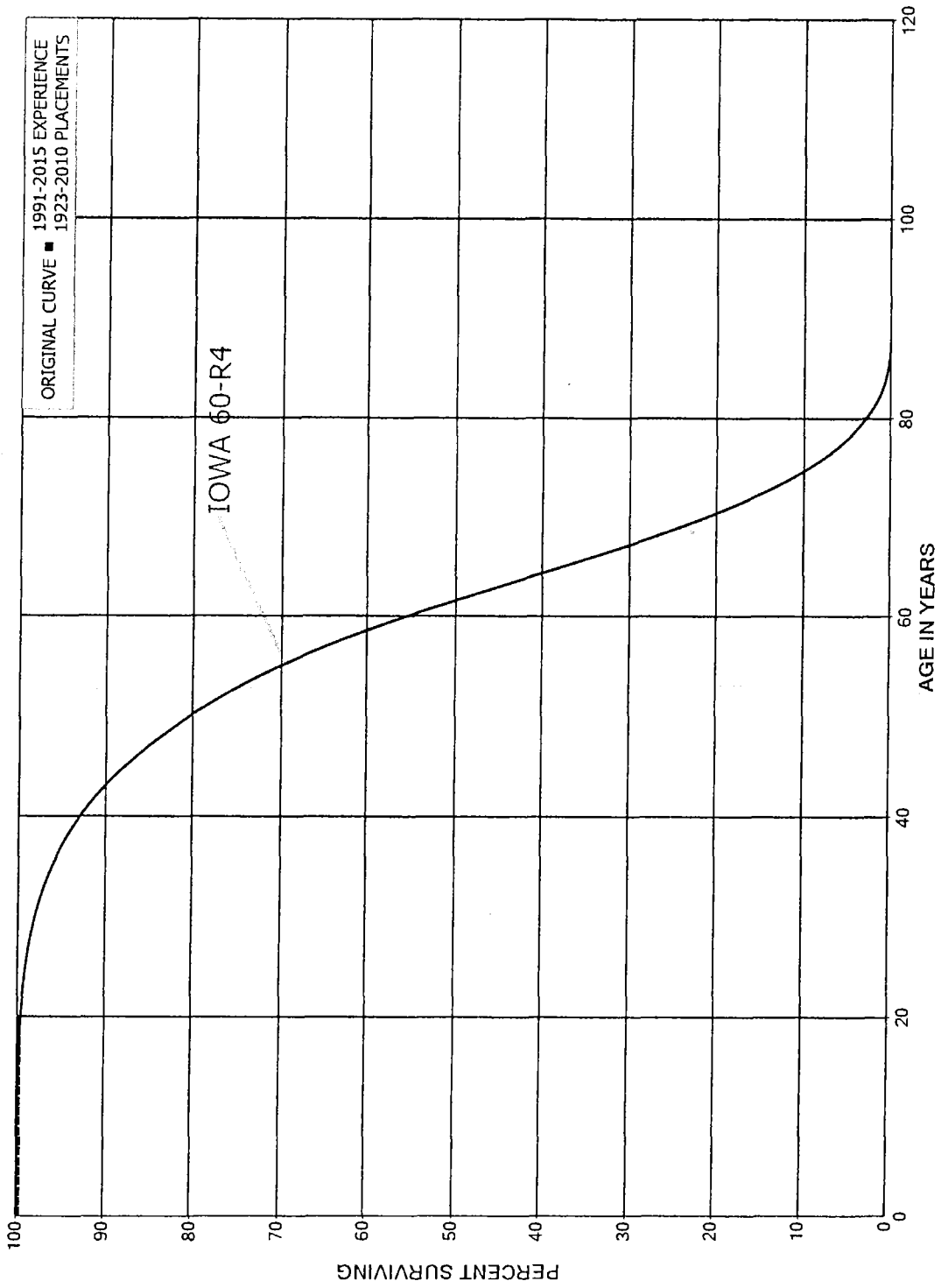
ACCOUNT 312.30 PURIFICATION BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1969-2008 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	988,399		0.0000		
40.5	988,399		0.0000		
41.5	988,399		0.0000		
42.5	988,399		0.0000		
43.5	988,399		0.0000		
44.5	988,399		0.0000		
45.5	988,399		0.0000		
46.5					

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 312.50 DISTRIBUTION RESERVOIRS AND STANDPIPES
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.50 DISTRIBUTION RESERVOIRS AND STANDPIPES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1923-2010 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,653,684		0.0000	1.0000	100.00
0.5	1,653,684		0.0000	1.0000	100.00
1.5	1,653,684		0.0000	1.0000	100.00
2.5	1,653,684		0.0000	1.0000	100.00
3.5	1,653,684		0.0000	1.0000	100.00
4.5	1,653,684		0.0000	1.0000	100.00
5.5	1,114,044		0.0000	1.0000	100.00
6.5	1,114,044		0.0000	1.0000	100.00
7.5	1,114,044		0.0000	1.0000	100.00
8.5	1,114,044		0.0000	1.0000	100.00
9.5	1,114,044		0.0000	1.0000	100.00
10.5	1,114,044		0.0000	1.0000	100.00
11.5	1,114,044		0.0000	1.0000	100.00
12.5	1,114,044		0.0000	1.0000	100.00
13.5	1,114,044		0.0000	1.0000	100.00
14.5	1,114,044		0.0000	1.0000	100.00
15.5	1,114,044		0.0000	1.0000	100.00
16.5	1,114,044		0.0000	1.0000	100.00
17.5	1,114,044		0.0000	1.0000	100.00
18.5	1,114,044		0.0000	1.0000	100.00
19.5					100.00
20.5					
21.5					
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5					
33.5					
34.5					
35.5					
36.5					
37.5					
38.5					

CITY OF DUBOIS - BUREAU OF WATER

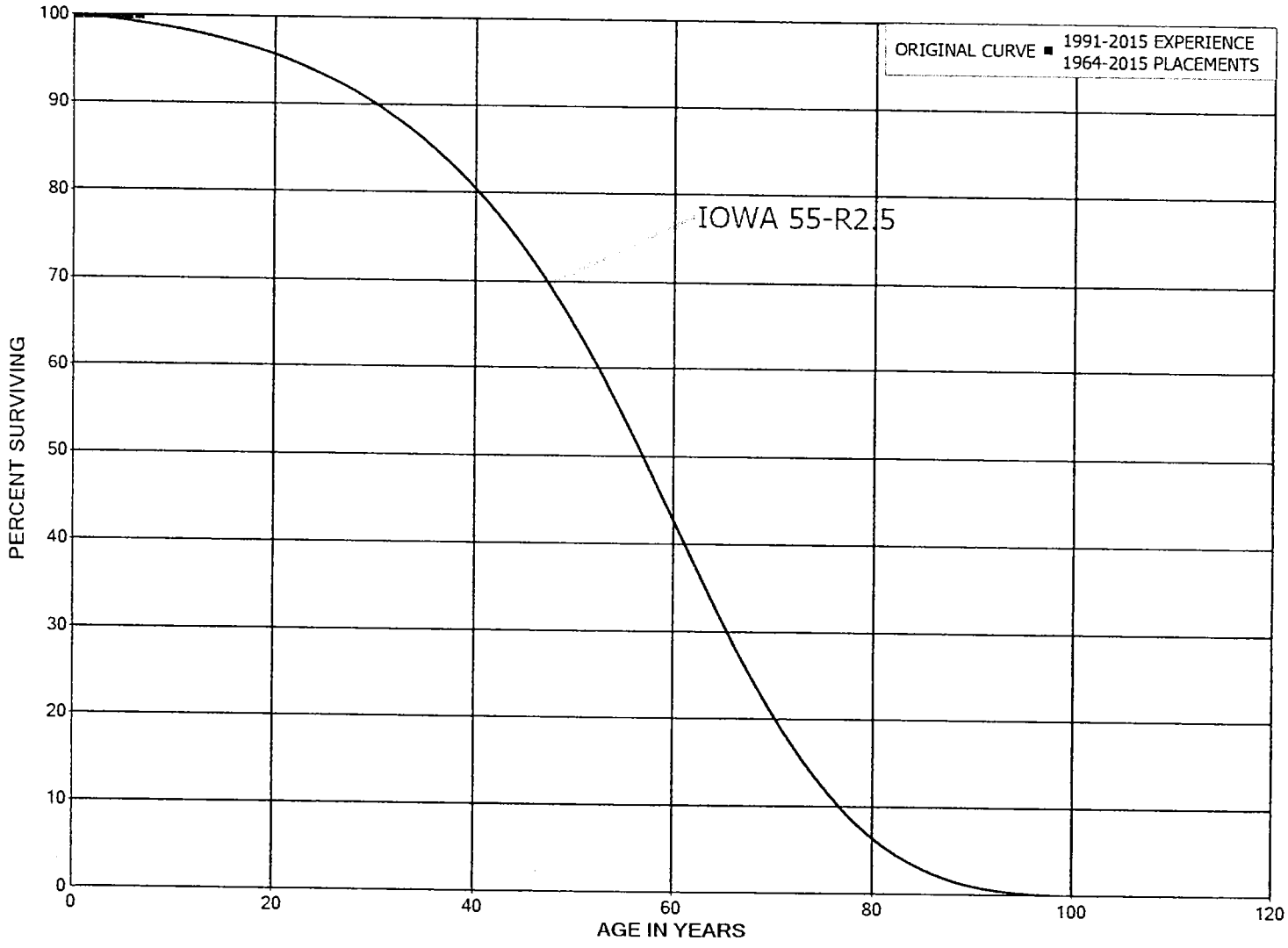
ACCOUNT 312.50 DISTRIBUTION RESERVOIRS AND STANDPIPES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1923-2010 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5					
40.5					
41.5					
42.5					
43.5					
44.5					
45.5					
46.5					
47.5					
48.5					
49.5					
50.5					
51.5					
52.5					
53.5					
54.5					
55.5					
56.5					
57.5					
58.5					
59.5					
60.5					
61.5					
62.5					
63.5					
64.5	7,000		0.0000		
65.5	9,054		0.0000		
66.5	34,853		0.0000		
67.5	80,368		0.0000		
68.5	80,368		0.0000		
69.5	80,368	7,000	0.0871		
70.5	73,368	2,054	0.0280		
71.5	71,314	25,799	0.3618		
72.5	45,515	45,515	1.0000		
73.5					

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 312.63 MISCELLANEOUS STRUCTURES AND IMPROVEMENTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.63 MISCELLANEOUS STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1964-2015 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	413,847		0.0000	1.0000	100.00
0.5	395,447		0.0000	1.0000	100.00
1.5	298,779		0.0000	1.0000	100.00
2.5	298,779		0.0000	1.0000	100.00
3.5	298,779		0.0000	1.0000	100.00
4.5	298,779		0.0000	1.0000	100.00
5.5	273,285		0.0000	1.0000	100.00
6.5					100.00
7.5					
8.5					
9.5					
10.5					
11.5					
12.5					
13.5					
14.5					
15.5					
16.5					
17.5	37,473		0.0000		
18.5	37,473		0.0000		
19.5	37,473		0.0000		
20.5	37,473		0.0000		
21.5	37,473		0.0000		
22.5	37,473		0.0000		
23.5	37,473		0.0000		
24.5	37,473		0.0000		
25.5	37,473		0.0000		
26.5	58,136		0.0000		
27.5	58,136		0.0000		
28.5	58,136		0.0000		
29.5	58,136		0.0000		
30.5	58,136		0.0000		
31.5	58,136		0.0000		
32.5	58,136		0.0000		
33.5	58,136		0.0000		
34.5	58,136		0.0000		
35.5	58,136		0.0000		
36.5	58,136		0.0000		
37.5	58,136		0.0000		
38.5	58,136		0.0000		

CITY OF DUBOIS - BUREAU OF WATER

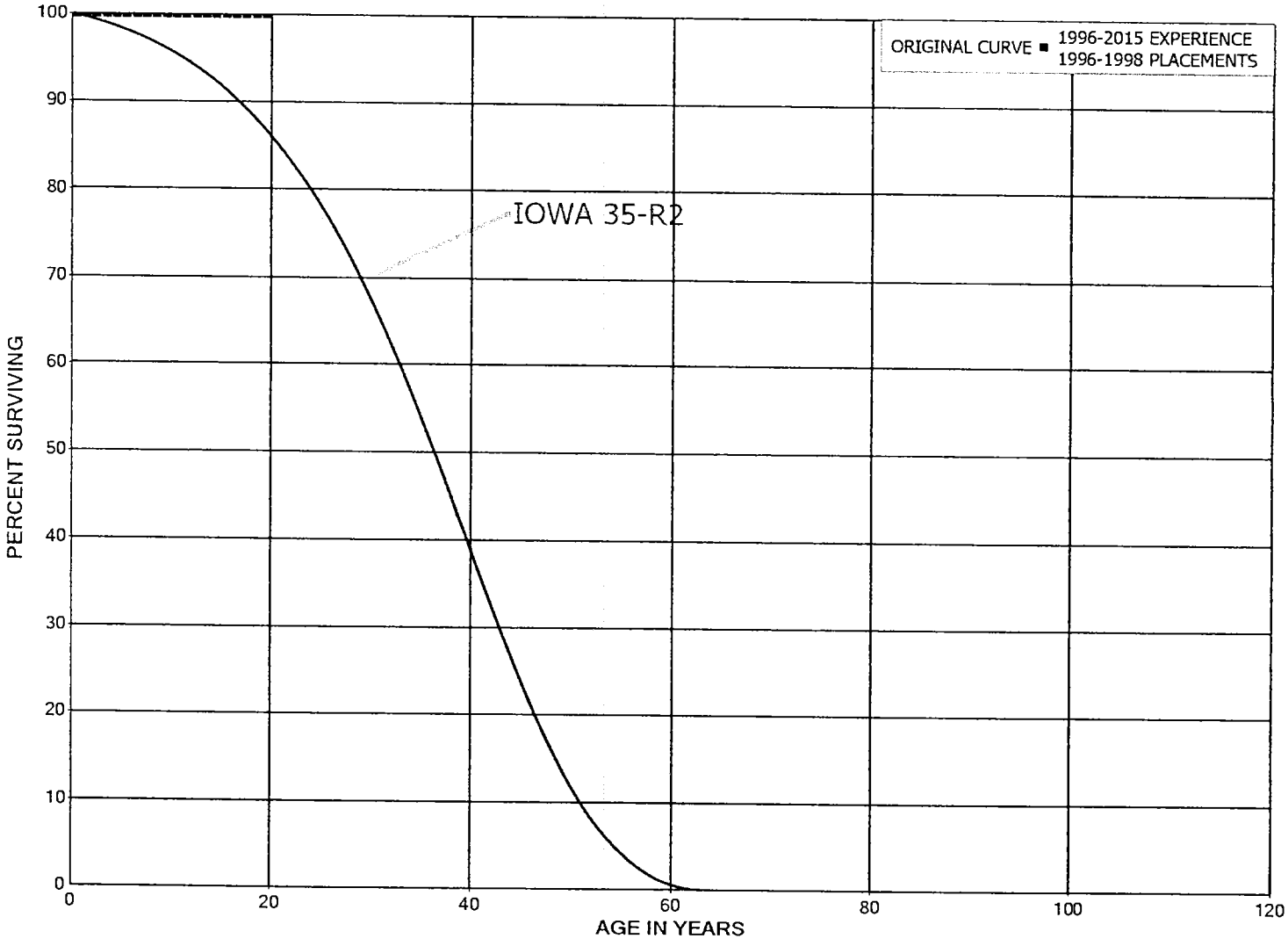
ACCOUNT 312.63 MISCELLANEOUS STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1964-2015 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	58,136		0.0000		
40.5	58,136		0.0000		
41.5	58,136		0.0000		
42.5	20,663		0.0000		
43.5	20,663		0.0000		
44.5	20,663		0.0000		
45.5	20,663		0.0000		
46.5	20,663		0.0000		
47.5	20,663		0.0000		
48.5	20,663		0.0000		
49.5	20,663		0.0000		
50.5	20,663		0.0000		
51.5					

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 314.00 OTHER POWER PRODUCTION EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

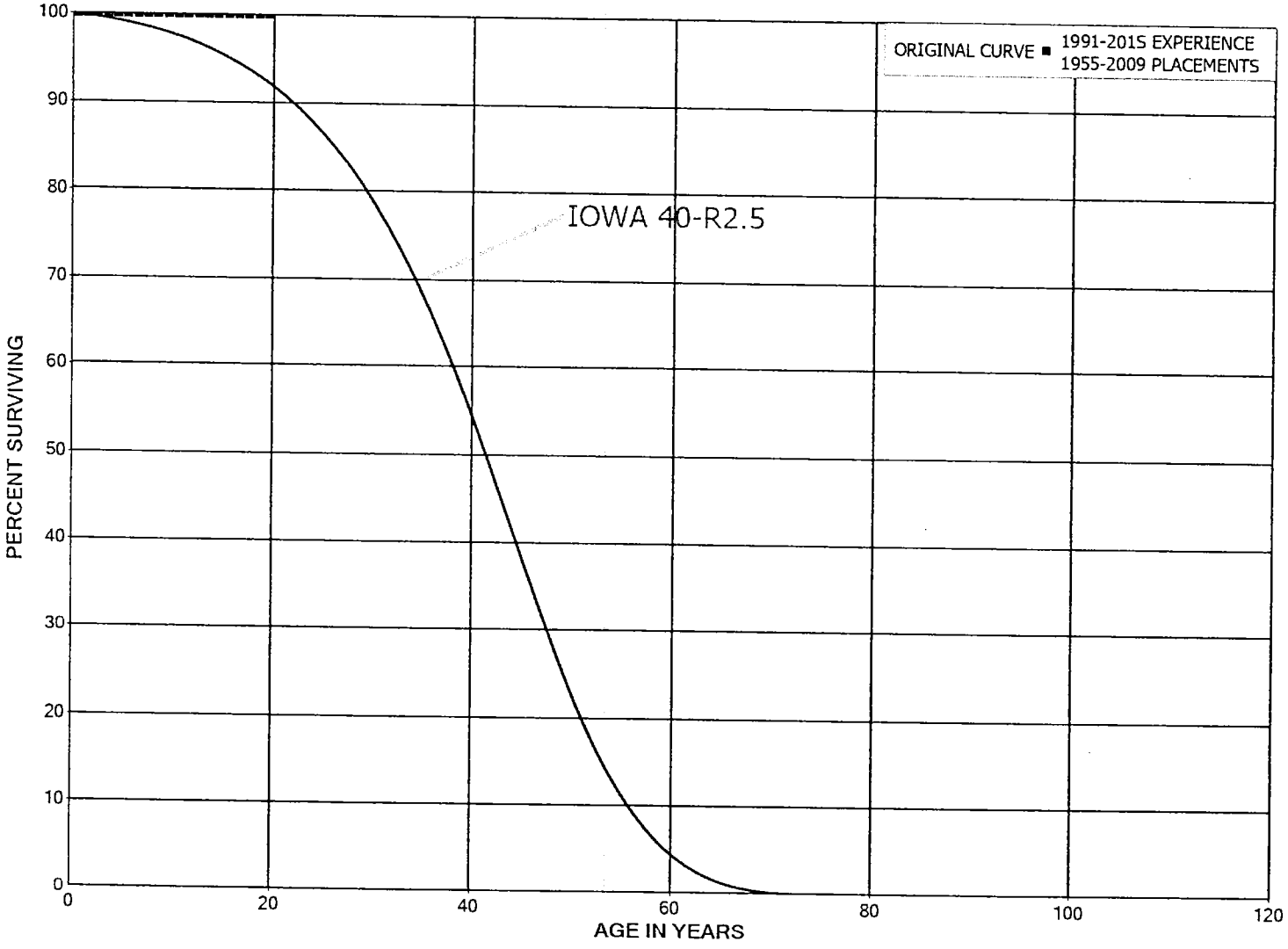
ACCOUNT 314.00 OTHER POWER PRODUCTION EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1996-1998 EXPERIENCE BAND 1996-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	120,660		0.0000	1.0000	100.00
0.5	120,660		0.0000	1.0000	100.00
1.5	120,660		0.0000	1.0000	100.00
2.5	120,660		0.0000	1.0000	100.00
3.5	120,660		0.0000	1.0000	100.00
4.5	120,660		0.0000	1.0000	100.00
5.5	120,660		0.0000	1.0000	100.00
6.5	120,660		0.0000	1.0000	100.00
7.5	120,660		0.0000	1.0000	100.00
8.5	120,660		0.0000	1.0000	100.00
9.5	120,660		0.0000	1.0000	100.00
10.5	120,660		0.0000	1.0000	100.00
11.5	120,660		0.0000	1.0000	100.00
12.5	120,660		0.0000	1.0000	100.00
13.5	120,660		0.0000	1.0000	100.00
14.5	120,660		0.0000	1.0000	100.00
15.5	120,660		0.0000	1.0000	100.00
16.5	120,660		0.0000	1.0000	100.00
17.5	58,559		0.0000	1.0000	100.00
18.5	58,559		0.0000	1.0000	100.00
19.5					100.00

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 316.00 ELECTRIC PUMPING EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 316.00 ELECTRIC PUMPING EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1955-2009 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	90,904		0.0000	1.0000	100.00
0.5	90,904		0.0000	1.0000	100.00
1.5	90,904		0.0000	1.0000	100.00
2.5	90,904		0.0000	1.0000	100.00
3.5	90,904		0.0000	1.0000	100.00
4.5	90,904		0.0000	1.0000	100.00
5.5	90,904		0.0000	1.0000	100.00
6.5	85,035		0.0000	1.0000	100.00
7.5	85,035		0.0000	1.0000	100.00
8.5	85,035		0.0000	1.0000	100.00
9.5	85,035		0.0000	1.0000	100.00
10.5	85,035		0.0000	1.0000	100.00
11.5	85,035		0.0000	1.0000	100.00
12.5	85,035		0.0000	1.0000	100.00
13.5	85,035		0.0000	1.0000	100.00
14.5	85,035		0.0000	1.0000	100.00
15.5	85,035		0.0000	1.0000	100.00
16.5	85,035		0.0000	1.0000	100.00
17.5	81,665		0.0000	1.0000	100.00
18.5	81,665		0.0000	1.0000	100.00
19.5					100.00
20.5					
21.5					
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5					
33.5					
34.5	90		0.0000		
35.5	10,778		0.0000		
36.5	10,778		0.0000		
37.5	10,778		0.0000		
38.5	10,778		0.0000		

CITY OF DUBOIS - BUREAU OF WATER

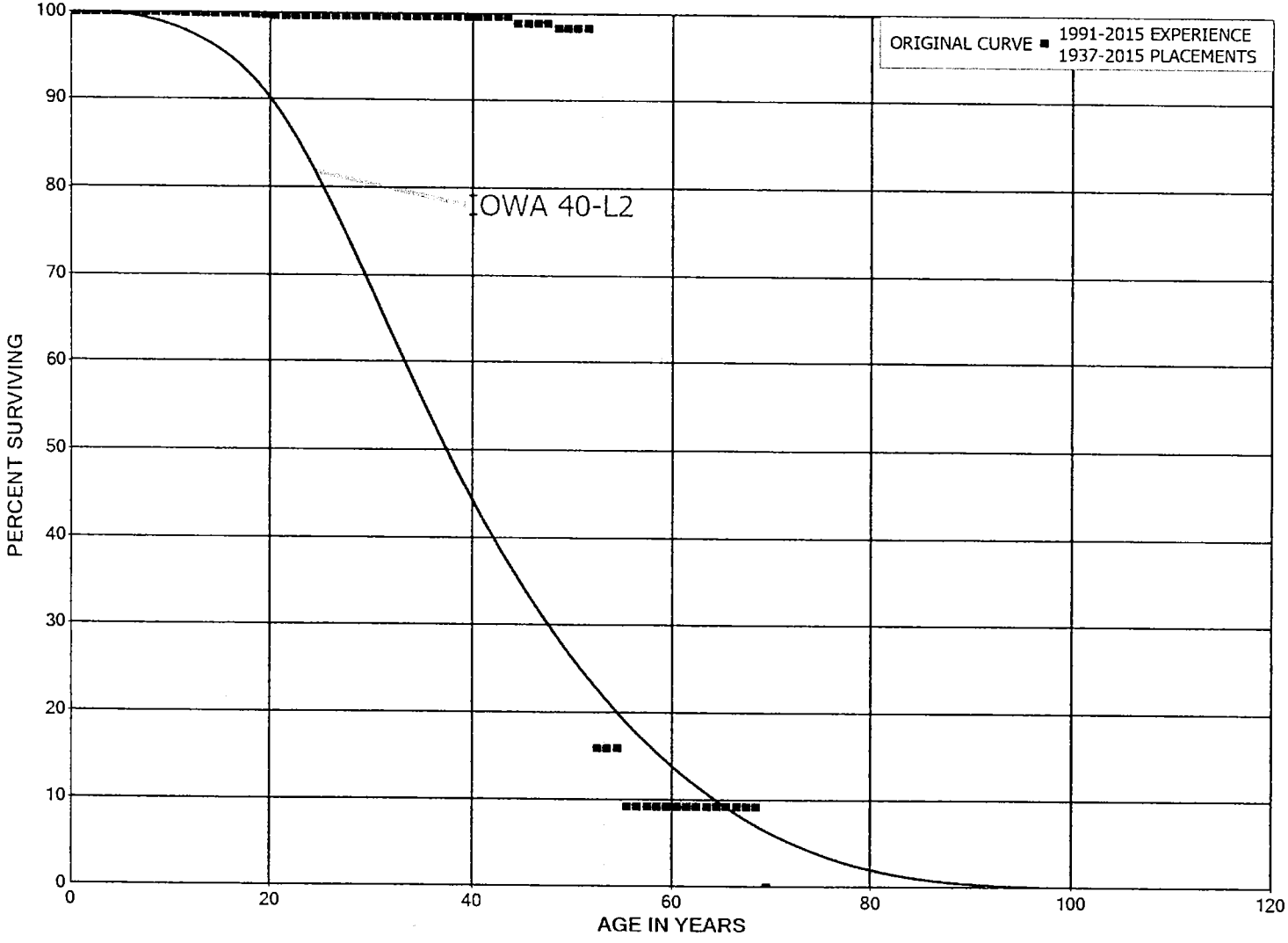
ACCOUNT 316.00 ELECTRIC PUMPING EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

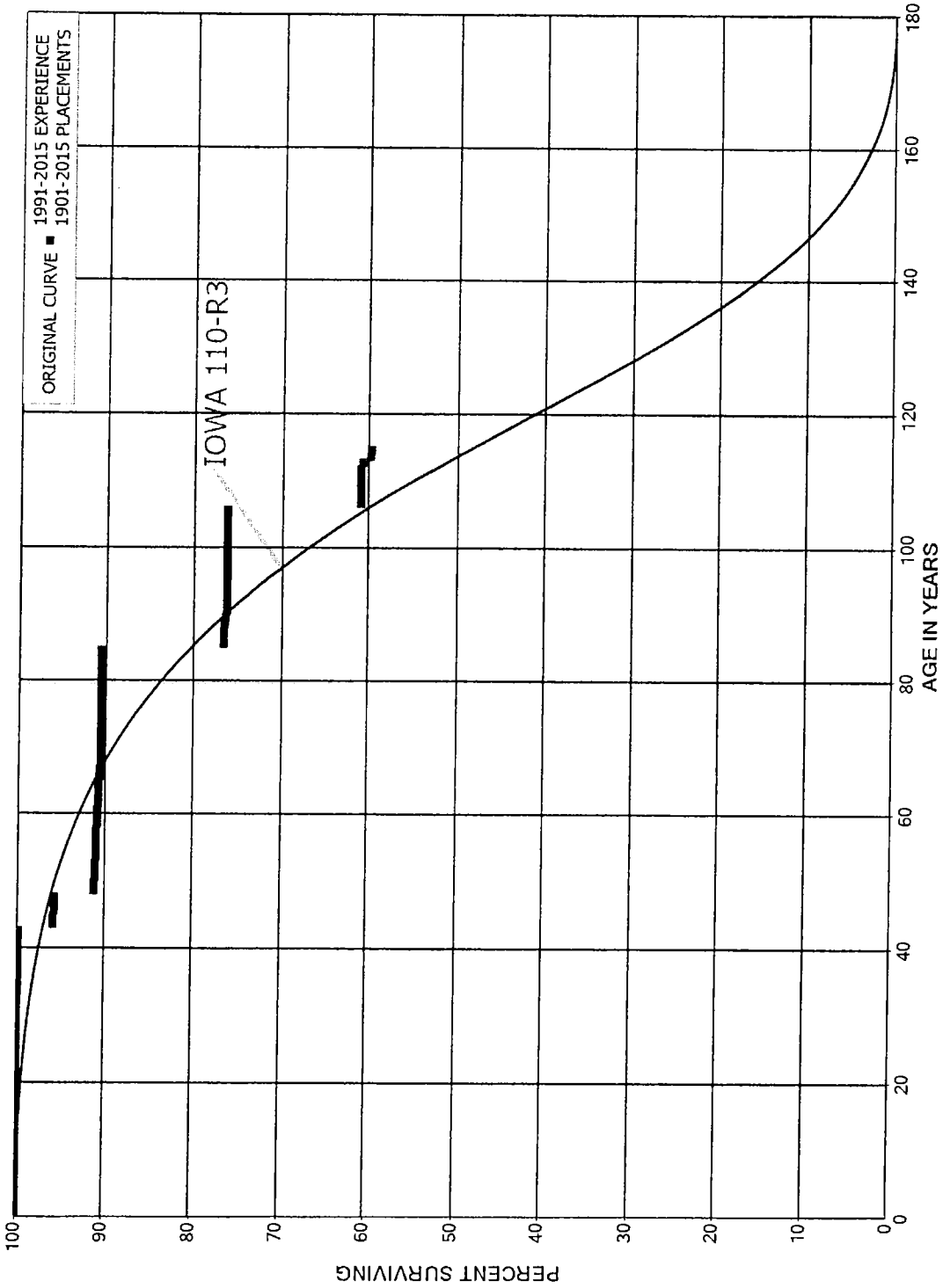
PLACEMENT BAND 1955-2009 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	10,778		0.0000		
40.5	10,778		0.0000		
41.5	10,778		0.0000		
42.5	10,778		0.0000		
43.5	10,778		0.0000		
44.5	10,778		0.0000		
45.5	10,778		0.0000		
46.5	10,778		0.0000		
47.5	10,778		0.0000		
48.5	10,778		0.0000		
49.5	10,778		0.0000		
50.5	10,778		0.0000		
51.5	10,778		0.0000		
52.5	10,778		0.0000		
53.5	10,778		0.0000		
54.5	10,778		0.0000		
55.5	10,778		0.0000		
56.5	10,778		0.0000		
57.5	10,778		0.0000		
58.5	10,778		0.0000		
59.5	10,688		0.0000		
60.5					

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 320.00 PURIFICATION SYSTEM
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 322.00 MAINS AND ACCESSORIES
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

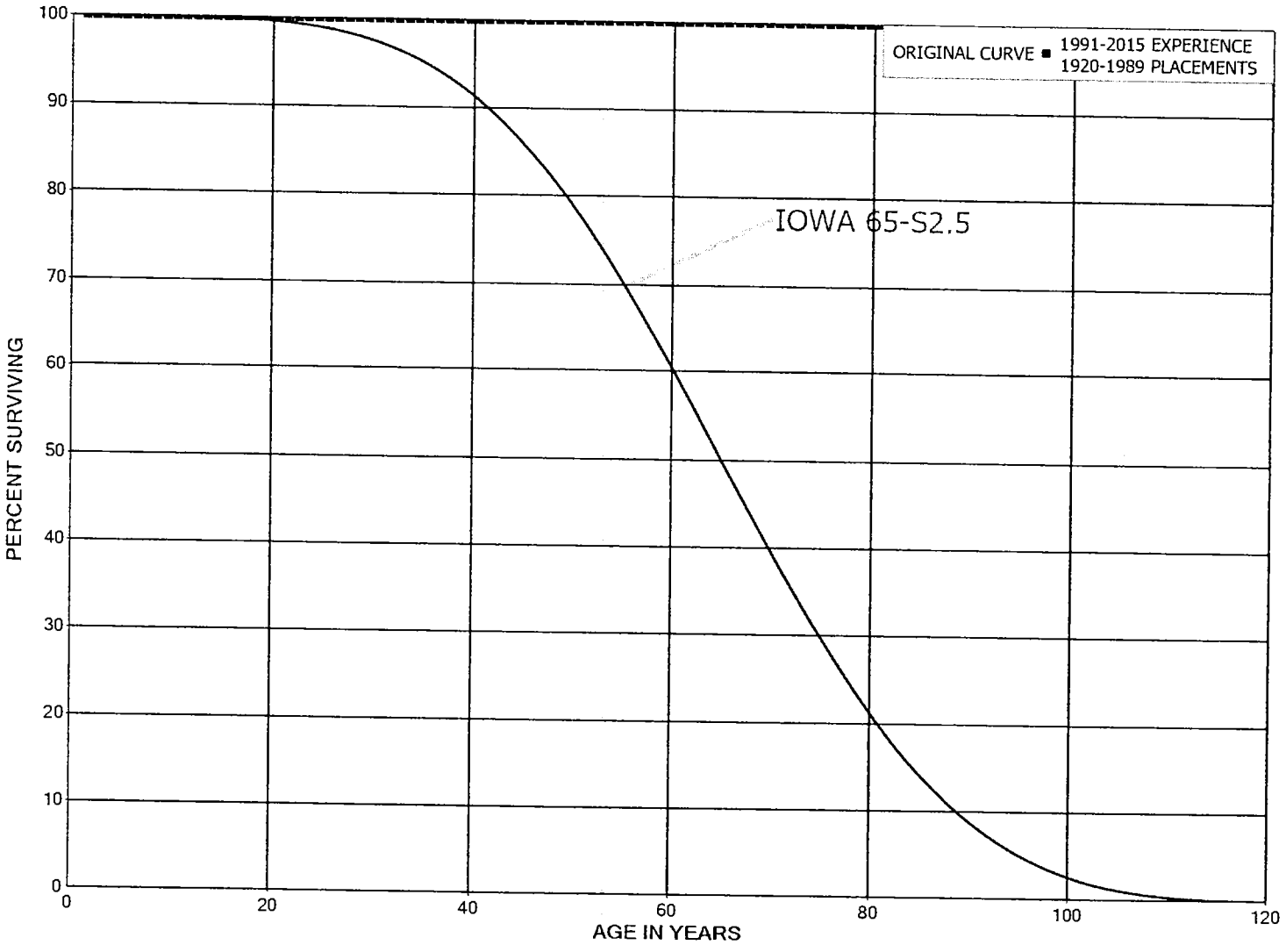
ACCOUNT 322.00 MAINS AND ACCESSORIES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-2015 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	116,079	2	0.0000	1.0000	90.48
80.5	113,529	3	0.0000	1.0000	90.48
81.5	113,362	7	0.0001	0.9999	90.48
82.5	113,067	14	0.0001	0.9999	90.47
83.5	112,356	14	0.0001	0.9999	90.46
84.5	110,395	16,898	0.1531	0.8469	90.45
85.5	92,046	5	0.0001	0.9999	76.61
86.5	89,108	26	0.0003	0.9997	76.60
87.5	88,949	57	0.0006	0.9994	76.58
88.5	87,019	146	0.0017	0.9983	76.53
89.5	288,766	411	0.0014	0.9986	76.40
90.5	283,265	126	0.0004	0.9996	76.29
91.5	230,553	24	0.0001	0.9999	76.26
92.5	216,242	27	0.0001	0.9999	76.25
93.5	214,311	27	0.0001	0.9999	76.24
94.5	211,865	1	0.0000	1.0000	76.23
95.5	208,744		0.0000	1.0000	76.23
96.5	208,744		0.0000	1.0000	76.23
97.5	208,744		0.0000	1.0000	76.23
98.5	208,744		0.0000	1.0000	76.23
99.5	208,744		0.0000	1.0000	76.23
100.5	208,744		0.0000	1.0000	76.23
101.5	208,744		0.0000	1.0000	76.23
102.5	208,744		0.0000	1.0000	76.23
103.5	208,744		0.0000	1.0000	76.23
104.5	208,744		0.0000	1.0000	76.23
105.5	208,744	41,749	0.2000	0.8000	76.23
106.5	166,995		0.0000	1.0000	60.99
107.5	166,995		0.0000	1.0000	60.99
108.5	166,995		0.0000	1.0000	60.99
109.5	166,995		0.0000	1.0000	60.99
110.5	166,995		0.0000	1.0000	60.99
111.5	166,995	598	0.0036	0.9964	60.99
112.5	166,398	2,668	0.0160	0.9840	60.77
113.5	163,730	67	0.0004	0.9996	59.79
114.5					59.77

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 323.00 SERVICES
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 323.00 SERVICES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1920-1989 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0					
0.5					
1.5	7,323		0.0000	1.0000	100.00
2.5	26,743		0.0000	1.0000	100.00
3.5	31,987		0.0000	1.0000	100.00
4.5	47,648		0.0000	1.0000	100.00
5.5	55,078		0.0000	1.0000	100.00
6.5	63,837		0.0000	1.0000	100.00
7.5	75,936		0.0000	1.0000	100.00
8.5	82,680		0.0000	1.0000	100.00
9.5	82,680		0.0000	1.0000	100.00
10.5	82,680		0.0000	1.0000	100.00
11.5	82,680		0.0000	1.0000	100.00
12.5	82,680		0.0000	1.0000	100.00
13.5	82,680		0.0000	1.0000	100.00
14.5	89,549		0.0000	1.0000	100.00
15.5	93,211		0.0000	1.0000	100.00
16.5	118,398		0.0000	1.0000	100.00
17.5	147,602		0.0000	1.0000	100.00
18.5	150,761		0.0000	1.0000	100.00
19.5	158,097		0.0000	1.0000	100.00
20.5	164,477		0.0000	1.0000	100.00
21.5	176,665		0.0000	1.0000	100.00
22.5	178,027		0.0000	1.0000	100.00
23.5	182,358		0.0000	1.0000	100.00
24.5	185,740		0.0000	1.0000	100.00
25.5	187,060		0.0000	1.0000	100.00
26.5	181,639		0.0000	1.0000	100.00
27.5	167,540		0.0000	1.0000	100.00
28.5	163,965		0.0000	1.0000	100.00
29.5	149,024		0.0000	1.0000	100.00
30.5	142,810		0.0000	1.0000	100.00
31.5	135,235		0.0000	1.0000	100.00
32.5	123,852		0.0000	1.0000	100.00
33.5	117,547		0.0000	1.0000	100.00
34.5	117,651		0.0000	1.0000	100.00
35.5	119,304		0.0000	1.0000	100.00
36.5	120,208		0.0000	1.0000	100.00
37.5	121,024		0.0000	1.0000	100.00
38.5	122,455		0.0000	1.0000	100.00

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 323.00 SERVICES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1920-1989 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	116,952		0.0000	1.0000	100.00
40.5	116,038		0.0000	1.0000	100.00
41.5	91,261		0.0000	1.0000	100.00
42.5	63,995		0.0000	1.0000	100.00
43.5	61,534		0.0000	1.0000	100.00
44.5	54,332		0.0000	1.0000	100.00
45.5	47,987		0.0000	1.0000	100.00
46.5	35,808		0.0000	1.0000	100.00
47.5	34,449		0.0000	1.0000	100.00
48.5	30,373		0.0000	1.0000	100.00
49.5	27,480		0.0000	1.0000	100.00
50.5	26,192		0.0000	1.0000	100.00
51.5	24,812		0.0000	1.0000	100.00
52.5	19,680		0.0000	1.0000	100.00
53.5	18,013		0.0000	1.0000	100.00
54.5	17,335		0.0000	1.0000	100.00
55.5	16,119		0.0000	1.0000	100.00
56.5	15,022		0.0000	1.0000	100.00
57.5	14,306		0.0000	1.0000	100.00
58.5	13,869		0.0000	1.0000	100.00
59.5	13,776		0.0000	1.0000	100.00
60.5	12,152		0.0000	1.0000	100.00
61.5	11,906		0.0000	1.0000	100.00
62.5	11,144		0.0000	1.0000	100.00
63.5	9,735		0.0000	1.0000	100.00
64.5	8,381		0.0000	1.0000	100.00
65.5	5,699		0.0000	1.0000	100.00
66.5	5,289		0.0000	1.0000	100.00
67.5	3,351		0.0000	1.0000	100.00
68.5	2,968		0.0000	1.0000	100.00
69.5	3,256		0.0000	1.0000	100.00
70.5	3,632		0.0000	1.0000	100.00
71.5	3,623		0.0000	1.0000	100.00
72.5	3,620		0.0000	1.0000	100.00
73.5	3,365		0.0000	1.0000	100.00
74.5	2,876		0.0000	1.0000	100.00
75.5	2,844		0.0000	1.0000	100.00
76.5	2,322		0.0000	1.0000	100.00
77.5	2,133		0.0000	1.0000	100.00
78.5	2,131		0.0000	1.0000	100.00

CITY OF DUBOIS - BUREAU OF WATER

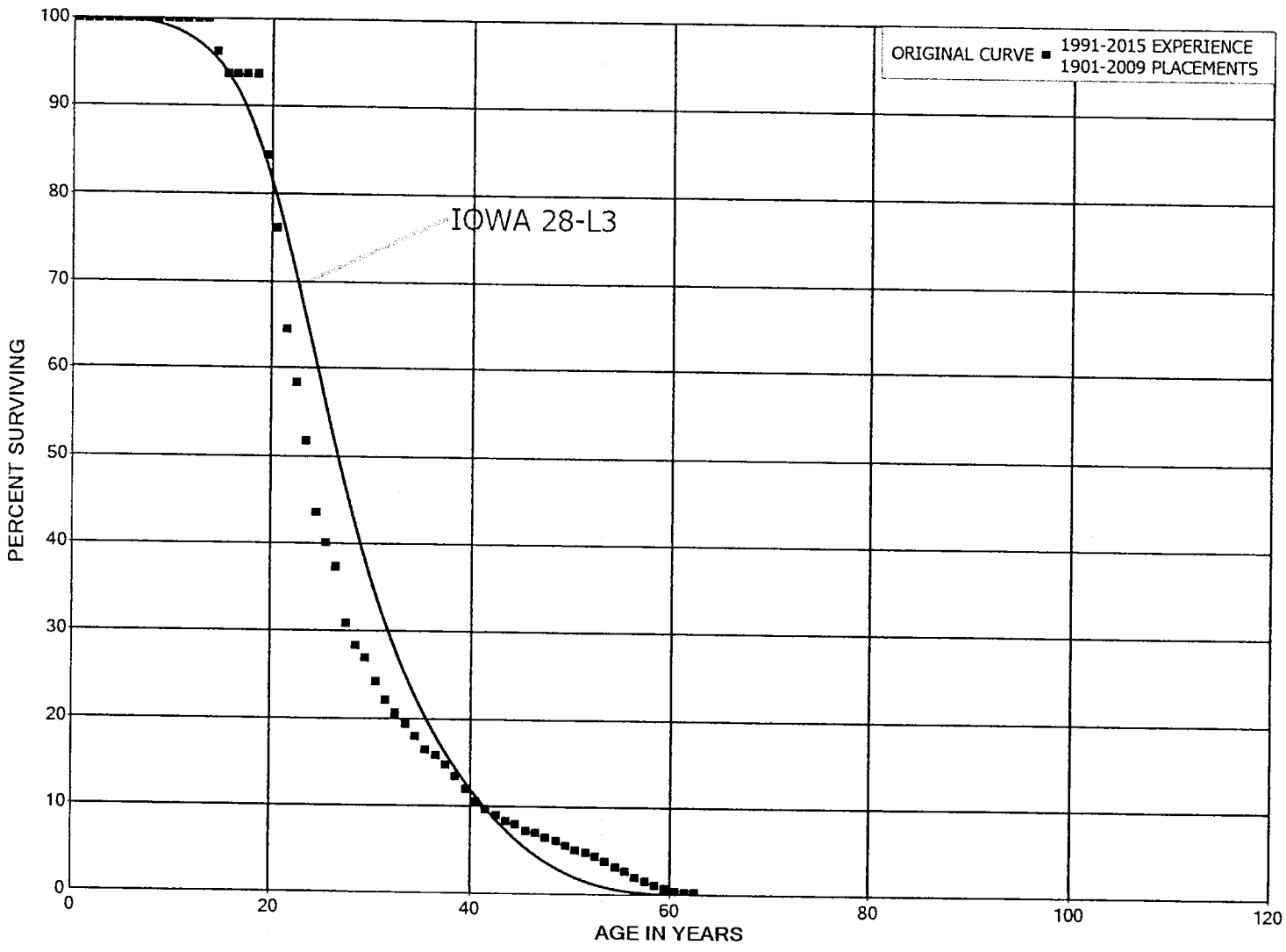
ACCOUNT 323.00 SERVICES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1920-1989 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	2,089		0.0000	1.0000	100.00
80.5	2,089		0.0000	1.0000	100.00
81.5	2,002		0.0000	1.0000	100.00
82.5	2,002		0.0000	1.0000	100.00
83.5	2,000		0.0000	1.0000	100.00
84.5	1,989		0.0000	1.0000	100.00
85.5	1,960		0.0000	1.0000	100.00
86.5	1,302		0.0000	1.0000	100.00
87.5	1,248		0.0000	1.0000	100.00
88.5	1,226		0.0000	1.0000	100.00
89.5	1,214		0.0000	1.0000	100.00
90.5	1,148		0.0000	1.0000	100.00
91.5	1,148		0.0000	1.0000	100.00
92.5	1,148		0.0000	1.0000	100.00
93.5	833		0.0000	1.0000	100.00
94.5	411		0.0000	1.0000	100.00
95.5					100.00

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 324.00 METERS
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 324.00 METERS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1901-2009 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,471,204		0.0000	1.0000	100.00
0.5	1,495,783		0.0000	1.0000	100.00
1.5	1,518,767		0.0000	1.0000	100.00
2.5	1,551,863		0.0000	1.0000	100.00
3.5	1,569,987		0.0000	1.0000	100.00
4.5	1,591,013		0.0000	1.0000	100.00
5.5	1,617,306		0.0000	1.0000	100.00
6.5	1,140,305		0.0000	1.0000	100.00
7.5	182,606		0.0000	1.0000	100.00
8.5	196,427		0.0000	1.0000	100.00
9.5	205,402		0.0000	1.0000	100.00
10.5	214,674		0.0000	1.0000	100.00
11.5	220,328		0.0000	1.0000	100.00
12.5	230,666		0.0000	1.0000	100.00
13.5	238,734	9,221	0.0386	0.9614	100.00
14.5	235,653	6,147	0.0261	0.9739	96.14
15.5	235,060		0.0000	1.0000	93.63
16.5	241,136		0.0000	1.0000	93.63
17.5	248,127		0.0000	1.0000	93.63
18.5	251,454	24,579	0.0977	0.9023	93.63
19.5	232,512	22,984	0.0989	0.9011	84.48
20.5	216,578	33,096	0.1528	0.8472	76.13
21.5	191,819	18,124	0.0945	0.9055	64.49
22.5	182,770	21,026	0.1150	0.8850	58.40
23.5	166,812	26,293	0.1576	0.8424	51.68
24.5	145,520	11,602	0.0797	0.9203	43.54
25.5	138,100	9,534	0.0690	0.9310	40.06
26.5	131,087	22,796	0.1739	0.8261	37.30
27.5	113,540	9,272	0.0817	0.9183	30.81
28.5	106,368	5,654	0.0532	0.9468	28.30
29.5	104,244	10,338	0.0992	0.9008	26.79
30.5	96,429	8,068	0.0837	0.9163	24.14
31.5	92,253	6,140	0.0666	0.9334	22.12
32.5	89,000	5,554	0.0624	0.9376	20.64
33.5	86,385	6,076	0.0703	0.9297	19.36
34.5	83,185	6,991	0.0840	0.9160	17.99
35.5	80,155	3,327	0.0415	0.9585	16.48
36.5	81,766	5,637	0.0689	0.9311	15.80
37.5	79,407	7,050	0.0888	0.9112	14.71
38.5	77,313	8,337	0.1078	0.8922	13.40

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 324.00 METERS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-2009 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	72,665	9,075	0.1249	0.8751	11.96
40.5	66,289	5,068	0.0765	0.9235	10.46
41.5	64,426	5,001	0.0776	0.9224	9.66
42.5	61,569	4,182	0.0679	0.9321	8.91
43.5	58,049	2,521	0.0434	0.9566	8.31
44.5	55,790	5,249	0.0941	0.9059	7.95
45.5	50,651	2,100	0.0415	0.9585	7.20
46.5	48,654	3,530	0.0726	0.9274	6.90
47.5	45,124	2,523	0.0559	0.9441	6.40
48.5	42,754	3,892	0.0910	0.9090	6.04
49.5	39,199	2,887	0.0736	0.9264	5.49
50.5	36,537	2,939	0.0804	0.9196	5.09
51.5	33,794	2,876	0.0851	0.9149	4.68
52.5	31,096	3,961	0.1274	0.8726	4.28
53.5	27,412	4,938	0.1801	0.8199	3.74
54.5	22,627	3,278	0.1449	0.8551	3.06
55.5	19,449	4,956	0.2548	0.7452	2.62
56.5	14,789	3,689	0.2494	0.7506	1.95
57.5	11,109	2,699	0.2430	0.7570	1.46
58.5	8,420	3,205	0.3806	0.6194	1.11
59.5	5,284	2,144	0.4058	0.5942	0.69
60.5	3,215	662	0.2059	0.7941	0.41
61.5	3,190	262	0.0821	0.9179	0.32
62.5	3,083	110	0.0357	0.9643	0.30
63.5	3,051	103	0.0338	0.9662	0.29
64.5	3,157		0.0000	1.0000	0.28
65.5	3,380	153	0.0453	0.9547	0.28
66.5	4,023	337	0.0838	0.9162	0.26
67.5	4,766	225	0.0472	0.9528	0.24
68.5	4,877	196	0.0402	0.9598	0.23
69.5	5,156	178	0.0345	0.9655	0.22
70.5	5,416	277	0.0511	0.9489	0.21
71.5	5,139	153	0.0298	0.9702	0.20
72.5	4,986	100	0.0201	0.9799	0.20
73.5	4,886	296	0.0606	0.9394	0.19
74.5	4,590	9	0.0020	0.9980	0.18
75.5	4,581	10	0.0022	0.9978	0.18
76.5	4,571	69	0.0151	0.9849	0.18
77.5	4,502	75	0.0167	0.9833	0.18
78.5	4,427	637	0.1439	0.8561	0.17

CITY OF DUBOIS - BUREAU OF WATER

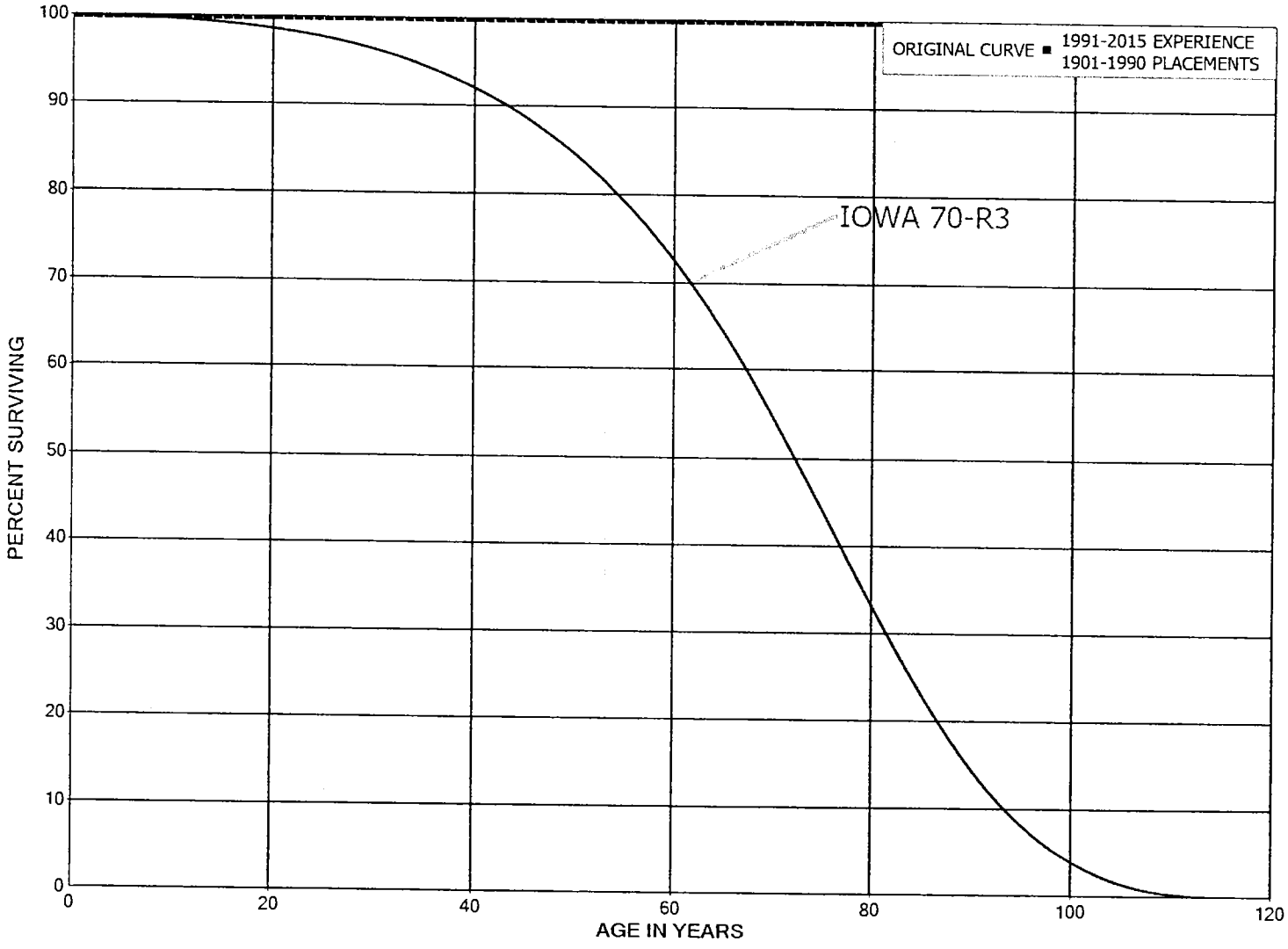
ACCOUNT 324.00 METERS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-2009 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	3,790	155	0.0409	0.9591	0.15
80.5	3,635	78	0.0215	0.9785	0.14
81.5	3,557	209	0.0588	0.9412	0.14
82.5	3,348	223	0.0666	0.9334	0.13
83.5	3,125	796	0.2547	0.7453	0.12
84.5	2,329	1,080	0.4637	0.5363	0.09
85.5	1,249	336	0.2690	0.7310	0.05
86.5	913	475	0.5203	0.4797	0.04
87.5	438	438	1.0000		0.02
88.5					
89.5	13,459		0.0000		
90.5	13,459		0.0000		
91.5	13,459		0.0000		
92.5	13,459		0.0000		
93.5	13,459		0.0000		
94.5	13,459		0.0000		
95.5	13,459		0.0000		
96.5	13,459		0.0000		
97.5	13,459		0.0000		
98.5	13,459		0.0000		
99.5	13,459		0.0000		
100.5	13,459		0.0000		
101.5	13,459		0.0000		
102.5	13,459		0.0000		
103.5	13,459		0.0000		
104.5	13,459		0.0000		
105.5	13,459		0.0000		
106.5	13,459	13,459	1.0000		
107.5					

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 325.00 FIRE HYDRANTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1901-1990 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0					
0.5	10,663		0.0000	1.0000	100.00
1.5	27,730		0.0000	1.0000	100.00
2.5	43,417		0.0000	1.0000	100.00
3.5	47,795		0.0000	1.0000	100.00
4.5	51,452		0.0000	1.0000	100.00
5.5	54,173		0.0000	1.0000	100.00
6.5	57,446		0.0000	1.0000	100.00
7.5	61,351		0.0000	1.0000	100.00
8.5	63,396		0.0000	1.0000	100.00
9.5	71,562		0.0000	1.0000	100.00
10.5	76,526		0.0000	1.0000	100.00
11.5	83,663		0.0000	1.0000	100.00
12.5	88,357		0.0000	1.0000	100.00
13.5	89,865		0.0000	1.0000	100.00
14.5	93,394		0.0000	1.0000	100.00
15.5	96,704		0.0000	1.0000	100.00
16.5	100,686		0.0000	1.0000	100.00
17.5	106,075		0.0000	1.0000	100.00
18.5	107,230		0.0000	1.0000	100.00
19.5	110,688		0.0000	1.0000	100.00
20.5	114,008		0.0000	1.0000	100.00
21.5	115,160		0.0000	1.0000	100.00
22.5	115,548		0.0000	1.0000	100.00
23.5	117,158		0.0000	1.0000	100.00
24.5	117,620		0.0000	1.0000	100.00
25.5	106,957		0.0000	1.0000	100.00
26.5	92,549		0.0000	1.0000	100.00
27.5	77,479		0.0000	1.0000	100.00
28.5	74,484		0.0000	1.0000	100.00
29.5	71,760		0.0000	1.0000	100.00
30.5	70,487		0.0000	1.0000	100.00
31.5	71,036		0.0000	1.0000	100.00
32.5	68,665		0.0000	1.0000	100.00
33.5	67,528		0.0000	1.0000	100.00
34.5	60,074		0.0000	1.0000	100.00
35.5	55,329		0.0000	1.0000	100.00
36.5	48,494		0.0000	1.0000	100.00
37.5	44,635		0.0000	1.0000	100.00
38.5	44,110		0.0000	1.0000	100.00

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-1990 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	40,959		0.0000	1.0000	100.00
40.5	38,522		0.0000	1.0000	100.00
41.5	36,004		0.0000	1.0000	100.00
42.5	31,115		0.0000	1.0000	100.00
43.5	30,868		0.0000	1.0000	100.00
44.5	27,750		0.0000	1.0000	100.00
45.5	24,430		0.0000	1.0000	100.00
46.5	23,434		0.0000	1.0000	100.00
47.5	23,046		0.0000	1.0000	100.00
48.5	21,530		0.0000	1.0000	100.00
49.5	21,319		0.0000	1.0000	100.00
50.5	21,986		0.0000	1.0000	100.00
51.5	19,327		0.0000	1.0000	100.00
52.5	19,197		0.0000	1.0000	100.00
53.5	18,200		0.0000	1.0000	100.00
54.5	17,511		0.0000	1.0000	100.00
55.5	16,296		0.0000	1.0000	100.00
56.5	12,474		0.0000	1.0000	100.00
57.5	10,940		0.0000	1.0000	100.00
58.5	10,215		0.0000	1.0000	100.00
59.5	9,735		0.0000	1.0000	100.00
60.5	9,577		0.0000	1.0000	100.00
61.5	9,275		0.0000	1.0000	100.00
62.5	8,440		0.0000	1.0000	100.00
63.5	7,518		0.0000	1.0000	100.00
64.5	7,296		0.0000	1.0000	100.00
65.5	6,579		0.0000	1.0000	100.00
66.5	5,730		0.0000	1.0000	100.00
67.5	5,383		0.0000	1.0000	100.00
68.5	4,707		0.0000	1.0000	100.00
69.5	4,501		0.0000	1.0000	100.00
70.5	4,653		0.0000	1.0000	100.00
71.5	4,497		0.0000	1.0000	100.00
72.5	4,497		0.0000	1.0000	100.00
73.5	4,403		0.0000	1.0000	100.00
74.5	4,152		0.0000	1.0000	100.00
75.5	3,485		0.0000	1.0000	100.00
76.5	3,485		0.0000	1.0000	100.00
77.5	2,998		0.0000	1.0000	100.00
78.5	2,612		0.0000	1.0000	100.00

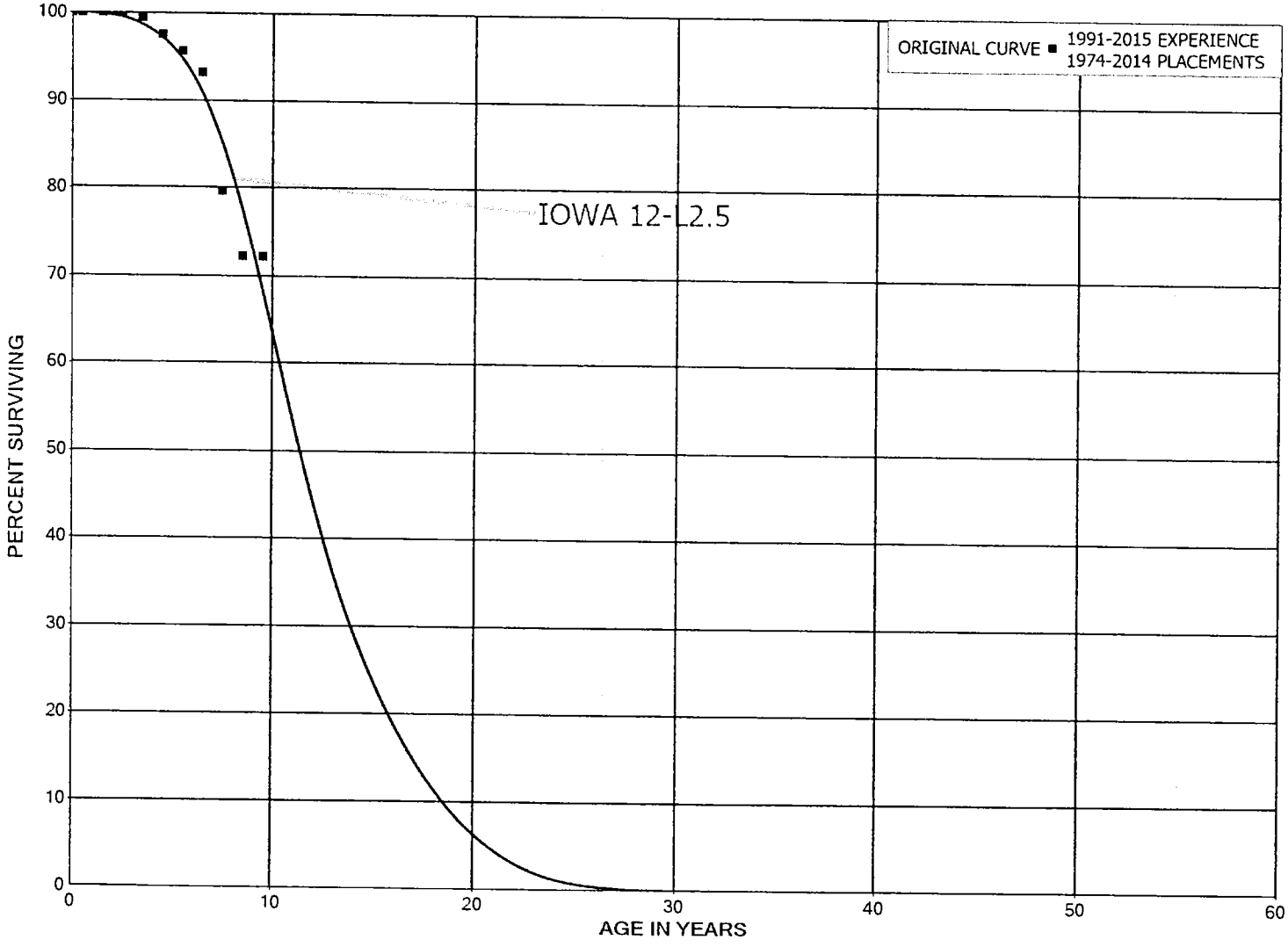
CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1901-1990			EXPERIENCE BAND 1991-2015		
AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	2,368		0.0000	1.0000	100.00
80.5	2,135		0.0000	1.0000	100.00
81.5	2,135		0.0000	1.0000	100.00
82.5	2,135		0.0000	1.0000	100.00
83.5	1,952		0.0000	1.0000	100.00
84.5	1,720		0.0000	1.0000	100.00
85.5	1,659		0.0000	1.0000	100.00
86.5	1,659		0.0000	1.0000	100.00
87.5	1,659		0.0000	1.0000	100.00
88.5	1,598		0.0000	1.0000	100.00
89.5	7,412		0.0000	1.0000	100.00
90.5	7,256		0.0000	1.0000	100.00
91.5	6,641		0.0000	1.0000	100.00
92.5	6,488		0.0000	1.0000	100.00
93.5	6,256		0.0000	1.0000	100.00
94.5	6,122		0.0000	1.0000	100.00
95.5	5,970		0.0000	1.0000	100.00
96.5	5,970		0.0000	1.0000	100.00
97.5	5,970		0.0000	1.0000	100.00
98.5	5,970		0.0000	1.0000	100.00
99.5	5,970		0.0000	1.0000	100.00
100.5	5,970		0.0000	1.0000	100.00
101.5	5,970		0.0000	1.0000	100.00
102.5	5,970		0.0000	1.0000	100.00
103.5	5,970		0.0000	1.0000	100.00
104.5	5,970		0.0000	1.0000	100.00
105.5	5,970		0.0000	1.0000	100.00
106.5	5,970		0.0000	1.0000	100.00
107.5	5,970		0.0000	1.0000	100.00
108.5	5,970		0.0000	1.0000	100.00
109.5	5,970		0.0000	1.0000	100.00
110.5	5,970		0.0000	1.0000	100.00
111.5	5,970		0.0000	1.0000	100.00
112.5	5,970		0.0000	1.0000	100.00
113.5	5,970		0.0000	1.0000	100.00
114.5					100.00

CITY OF DUBOIS - BUREAU OF WATER
ACCOUNT 329.00 TRANSPORTATION EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 329.00 TRANSPORTATION EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1974-2014 EXPERIENCE BAND 1991-2015

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	546,408		0.0000	1.0000	100.00
0.5	546,408	141	0.0003	0.9997	100.00
1.5	423,329	657	0.0016	0.9984	99.97
2.5	261,403	1,187	0.0045	0.9955	99.82
3.5	199,179	3,718	0.0187	0.9813	99.37
4.5	168,947	3,380	0.0200	0.9800	97.51
5.5	126,650	3,173	0.0251	0.9749	95.56
6.5	60,218	8,725	0.1449	0.8551	93.17
7.5	51,493	4,820	0.0936	0.9064	79.67
8.5	24,421		0.0000	1.0000	72.21
9.5					72.21
10.5					
11.5	5,965		0.0000		
12.5	5,965		0.0000		
13.5	5,965		0.0000		
14.5	9,277		0.0000		
15.5	9,277		0.0000		
16.5	31,283		0.0000		
17.5	31,283		0.0000		
18.5	31,283		0.0000		
19.5	31,283		0.0000		
20.5	31,283	5,965	0.1907		
21.5	25,318		0.0000		
22.5	25,318		0.0000		
23.5	25,318	3,312	0.1308		
24.5	22,006		0.0000		
25.5	22,006	22,006	1.0000		
26.5					

PART IV. DETAILED DEPRECIATION CALCULATIONS

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.11 COLLECTING AND IMPOUNDING RESERVOIRS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 110-R2.5						
1901	57,916.80	45,344	57,917			
1924	43,529.40	29,481	37,768	5,761	35.50	162
1925	10,119.00	6,799	8,710	1,409	36.09	39
1926	1,251.00	834	1,068	183	36.69	5
1927	142.00	94	120	22	37.30	1
1935	610.00	375	480	130	42.39	3
1936	160,139.00	97,467	124,866	35,273	43.05	819
1937	8,863.00	5,340	6,841	2,022	43.72	46
1940	1,184.00	691	885	299	45.76	7
1948	837.00	446	571	266	51.42	5
1954	626.00	308	395	231	55.87	4
1996	433,471.00	74,873	95,920	337,551	91.00	3,709
2010	275,429.22	15,300	19,601	255,828	103.89	2,462
	994,117.42	277,352	355,142	638,975		7,262

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 88.0 0.73

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.13 WELLS AND SPRINGS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 45-S2.5						
2009	2,288,050.61	380,823	380,799	1,907,252	37.51	50,846
2010	443,276.12	63,929	63,925	379,351	38.51	9,851
2011	1,027,564.76	125,589	125,581	901,984	39.50	22,835
2012	715,995.01	71,600	71,596	644,399	40.50	15,911
2013	55,908.16	4,349	4,349	51,559	41.50	1,242
2014	185,750.59	10,320	10,319	175,432	42.50	4,128
2015	43,777.14	1,459	1,459	42,318	43.50	973
	4,760,322.39	658,069	658,028	4,102,294		105,786

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 38.8 2.22

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.15 OTHER WATER SOURCE STRUCTURES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 50-R3						
1901	1,219.00	1,219	1,219			
1927	875.00	875	875			
	2,094.00	2,094	2,094			
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					0.0	0.00

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.30 PURIFICATION BUILDINGS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
INTERIM SURVIVOR CURVE.. IOWA 65-S1.5						
PROBABLE RETIREMENT YEAR.. 6-2044						
1969	988,399.00	656,732	727,765	260,634	20.09	12,973
1998	108,262.00	44,982	49,847	58,415	25.35	2,304
2008	14,727.86	3,559	3,944	10,784	26.52	407
	1,111,388.86	705,273	781,556	329,833		15,684

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 21.0 1.41

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.50 DISTRIBUTION RESERVOIRS AND STANDPIPES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 60-R4						
1996	1,114,044.00	377,104	388,611	725,433	39.69	18,277
2010	539,639.66	58,373	60,154	479,486	53.51	8,961
	1,653,683.66	435,477	448,765	1,204,919		27,238
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					44.2	1.65

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 312.63 MISCELLANEOUS STRUCTURES AND IMPROVEMENTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R2.5						
1964	19,313.00	14,278	15,279	4,034	14.34	281
1973	36,123.00	23,368	25,007	11,116	19.42	572
2009	273,285.17	34,732	37,169	236,116	48.01	4,918
2010	25,494.16	2,814	3,011	22,483	48.93	459
2014	96,667.26	4,131	4,421	92,246	52.65	1,752
2015	18,400.00	475	508	17,892	53.58	334
2016	75,000.00	641	686	74,314	54.53	1,363
	544,282.59	80,439	86,081	458,202		9,679

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 47.3 1.78

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 314.00 OTHER POWER PRODUCTION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 35-R2						
1996	58,559.00	27,958	46,483	12,076	18.29	660
1998	62,101.00	27,111	45,074	17,027	19.72	863
	120,660.00	55,069	91,557	29,103		1,523

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 19.1 1.26

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 316.00 ELECTRIC PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R2.5						
1955	10,688.00	9,817	10,688			
1956	90.00	82	90			
1996	81,665.00	36,688	63,615	18,050	22.03	819
1998	3,370.00	1,380	2,393	977	23.62	41
2009	5,868.77	1,020	1,769	4,100	33.05	124
	101,681.77	48,987	78,555	23,127		984

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 23.5 0.97

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 320.00 PURIFICATION SYSTEM

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-L2						
1965	5,616.50	3,826	4,577	1,040	12.75	82
1969	527,932.68	346,456	414,474	113,459	13.75	8,252
1991	21,877.99	10,983	13,139	8,739	19.92	439
1993	32,828.04	15,725	18,812	14,016	20.84	673
1995	27,367.25	12,391	14,824	12,543	21.89	573
1996	4,470.97	1,959	2,344	2,127	22.47	95
1998	58,237.46	23,674	28,322	29,915	23.74	1,260
2000	3,233.34	1,200	1,436	1,797	25.16	71
2002	133,165.05	44,244	52,930	80,235	26.71	3,004
2003	132,288.33	41,307	49,416	82,872	27.51	3,012
2006	297,257.62	73,943	88,460	208,798	30.05	6,948
2007	100,353.99	22,780	27,252	73,102	30.92	2,364
2008	64,789.80	13,250	15,851	48,939	31.82	1,538
2011	19,676.23	2,656	3,178	16,498	34.60	477
2013	99,544.01	8,635	10,330	89,214	36.53	2,442
2014	13,397.32	834	998	12,399	37.51	331
2015	38,446.40	1,442	1,725	36,721	38.50	954
	1,580,482.98	625,305	748,068	832,415		32,515

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 25.6 2.06

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 322.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 110-R3						
1901	162,163.20	133,063	159,820	2,343	19.74	119
1920	3,120.00	2,288	2,748	372	29.32	13
1921	2,419.56	1,762	2,116	304	29.90	10
1922	1,903.59	1,376	1,653	251	30.50	8
1923	14,287.24	10,248	12,309	1,978	31.10	64
1924	50,336.76	35,822	43,025	7,312	31.72	231
1925	5,088.85	3,593	4,315	774	32.34	24
1926	6,850.57	4,798	5,763	1,088	32.96	33
1927	1,873.76	1,301	1,563	311	33.60	9
1928	132.88	92	110	23	34.24	1
1929	2,933.10	2,003	2,406	527	34.88	15
1930	1,450.57	982	1,179	272	35.54	8
1931	1,947.09	1,306	1,569	378	36.20	10
1932	696.85	463	556	141	36.87	4
1933	287.94	190	228	60	37.54	2
1934	164.86	108	130	35	38.23	1
1935	2,547.89	1,647	1,978	570	38.91	15
1937	1,508.49	956	1,148	360	40.31	9
1938	3,006.69	1,885	2,264	743	41.02	18
1939	710.81	441	530	181	41.73	4
1940	48.73	30	36	13	42.45	
1942	18.91	11	13	6	43.90	
1944	1,305.46	767	921	384	45.38	8
1945	369.21	214	257	112	46.12	2
1946	2,238.45	1,284	1,542	696	46.88	15
1947	10,658.91	6,044	7,259	3,400	47.63	71
1948	5,586.33	3,128	3,757	1,829	48.40	38
1949	10,103.00	5,588	6,712	3,391	49.16	69
1950	3,059.45	1,670	2,006	1,053	49.94	21
1951	5,239.12	2,824	3,392	1,847	50.71	36
1952	8,666.69	4,609	5,536	3,131	51.50	61
1953	4,519.14	2,371	2,848	1,671	52.29	32
1954	6,163.84	3,189	3,830	2,334	53.08	44
1955	27,147.00	13,852	16,637	10,510	53.87	195
1956	9,950.65	5,004	6,010	3,941	54.68	72
1957	6,969.50	3,454	4,149	2,820	55.48	51
1958	8,992.82	4,390	5,273	3,720	56.30	66
1959	6,337.89	3,047	3,660	2,678	57.11	47
1960	18,829.17	8,913	10,705	8,124	57.93	140
1961	8,770.47	4,085	4,906	3,864	58.76	66
1962	56,523.97	25,903	31,112	25,412	59.59	426
1963	48,954.34	22,065	26,502	22,452	60.42	372
1964	26,499.79	11,742	14,103	12,397	61.26	202
1965	2,358.27	1,027	1,234	1,124	62.10	18

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 322.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 110-R3						
1966	4,819.77	2,062	2,477	2,343	62.95	37
1967	3,653.83	1,535	1,844	1,810	63.80	28
1968	2,886.76	1,190	1,429	1,458	64.66	23
1969	225,225.15	91,072	109,385	115,840	65.52	1,768
1970	36,241.20	14,371	17,261	18,980	66.38	286
1971	28,947.35	11,250	13,512	15,435	67.25	230
1972	24,549.72	9,347	11,227	13,323	68.12	196
1973	19,744.92	7,360	8,840	10,905	69.00	158
1974	17,003.08	6,202	7,449	9,554	69.88	137
1975	14,888.52	5,311	6,379	8,510	70.76	120
1976	21,979.44	7,663	9,204	12,775	71.65	178
1977	27,582.27	9,393	11,282	16,300	72.54	225
1978	24,104.26	8,011	9,622	14,482	73.44	197
1979	34,017.86	11,028	13,246	20,772	74.34	279
1980	28,992.26	9,162	11,004	17,988	75.24	239
1981	31,882.49	9,814	11,787	20,095	76.14	264
1982	31,177.76	9,339	11,217	19,961	77.05	259
1983	23,862.15	6,948	8,345	15,517	77.97	199
1984	20,179.49	5,709	6,857	13,322	78.88	169
1985	69,612.55	19,112	22,955	46,658	79.80	585
1986	43,831.20	11,667	14,013	29,818	80.72	369
1987	25,546.82	6,584	7,908	17,639	81.65	216
1988	32,302.86	8,052	9,671	22,632	82.58	274
1989	29,005.17	6,985	8,390	20,615	83.51	247
1990	40,463.51	9,402	11,293	29,171	84.44	345
1992	41,446.71	8,922	10,716	30,731	86.32	356
1993	58,405.79	12,074	14,502	43,904	87.26	503
1994	67,020.42	13,276	15,946	51,074	88.21	579
1998	2,120,473.30	346,803	416,537	1,703,936	92.01	18,519
2007	353,555.78	29,893	35,904	317,652	100.70	3,154
2008	111,116.70	8,415	10,107	101,010	101.67	994
2009	151,650.94	10,147	12,187	139,464	102.64	1,359
2010	8,599.07	499	599	8,000	103.62	77
2011	14,305.05	702	843	13,462	104.60	129
2012	133,596.62	5,368	6,447	127,150	105.58	1,204
2013	878,203.32	27,461	32,983	845,220	106.56	7,932
2014	414,388.27	9,266	11,130	403,258	107.54	3,750
2015	150,366.85	2,022	2,429	147,938	108.52	1,363
2016	807,500.00	3,593	4,315	803,185	109.51	7,334
	6,715,871.02	1,106,545	1,329,052	5,386,819		56,931

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 94.6 0.85

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 323.00 SERVICES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 65-S2.5						
1920	411.00	371	411			
1921	422.00	380	422			
1922	315.00	283	315			
1925	66.00	59	66			
1926	12.00	11	12			
1927	22.00	19	22			
1928	54.00	47	54			
1929	658.00	576	658			
1930	29.00	25	29			
1931	11.00	10	11			
1932	2.00	2	2			
1934	87.00	75	86	1	9.31	
1936	42.00	36	41	1	9.81	
1937	2.00	2	2			
1938	189.00	159	182	7	10.34	1
1939	522.00	437	500	22	10.61	2
1940	32.00	27	31	1	10.89	
1941	489.00	405	463	26	11.18	2
1942	255.00	210	240	15	11.47	1
1943	3.00	2	2	1	11.77	
1944	9.00	7	8	1	12.08	
1945	35.00	28	32	3	12.39	
1946	134.00	108	123	11	12.72	1
1947	698.00	558	638	60	13.05	5
1948	1,938.00	1,539	1,759	179	13.39	13
1949	410.00	323	369	41	13.74	3
1950	2,748.00	2,152	2,460	288	14.10	20
1951	1,366.00	1,062	1,214	152	14.47	11
1952	1,431.00	1,104	1,262	169	14.85	11
1953	816.00	625	714	102	15.24	7
1954	904.00	686	784	120	15.64	8
1955	1,653.00	1,245	1,423	230	16.05	14
1956	104.00	78	89	15	16.47	1
1957	439.00	325	372	67	16.91	4
1958	716.00	525	600	116	17.35	7
1959	1,184.00	860	983	201	17.81	11
1960	1,216.00	874	999	217	18.29	12
1961	720.00	512	585	135	18.77	7
1962	1,669.00	1,174	1,342	327	19.27	17
1963	5,321.00	3,702	4,232	1,089	19.78	55
1964	1,902.00	1,308	1,495	407	20.30	20
1965	1,320.00	897	1,025	295	20.84	14
1966	3,382.00	2,269	2,594	788	21.40	37
1967	4,331.00	2,868	3,278	1,053	21.96	48

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 323.00 SERVICES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 65-S2.5						
1968	1,362.00	889	1,016	346	22.55	15
1969	12,188.00	7,847	8,970	3,218	23.15	139
1970	6,380.00	4,048	4,627	1,753	23.76	74
1971	7,336.00	4,583	5,239	2,097	24.39	86
1972	3,159.00	1,943	2,221	938	25.03	37
1973	29,204.00	17,662	20,190	9,014	25.69	351
1974	25,187.00	14,969	17,111	8,076	26.37	306
1975	3,662.00	2,137	2,443	1,219	27.06	45
1976	6,869.00	3,935	4,498	2,371	27.76	85
1982	6,744.00	3,392	3,877	2,867	32.31	89
1983	12,099.00	5,932	6,781	5,318	33.13	161
1984	8,759.00	4,184	4,783	3,976	33.95	117
1985	7,430.00	3,453	3,947	3,483	34.79	100
1986	15,661.00	7,074	8,087	7,574	35.64	213
1987	5,244.00	2,299	2,628	2,616	36.50	72
1988	19,420.00	8,255	9,437	9,983	37.37	267
1989	7,323.00	3,013	3,444	3,879	38.26	101
	216,096.00	123,580	141,228	74,868		2,590

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 28.9 1.20

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 324.00 METERS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 28-L3						
2008	967,233.00	289,483	220,882	746,351	19.62	38,040
2009	488,602.89	129,656	98,931	389,672	20.57	18,944
	1,455,835.89	419,139	319,813	1,136,023		56,984
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					19.9	3.91

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R3						
1901	5,970.00	5,908	5,910	60	0.73	60
1920	152.00	140	140	12	5.39	2
1921	134.00	123	123	11	5.65	2
1922	232.00	212	212	20	5.91	3
1923	153.00	140	140	13	6.16	2
1924	615.00	559	559	56	6.43	9
1925	156.00	141	141	15	6.69	2
1926	156.00	141	141	15	6.95	2
1927	61.00	55	55	6	7.22	1
1930	61.00	54	54	7	8.05	1
1931	232.00	204	204	28	8.34	3
1932	183.00	160	160	23	8.64	3
1935	233.00	201	201	32	9.58	3
1936	244.00	209	209	35	9.91	4
1937	386.00	329	329	57	10.25	6
1938	487.00	413	413	74	10.61	7
1940	667.00	559	559	108	11.35	10
1941	251.00	209	209	42	11.74	4
1942	94.00	78	78	16	12.15	1
1944	156.00	127	127	29	12.99	2
1946	340.00	273	273	67	13.89	5
1947	908.00	722	722	186	14.36	13
1948	500.00	394	394	106	14.84	7
1949	1,464.00	1,143	1,143	321	15.34	21
1950	873.00	675	675	198	15.85	12
1951	378.00	290	290	88	16.37	5
1952	983.00	746	746	237	16.91	14
1953	835.00	627	627	208	17.46	12
1954	302.00	224	224	78	18.03	4
1955	219.00	161	161	58	18.60	3
1956	712.00	517	517	195	19.19	10
1957	908.00	651	651	257	19.79	13
1958	1,534.00	1,087	1,087	447	20.41	22
1959	3,822.00	2,674	2,675	1,147	21.03	55
1960	1,448.00	1,000	1,000	448	21.67	21
1961	933.00	636	636	297	22.32	13
1962	1,383.00	929	929	454	22.98	20
1963	617.00	409	409	208	23.65	9
1964	2,659.00	1,735	1,736	923	24.33	38
1966	462.00	292	292	170	25.72	7
1967	1,610.00	1,002	1,002	608	26.43	23
1968	388.00	238	238	150	27.14	6
1969	1,152.00	693	693	459	27.87	16
1970	3,320.00	1,963	1,964	1,356	28.61	47

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 325.00 FIRE HYDRANTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R3						
1971	3,458.00	2,008	2,009	1,449	29.35	49
1972	1,155.00	658	658	497	30.11	17
1973	5,389.00	3,012	3,013	2,376	30.87	77
1974	3,982.00	2,182	2,183	1,799	31.64	57
1975	3,310.00	1,777	1,778	1,532	32.42	47
1976	3,529.00	1,855	1,856	1,673	33.20	50
1977	1,508.00	776	776	732	33.99	22
1978	4,694.00	2,361	2,362	2,332	34.79	67
1979	7,137.00	3,507	3,509	3,628	35.60	102
1980	4,964.00	2,381	2,382	2,582	36.42	71
1981	8,166.00	3,822	3,824	4,342	37.24	117
1982	2,045.00	933	933	1,112	38.07	29
1983	3,905.00	1,734	1,735	2,170	38.91	56
1984	3,273.00	1,414	1,415	1,858	39.75	47
1985	2,721.00	1,143	1,144	1,577	40.60	39
1986	3,657.00	1,491	1,492	2,165	41.46	52
1987	4,378.00	1,731	1,732	2,646	42.32	63
1988	15,687.00	6,008	6,010	9,677	43.19	224
1989	17,067.00	6,322	6,325	10,742	44.07	244
1990	10,663.00	3,816	3,818	6,845	44.95	152
2016	120,000.00	840	840	119,160	69.51	1,714
	269,061.00	78,814	78,842	190,219		3,819

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 49.8 1.42

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 328.00 OFFICE FURNITURE AND EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
2006	4,382.01	3,067	3,067	1,315	4.50	292
2007	15,396.36	9,751	9,750	5,646	5.50	1,027
2016	5,000.00	167	167	4,833	14.50	333
	24,778.37	12,985	12,984	11,794		1,652
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					7.1	6.67

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 329.00 TRANSPORTATION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 12-L2.5						
2006	24,421.13	15,365	18,804	5,617	4.45	1,262
2007	22,252.04	13,500	16,522	5,730	4.72	1,214
2009	63,258.57	33,738	41,290	21,969	5.60	3,923
2010	38,917.58	18,745	22,941	15,977	6.22	2,569
2011	26,513.90	11,180	13,683	12,831	6.94	1,849
2012	61,037.28	21,618	26,457	34,580	7.75	4,462
2013	161,269.17	45,289	55,427	105,842	8.63	12,264
2014	122,938.00	25,100	30,719	92,219	9.55	9,656
	520,607.67	184,535	225,843	294,765		37,199

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 7.9 7.15

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 332.00 TOOLS AND WORK EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 25-SQUARE						
1999	13,625.00	9,538	10,657	2,968	7.50	396
2000	134,000.00	88,440	98,818	35,182	8.50	4,139
2003	13,350.00	7,209	8,055	5,295	11.50	460
2004	71,974.00	35,987	40,210	31,764	12.50	2,541
2007	5,924.07	2,251	2,515	3,409	15.50	220
2010	12,607.16	3,278	3,663	8,944	18.50	483
2011	102,702.72	22,595	25,246	77,457	19.50	3,972
2013	4,950.00	693	774	4,176	21.50	194
	359,132.95	169,991	189,938	169,195		12,405

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 13.6 3.45

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 333.00 COMMUNICATION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
2009	485.63	243	243	243	7.50	32
2010	70,498.43	30,549	30,546	39,952	8.50	4,700
2016	10,000.00	333	333	9,667	14.50	667
	80,984.06	31,125	31,122	49,862		5,399

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 9.2 6.67

CITY OF DUBOIS - BUREAU OF WATER

ACCOUNT 335.00 OTHER TANGIBLE PLANT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2016

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 50-SQUARE						
1901	43,232.00	43,232	43,232			
	43,232.00	43,232	43,232			
COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT ..					0.0	0.00

5

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission, et al.	:	
	:	
v.	:	**R-2016-_____**
	:	
City of Dubois – Bureau of Water	:	

DIRECT TESTIMONY

OF

HAROLD WALKER, III
MANAGER, FINANCIAL STUDIES
GANNETT FLEMING, INC.
VALUATION AND RATE DESIGN

RATE OF RETURN

June 30, 2016

TABLE OF CONTENTS

TERMS, ABBREVIATIONS AND ACRONYMS

Terms, Abbreviations and Acronyms	Defined
Bureau of Water	Water Enterprise Fund
CAPM	Capital Asset Pricing Model
City of DuBois	The City in its entirety
Commission	Pennsylvania Public Utility Commission
Comparable Companies	Water Group Followed by Analysts
Comparable Group	Water Group Followed by Analysts
Cost of Capital	Investor-required cost rate
DCF	Discounted Cash Flow
EPA	U.S. Environmental Protection Agency's
EPS	Earnings per share
Financial Risk	Leverage
GICS	Global Industry Classification System
GO	General Obligation Bonds
IOU	Investor Owned Utilities
Leverage	Fixed cost capital
Long-term U.S. Treasury Securities	Base Risk-Free Rate
M/B	Market-to-Book Ratios
Moody's	Moody's Investors Service
NARUC	National Association of Regulatory Utility Commissioners
Non-Systematic Risk	Company-Specific Risk
Outside Customers	Customers who are located in the periphery of the City of DuBois
ROE	Return on Equity
RP	Risk Premium
S&P	Standard & Poor's
SIC	Standard Industrial Classification
Systematic Risk	Non-Diversifiable Risk
Water Group	Water Group Followed by Analysts

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Harold Walker, III. My business mailing address is P.O. Box 80794, Valley Forge, Pennsylvania 19484.

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

A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC as Manager, Financial Studies.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND AND EMPLOYMENT EXPERIENCE?

A. My educational background, business experience and qualifications are provided in Appendix A.

SCOPE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to recommend an appropriate overall rate of return that the City of DuBois - Bureau of Water (the "Bureau of Water") should be afforded an opportunity to earn on its water utility service rate base. My testimony is supported by Exhibit_(HW-1), which is composed of 25 Schedules. It should be noted, for the purposes of my testimony, my reference to City of DuBois refers to the City of DuBois in its entirety; while my reference to the Bureau of Water refers to that portion of the City of DuBois's services that are accounted for as the Water Enterprise Fund.

SUMMARY OF RECOMMENDATION

Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY?

A. My recommendation is that the Bureau of Water be permitted an overall rate of return of 6.76% based upon the Company's hypothetical capital structure at December 31, 2016, including a 10.50% cost of common equity. My alternative recommended cost of common equity, should the Commission decide to adjust my primary recommendation of 10.50% to reflect the income tax status of the investors of the Bureau of Water, is 9.56%. My recommended cost of common equity reflects the Bureau of Water's unique risk characteristics.

Q. HOW DID YOU DETERMINE YOUR RECOMMENDED COMMON EQUITY COST RATE?

A. I used several models to help me in formulating my recommended common equity cost rate including Discounted Cash Flow ("DCF"), Capital Asset Pricing Model ("CAPM") and Risk Premium ("RP").

Q. IS IT IMPORTANT TO USE MORE THAN ONE MARKET MODEL?

A. Yes. It is necessary to estimate common equity cost rates using a number of different models. At any given time, a particular model may understate or overstate the cost of equity. While any single investor may rely solely upon one model, different investors rely on different models and many investors use multiple models. Therefore, because the price of common stock reflects a number of valuation models, it is appropriate to estimate the market-required common equity cost rate by applying a broad range of analytical models.

Q. PLEASE SUMMARIZE YOUR COMMON EQUITY COST RATE RECOMMENDATION.

A. There is no market data concerning the Bureau of Water's shares of common stock because the Bureau of Water is a municipal organization. Accordingly, due to the lack of market data concerning the Bureau of Water's equity, I used a comparable group of publicly traded companies to estimate the common equity cost rate. Based upon the results of my entire analysis, I conclude the Bureau of Water's current common equity cost rate is at least 10.50%.[1] The current range of common equity cost for the Bureau of Water is 10.25% (DCF), 11.25% (CAPM), and 11.25% (RP). Value Line Investment Survey ("Value Line") is relied upon by many investors and is the only investment advisory service of which I am aware that projects earned return on equity. As a check on the reasonableness of my common equity cost rate recommendation, I reviewed Value Line's projected returns on common equity for comparable utilities. Value Line's projected earned returns on common equity for my comparable utilities range from 11.1% to 11.3%. The range of the projected returns suggests that my recommendation that Bureau of Water be permitted an opportunity to earn 10.50% is reasonable. If the Commission adjusts for the maximum level of personal income taxes of the Bureau of Water equity investor, the current common equity cost rate is 9.56%.

1 It should be noted that my current analysis contained in Exhibit_(HW-1) supports a cost of common equity of 10.50% for the Bureau of Water. The Bureau of Water's filing includes a 10.0% a cost of common equity to minimize it's requested revenue increase.

PRINCIPLES OF RATE REGULATION AND FAIR RATE OF RETURN

Q. WHAT ARE THE PRINCIPLES GUIDING FAIR RATES OF RETURN IN THE CONTEXT OF RATE REGULATION?

A. In a capitalistic or free market system, competition determines the price for all goods and services. Utilities are permitted to operate as monopolies or near monopolies as a tradeoff for a ceiling on the price of service because: (1) the services provided by utilities are considered necessities by society; and (2) capital-intensive and long-lived facilities are necessary to provide utility service. Generally, utilities are required to serve all customers in their service territory at reasonable rates determined by regulators. As a result, regulators act as a substitute for a competitive-free market system when they authorize prices for utility service.

Although utilities operate in varying degrees as regulated monopolies, they must compete with governmental bodies, non-regulated industries, and other utilities for labor, materials, and capital. Capital is provided by investors who seek the highest return commensurate with the perceived level of risk; the greater the perceived risk, the higher the required return rate. In order for utilities to attract the capital required to provide service, a fair rate of return should equal an investor-required, market-determined rate of return.

Q. WHAT CONSTITUTES A FAIR RATE OF RETURN?

A. Two noted Supreme Court cases define the benchmarks of a fair rate of return. In *Bluefield,*[2] a fair rate of return is defined as: (1) equal to the return on investments in other business undertakings with the same level of risks (the comparable earnings standard); (2) sufficient to assure confidence in the financial soundness of a utility (the

[2]Bluefield Water Works & Improvement Company v. P.S.C. of West Virginia, 262 U.S. 679 (1923).

financial integrity standard); and (3) adequate to permit a public utility to maintain and support its credit, enabling the utility to raise or attract additional capital necessary to provide reliable service (the capital attraction standard). The second case, *Hope,*[3] determined a fair rate of return to be based upon guidelines found in *Bluefield* as well as stating that: (1) allowed revenues must cover capital costs including service on debt and dividends on stock; and (2) the Commission was not bound to use any single formula or combination of formulae in determining rates. Utilities are not entitled to a guaranteed return. However, the regulatory-determined price for service must allow the utility a fair opportunity to recover all costs associated with providing the service, including a fair rate of return.

INVESTMENT RISK

Q. PREVIOUSLY, YOU REFERRED TO RISK. PLEASE DEFINE THE TERM RISK.

A. Risk is the uncertainty associated with a particular action; the greater the uncertainty of a particular outcome, the greater the risk. Investors who invest in risky assets expose themselves to investment risk particular to that investment. Investment risk is the sum of business risk and financial risk. Business risk is the risk inherent in the operations of a business. Assuming that a Company is financed with 100% common equity, business risk includes all operating factors that affect the probability of receiving expected future income such as: sales volatility, management actions, availability of product substitutes, technological obsolescence, regulation, raw materials, labor, size and growth of the market

[3] Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591 (1944).

served, diversity of the customer base, economic activity of the area served, and other similar factors.

Q. WHAT IS FINANCIAL RISK?

A. Financial risk reflects the manner in which an enterprise is financed. Financial risk arises from the use of fixed cost capital (leverage) such as debt and/or preferred stock, because of the contractual obligations associated with the use of such capital. Because the fixed contractual obligations must be serviced before earnings are available for common stockholders, the introduction of leverage increases the potential volatility of the earnings available for common shareholders and therefore increases common shareholder risks. Although financial risk and business risk are separate and distinct, they are interrelated. In order for a company to maintain a given level of investment risk, business risk and financial risk should complement one another to the extent possible. For example, two firms may have similar investment risks while having different levels of business risk, if the business risk differences are compensated for by using more or less leverage (financial risk) thereby resulting in similar investment risk.

DESCRIPTION OF THE CITY OF DUBOIS BUREAU OF WATER

Q. PLEASE GIVE A BRIEF DESCRIPTION OF THE CITY OF DUBOIS BUREAU OF WATER.

A. The Bureau of Water provides water services to about 4,500 customers who are primarily located in the City of DuBois and outlying municipalities in Clearfield and Jefferson Counties. The Bureau of Water's service area includes all of the City of DuBois, and communities that are located outside the City of DuBois ("Outside Customers"). The Outside Customers that are jurisdictional include portions of the Township of Sandy, and

the Township of Union. In total, the entire population of the City of DuBois that is provided water service by the Bureau of Water is approximately 7,800 people. Only about 16% of DuBois's water customers, or 705 customers, have their water rates regulated by the PUC.

The Bureau of Water's main source of water is the Anderson Creek Reservoir, which is fed by Anderson Creek, Dressler Run and Montgomery Run. The reservoir was constructed in 1903, expanded in 1925 and expanded again in 1936. PA DEP has mandated that the reservoir be further improved. The reservoir has an area of 210 acres and a perimeter of 5 miles. It is designed to hold 615 million gallons of water.

THE INDUSTRY

Q. PLEASE GIVE A BRIEF OVERVIEW OF THE INDUSTRY IN WHICH THE BUREAU OF WATER OPERATES.

A. The Bureau of Water operates in the water supply industry. The water supply industry has a Standard Industrial Classification ("SIC") code of 4941, has water utilities, and includes establishments primarily engaged in distributing water for sale for residential, commercial, and industrial uses. Government controlled establishments such as municipal service districts and public utilities dominate the industry. Private companies or investor owned utilities ("IOU") are active in the construction and improvement of water supply facilities and infrastructure.

The water supply industry is the most fragmented of the major utility industries with more than 53,000 community water systems in the U.S. (83% of which serve less than 3,300 customers). The nation's water systems range in size from large municipally owned

systems, such as the New York City water system that serves approximately 9 million people, to small systems, where a few customers share a common well.

A comparative industry to the water supply industry is the wastewater utility industry. The wastewater utility industry is another fragmented industry, although not as fragmented as the water supply industry. According to the U.S. Environmental Protection Agency's ("EPA") most recent survey of publicly-owned wastewater treatment facilities in 2008, there are approximately 15,000 such facilities in the nation, serving approximately 74% of the U.S. population. Eighty percent of domestic wastewater systems are government owned rather than IOUs. Currently, there are no wastewater utility companies that have actively traded stock.

An estimated 14% of all water supplies are managed or owned by IOUs. IOUs consist of companies with common stock that is either actively traded or inactively traded, as well as companies that are closely held, or not publicly traded. Currently, there are only about 11 investor owned water utility companies with publicly traded stock in the U.S.

COMPARABLE GROUP

Q. HOW DO YOU ESTIMATE THE COST OF COMMON EQUITY FOR THE BUREAU OF WATER?

A. The Bureau of Water's fund equity is not traded. Accordingly, I employed a comparable group of utility companies with actively traded stock, to determine a market-required cost rate of common equity capital for the Bureau of Water. Since no companies are perfectly identical to the Bureau of Water, it is reasonable to determine the market-required cost rate for a comparable group of utility companies and adjust, to the extent necessary, for investment risk differences between the Bureau of Water and the comparable group.

Q. HOW DID YOU SELECT THE COMPARABLE GROUP USED TO DETERMINE THE COST OF COMMON EQUITY FOR THE BUREAU OF WATER?

A. I selected a comparable group of water utilities to determine the cost of common equity for the Bureau of Water. Unlike the other utility industries, only a portion of the IOU water companies with publicly traded stock in the U.S. are followed by security analysts. Coverage by security analysts is important when determining a market required cost of common equity. Accordingly, security analysts' coverage was considered when selecting my comparable group. I selected my water utility comparable group, Water Group Followed by Analysts ("Water Group"), based upon a general criteria that includes: (1) all U.S. water utilities who are covered by several security analysts as measured by the existence of several sources of published projected five-year growth rates in earnings per share ("EPS"); (2) with a Global Industry Classification Standard[4] ("GICS") of 55104010 (*i.e.,* Water Utility); (3) are not the announced subject of an acquisition; (4) currently pay a common dividend and have not reduced their common dividend within the past four years; and (5) have market capitalization greater than $75.0 million.

It should be noted that the Water Group is also referred to as the Comparable Group and/or the Comparable Companies. The names of the utilities that comprise the Comparable Group and their bond or credit ratings are listed in Table 1.

[4]GICS is an eight-digit code that represents a company's Global Industry Classification Standard that was developed by Standard & Poor's and Morgan Stanley Capital International. The eight-digit code can be broken down according to a hierarchy of economic sectors, industry groups, industries and sub-industries: All Economic Sectors are represented by the leftmost two-digits; Industry Groups are represented by the combination of the leftmost four-digits; Industries are represented by the combination of the leftmost six-digits; and Sub-Industries are represented by the combination of the leftmost eight-digits.

Bond and Credit Ratings for
The Water Group Followed by Analysts

Water Group Followed by Analysts	S&P Credit Rating
American States Water Co	A+
American Water Works Co Inc	A
Aqua America Inc *	A+
California Water Service Gp **	A+
Connecticut Water Svc Inc	A
Middlesex Water Co	A
SJW Corp ***	A
York Water Co	A-
Average	A

* - The A+ bond rating is that for Aqua Pennsylvania, Inc.
** - The A+ bond rating is that for California Water Service Co., Inc.
*** - The A bond rating is that for San Jose Water Co.

Table 1

Q. WHY DID YOU INCLUDE NOT BEING THE SUBJECT OF AN ACQUISITION AS A CRITERIA FOR THE WATER GROUP?

A. To begin with, there are only about 10 investor owned water utility companies with publicly traded stock in the U.S., and some of these companies are very small. As stated previously, the IOU water industry receives only limited exposure on Wall Street. Additionally, the merger activity in the water industry has resulted in abnormal or "tainted" stock prices in terms of a DCF analysis. Eight acquisitions of publicly traded water utility stocks have occurred or been announced since June 1998. This is a very large percentage (~50%) of available publicly traded water utility stocks. Typically, premiums are paid in corporate acquisitions. That is, when a tender offer is made for the purchase of all the

outstanding stock of a company, the amount of that offer usually exceeds the price at which the stock was previously traded in the market. These large premiums are reflected in the prices of other water utilities that are not currently the announced subject of an acquisition.[5] The merger activity in the water industry is still occurring as evidenced by the announced acquisitions of Chaparral City Water Company, SouthWest Water Company, New York Service Co., Aquarion Water Company of Sea Cliff, Aquarion Water Company of New York and Birmingham Utilities over the last few years.

CAPITAL STRUCTURE

Q. WHAT IS REQUIRED TO DEVELOP AN OVERALL RATE OF RETURN?

A. The first step in developing an overall rate of return is the selection of capital structure ratios to be employed. Next, the cost rate for each capital component is determined. The overall rate of return is the product of weighting each capital component by its respective capital cost rate. This procedure results in Bureau of Water's overall rate of return being weighted proportionately to the amount of capital and cost of capital of each type of capital.

Q. DOES THE BUREAU OF WATER DIRECTLY RAISE OR ISSUE ITS OWN DEBT CAPITAL?

A. No, the Bureau of Water does not raise its own capital; rather it is essentially a "subsidiary" of the City of DuBois, although not a separate legal entity. Most government entities such as the City of DuBois do not have subsidiaries, rather, they have departments. The Bureau of Water is a department but a separate accounting entity from the City of DuBois, accounted for as an Enterprise Fund. As a department of the City of DuBois, the Bureau

[5]Multiple publications mention these impacts including Research Magazine – April, 2010, Barron's – March 2001, Utility Business – June 2002, and Value Line Investment Survey – April 2013.

of Water has no managerial control over its capital structure and is not able to obtain its equity and debt financing in the open market.

Q. IS THERE A SET OF REGULATORY AND FINANCIAL PRINCIPLES USED IN DECIDING THE APPROPRIATE CAPITAL STRUCTURE TO USE FOR COST OF CAPITAL PURPOSES?

A. Yes. There is a general set of regulatory and financial principles used in deciding the capital structure issue for cost of capital purposes that are consistent with both regulatory and financial theories:

1) It is generally preferable to use a utility's actual capital structure in developing its rate of return. However, in deciding whether a departure from this general preference is warranted in a particular case, it is appropriate to first look to the issue of whether the utility is a financially independent entity. In determining whether a utility is a financially independent entity or self-financing, it is important to look to whether the utility:

- has its own bond rating;
- provides its own debt financing; and
- debt financing is <u>not</u> guaranteed by a parent company.

2) When a utility issues its own debt that is not guaranteed by the public or private parent and has its own bond rating, regulatory and financial principles indicate to use a utility's own capital structure, unless the utility's capital structure is not representative of the utility's risk profile or where use of the actual capital structure would create atypical results. Regulatory and financial principles involve determining whether the actual capital structure is atypical when compared with the

capital structures approved by the Commission for other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility, etc.), as well as those of the proxy utility companies that operate in the same industry.

3) For utility subsidiaries without publicly traded stock, the manner in which the utility obtains its debt financing determines whether it does its own financing. Public Utility Commissions generally determine if a subsidiary has financial, operational, and managerial relationships with its parent entity. However, having such ties typically has not led to use of a parent's capital structure for regulatory purposes, unless the subsidiary utility issues no long-term debt, issues long-term debt only to its parent, or issues long-term debt to outside investors only with the guarantee of its parent.

4) If a utility does not provide its own financing, Public Utility Commissions often look to another entity. Generally, Public Utility Commissions use the actual capital structure of the entity that does the financing for the regulated utility as long as it results in just and reasonable rates. This generally means using a parent company.

5) If the parent's capital structure is used, because it finances the operation of the utility, regulatory and financial principles require adjustments in the utility's allowed rate of return on equity to adjust for risk differences, if any, between the parent and the regulated subsidiary. If, however, the financing entity's capital structure is inconsistent relative to the capital structures of the publicly-traded proxy companies used in the cost of equity analysis and capital structures approved for other utilities that operate in the same industry (*i.e.,* water utility, gas

distribution utility, etc.), Public Utility Commissions employ a hypothetical capital structure.

Once the cost of equity for the proxy companies is determined, thereby establishing a range of reasonable returns, Public Utility Commissions should determine where to set the utility's return in that range based upon how the utility's risk compares with that of other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility, etc.). The risk analysis begins with the assumption that the utility generally falls within a broad range of average risk, absent highly unusual circumstances that indicate an inconsistently high or low risk as compared to other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility, etc.). Generally, financial risk is a function of the amount of debt in an entity's capital structure used for cost of capital purposes. When there is more debt, there is more risk.

Q. WHAT INFORMATION IS SHOWN ON PAGE 1 OF SCHEDULE 2?

A. According to the City of DuBois's most recent balance sheets contained in their 2014 Audited Financial Statements, which are reported on a cash basis and summarized on Page 1 of Schedule 2, the per books capital structure of the City of DuBois consists of 0% long term debt and 100% equity, and the Bureau of Water's capital structure is comprised of 0% long term debt and 100% equity. It should be noted that the City of DuBois and the Bureau of Water's capital structures' shown on page 1 of Schedule 2 are adjusted since restricted net assets have been subtracted from fund equity. Further, as discussed later in my testimony, the City's true cost of debt is not reflected in the Audited Financial Statements due to its use of cash flow accounting.

As stated previously, the City of DuBois provides all the debt financing for the Bureau of Water. Under certain circumstances, it could be appropriate for a municipal water utility to adopt the capital structure of the municipality providing its debt capital. However, the City of DuBois's capital structure is reflective of services other than that of a water utility, and its capital structure contains a larger percentage of equity than is typically employed by a water utility.

Q. WHAT CAPITAL STRUCTURE RATIOS ARE APPROPRIATE TO BE USED TO DEVELOP THE BUREAU OF WATER'S OVERALL RATE OF RETURN?

A. Consistent with settled rate setting principles, I believe it is necessary to evaluate the Bureau of Water's current cost of capital based upon a hypothetical rate making capital structure at December 31, 2016, for a number of reasons. The Bureau of Water's per books capital structure at December 31, 2014, consisting of 0% long term debt and 100% equity, shown on Schedule 2, includes a percentage of equity excessively larger than typical in the water industry. A hypothetical capital structure, at December 31, 2016, consisting of 50% long term debt and 50% equity, represents the current water industry practice. Using an industry standard eliminates the need for warranted, but highly debatable, adjustments required when using an industry to calculate an equity cost rate that is far different than a subject company's ratios. Further, such hypothetical ratios are in line with Standard & Poor's ("S&P") implied ratios based upon published financial benchmarks for a water utility. Moreover, utilizing more conventional industry standard ratios has been used by the Commission in past rate cases involving water utility systems.

Q. HOW DOES THE BUREAU OF WATER'S COMMON EQUITY RATIO CALCULATED FROM A HYPOTHETICAL CAPITAL STRUCTURE COMPARE WITH RATIOS EMPLOYED BY OTHER INVESTOR-OWNED COMPANIES?

A. The Bureau of Water's hypothetical capital structure reflecting a common equity ratio of 50.0% is similar to ratios employed by other investor-owned water companies as shown on page 3 of Schedule 2. A comparison of the Bureau of Water's capital structure ratios to those recently employed and forecasted to be employed by the Comparison Group is shown in Table 2.

Comparison of Capital Structure Ratios

	Estimated 12/31/16	Water Group	
	Bureau of Water	At 3/31/2016	Projected 2020
Debt	50.0	45.6	49.0
Preferred Stock	0.0	0.1	0.0
Common Equity	50.0	54.3	51.0
	100.0	100.0	100.0

Table 2

The Bureau of Water's rate making capital structure ratios are reasonable based upon the above information. In fact, the Bureau of Water's small size justifies the use of more equity capital than the Comparison Group in order to counterbalance some of the risk associated with its size. The size of company is an indicator of risk and is discussed later in my testimony in more detail.

Q. ARE THERE OTHER REASONS TO USE A HYPOTHETICAL CAPITAL STRUCTURE?

A. Yes. One reason that regulatory commissions use hypothetical capital structure ratios is to eliminate the required cost rate adjustments resulting from large differences in financial risk between a comparison group and a subject company. For example, both the City of DuBois and the Bureau of Water's actual reported common equity ratios of 100% and 100%, respectively, contain an excessive percentage of common equity when the industry norm common equity ratio is 50% and would require an estimated risk adjustment based upon published financial studies.[6] These adjustments (*i.e.,* additions or subtractions) would be warranted but can be subjective or controversial. If either the City of DuBois or the Bureau of Water's actual common equity ratios of 100% are used, then a negative risk adjustment should be applied.

EMBEDDED COST RATE

Q. YOU TESTIFIED THAT THE BUREAU OF WATER DOES NOT DIRECTLY RAISE OR ISSUE ITS OWN DEBT CAPITAL. WHAT TYPE OF MUNICIPAL DEBT CAPITAL IS ASSUMED OR RAISED FOR THE BUREAU OF WATER?

A. The City of DuBois issues general obligation municipal bonds and other notes including those financing the Bureau of Water's rate base. The bonds used to fund the construction

[6] Eugene F. Brigham, Louis C. Gapenski, and Dana A. Aberwald, "Capital Structure, Cost of Capital, and Revenue Requirements," Public Utilities Fortnightly, 8 January 1987, pp. 15-24. They found that the average change in common equity cost rate is 12-basis points per percentage point change in common equity ratios between 40% and 50% equity ratios. Further, the change at the upper end of the common equity ratio range, 49% to 50%, was 7-basis points and 15-basis points at the lower end of the common equity ratio range, 41% to 40%. See pages 4 and 5 of Schedule 2 for the development of the estimated risk adjustment based on this published study.

of the water system, are guaranteed by the full faith and credit and taxing authority of the City of DuBois; hence, they are a general obligation of the City of DuBois **only**.

Municipal bonds are roughly divided into two classes: general obligation ("GO") and revenue bonds. The difference between GO and revenue bonds is the specific security that is pledged to repay the debt. GO bonds are secured by the full faith and credit of the issuer, meaning that the borrower is committing to raise taxes or other revenues sufficient to cover the amount owed. By comparison, revenue bonds are backed or secured solely by the income received by the revenue-producing enterprise (*e.g.,* a water system) being financed by the revenue bonds. Therefore, unlike GO bonds, revenue bonds are not backed by the full faith and credit of the issuing entity. All other things being equal, GO bonds are less risky or a more secure investment than revenue bonds since revenue bonds lack the full faith and credit of the issuing entity. This fact is shown in the yield difference of GO bonds which have traded at an average yield of 3.32% during 2016; while revenue bonds traded at an average yield of 3.68% at the same point in time.[7] Accordingly, since the cost of borrowing increases as the risk of nonpayment increases, GO bonds command (*i.e.,* allow the City of DuBois to borrow at) lower interest rates than revenue bonds. Moreover, the City of DuBois's GO bonds are tax-exempt to the investor, lowering their cost of borrowing further, including the portion of the City of DuBois's GO bonds that are allocated to the Bureau of Water. Accordingly, the Bureau of Water's customers benefit from the taxing powers of the City of DuBois securing lower borrowing costs of GO bonds, and also benefit further from the tax-exemption of the interest paid on the City of DuBois's GO bonds, lowering their borrowing costs further.

[7] Based on the Bond Buyers Online reported annual yield for the 20-Bond GO Index and the Revenue Bond Index, http://www.bondbuyer.com/marketstatistics/search_bbi.html?details=true, (6/22/2016).

Q. WHAT EMBEDDED COST RATES DO YOU RECOMMEND BE USED TO CALCULATE THE BUREAU OF WATER'S OVERALL RATE OF RETURN?

A. I recommend using the Bureau of Water's estimated embedded debt cost rate of 3.02% at December 31, 2016. The determination of the embedded debt cost rate is shown on Schedule 3 and the effective cost rate for each individual debt issue is shown on Schedule 4. As stated previously, the 2014 Audited Financial Statements are reported on a cash basis. Under cash accounting, the GO Bonds and Notes attributable to the Bureau of Water did not exist as "cash" on that particular day (*i.e.,* December 31, 2014); rather, the GO Bonds and Notes attributable to the Bureau of Water would only have been reported on the particular day they were issued. The cost of debt shown on Schedule 3 was not based on the 2014 Financial Statements; rather, it is based on an estimate of bonds and notes that would be reported as of December 31, 2016, on an accrual basis.

Q. HOW DID YOU DETERMINE THE BUREAU OF WATER'S EMBEDDED COST RATES?

A. The determination of an embedded cost rate is a relatively simple arithmetic exercise because a company has contracted for this capital for a specific period of time and at a specific cost, including issuance expenses and coupon rate.

The embedded cost rate is determined by employing a cost rate to maturity calculation, using as inputs, the coupon rate, net proceeds ratio, and term in years. Once the cost rate to maturity, or effective cost rate, is determined for each issue, it is weighted according to the amount of capital outstanding for each series to determine the weighted composite cost or the embedded cost.

FINANCIAL ANALYSIS

Q. WHAT IS THE INFORMATION SHOWN ON SCHEDULES 5 AND 6?

A. On page 1 of Schedule 5, I developed a five-year analysis, ending in 2015, detailing various financial ratios for the Water Group. On Schedule 6, I performed a similar analysis for a large broad-based group of utilities known as the S&P Utilities for the five years ending 2015. This information is useful in determining relative risk differences between different types of utilities.

Comparing the Comparable Group and the S&P Utilities' coverage of fixed charges and the various cash flow coverage prove that the Comparable Group have experienced a higher level of coverage than the S&P Utilities.

Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 7?

A. Schedule 7 lists the names, issuer credit ratings, common stock rankings, betas and market values of the companies contained in the Comparable Group and the S&P Utilities. As is evident from the information shown on Table 3, the Comparable Group and the S&P Utilities are similar to each other in risk. The Water Group's average issuer credit ratings and common stock rankings are higher than the S&P Utilities. The average beta of the Comparable Group, 0.71, is similar to the average beta of the S&P Utilities, 0.72. Beta is a measure of volatility or market risk, the higher the beta, the higher the market risk. The market values provide an indication of the relative size of each group. As a generalization, the smaller the average sizes of a group, the greater the risk.

Page 2 of Schedule 7 shows that S&P Utilities have experienced the lowest return on equity ("ROE") when compared to the Comparable Companies. Moreover, Comparable Companies' dividend payout ratio is lower than the S&P Utilities'.

	S&P Issuer Credit Rating	S&P Common Stock Ranking	Value Line Beta	Recent Market Value (Mill $)	Market Quartile Name
Water Group	A	Above Average (A-)	0.71	1,051.468	Low-Cap
S&P Utilities	BBB+	Average (B+)	0.72	21,208.615	Large-Cap

Table 3

Standard & Poor's ("S&P"), the predominant bond rating agency, considers profit to be a fundamental determinant of credit protection. S&P states that a firm's profit level:

> Whether generated by the regulated or deregulated side of the business, profitability is critical for utilities because of the need to fund investment-generating capacity, maintain access to external debt and equity capital, and make acquisitions. Profit potential and stability is a critical determinant of credit protection. A company that generates higher operating margins and returns on capital also has a greater ability to fund growth internally, attract capital externally, and withstand business adversity. Earnings power ultimately attests to the value of the company's assets, as well. In fact, a company's profit performance offers a litmus test of its fundamental health and competitive position.
>
> Accordingly, the conclusions about profitability should confirm the assessment of business risk, including the degree of advantage provided by the regulatory environment.[8]

Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 8?

A. Schedule 8 reveals the capital intensity and capital recovery for the Bureau of Water, the Comparable Companies and the S&P Utilities. Based upon the 2015 capital intensity ratio of plant to revenues, the Bureau of Water ($6.94) is the most capital intensive as compared to the Water Group ($5.68), and S&P Utilities ($3.32). In other words, the Bureau of

[8] Standard & Poor's Ratings Services, *Criteria, Utilities: Key Credit Factors: Business And Financial Risks In The Investor-Owned Utilities Industry*, Nov. 26, 2008, pgs. 8-9.

Water must invest $6.94 in plant to produce a dollar of revenue or about 22% more than the amount of capital required in the Water Group just to produce the same level of revenue. From a purely financial point of view, based on current accounting practices, the rate of capital recovery or depreciation rate is an indication of risk because it represents cash flow and the return of an investment. The Bureau of Water's average rate of capital recovery is lower than the Comparable Group's, suggesting higher risk.

The return on equity and depreciation expense provides the margin for coverage of construction expenditures. For a utility company, depreciation expense is the single largest generator of cash flow. From a financial analyst's point of view, cash flow is the life blood of a utility company. Without it, a utility cannot access capital markets, it cannot construct plant, and therefore, it cannot provide service to its customers. As shown on Schedule 8, Bureau of Water has an inadequate level of cash flow and is clearly higher risk than the Comparable Companies.

RISK ANALYSIS

Q. PLEASE EXPLAIN THE INFORMATION SHOWN ON SCHEDULE 9.

A. Schedule 9 details the large size difference between the Bureau of Water and the Comparable Group. Company size is an indicator of business risk and is summarized in Table 4.

Number of Times Larger Than the Bureau of Water	
	Water Group
Capitalization	157.9x
Revenues	243.0x
Number of Customers	152.9x

Table 4

As shown in Table 4, the Bureau of Water is many times smaller than the Water Group. The size of a company affects risk. A smaller company requires the employment of proportionately less financial leverage (*i.e.,* debt and preferred capital) than a larger company to balance out investment risk. If investment risk is not balanced out, then a higher cost of capital is required.

Q. WHY IS SIZE SIGNIFICANT TO YOUR ANALYSIS?

A. The size of a company can be likened to ships on the ocean, since a large ship has a much better chance of weathering a storm than a small ship. The loss of a large customer will impact a small company much more than a large company because a large customer of a small company usually accounts for a larger percentage of the small company's sales. Moreover, a larger company is likely to have a more diverse geographic operation than a smaller company, which enables it to sustain earnings fluctuations caused by abnormal levels of rainfall in one portion of its service territory. A larger company operating in more than one regulatory jurisdiction enjoys "regulatory diversification" which makes it less susceptible to adverse regulatory developments or eminent domain claims in any single jurisdiction. Further, a larger company with a more diverse customer base is less susceptible to downturns associated with regional economic conditions than a small

company. For example, on average, the average company in the Water Group provides water/sewer service in multiple states for about 668,000 customers. The average population of the communities served by the average company in the Water Group is about 2 million people. These wide ranging operations provide the Water Group substantial geographic, economic, regulatory, weather and customer diversification. The Bureau of Water provides regulated water service to about 4,500 customers and to only about 700 Outside Customers. The concentration of the Bureau of Water's business in west central Pennsylvania makes it very susceptible to any adverse development in local regulatory, economic, demographic, competitive and weather conditions.

Further, S&P, a major credit rating agency, recognizes the importance that diversification and size play in credit ratings. S&P believes some of the critical factors include: regional and cross-border market diversification (mitigates economic, demographic, and political risk concentration); customer diversification; and regulatory regime diversification.[9]

The size of a company can be a barrier to fluid access to capital markets (*i.e.,* liquidity risk). Investors require compensation for the lack of marketability and liquidity of their investments. If no compensation is provided, then investors, or at least sophisticated investors, shy away.

Q. IS THE IMPACT OF SIZE COMMONLY RECOGNIZED?

A. Yes, the National Association of Regulatory Utility Commissioners ("NARUC"), as well as most good financial texts, recognizes that size affects relative business risk. Liquidity risk and the existence of the small firm effect relating to business risk of small firms are

[9] Standard & Poor's, Corporate Ratings Criteria, Utilities: Key Credit Factors: Business And Financial Risks In The Investor-Owned Utilities Industry, Nov. 26, 2008.

well-documented in financial literature.[10] Investors' expectations reflect the highly-publicized existence of the small firm effect. For example, many mutual funds classify their investment strategy as small capitalization in an attempt to profit from the existence of the small firm effect.

As previously discussed, S&P recognizes that size plays a role in credit ratings.

> Standard & Poor's has no minimum size criterion for any given rating level. However, size turns out to be significantly correlated to ratings. The reason: size often provides a measure of diversification, and/or affects competitive position. . . . Small companies are, almost by definition, more concentrated in terms of product, number of customers, or geography. In effect, they lack some elements of diversification that can benefit larger companies. To the extent that markets and regional economies change, a broader scope of business affords protection. This consideration is balanced against the performance and prospects of a given business... In addition, lack of financial flexibility is usually an important negative factor in the case of very small companies. Adverse developments that would simply be a setback for companies with greater resources could spell the end for companies with limited access to funds.[11]

As shown on Schedule 10, size plays a role in the composition of investors, and hence liquidity. In 2015, only 86% of the Water Group's shares traded while the larger companies comprising the S&P Utilities had a much higher trading volume of 184%. Insiders[12] hold more than six times more, as a percent to total, of the Water Group's shares than the S&P Utilities. Currently, only about 54% of the Water Group shares are held by institutions[13] while the larger companies comprising the S&P Utilities had much higher

---

[10] Banz, Rolf, W. "The Relationship Between Return and Market Value of Common Stocks," Journal of Financial Economics, 9:3-18 1981. For subsequent studies see Fama and French, etc.

[11] *Standard & Poor's*, Corporate Ratings Criteria 2006; pg. 22.

[12] An insider is a director or an officer who has a policy-making role or a person who is directly or indirectly the beneficial owner of more than 10% of a certain company's stock.

[13] Institutional holders are those investment managers having a fair market value of equity assets under management of $100 million or more. Certain banks, insurance companies, investment advisers, investment companies, foundations and pension funds are included in this category.

institutional holdings of 76%. Due to small size and less interest by financial institutions, fewer security analysts follow the Comparable Group and none follow the Bureau of Water.

The lack of trading activity may affect the cost of equity estimates for small entities such as the Bureau of Water and the Water Group. When stock prices do not change because of inactive trading activity, estimates of dividend yield for use in a dividend cash flow model and beta estimates for use in the capital asset pricing model are affected. In a stock market that is generally up, the beta estimates for the Comparable Companies are understated due to thin trading.

Q. DO THE BUREAU OF WATER AND THE COMPARABLE COMPANIES HAVE SIMILAR RISKS?

A. Yes. From an operations standpoint, the Bureau of Water and non-municipal utilities have similar risks and are indistinguishable. Both are required to meet Clean Water Acts and Safe Drinking Water Act requirements and are also required to provide safe and reliable services to their customers and comply with Commission regulations. Further, municipal and non-municipal utilities have similar investment risks as is evident by the fact that their bonds are often rated similarly. However, the Bureau of Water is unique when compared with a traditional municipal authority or municipally owned water or sewer utility because the Bureau of Water is not able to increase rates for service at the discretion of municipal officials. Rather, rates for Outside Borough Customers fall under the jurisdiction of the Pennsylvania Public Utility Commission. Accordingly, the Bureau of Water must comply with the same regulatory requirements for increasing rates as non-municipals require. The

Bureau of Water experiences attrition and regulatory lag similar to a non-municipal utility but lacks the benefits that income taxes provide a non-municipal utility, for two reasons. First, deferred income taxes provide non-municipal utilities a cash flow advantage that the Bureau of Water does not enjoy. It is important to recognize that deferred income taxes have been unusually large recently due to the liberal depreciation allowance for income tax purposes afforded by Section 179 expenses and "bonus depreciation" of the tax code. Second, current income taxes included in the revenue requirement provide a margin or cushion against an unanticipated drop in sales or increase in operating expenses. The Bureau of Water does not have this margin of protection. Thus, the Bureau of Water faces much higher risk than non-municipal utilities.

Q. PLEASE EXPLAIN HOW INCOME TAXES INCLUDED IN THE REVENUE REQUIREMENT PROVIDE A MARGIN OR CUSHION AGAINST AN UNANTICIPATED DROP IN SALES OR INCREASE IN OPERATING EXPENSES.

A. Page 1 of Schedule 11 illustrates the Bureau of Water's higher variability in earnings due to the absence of income taxes by reviewing the impact of both including and excluding income taxes in the revenue requirement for the Comparable Group and the Bureau of Water. Page 1 of Schedule 11 proves the Comparable Group and the Bureau of Water earnings are 11% and 12% (11.53%÷10.40%=111%-100%=11% and 11.99%÷10.68%=112%-100%=12%) more volatile, or variable, as a result of income taxes being excluded from their revenue requirement. As shown, the removal of income taxes eliminates the margin or cushion against an unanticipated drop in sales or increase in operating expenses.

Something that is volatile or variable is riskier than something that is more stable. Since current income taxes included in the revenue requirement provide a cushion against an unanticipated drop in sales or increase in operating expenses, their absence increases volatility or variability. The Bureau of Water does **not** have this margin of protection that income taxes provide, and is therefore riskier than the Comparison Companies.

Q. IS THERE ANY SINGLE MEASURE THAT BEST SHOWS INVESTMENT RISK FROM A COMMON STOCKHOLDER'S PERSPECTIVE?

A. No. However, from a creditor's viewpoint, the best measure of investment risk is debt rating. The debt rating process generally provides a good measure of investment risk for common stockholders because the factors considered in the debt rating process are usually relevant factors that a common stock investor would consider in assessing the risk of an investment. Credit rating agencies, such as S&P, assess the risk of an investment into two categories based on: fundamental business analysis; and financial analysis.[14] The business risk analysis includes assessing: Country risk; industry risk; competitive position; and profitability/peer group comparisons. The financial risk analysis includes assessing: accounting; financial governance and policies/risk tolerance; cash flow adequacy; capital structure/asset protection; and liquidity/short-term factors.

Q. WHAT IS THE BOND RATING OF THE BUREAU OF WATER AND THE COMPARABLE GROUP?

A. Page 1 of Schedule 12 shows the average bond/credit rating Comparable Group. The Comparable Group have an A credit profile. The Bureau of Water does not have bonds

[14] *Standard & Poor's*, Corporate Ratings Criteria, General: Criteria Methodology: Business Risk/Financial Risk Matrix Expanded, May 27, 2009.

rated. The City of DuBois purchased bond insurance for their 2011 debt offering to get an AA- insured rating from S&P.[15] It should be noted that the market does not equate an AA- bond rating to an "AA- insured rating" as is evident by the higher yield required on an "AA- insured" bond. The major bond rating/credit rating agencies append modifiers, such as +, - for S&P and 1, 2, and 3 for Moody's Investors Service ("Moody's") to each generic rating classification. For example, an "A" credit profile is comprised of three subsets such as A+, A, A- for S&P or A1, A2 or A3 for Moody's. The modifier of either "+" or "1" indicates that the obligation ranks in the higher end of its generic rating category; the modifier "2" indicates a mid-range ranking; and the modifier of "-" or "3" indicates a ranking in the lower end of that generic rating category.

S&P publishes financial benchmark criteria necessary to obtain a bond rating for different types of utilities. As a generalization, the higher the perceived business risk, the more stringent the financial criteria so the sum of the two, investment risk and bond rating, remains the same.

Q. WHAT ARE SOME FINANCIAL BENCHMARKS APPLIED BY CREDIT RATING AGENCIES FOR RATING PUBLIC UTILITY DEBT?

A. S&P describes their range of financial benchmarks as

> Risk-adjusted ratio guidelines depict the role that financial ratios play in Standard & Poor's rating process, since financial ratios are viewed in the context of a firm's business risk. A company with a stronger competitive position, more favorable business prospects, and more predictable cash flows can afford to undertake added financial risk while maintaining the same credit rating. The guidelines displayed in the matrices make explicit the linkage between financial ratios and levels of business risk.[16]

15The City of DuBois' 2011 debt offering, which had an AA- insured rating from S&P, was redeemed in 2015.

[16]Standard & Poor's Corporate Rating Criteria, 2000.

Q. WHAT OTHER INFORMATION IS SHOWN ON SCHEDULE 12?

A. Page 2 of Schedule 12 summarizes the application of S&P's measures of financial risk for the Comparable Group. S&P's measures of financial risk are broader than the traditional measure of financial risk, leverage. Besides reviewing amounts of leverage employed, S&P also focuses on earnings protection and cash flow adequacy. For a municipal bond, the most important measure of financial risk is debt service and other measures of cash flow adequacy.

Based solely upon the Bureau of Water's size, it is my opinion that the Bureau of Water's debt would be rated lower than the Comparable Groups'. The Bureau of Water's size supports at best a "BBB" credit profile.

At best, the Bureau of Water's credit profile is that of BBB rated companies. Based on their small size, it is highly likely that their credit profile is below BBB (*i.e.,* BB). An analysis of corporate credit ratings, shown on page 4 of Schedule 12, indicates that there is an 92% (100%-0%-0%-5%-3%=92%) chance that the Bureau of Water's credit profile falls below BBB based on their small size alone. As S&P has stated, size is significantly correlated to credit ratings. An analysis of corporate credit ratings found The York Water Company to be the smallest utility with a credit rating. Their credit rating is only A- despite having a capitalization comprised of more than $196 million and a common equity ratio in excess of 56%.

Q. WHAT DEBT SERVICE COVERAGE HAVE THE COMPARABLE COMPANIES EXPERIENCED?

A. As shown on page 1 of Schedule 13, the Comparable Group has an average debt service coverage of 2.8 times and the average has ranged from 2.4 times to 3.3 times. In order to

compete with the Comparable Group' for capital, in the future, it will be necessary for the Bureau of Water to achieve higher returns on equity, and increased cash flow just to maintain a similar credit quality.

S&P has stated:

> ... low authorized returns may affect the industry's ability to attract necessary capital to develop new water supplies and upgrade the quality of existing supplies . . . Traditional ratemaking policy has not provided sufficient credit support during the construction cycle of the electric industry over the past 15 years. To avoid a repeat in the water industry, regulators must be aware of the increased challenges the industry faces.[17] (Emphasis added)

Investors will not provide the equity capital necessary for increasing the amount of common equity in a capital structure unless the regulatory authority allows an adequate rate of return on the equity.[18]

Q. WHAT INFORMATION IS SHOWN ON PAGE 2 OF SCHEDULE 13?

A. Page 2 of Schedule 13 summarizes the finding of a recent report from Fitch Ratings concerning debt service coverage levels for the typical municipal water and sewer utility.[19] The recent 2011 Fitch report compiled data for 162 public water and sewer bond issuers and found that the median A rated government utility had a minimum (covenanted) debt service coverage of 1.5 times, and an average debt service coverage level of 1.8 times. The 2007 Fitch report compiled data for 153 public water and sewer bond issuers and found that the median A rated government utility had a minimum (covenanted) debt service coverage of 1.5 times, and an average debt service coverage level of 2.1 times.

---

[17] Standard & Poor's CreditWeek, May 25, 1992.

[18] National Association of Regulatory Utility Commissioners, loc. cit.

[19] Fitch, Inc., Fitch Ratings Ltd. "2011 Water and Wastewater Medians," Nov. 18, 2011, and "2007 Median Ratios for Water and Sewer Revenue Bonds - Retail Systems," Jan. 17, 2007.

Q. WHAT INFORMATION IS SHOWN ON PAGE 3 OF SCHEDULE 13?

A. Page 3 of Schedule 13 shows the debt service coverage levels for Pennsylvania Municipal Authorities reported for the years 2010 to 2015. The information shown reflects debt service for about 850 Pennsylvania Municipal Authorities in each year, including 500 sewer and 260 water municipal authorities. Most of the Pennsylvania Municipal Authorities included in page 3 of Schedule 13 are not regulated by the PUC. The median debt service coverage (*i.e.,* 50th percentile) on page 3 of Schedule 13 over the period 2010 to 2015 ranged from: 4.6x to 4.7x for all Pennsylvania Municipal Authorities; 5.4x to 5.7x for all water municipal authorities, and 4.4x for all sewer municipal authorities. Based upon the information shown, absent rate regulation, Pennsylvania Municipal Authorities have rates that produced median debt service coverage of 4.6x to 4.7x (*i.e.,* both 2010-14 and 2011-15 averages for All Municipal Authorities at 50th percentile on page 3 of Schedule 13).

Q. WHAT DEBT SERVICE COVERAGE LEVEL HAS THE BUREAU OF WATER EXPERIENCED?

A. For a municipal utility, the revenue requirement should include the potential impact of a revenue bond financing, which requires revenue sufficient to achieve debt service coverage. Page 4 of Schedule 13 shows that the Bureau of Water revenues in 2013 through 2015 only provided debt service coverage of 0.4 times to 2.8 times, or below the 1.8 to 2.1 times average debt service coverage level achieved by A rated government utilities shown in the Fitch reports (page 2 of Schedule 13), and also far below the 5.4 times to 5.7 times median for all Pennsylvania water municipal authorities (page 3 of Schedule 13).

Q. WHAT INFORMATION IS SHOWN ON PAGE 5 OF SCHEDULE 13?

A. On page 5 of Schedule 13, I show a comparison between the Bureau of Water and the Water Group of various measures of cash flow adequacy, including debt service coverage, for the period 2013 through 2015. This information is useful in determining relative risk differences between the Bureau of Water and the Water Group. Comparing the Bureau of Water and the Water Group's measures of cash flow adequacy prove that the Water Group has experienced a much higher level of cash flow adequacy than the Bureau of Water; verifying that the Bureau of Water is a much higher investment risk than the Water Group.

Q. WHAT DO YOU CONCLUDE FROM THE VARIOUS MEASURES OF INVESTMENT RISK INFORMATION YOU HAVE TESTIFIED TO?

A. A summary of my conclusions regarding the risk analyses discussed previously is shown in Table 5. Overall, the information summarized in Table 5 proves that the Bureau of Water is a greater investment risk than the Water Group.

1

Summary of Risk Analyses		
	City of DuBois - Bureau of Water	Water Group Followed by Analysts
1. Business Risk:		
2. Country Risk	Similar Level	
3. Industry Risk	Similar Level	
4. Competitive Position	Similar Level	
5. Profitability/Peer Group Comparisons	Higher Level	
6. Capitalization Ratios & Financial Risk (Leverage)*	Similar Level	
7. Debt Cost Rate		Higher Level
8. Relative Size:		
9. Regulatory Diversification	Higher Level	
10. Economic Diversification	Higher Level	
11. Demographic Diversification	Higher Level	
12. Diversification of Weather Conditions	Higher Level	
13. Capital Intensity	Higher Level	
14. Capital Recovery	Higher Level	
15. Lower Liquidity:		
16. Institutional Holdings	Higher Level	
17. Insider Holdings	Higher Level	
18. Percentage of Shares Traded	Higher Level	
19. Required To Meet Clean Water Acts and Safe Drinking Water Act	Similar Level	
20. Same Regulatory Requirements For Increasing Rates As Non-Municipals	Similar Level	
21. Experiences Regulatory Lag and Attrition Similar To A Non-Municipal Utility	Similar Level	
22. Lacks The Benefits That Income Taxes Provide in the Revenue Requirement	Higher Level	
23. Deferred Income Taxes Provide Non-Municipal Utilities A Cash Flow Advantage	Higher Level	
24. Current Income Taxes Included In The Revenue Requirement Provide A Margin Or Cushion Against An Unanticipated Drop In Sales Or Increase In Operating Expenses	Higher Level	
25. Comparison of Variability Due to Income Taxes	Higher Level	
26. Does Not Issue, And Possibly Can Not Issue Bonds Due To Their Size, Bonds To Finance Their Rate Base Additions.	Higher Level	
27. Debt Service Coverage	Higher Level	
28. Credit Market Financial Risk Metrics	Higher Level	
29. Cash Flow Adequacy	Higher Level	
30. Credit Rating	Higher Level	

* - Based on recommended capital structure for rate making purposes.
Comment: The terms "Similar Level " indicates same amount of risk and the terms "Higher Level " indicates greater risk.

2
3

Table 5

Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 14?

A. Schedule 14 reviews long-term and short-term interest rate trends. Long-term and short-term interest rate trends are reviewed to ascertain the "sub-flooring" or "basement" upon which the Comparable Companies' common equity market capitalization rate is built. Based upon the settled yields implied in the Treasury Bond future contracts and the long-term and recent trends in spreads between long-term government bonds and A-rated public utility bonds available to me at the time Schedule 14 was prepared, I conclude that the market believes that if the Comparable Companies issued new long-term bonds prospectively, they would be priced to yield about 4.3% based upon a credit profile of "A." Further, it is reasonable to conclude the market anticipates that long-term government bonds will be priced to yield about 2.7%, prospectively. It should be noted that the aforementioned long-term capital yields are not adjusted for the 2008 capital market meltdown.

I believe the overall risk of the market has increased since 2008 as a result of the Federal Reserve's attempt to artificially suppress interest rates through expansionary money policies throughout the ongoing financial crisis and market turmoil.

Since October 2008, the Federal Reserve has been monetizing US Treasury debt. The Federal Reserve, with effectively unlimited money at its disposal, intervenes at any time it wishes, in whatever volume it wishes, to make sure that Treasury bond and bill prices and yields are exactly what the Federal Reserve wants them to be. The US Treasury bond market, and mortgage market, has become an artificial market with no connection to objective risk and interest rates.

In August 2011, the Federal Reserve began "Operation Twist." Under "Operation Twist," the Federal Reserve began buying $400 billion of long-dated or long-term US Treasury debt, financed by selling short-term US Treasury debt with three years to go or less. The goal of "Operation Twist" is to try to drive long-term rates lower, which the Federal Reserve thinks will help the mortgage market. Further, not only has the Federal Reserve been buying long-term US Treasury debt to reduce interest rates, their member banks have been borrowing at 0% or near 0% and using those proceeds to buy long-term US Treasury debt. This entire process has created an artificial demand for the US Treasury debt themselves, and easily drives interest rates artificially lower and deceives investors into believing US Treasury debt are safe with wide demand. In fact, the long-term Treasury Bonds yield has been below the prevailing Price Inflation rate at numerous times since 2011. This fact has resulted in the entire capital system suffering from the Federal Reserve's grand distortion.

> In the real world of economics, the borrower pays an interest rate to a lender, who makes money (interest) by taking on the risk of lending and deferring gratification. The lender is willing to not spend his money now. In a free market economy, interest rates are essentially a price put on money, and they reflect the time preference of people. Higher interest rates reflect a high demand for borrowing and lower savings. But the higher rates automatically correct this situation by encouraging savings and discouraging borrowing. Lower interest rates will work the opposite way. When the government/central bank tampers with interest rates, savings and lending are distorted, and resources are misallocated. This is evident in looking back on the housing bubble. The artificially low interest rates signaled that there was a high amount of savings. But it was a false signal. There was also a signal for people to borrow more. Again, it was a false signal. As these false signals were revealed, the housing boom turned into a bust.[20]

20 Pike, Geoffrey "The Threat of Negative Interest Rates," Wealth Daily, May 30, 2014, http://www.wealthdaily.com/articles/the-threat-of-negative-interest-rates/5185, (6/03/2014)

Since October 2008, the capital markets have been rather chaotic. I believe the market turmoil is possibly the worst since the 1929 Great Depression, because there have been numerous bankruptcies in the financial sector, extreme volatility in equity valuations, and an overall unsteadiness in the economy, both domestic and foreign, during the last seven years.

MARKET TURMOIL

Q. WHAT DID YOU MEAN WHEN YOU REFERRED TO THE 2008 MARKET MELTDOWN?

A. Since late 2008, the financial markets have experienced extraordinary chaos. With hindsight, it is apparent the credit markets began to slowly tighten up at the end of 2007. Since 2007, many significant and extraordinary events occurred including:

- The collapse of The Bear Stearns Companies, a major investment bank, and its acquisition by JPMorgan Chase & Co., with the aid of the Federal Reserve Bank of New York;
- The third-largest banking failure, IndyMac, in U.S. history, after a "run on the bank" by depositors;
- The placement of the government-sponsored enterprises, or GSE, of Fannie Mae and Freddie Mac into conservatorship by the Federal Housing Finance Agency;
- The bankruptcy of Lehman Brothers Holding, Inc., the largest bankruptcy filing in history;
- The acquisition of the banking operations of Washington Mutual, the largest U.S. savings bank, by JPMorgan Chase;
- The rescue of Merrill Lynch & Co. by Bank of America, Inc., with assistance of the Federal government;
- The effective nationalization of the world's largest insurance company, American International Group, through the acquisition of its equity by the U.S. Treasury;
- The effective nationalization of General Motors and Chrysler by the U.S. Treasury; and
- Other international coordinated actions affecting financial markets throughout the world.

When there is a crisis in the markets, such as a financial meltdown, market participants usually sell off and move their money to a safer place; fleeing from illiquid, low quality investments to liquid, high quality investments. This flight to quality reflects a collapse of confidence in the financial system and is most evident in short-term interest rates. It appears that the combined efforts of the Treasury and the Federal Reserve stabilized the capital markets, although volatility is still high. Prospectively the capital markets will be affected by the upcoming unprecedented large Treasury financings. Additionally, extremely high debt levels in Greece, Spain, Portugal and some other European countries could trigger a wave of national defaults, undermining credit markets revival. The results of the upcoming unprecedented large Treasury financings, and sovereign debt defaults will impact the Bureau of Water's cost of capital. Investors provide capital based upon risk and return opportunities. Investors will not provide common equity capital when higher risk-adjusted returns are available.

COMMON EQUITY COST RATE ESTIMATE

Q. WHAT IS THE BEST METHOD OF ESTIMATING COMMON EQUITY COST RATES?

A. There is no single method (model) suitable for estimating the cost rate for common equity. While a single investor may rely solely upon one model in evaluating investment opportunities, other investors rely on different models. Most sophisticated investors who use an equity valuation model rely on many models in evaluating their common equity investment alternatives. Therefore, the average price of an equity security reflects the results of the application of many equity models used by investors in determining their investment decisions.

The application of any single model to estimate common equity cost rates is not appropriate because the security price for which the equity cost rate is being estimated reflects the application of many models used in the valuation of the investment. That is, the price of any security reflects the collective application of many models. Accordingly, if only one model is used to estimate common equity cost rates, that cost rate will most likely be different from the collective market's cost rates because the collective valuation in the market reflects more than one method.

Noted financial texts, investor organizations and professional societies all endorse the use of more than one valuation method. "We endorse the dividend discount model, particularly when used for establishing companies with consistent earnings power and when used along with other valuation models. It is our view that, in any case, an investor should employ more than one model."[21] (Emphasis added).

The American Association of Individual Investors state, "No one area of investment is suitable for all investors and no single method of evaluating investment opportunities has been proven successful all of the time."[22]

In their study guide, the National Society of Rate of Return Analysts state, "No cost of equity model or other concept is recommended or emphasized, nor is any procedure for employing any model recommended… it remains important to recognize that alternative methods exist and have merit in cost of capital estimation. To this end, analysts should be knowledgeable of a broad spectrum of cost of capital techniques and issues."[23]

---

[21]Sidney Cottle, Roger F. Murray and Frank E. Block, Graham and Dodd's Securities Analysis 5th Edition, McGraw-Hill, Inc., 1988, p. 568.

[22]Editorial Policy, AAII Journal, American Association of Individual Investors, Volume 18, No. 1, January 1996, p. 1.

[23]David C. Parcell, The Cost of Capital - A Practitioners Guide, National Society of Rate of Return Analysts, 1995 Edition.

Several different models should be employed to measure accurately the market-required cost of equity reflected in the price of stock. Therefore, I used three recognized methods including the DCF shown on Schedule 15, the CAPM shown on Schedule 20, and the RP shown on Schedule 21.

DISCOUNTED CASH FLOW

Q. PLEASE EXPLAIN THE DISCOUNTED CASH FLOW MODEL.

A. The DCF, is based upon the assumption that the price of a share of stock is equal to a future stream of cash flows to which the holder is entitled. The stream of cash flows is discounted at the investor-required cost rate (cost of capital).

Although the traditional DCF assumes a stream of cash flow into perpetuity, a termination, or sale price can be calculated at any point in time. Therefore, the return rate to the stockholder consists of cash flow (earnings or dividends) received and the change in the price of a share of stock. The cost of equity is defined as:

> …the minimum rate of return that must be earned on equity finance and investments to keep the value of existing common equity unchanged. This return rate is the rate of return that investors expect to receive on the Company's common stock… the dividend yield plus the capital gains yield… .[24] (Emphasis added).

Q. PLEASE EXPLAIN HOW YOU CALCULATED YOUR DIVIDEND YIELD IN THE DCF SHOWN ON SCHEDULE 15.

A. As shown on page 1 of Schedule 15, I used the average dividend yield of 2.5% for the Water Group. The individual dividend yields are shown on page 2 of Schedule 15 and are based upon the most recent months' yield, May 2016, and the twelve-month average yield,

[24] J. Fred Weston and Eugene F. Brigham, Essentials of Managerial Finance, 3rd ed. (The Dryden Press), 1974, p. 504.

ending May 2016. The second input to a market DCF calculation is the determination of an appropriate share price growth rate.

Q. WHAT SOURCES OF GROWTH RATES DID YOU REVIEW?

A. I reviewed both historical and projected growth rates. Schedule 16 shows the array of projected growth rates for the Comparable Companies that are published. Specific historical growth rates are not shown because I believe the meaningful historical growth rates are already considered when analysts arrive at their projected growth rates. Nonetheless, some investors may still rely on historical growth rates.

Q. PLEASE EXPLAIN THE SOURCES OF THE PROJECTED GROWTH RATES SHOWN ON SCHEDULE 16.

A. I relied upon four sources for projected growth rates, First Call, Reuters, Zacks Investment Research and Value Line.[25]

Q. DID YOU REVIEW ANY OTHER GROWTH RATES BESIDES THOSE SHOWN ON SCHEDULE 16?

A. Yes. I reviewed EPS growth rates reflecting changes in return rates on book common equity (ROE) over time. I summarized recent ROEs on page 1 of Schedule 17, and compared those to the Water Group's higher levels projected to be achieved by Value Line, as shown on page 2 of Schedule 17. ROEs increase when EPS grows at much higher/faster rates than book value.

I also reviewed industry specific average projected growth rates that are published by First Call and Zacks for the industries in which the Comparable Companies operate. According

[25]With the exception of Value Line, the earnings growth rate projections are consensus estimates five-year EPS estimates. These consensus estimates are compiled from more than 1,700 financial analysts and brokerage firms nationwide. It should be noted that none of the consensus forecasts provides projected DPS estimates. Value Line publishes projected Cash flow, EPS and DPS five-year growth projections as well.

to Zacks and First Call, the Water Group's industry is projected to have EPS growth rates that average 6.0% to 8.7% over the next five years. According to First Call, the Water Group's sector is projected to have EPS growth rates that average 11.5% over the next five years.

Q. WHAT DO YOU CONCLUDE FROM THE GROWTH RATES YOU HAVE REVIEWED?

A. Table 6 summarizes some of the various growth rates reviewed.

Summary of Growth Rates

	Water Group
Projected 5 Year Growth in EPS	6.0
Projected 5 Year Growth in EPS, DPS & Cash Flow	5.9
Projected 5 Year Growth in EPS for the industry	7.4
Projected 5 Year Growth in EPS for utility sector	11.5

Table 6

Academic studies suggest that growth rate conclusions should be tested for reasonableness against long-term interest rate levels. Further, the minimum growth rate must at least exceed expected inflation levels. Otherwise, investors would experience decreases in the purchasing power of their investment. Finally, the combined result of adding the growth rate to the market value dividend yield must provide a sufficient margin over yields of public utility debt.

Q. WHAT METHOD DID YOU USE TO ARRIVE AT YOUR GROWTH RATE CONCLUSION?

A. No single method is necessarily the correct method of estimating share value growth. It is reasonable to assume that investors anticipate that the Water Group's current ROE will

expand to higher levels. Further, I am aware the PUC has recently been giving weight to historical earnings growth rates. The published historical earnings growth rates for the Water Group averages 10.9%. Because there is not necessarily any single means of estimating share value growth, I considered all of this information in determining a growth rate conclusion for the Comparable Companies.

Moreover, while some rate of return practitioners would advocate that mathematical precision should be followed when selecting a growth rate; the fact is that investors do not behave in the same manner when establishing the market price for a stock. Rather, investors consider both company-specific variables and overall market sentiment such as inflation rates, interest rates and economic conditions when formulating their capital gains expectations. This is especially true when one considers the relatively meaningless negative growth rates. That is, use of a negative growth rate in a DCF implies that investors invest with the expectation of losing money.

The range of growth rates previously summarized supports the reasonableness of an expected 6.7% growth rate for the Water Group based primarily on the projected five-year growth rates and the Water Group's industry projected EPS growth rates of 7.4%. Like the projected growth rates, these investor-expected growth rate of 6.7% is based on a survey of projected and historical growth rates published by established entities, including First Call, Reuters, Zacks Investment Research and Value Line. Use of information from these unbiased professional organizations provides an objective estimation of investor's expectations of growth. Based on the aforesaid, all growth rates for the Comparison Companies have been considered and have been given weight in determining a 6.7% growth rate for the Water Group.

Q. WHAT IS YOUR MARKET VALUE DCF ESTIMATE FOR THE COMPARABLE COMPANIES?

A. The market value DCF cost rate estimate for the Water Group is 9.3%, as detailed on page 1 of Schedule 15.

Q. ARE THERE OTHER CONSIDERATIONS THAT SHOULD BE TAKEN INTO ACCOUNT IN REVIEWING A MARKET VALUE CAPITALIZATION DCF COST RATE ESTIMATE?

A. Yes. It should be noted that although I recommend specific dividend yields for the Comparable Group, I recommend that less weight be given to the resultant market value DCF cost rate due to the market's current market capitalization ratios and the impact that the market-to-book ratio has on the DCF results. The Comparable Companies' current market-to-book ratios of 266% and low dividend yields are being affected by short-term acquisition frenzy and worldwide market sentiment, not DCF fundamentals.

Although the DCF cost for common equity appears to be based upon mathematical precision, the derived result does not reflect the reality of the marketplace since the model proceeds from unconnected assumptions. The traditional DCF derived cost rate for common equity will continuously understate or overstate investors' return requirements as long as stock prices continually sell above or below book value. A traditional DCF model implicitly assumes that stock price will be driven to book value over time. However, such a proposition is not rational when viewed in the context of an investor purchasing stock above book value. It is not rational to assume that an investor would expect share price to decrease 62% (100%÷266%=38%-100%=62%) in value to equal book value.

Utility stocks do not trade in a vacuum. Utility stock prices, whether they are above or below book value, reflect worldwide market sentiment and are not reflective of only one element.

Q. WHAT DO YOU MEAN BY YOUR STATEMENT THAT UTILITY STOCKS ARE NOT TRADED IN A VACUUM?

A. Utility stocks cannot be viewed solely by themselves. They must be viewed in the context of the market environment. Table 7 summarizes recent market-to-book ratios ("M/B") for well-known measures of market value reported in the June 20, 2016 issue of Barron's and the Water Group average M/B as shown on page 1 of Schedule 17.

	M/B Ratios(%)
Dow Jones Industrials	323
Dow Jones Transportation	348
Dow Jones Utilities	209
S&P 500	285
S&P Industrials	376
Vs.	
Water Group	266

Table 7

Utility stock investors view their investment decisions compared with other investment alternatives, including those of the various market measures shown in Table 7.

Q. HOW DOES A TRADITIONAL DCF IMPLICITLY ASSUME THAT MARKET PRICE WILL EQUAL BOOK VALUE?

A. Under traditional DCF theory, price will equal book value (M/B=1.00) only when a company is earning its cost of capital. Traditional DCF theory maintains that a company is under-earning its cost of capital when the market price is below book value (M/B<1.00),

while a company over-earning its cost of capital will have a market price above its book value (M/B>1.00). If this were true, it would imply that the capitalistic free-market is not efficient because the overwhelming majority of stocks would currently be earning more than their cost of capital. Table 7 shows that most stocks sell at an M/B that is greater than 1.0.

Q. PLEASE EXPLAIN WHY SUCH A PHENOMENON WOULD SHOW THAT THE CAPITALISTIC FREE-MARKET IS NOT EFFICIENT.

A. Historically, the S&P Industrials, which represented approximately 400 companies, have sold at an M/B as low as 1.0 only one time out of the past 53 years (period 1947-1999). Based upon the traditional DCF assumption, which suggests that companies with M/Bs greater than 1.0 earn more than their cost of capital, this data would suggest that the S&P Industrial companies have earned more than their cost of capital while competing in a competitive environment over the past 53 years. In a competitive market, new companies would continually enter the market up to the point that the earnings rate was at least equal to their cost of capital.

During this period the S&P Industrials sold at an average M/B of 223.7% while experiencing a ROE of 15.7% over a period in which interest rates averaged 7.2%. It is important to note that the average ROE of 14.7% is relative to a common equity ratio of more than 60% for the S&P Industrials over many years.

Q. WHAT IS THE SIGNIFICANCE OF INDUSTRIAL COMPANIES' M/B AND THE COST OF CAPITAL FOR A WATER UTILITY?

A. As stated previously, utility stocks do not trade in a vacuum. They must compete for capital with other firms including industrial stocks. Over time, there has been a

relationship between M/Bs of industrial stocks and utility stocks. Although industrial stocks have sold at a higher multiple of book value than utility stocks, both have tracked in similar directions. Because utility 'and industrial stock' prices relative to book values' move in similar directions, it is irrational to conclude that stock prices that are different from book value, either higher or lower, suggests that a firm is over-or under-earning its cost of capital when competitive free-markets exist.

Q. DOES THE MARKET VALUE DCF PROVIDE A REASONABLE ESTIMATE OF THE WATER GROUP'S COMMON EQUITY COST RATE?

A. No, the DCF only provides a reasonable estimate of the Comparable Group's common equity cost rate when their market price and book value are similar (M/B=100%).[26] A DCF will overstate a common equity cost rate when M/Bs are below 100% and understate when they are above 100%. Since the Comparable Group's current M/Bs average 215%, the DCF understates their common equity cost rate. Schedule 18 provides a numerical illustration of the impact of M/Bs on investors' market returns and DCF returns. The reason that DCF understates or overstates investors' return requirements depending upon M/B levels is because a DCF-derived equity cost rate is applied to a book value rate base while investors' returns are measured relative to stock price levels. Based upon this, I recommend that less weight be given to the market value DCF cost rate unless the increased financial risk, resulting from applying a market value cost rate to a book value, is accounted for.

[26]Roger A Morin, Regulatory Finance - Utilities' Cost of Capital, Public Utility Reports, Inc., 1994, pp. 236-237.

Q. HOW DO YOU RESOLVE THE FINANCIAL RISK DIFFERENCE BETWEEN MARKET VALUE COST RATES AND BOOK VALUE COST RATES?

A. The basic proposition of financial theory regarding the economic value of a company is based on market value. That is, a company's value is based on its market value weighted average cost of capital.[27] Accordingly, the market value derived cost rate reflects the financial risk or leverage associated with capitalization ratios based on market value, not book value. As shown on page 1 of Schedule 19, for the Water Group there is a large difference in leverage as a result of the average $1,109 million difference in market value common equity and book value common equity. This difference in market values and book values results in debt/equity ratios based on market value of 25%/75% (debt/equity) verses 46%/54% (debt/equity) based on book value as shown on page 1 of Schedule 19. Differences in the amount of leverage employed can be quantified based upon the Comparable Group's leveraged beta being "unleveraged" through the application of the "Hamada Formula." The details of the model are shown on page 2 of Schedule 19. For example, the inputs to the formula for the Water Group market value capitalization consist of their leveraged beta of 0.71, debt ratio of 24.6%, preferred stock ratio of 0.1%, common equity ratio of 75.3% and combined tax rate of 39.80%. The group's unleveraged beta is determined to be .55 through the use of the following Hamada formula:

[27]Shannon P. Pratt, Cost of Capital, John Wiley & Sons, Inc., 1998, pp. 45-46.

$$Bl = Bu\ (1 + (1 - t)\ D/E + P/E)$$

where:

Bl = observed, leveraged beta

Bu = calculated, unleveraged beta

t = income tax rate

D = debt ratio

P = preferred stock ratio

E = common equity ratio

Applying the unleveraged beta of 0.59 along with the Water Group's book value capitalization ratios of 45.6% long-term debt, 0.1% preferred stock and 54.3% common equity and combined tax rate of 39.80% results in a leveraged beta of .84 applicable to the group's book value capitalization. Based upon the Water Group's risk premium of 6.0% and the difference between Water Group's market value leveraged beta, their book value leveraged beta of 0.18 (0.89 - 0.71) indicates that the Water Group's common equity cost rate must be increased by 1.08 (0.18 x 6.0 = 1.08) in recognition of their book value's exposure to more financial risk.

Q. IS THERE ANOTHER WAY TO REFLECT THE FINANCIAL RISK DIFFERENCE THAT EXISTS AS A RESULT OF MARKET CAPITALIZATION RATIOS BEING SIGNIFICANTLY DIFFERENT FROM BOOK VALUE CAPITALIZATION RATIOS?

A. Yes, generally speaking. Although it is possible to know the direction of a financial risk adjustment on common equity cost rate, a specific quantification of financial risk differences is very difficult. Although the end result of a financial risk adjustment is very subjective and specific quantification very difficult, the direction of the adjustment is

clearly known. However, if the Comparable Group's debt were rated based on market value debt ratios they would command an Aaa rating. The Comparison Group currently has bonds rated A based upon their book value debt ratios. The yield spread on a bond rated Aaa versus A rated bonds averages 30 basis points or 0.30% as shown on page 3 of Schedule 19.

The end result of the application of the Hamada Model and the bond yield spread indicates that the Water Group market value common equity cost rate equity cost rate should be adjusted upward by at least 0.70% (1.08% hamada est. + 0.3% yield spread = 1.38% ÷ 2 = 0.70%) since it is going to be applied to a book value.

Accounting for the increased amount of leverage between market value derived DCF cost rates and book value cost rates indicates a book value DCF cost rate of 10.0% for the Water Group (9.3% + 0.70% = 10.0%).

CAPITAL ASSET PRICING MODEL

Q. PLEASE BRIEFLY DESCRIBE THE THEORY OF THE CAPITAL ASSET PRICING MODEL.

A. The CAPM is based upon the assumption that investors hold diversified portfolios and that the market only recognizes or rewards non-diversifiable (or systematic) risk when determining the price of a security because company-specific risk (or non-systematic) is removed through diversification. Further, investors are assumed to require additional or higher returns for assuming additional or higher risk. This assumption is captured by using a beta that provides an incremental cost of additional risk above the base risk-free rate available to investors. The beta of a security reflects the market risk or systematic risk of the security relative to the market. The beta for the market is always equal to 1.00;

therefore, a company whose stock has a beta greater than 1.00 is considered riskier than the market, and a company with a beta less than 1.00 is considered less risky than the market. The base risk-free rate is assumed to be a U.S. Government treasury security because they are assumed to be free of default risk.

Q. WHAT RISK-FREE RATE AND BETA HAVE YOU USED IN YOUR CAPM CALCULATION?

A. The risk-free rate used in CAPM should have approximately the same maturity as the life of the asset for which the cost rate is being determined. Because utility assets are long-lived, a long-term Treasury Bond yield serves as an appropriate proxy. Previously, I estimated an appropriate risk-free rate of 2.7% based upon the recent and forward long-term Treasury yields. I used the average beta of 0.71 for the Water Group as shown on page 1 of Schedule 20. However, as stated previously, the Comparable Group's betas are understated due to their small size' which affects their stock price changes.

Q. AFTER DEVELOPING AN APPROPRIATE BETA AND RISK-FREE RATE, WHAT ELSE IS NECESSARY TO CALCULATE A CAPM DERIVED COST RATE?

A. A market premium is necessary to determine a traditional CAPM derived cost rate. The market return rate is the return expected for the entire market. The market premium is then multiplied by the company specific beta to capture the incremental cost of additional risk (market premium) above the base risk-free rate (long-term treasury securities) to develop a risk adjusted market premium. For example, if you conclude that the expected return on the market as a whole is 15% and further assume that the risk-free rate is 8%, then the market premium is shown to be 7% (15% - 8% = 7%).

Further, assume there are two companies, one of which is considered less risky than the market, and therefore has a beta of less than 1.00 or 0.80. The second company has a beta that is greater than 1.00 or 1.20, and is therefore considered riskier than the market. By multiplying the hypothetical 7.0% market premium by the respective betas of 0.80 and 1.20, risk adjusted market premiums of 5.6% (7.0% x 0.80) and 8.4% (7.0% x 1.20) are shown for the company considered less risky than the market and for the company considered more risky than the market, respectively.

Adding the assumed risk-free rate of 8% to the risk adjusted market premiums results in the CAPM derived cost rates of 13.6% (5.6% + 8.0%) for the less risky company and 16.4% (8.4% + 8.0%) for the company considered of greater risk than the market. In fact, the result of this hypothetical CAPM calculation shows that: (1) the least risky company, with the beta of 0.80, has a cost rate of 13.6%; (2) the market, with the beta of 1.00, has a cost rate of 15.0%; and (3) that the higher risk company, with a beta of 1.20, has a cost rate of 16.4%.

Q. HOW DID YOU DEVELOP A MARKET PREMIUM FOR YOUR CAPM?

A. The average projected market premium of 9.9% is developed on page 2 of Schedule 20. It is based upon Value Line's average projected total market return for the next three to five years of 12.6% less the risk free rate of 2.7%. I also reviewed market premiums derived from Ibbotson Associates' most recent publication concerning asset returns that show a market premium of 7.0%. The comparison shows that the Ibbotson Associates' market premium may be on the low side reflective of the higher interest rate environment found during their study (*i.e.,* 5.1%). Equally, the Value Line market premium reflects current

interest rate levels while the Ibbotson Associates' market premiums reflect a higher interest rate environment.

Q. HOW DID YOU ADJUST FOR THE IMPACT THAT SIZE HAS ON THE COMPARABLE GROUP'S BETA?

A. The adjustment is reflected in the CAPM size premium. The CAPM size premium is developed on page 4 of Schedule 20. The size premium reflects the risks associated with the Comparable Group's small size and its impact on the determination of their beta. This adjustment is necessary because beta (systematic risk) does not capture or reflect the Comparable Group's small size. I reduced the size premium by the ratio of the Comparison Group's beta to their respective market quartile's beta.

Q. WHAT IS THE COMPARISON GROUP'S MARKET COST OF EQUITY BASED UPON YOUR CAPM CALCULATION?

A. The CAPM based on Ibbotson Associates' historical market returns shows a market cost rate of 8.8% for the Water Group. The CAPM based on Value Line's projected market returns shows a 10.8% for the Water Group, as shown on page 1 of Schedule 20. The historical market returns has been impacted a higher interest rate environment. Accordingly, the Comparable Group's average market value CAPM of 10.3% is based 25% on the results of the historical market returns and 75% on the projected market returns. Adjusting the market value CAPM based upon the end result of the application of the Hamada Model and the bond yield spread to account for the difference in leverage between market value capitalization ratios and book value ratios discussed previously indicates a cost rate of 11.0% for the Water Group applicable to book value (10.3% + 0.7% = 11.0%).

RISK PREMIUM

Q. WHAT IS A RISK PREMIUM?

A. A risk premium is the common equity investors' required premium over the long-term debt cost rate for the same company, in recognition of the added risk to which the common stockholder is exposed versus long-term debtholders. Long-term debtholders have a stated contract concerning the receipt of dividend and principal repayment whereas common stock investors do not. Further, long-term debtholders have the first claim on assets in case of bankruptcy. A risk premium recognizes the higher risk to which a common stock investor is exposed. The risk premium-derived cost rate for common equity is the simplest form of deriving the cost rate for common equity because it is nothing more than a premium above the prospective level of long-term corporate debt.

Q. WHAT IS THE APPROPRIATE ESTIMATED FUTURE LONG-TERM BORROWING RATE FOR THE COMPARABLE COMPANIES?

A. The estimated future long-term borrowing rate for the Comparable Companies is 4.3% based upon their credit profile that supports an A bond rating.

Q. WHAT IS THE APPROPRIATE RISK PREMIUM TO BE ADDED TO THE FUTURE LONG-TERM BORROWING RATE?

A. To determine a common equity cost rate, it is necessary to estimate a risk premium to be added to the Comparable Group's prospective long-term debt rate. Investors may rely upon published projected premiums; they also rely upon their experiences of investing in ultimately determining a probabilistic forecasted risk premium.

Projections of total market returns are shown on page 2 of Schedule 21. A projected risk premium for the market can be derived by subtracting the debt cost rate from the projected

market return as shown on page 2 of Schedule 21. However, the derived risk premium for the market is not directly applicable to the Comparable Companies because they are less risky than the market. The use of 90% of the market's risk is a conservative estimation of their level of risk as compared to the market.

The midpoint of the risk premium range is 7.7% and the average for the most recent quarter is 7.8% as shown on page 2 of Schedule 21. Based on this, a reasonable estimate of a longer term projected risk premium is 7.8%.

Q. HOW DO INVESTORS' EXPERIENCES AFFECT THEIR DETERMINATION OF A RISK PREMIUM?

A. Returns on various assets are studied to determine a probabilistic risk premium. The most noted asset return studies and resultant risk premium studies are those performed by Ibbotson Associates. However, Ibbotson Associates has not performed asset return studies concerning public utility common stocks. Based upon Ibbotson Associates' methodology of computing asset returns, I calculated annual returns for the S&P utilities and bonds for the period 1928-2015. The resultant annual returns were then compared to determine a recent risk premium from a recent 20-year period, 1986-2015 and subsequent periods that were each increased by ten years until the entire study period was reviewed (pages 3 and 4 of Schedule 21).

A long-term analysis of rates of return is necessary because it assumes that investors' expectations are, on average, equal to realized long-run rates of return and resultant risk premium. Observing a single year's risk premium, either high or low, may not be consistent with investors' requirements. Further, studies show a mean reversion in risk premiums. In other words, over time, risk premiums revert to a longer-term average premium.

Moreover, since the expected rate of return is defined as "the rate of return expected to be realized from an investment; the mean value of the probability distribution of possible results,"[28] a long-term analysis of annual returns is appropriate.

Q. WHAT DO YOU CONCLUDE FROM THE INFORMATION SHOWN ON PAGES 3 AND 4 OF SCHEDULE 21?

A. The average of the absolute range of the S&P Utilities' appropriate average risk premium (*i.e.,* bonds rated AAA to A) was 3.8% during the seven periods studied, as calculated from page 3 of Schedule 21. The credit adjusted longer term risk premiums (*i.e.,* bonds rated A), 1928-2015, and averages 4.3%. The appropriate average (*i.e.,* bonds rated AAA to A) longer term risk premiums, 1928-2015, have an absolute range of 4.3% to 5.0%, and averages 4.5%.

The aforementioned premiums are based on total returns for bonds; and reflect their price risk. A bond's price risk is not related to its credit quality and is eliminated when a bond is held to maturity from time of purchase. Using the income returns, page 4 of Schedule 20, for bonds eliminates price risk and better measures an investor's required return based on credit quality. The appropriate average risk premium (*i.e.,* bonds rated AAA to A) based on income returns was 4.6% during the seven periods studied. The credit adjusted longer term risk premiums (*i.e.,* bonds rated A), 1928-2015, and averages 4.5%. The appropriate average (*i.e.,* bonds rated AAA to A) longer term risk premiums, 1928-2015, have an absolute range of 4.5% to 4.8%, and averages 4.7%.

[28]Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition, The Dryden Press, 1989, p. 106.

Q. WHAT INFORMATION IS SHOWN ON PAGE 5 OF SCHEDULE 21?

A. Page 5 of Schedule 21 proves and measures the negative relationship between interest rate levels and the resulting risk premium. That is, risk premiums are generally higher when interest rates are low and risk premiums are generally lower when interest rates are high. This was proven by sorting the 88 year period, 1928 to 2015, annual returns based on interest rate level from lowest interest rate to highest interest rate and distributing the results into two equal groups, a 44-year low interest rate environment group and a 44-year high interest rate environment group.

During the period 1928 to 2015, the 44 years with the lowest interest rates had an average interest rate of 3.0% and reflected a range of interest rates from 2.0% to 4.2%. This period resembles the current interest rate environment of 2.7% discussed previously regarding the CAPM's risk free rate. The risk premium based on total returns during this low interest rate environment produced the appropriate average (*i.e.,* bonds rated AAA to A) longer term risk premium of 6.5% and a credit adjusted longer term risk premium (*i.e.,* bonds rated A) of 6.1%. The annual income return based risk premium during this low interest rate environment produced the appropriate average (*i.e.,* bonds rated AAA to A) longer term risk premium of 7.1% and a credit adjusted longer term risk premium (*i.e.,* bonds rated A) of 6.8%.

However, during the period 1928 to 2015, the 44 years with the highest interest rates had an average interest rate of 7.4% and reflected a range of interest rates from 4.2% to 13.5%. This period is far different from the current interest rate environment of 2.7%. The risk premium based on total returns during the highest interest rate environment produced the an average longer term risk premium of 2.4% over bonds rated AAA to A and a credit

adjusted longer term risk premium (*i.e.*, bonds rated A) of only 2.4%. The annual income return based risk premium during the highest interest rate environment produced the an average longer term risk premium of 2.3% over bonds rated AAA to A and a credit adjusted longer term risk premium (*i.e.*, bonds rated A) of only 2.2%.

Over time, risk premiums are mean reverting. They constantly move toward a long-term average reflecting a long-term level of interest rates. That is, an above-average risk premium will decrease toward a long-term average while a below-average risk premium will increase toward a long-term average. In any single year, of course, investor-required rates of return may not be realized and in certain instances, a single year's risk premiums may be negative. Negative risk premiums are not indicative of investors' expectations and violate the basic premise of finance concerning risk and return. Negative risk premiums usually occur only in the stock market's down years (*i.e.*, the years in which the stock markets' return was negative).

When interest rate levels are not considered the credit adjusted longer term risk premium (*i.e.*, bonds rated A), 1928-2015, averages 4.5%, discussed previously regarding page 4 of Schedule 21. However, the annual income return based risk premium during the low interest rate environment produced a credit adjusted longer term risk premium (*i.e.*, bonds rated A) of 6.8%. Since this period resembles the current interest rate environment of 2.7%, a reasonable estimate of investors risk premium based on historical returns is based on a 50% weighting on the results of the entire 1928-2015 historical market returns and a 50% weighting on the results of the low interest rate environment to produce a 5.5% historical risk premium.

A reasonable estimate of investors' risk premium is 6.0%. The estimate of investors' risk premium is based 75% on the results of the historical market returns and 25% on the projected market returns. Adding the risk premium of 6.0% for the Comparable Group to the prospective cost of newly-issued long-term debt of 4.3% results in a market value risk premium derived cost rate for common equity of 10.3% as reflected on page 1 of Schedule 21. Adjusting the market value risk premium based upon the end result of the application of the Hamada Model and the bond yield spread to account for the difference in leverage between market value capitalization and book value ratios discussed previously indicates a cost rate of 11.0% applicable to book value (10.3% + 0.7% = 11.0%).

SUMMARY OF COMMON EQUITY COST RATE

Q. WHAT IS YOUR COMPARABLE GROUP'S COMMON EQUITY COST RATE?

A. Based upon the results of the models employed, the Water Group's common equity cost rate is in the range of 10.0% to 11.0% as reflected on Schedule 24. Based upon this data, the common equity cost rate for the Water Group is at least 10.25%. My recommendation is based upon the Water Group's 10.25% common equity cost rate.

Q. DO YOU RECOMMEND A COST OF COMMON EQUITY OF 10.25% FOR THE BUREAU OF WATER?

A. No. The Bureau of Water's cost rate must be adjusted to reflect the risk differences of the Bureau of Water versus the Comparable Group. Based upon the financial analysis and risk analysis, I conclude that the Bureau of Water is exposed to greater investment risk than the Comparable Group. This is evidenced by the Bureau of Water's small size, visibly lower credit rating and the other factors summarized in Table 5 discussed previously.

Q. HOW DO YOU REFLECT THE INVESTMENT RISK DIFFERENCE BETWEEN THE BUREAU OF WATER AND THE COMPARABLE GROUP?

A. The direction of the investment risk adjustment on common equity cost rates is clearly known. A specific quantification of risk differences is based on the Bureau of Water's implied BBB bond rating even though the evidence indicates the Bureau of Water's credit rating may be below BBB (*i.e.*, BB). An implied bond rating of BBB is a full bond rating below the bond rating of the Comparable Companies. The difference in bond rating between the Bureau of Water and the Comparable Companies suggests a minimum 25-basis point difference in long-term debt cost rates based upon the yield spread of A and BBB rated debt.

A 25-basis point spread between the Bureau of Water and the Water Group is a very conservative estimate of the risk differential. Adding the 0.25% risk adjustment to the various results of the three models employed for the Water Group shows a current range of common equity cost applicable to book value for the Bureau of Water of 10.25% (DCF), 11.25% (CAPM), and 11.25% (RP) as shown in Table 8.

Summary of the Bureau of Water's Equity Cost Rates	
DCF	10.25
CAPM	11.25
RP	11.25

Table 8

Q. WHAT IS YOUR COMMON EQUITY COST RATE RECOMMENDATION FOR THE BUREAU OF WATER?

A. As discussed above and as shown in Schedule 24, I recommend a 10.50% common equity cost rate for the Bureau of Water. My alternative recommended cost of common equity, should the Commission decide to adjust my primary recommendation of 10.50% to reflect the maximum income tax status of the investors of the Bureau of Water, is 9.56%.

Q. HOW DO YOU IMPUTE PERSONAL INCOME TAXES IN A RECOMMENDATION?

A. In past cases the PUC has relied upon bond yield spreads between public utility and GO bonds. The bond yield spreads between public utility and GO bonds produce an estimate of income tax rates of bond investors as shown on Schedule 22. However this method only measures the tax rate of the bond investors who simultaneously hold GO bonds and public utility bonds, it does not measure the income tax rate of the owners of the Bureau of Water nor the tax rate of other investor owned utility common stockholders.

When this type of measure is used it is important to recognize limits caused by: (1) the types of bonds used; (2) matching in credit quality; and (3) matching in the term or lives of the bonds used in the analysis.

Concerning the types of bonds used, the GO bonds and public utility bonds are published by Moody's. The GO bond yields are Moody's Municipal Bond Yield Averages and according to Bloomberg News Reports, the Moody's Municipal Bond Yield Averages are: derived from pricing data on unenhanced newly issued general obligation bonds; each observation is an unweighted average; with the composite average representing the unweighted average of the corresponding 20-year observations.

As explained previously, GO bonds are secured by the full faith and credit of the issuer, meaning that the borrower is committing to raise taxes or other revenues sufficient to cover the amount owed. Therefore, the yield on GO bond measures the ability to raise taxes while the Bureau of Water's cost of common equity should reflect the risk of the underlining assets devoted to providing water service. Revenue bonds are a better measure of the Bureau of Water's risk since they are backed or secured solely by the income received by the revenue-producing enterprise (*e.g.*, a water system) being financed by the revenue bonds. Unlike GO bonds, revenue bonds are not backed by the full faith and credit of the issuing entity. All other things being equal, GO bonds are less risky or a more secure investment than revenue bonds since revenue bonds lack the full faith and credit of the issuing entity. This fact is shown in the recent yield difference of GO bonds which are currently trading at an average yield of 3.18%; while revenue bonds are currently trading at an average yield of 3.38%.[29] Unfortunately, Moody's does not publish yields for revenue bonds. Correcting for this difference between the yield of GO bonds and revenue bonds used in this analysis would produce a lower income tax adjustment than that shown on Schedule 22.

Regarding matching credit quality, as shown on Schedule 22, credit quality of each type of bond used should be matched (*i.e.*, Aa vs. Aa, A vs. A, Baa vs. Baa, etc.) otherwise credit quality differences will be measured. As shown on Schedule 22, the credit quality of each type of bond has been matched.

Finally, regarding matching the term or lives of the bonds used in the analysis, Moody's GO bonds have an unweighted average of 20-years and the Moody's public utility bonds

[29] Based on the June 16, 2016 *Bond Buyers Online* reported yield for the 20-Bond GO Index and the Revenue Bond Index., http://www.bondbuyer.com/marketstatistics/search_bbi.html?details=true, (6/22/2016).

have maturities as close as possible to 30 years. Correcting for this difference in the term structure or lives of the bonds used in this analysis would produce a lower income tax adjustment than that shown on Schedule 22.

Even after recognizing the limitations and inconsistencies in comparing Moody's GO bonds and public utility bonds, the maximum income tax adjustment is shown to be 9% as shown on Schedule 22.

Q. WHAT IS THE APPROPRIATE RETURN ON EQUITY FOR THE BUREAU OF WATER IF PERSONAL INCOME TAXES ARE TAKEN INTO ACCOUNT?

A. A minimum 9.56% tax equivalent return is appropriate. This tax equivalent return is based upon the average of 10.50% from the range of the common equity cost rate estimated for investor-owned water utilities (of 10.25%, 11.25% and 11.25%), and a maximum tax rate of 9%.

Q. HAVE YOU CHECKED THE REASONABLENESS OF YOUR RECOMMENDED COMMON EQUITY RATE FOR THE BUREAU OF WATER?

A. Yes. Page 2 of Schedule 17 reflects the average projected earned return on average book common equity for the companies in Comparable Group for the period 2019-2021, which is shown to range from 11.1% to 11.3%. Given the large degree to which regulatory lag and attrition impacts water utilities earning, the range of the comparable utilities' projected earned returns suggests that my recommendation that the Bureau of Water be permitted an opportunity to earn 10.50% is reasonable.

Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 23?

A. Schedule 23 shows demographic data for the City of DuBois and the Outside Customers. Bureau of Water's Outside Customers, or those whose water rates the PUC regulates,

account for about 16% of the Bureau of Water's investment based on revenues and customers. The Outside Customers have income levels that are 23% higher than the median level in the City of DuBois. The City of DuBois's rate of poverty is over 100% higher than that of the Outside Customers.

I believe these factors should be considered when the determining the appropriate rate of return because any short-fall in the authorized rate of return for the Outside Customers will be borne directly by the City of DuBois's citizens.

OVERALL RATE OF RETURN RECOMMENDATION

Q. WHAT IS YOUR OVERALL FAIR RATE OF RETURN RECOMMENDATION FOR THE BUREAU OF WATER?

A. Based upon the recommended capital structure and my estimate of the Bureau of Water's common equity cost rate, I recommend an overall fair rate of return of 6.76%. The details of my recommendation are shown on Schedule 1. It should be noted, should the Commission decide to adjust my primary recommendation of 10.50% to reflect the income tax status of the investors of the Bureau of Water, my overall fair rate of return recommendation would be 6.29%, as shown on page 1 of Schedule 25.

Q. WHAT WOULD YOUR COMMON EQUITY COST RATE RECOMMENDATION FOR THE BUREAU OF WATER BE FOR THE BUREAU OF WATER IF THEIR ACTUAL PER BOOKS CAPITAL STRUCTURE WERE USED?

A. As shown on page 2 of Schedule 25, based upon the Bureau of Water's allocated and 2014 per books capital structure and my estimate of common equity cost rate adjusted for the large financial risk adjustments, I would determine a common equity cost rate estimated

of 9.82%. It should be noted, should the Commission decide to adjust to reflect the income tax status of the investors of the Bureau of Water, the common equity cost rate would be 8.94%.

Q. WHAT WOULD YOUR OVERALL RATE OF RETURN BE FOR THE BUREAU OF WATER IF THE BUREAU OF WATER'S CAPITAL STRUCTURE WERE USED?

A. As previously reviewed when describing Schedule 2, The Bureau of Water's actual reported common equity ratio of 100% contain an excessive percentage of common equity when the industry norm common equity ratio is 50% and would require an estimated risk adjustment based upon published financial studies.[30] The 50 percentage point difference (100% - 50% = 50%) in the Bureau of Water's actual common equity ratio when compared to my recommended common equity ratio requires an estimated financial risk adjustment of 68 basis points (*i.e.*, the average of 58 to 78 basis points) based upon published financial studies. As shown on page 1 of Schedule 25, based upon the Bureau of Water's 2014 per books capital structure and my estimate of common equity cost rate adjusted for the large financial risk adjustments, I would determine an overall rate of return of 9.82%. It should be noted, should the Commission decide to adjust my recommendation to reflect the income tax status of the investors of Bureau of Water, this overall rate of return would be 8.94%.

[30] Eugene F. Brigham, Louis C. Gapenski, and Dana A. Aberwald, "Capital Structure, Cost of Capital, and Revenue Requirements," Public Utilities Fortnightly, 8 January 1987, pp. 15-24. They found that the average change in common equity cost rate is 12-basis points per percentage point change in common equity ratios between 40% and 50% equity ratios. Further, the change at the upper end of the common equity ratio range, 49% to 50%, was 7-basis points and 15-basis points at the lower end of the common equity ratio range, 41% to 40%. See pages 4 and 5 of Schedule 2 for the development of the estimated risk adjustment based on this published study.

Q. HAVE YOU TESTED THE REASONABLENESS OF YOUR OVERALL FAIR RATE OF RETURN RECOMMENDATION?

A. Yes. If my recommended overall rate of return is actually earned, it will give the Bureau of Water ratios that will allow the Bureau of Water to present a financial profile that will enable it to attract capital necessary to provide safe and reliable water service, at reasonable terms.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

APPENDIX A

Professional Qualifications
of
Harold Walker, III
Manager, Financial Studies
Gannett Fleming Valuation and Rate Consultants, LLC.

EDUCATION

Mr. Walker graduated from Pennsylvania State University in 1984 with a Bachelor of Science Degree in Finance. His studies concentrated on securities analysis and portfolio management with an emphasis on economics and quantitative business analysis. He has also completed the regulation and the rate-making process courses presented by the College of Business Administration and Economics Center for Public Utilities at New Mexico State University. Additionally, he has attended programs presented by The Institute of Chartered Financial Analysts (CFA).

Mr. Walker was awarded the professional designation "Certified Rate of Return Analyst" (CRRA) by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience and the successful completion of a comprehensive examination. He is also a member of the Society of Utility and Regulatory Financial Analysts (SURFA) and has attended numerous financial forums sponsored by the Society. The SURFA forums are recognized by the Association for Investment Management and Research (AIMR) and the National Association of State Boards of Accountancy for continuing education credits.

Mr. Walker is also a licensed Municipal Advisor Representative (Series 50) by Municipal Securities Rulemaking Board (MSRB) and Financial Industry Regulatory Authority (FINRA).

BUSINESS EXPERIENCE

Prior to joining Gannett Fleming Valuation and Rate Consultants, LLC., Mr. Walker was employed by AUS Consultants - Utility Services. He held various positions during his eleven years with AUS, concluding his employment there as a Vice President. His duties included providing and supervising financial and economic studies on behalf of investor owned and municipally owned water, waste water, electric, natural gas distribution and transmission, oil pipeline and telephone utilities as well as resource recovery companies.

In 1996, Mr. Walker joined Gannett Fleming Valuation and Rate Consultants, LLC. In his capacity as Manager, Financial Studies and for the past twenty years, he has continuously studied rates of return requirements for regulated firms. In this regard, he supervised the preparation of rate of return studies in connection with his testimony and in the past, for other individuals. He also assisted and/or developed dividend policy studies, nuclear prudence studies, calculated fixed charge rates for avoided costs involving cogeneration projects, financial decision studies for capital budgeting purposes and developed financial models for determining future capital requirements and the effect of those requirements on investors and ratepayers, valued utility property and common stock for acquisition and divestiture, and assisted in the private placement of fixed capital securities for public utilities.

Head, Gannett Fleming GASB 34 Task Force responsible for developing Governmental Accounting Standards Board (GASB) 34 services, and educating Gannett Fleming personnel and Gannett Fleming clients on GASB 34 and how it may affect them. The GASB 34 related services include inventory of assets, valuation of assets, salvage estimation, annual depreciation rate determination, estimation of depreciation reserve, asset service life determination, asset condition assessment, condition assessment documentation, maintenance estimate for asset preservation, establishment of condition level index, geographic information system (GIS) and data management services, management discussion and analysis (MD&A) reporting, required supplemental information (RSI) reporting, auditor interface, and GASB 34 compliance review.

Mr. Walker was also the Publisher of C.A. Turner Utility Reports from 1988 to 1996. C.A. Turner Utility Reports is a financial publication which provides financial data and related ratios and forecasts covering the utility industry. From 1993 to 1994, he became a contributing author for the Fortnightly, a utility trade journal. His column was the Financial News column and focused mainly on the natural gas industry.

In 2004, Mr. Walker was elected to serve on the Board of Directors of SURFA. Previously, he served as an ex-officio directors as an advisor to SURFA's existing President. In 2000, Mr. Walker was elected President of SURFA for the 2001-2002 term. Prior to that, he was elected to serve on the Board of Directors of SURFA during the period 1997-1998 and 1999-2000. Currently, he also serves on the Pennsylvania Municipal Authorities Association, Electric Deregulation Committee.

EXPERT TESTIMONY

Mr. Walker has submitted testimony or been deposed on various topics before regulatory commissions and courts in twenty states including: Arizona, California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Vermont, Virginia, and West Virginia. His testimonies covered various subjects including: appropriate capital structure and fixed capital cost rates, depreciation, fair rate of return, purchased water adjustments, synchronization of interest charges for income tax purposes, valuation, cash working capital, lead-lag studies, financial analyses of investment alternatives, and fair value. The following tabulation provides a listing of the electric power, natural gas distribution, telephone, wastewater, and water

service utility cases in which he has been involved as a witness. Additionally, he has been involved in a number of rate proceedings involving small public utilities which were resolved by Option Orders and therefore, are not listed below.

Client	Docket No.
Alpena Power Company	U-10020
Armstrong Telephone Company - Northern Division	92-0884-T-42T
Armstrong Telephone Company - Northern Division	95-0571-T-42T
Artesian Water Company, Inc.	90 10
Artesian Water Company, Inc.	06 158
Aqua Illinois Consolidated Water Divisions and Consolidated Sewer Divisions	11-0436
Aqua Illinois Hawthorn Woods Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Hawthorn Woods Water Division	07 0620/07 0621/08 0067
Aqua Illinois Kankakee Water Division	10-0194
Aqua Illinois Kankakee Water Division	14-0419
Aqua Illinois Vermilion Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Water Division	07 0620/07 0621/08 0067
Aqua Virginia - Alpha Water Corporation	Pue-2009-00059
Aqua Virginia - Blue Ridge Utility Company, Inc.	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Wastewater)	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Earlysville Forest Water Company	Pue-2009-00059
Aqua Virginia - Heritage Homes of Virginia	Pue-2009-00059
Aqua Virginia - Indian River Water Company	Pue-2009-00059
Aqua Virginia - James River Service Corp.	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc.	

(Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Water)	Pue-2009-00059
Aqua Virginia - Lake Shawnee	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Wastewater)	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Water)	Pue-2009-00059
Aqua Virginia - Mountainview Water Company, Inc.	Pue-2009-00059
Aqua Virginia - Powhatan Water Works, Inc.	Pue-2009-00059
Aqua Virginia - Rainbow Forest Water Corporation	Pue-2009-00059
Aqua Virginia - Shawnee Land	Pue-2009-00059
Aqua Virginia - Sydnor Water Corporation	Pue-2009-00059
Aqua Virginia - Water Distributors, Inc.	Pue-2009-00059
Borough of Hanover	R-2009-2106908
Borough of Hanover	R-2012-2311725
Borough of Hanover	R-2014-242830
Chaparral City Water Company	W 02113a 04 0616
California-American Water Company	CIVCV156413
Connecticut-American Water Company	99-08-32
Connecticut Water Company	06 07 08
Citizens Utilities Company Colorado Gas Division	-
Citizens Utilities Company Vermont Electric Division	5426
Citizens Utilities Home Water Company	R 901664
Citizens Utilities Water Company of Pennsylvania	R 901663
City of Bethlehem - Bureau of Water	R-00984375
City of Bethlehem - Bureau of Water	R 00072492
City of Bethlehem - Bureau of Water	R-2013-2390244
City of Dubois – Bureau of Water	R-2013-2350509
City of Lancaster Sewer Fund	R-00005109
City of Lancaster Sewer Fund	R-00049862

City of Lancaster Sewer Fund	R-2012-2310366
City of Lancaster Water Fund	R-00984567
City of Lancaster Water Fund	R-00016114
City of Lancaster Water Fund	R 00051167
City of Lancaster Water Fund	R-2010-2179103
City of Lancaster Water Fund	R-2014-2418872
Consumers Pennsylvania Water Company Roaring Creek Division	R-00973869
Consumers Pennsylvania Water Company Shenango Valley Division	R-00973972
Country Knolls Water Works, Inc.	90 W 0458
East Resources, Inc. - West Virginia Utility	06 0445 G 42T
Elizabethtown Water Company	WR06030257
Hampton Water Works Company	DW 99-057
Illinois American Water Company	16-0093
Indian Rock Water Company	R-911971
Indiana Natural Gas Corporation	38891
Jamaica Water Supply Company	-
Kentucky American Water Company, Inc.	2007 00134
Middlesex Water Company	WR 89030266J
Missouri-American Water Company	WR 2000-281
Missouri-American Water Company	SR 2000-282
Mount Holly Water Company	WR06030257
New Jersey American Water Company	WR 89080702J
New Jersey American Water Company	WR 90090950J
New Jersey American Water Company	WR 03070511
New Jersey American Water Company	WR-06030257
New Jersey American Water Company	WR08010020
New Jersey American Water Company	WR10040260
New Jersey American Water Company	WR11070460
New Jersey American Water Company	WR15010035
Newtown Artesian Water Company	R-911977
Newtown Artesian Water Company	R-00943157
Newtown Artesian Water Company	R-2009-2117550
Newtown Artesian Water Company	R-2011-2230259
North Maine Utilities	14-0396
Northern Indiana Fuel & Light Company	38770

Oklahoma Natural Gas Company	PUD-940000477
Pennichuck Water Works, Inc.	DW 04 048
Pennichuck Water Works, Inc.	DW 06 073
Pennichuck Water Works, Inc.	DW 08 073
Pennsylvania Gas & Water Company (Gas)	R-891261
Pennsylvania Gas & Water Co. (Water)	R 901726
Pennsylvania Gas & Water Co. (Water)	R-911966
Pennsylvania Gas & Water Co. (Water)	R-22404
Pennsylvania Gas & Water Co. (Water)	R-00922482
Pennsylvania Gas & Water Co. (Water)	R-00932667
Public Service Company of North Carolina, Inc.	G-5, Sub 565
Presque Isle Harbor Water Company	U-9702
St. Louis County Water Company	WR-2000-844
Town of North East Water Fund	9190
United Water New Rochelle	W-95-W-1168
United Water Toms River	WR-95050219
Valley Water Systems, Inc.	06 10 07
West Virginia-American Water Company	15-0676-W-42T
West Virginia-American Water Company	15-0675-S-42T
Wilmington Suburban Water Corporation	94-149
York Water Company	R-901813
York Water Company	R-922168
York Water Company	R-943053
York Water Company	R-963619
York Water Company	R-994605
York Water Company	R-00016236

Exhibit_(HW-1)
Docket No. R-2016-_____
Witness: H. Walker, III

CITY OF DUBOIS - BUREAU OF WATER
DUBOIS, PENNSYLVANIA

RATE OF RETURN

EXHIBIT

TO ACCOMPANY THE

DIRECT TESTIMONY

JUNE 2016

Prepared by:
GANNETT FLEMING
VALUATION AND RATE CONSULTANTS, LLC

Valley Forge, Pennsylvania

City of DuBois - Bureau of Water
Recommended Fair Rate of Return
Recommended Rate Making Ratios at December 31, 2016

	Recommended Ratios(1)	Cost Rates(2)	Weighted Cost
Debt	50.0	3.02	1.51
Fund Equity	50.0	10.50	5.25
Overall	100.0		6.76

Notes: (1) As explained in the testimony.
(2) The debt cost rate is based on the weighted cost rate to maturity for all issues.

	Capital Outstanding* 12/31/2014		Recommended Rate Making Ratios Pro Forma 12/31/2016	
	(000's $)	Ratios	(000's $)	Ratios
Debt	?	?	$7,811,157	50.0
Fund Equity	?	?	7,811,157	50.0
Total	$0	0.0	$15,622,314	100.0

* Company's financials are reported on a cash basis; therefore, the required information does not exist to calculate actual capital structure.

City of DuBois and the City of DuBois - Bureau of Water
Capitalization and Capitalization Ratios
At December 31, 2014

	Actual at 12/31/14*		
	Capital	Ratios Excluding Short-Term debt	Ratios Including Short-Term debt
City of DuBois			
Debt			
Current portion of long-term obligations	$0		
Noncurrent portion of long-term obligations	0		
Long-Term Debt	0	0.00 %	0.00 %
Fund Equity **			
Invested In Capital Assets, Net of Related Debt	0		
Unrestricted	4,082,899		
Fund Equity (Less Net Contributions)	4,082,899	100.00	100.00
Investor Provided Capital	4,082,899	100.00 %	
Short-Term Debt	0		0.00
Total Capital	$4,082,899		100.00 %
City of DuBois - Bureau of Water			
Debt			
Current portion of long-term obligations	$0		
Noncurrent portion of long-term obligations	0		
Long-Term Debt	0	0.00 %	0.00 %
Fund Equity **			
Invested In Capital Assets, Net of Related Debt	0		
Unrestricted	46,488		
Fund Equity (Less Net Contributions)	46,488	100.00	100.00
Investor Provided Capital	46,488	100.00 %	
Short-Term Debt	0		0.00
Total Capital	$46,488		100.00 %

* Based on audited results for 2014.
** Excludes restricted net assets.

City of DuBois - Bureau of Water
Capitalization and Capitalization Ratios
At December 31, 2014 and Recommended Rate Making Ratios Esimated at December 31, 2016

	Actual at 12/31/14*		
	Capital	Ratios Excluding Short-Term debt	Ratios Including Short-Term debt
Debt			
Current portion of long-term obligations	$0		
Noncurrent portion of long-term obligations	0		
Long-Term Debt	0	0.00 %	0.00 %
Fund Equity **			
Invested In Capital Assets, Net of Related Debt	0		
Unrestricted	46,488		
Fund Equity (Less Net Contributions)	46,488	100.00	100.00
Investor Provided Capital	46,488	100.00 %	
Short-Term Debt	0		0.00
Total Capital	$46,488		100.00 %

	Recommended Rate Making Ratios Estimated at 12/31/16		
	Capital	Ratios Excluding Short-Term debt	Ratios Including Short-Term debt
Long-Term Debt	$7,811,157	50.00 %	50.00 %
Fund Equity	7,811,157	50.00	50.00
Investor Provided Capital	15,622,314	100.00 %	
Short-Term Debt	0		0.00
Total Capital	$15,622,314		100.00 %

* Based on audited results for 2014.
** Excludes restricted net assets.

Capital Structure Ratios for
The Water Group Followed by Analysts
At 3/31/2016 and Estimated for 2020

	3/31/2016	Est.(1) 2020
Water Group Followed by Analysts		
Long-term Debt	45.6 %	49.0 %
Preferred Stock	0.1	0.0
Common Equity	54.3	51.0
Total	100.0 %	100.0 %

Notes: (1) Project by Value Line for the period 2019 to 2021.

Source of Information: Value Line Investment Survey, 4/15/16
S&P and Quarterly Reports

City of DuBois - Bureau of Water
General Obligations Bonds and Notes
Bonds Attributable to Bureau of Water
Effective Cost of Debt

	Outstanding	Cost Rate (1)	Annual Cost	Effective Cost
Actual at 12/31/15				
S&T Bank Notes, Series of 2012	6,202,561	2.99%	$185,457	
S&T Bank Notes, Series of 2013	1,565,345	2.44%	38,194	
S&T Bank Notes, Series of 2015	3,337,738	3.35%	111,814	
Total	$11,105,644		$335,465	3.02%
Estimated at 12/31/16				
S&T Bank Notes, Series of 2012	5,985,290	2.99%	$178,960	
S&T Bank Notes, Series of 2013	1,511,303	2.44%	36,876	
S&T Bank Notes, Series of 2015	3,241,675	3.35%	108,596	
Total	$10,738,268		$324,432	3.02%

Note: (1) Developed based on an IRR of the expected cash flows.

City of DuBois - Bureau of Water
General Obligations Bonds and Notes
Bonds Attributable to Bureau of Water
Effective Cost of Debt - Estimated S&T Bank Notes, Series of 2012

Expenses	$609,300.00			
Years	25			
		$0.00	G	0.00%
Rate	2.330%	2,174,400.00	S	24.16%
		6,825,600.00	W	75.84%
Amount	9,000,000.00	$9,000,000.00		

Payment Year	Payment Amount	Interest Paid	Principal Paid	Remaining Balance	IRR Cash Flow
					($8,390,700.00)
2013	477,125.52	209,722.95	267,402.57	8,732,597.43	477,125.52
2014	477,125.52	203,337.09	273,788.43	8,458,809.00	477,125.52
2015	477,125.52	196,798.73	280,326.79	8,178,482.21	477,125.52
2016	477,125.52	190,639.98	286,485.54	7,891,996.67	477,125.52
2017	477,125.52	183,262.65	293,862.87	7,598,133.80	477,125.52
2018	477,125.52	176,244.89	300,880.63	7,297,253.18	477,125.52
2019	477,125.52	169,059.55	308,065.97	6,989,187.20	477,125.52
2020	477,125.52	162,159.68	314,965.84	6,674,221.36	477,125.52
2021	477,125.52	154,180.88	322,944.64	6,351,276.72	477,125.52
2022	477,125.52	146,468.62	330,656.90	6,020,619.83	477,125.52
2023	477,125.52	138,572.18	338,553.34	5,682,066.49	477,125.52
2024	477,125.52	130,857.78	346,267.74	5,335,798.76	477,125.52
2025	477,125.52	122,217.93	354,907.59	4,980,891.17	477,125.52
2026	477,125.52	113,742.36	363,383.16	4,617,508.01	477,125.52
2027	477,125.52	105,064.38	372,061.14	4,245,446.87	477,125.52
2028	477,125.52	96,454.75	380,670.77	3,864,776.10	477,125.52
2029	477,125.52	87,088.35	390,037.17	3,474,738.93	477,125.52
2030	477,125.52	77,773.84	399,351.68	3,075,387.25	477,125.52
2031	477,125.52	68,236.90	408,888.62	2,666,498.64	477,125.52
2032	477,125.52	58,643.35	418,482.17	2,248,016.46	477,125.52
2033	477,125.52	48,478.41	428,647.11	1,819,369.35	477,125.52
2034	477,125.52	38,241.86	438,883.66	1,380,485.69	477,125.52
2035	477,125.52	27,760.85	449,364.67	931,121.02	477,125.52
2036	477,125.52	17,085.89	460,039.63	471,081.40	477,125.52
2037	477,124.71	6,043.31	471,081.40	0.00	477,124.71
	11,928,137.19	2,928,137.19	9,000,000.00		
				Effective Cost *	2.99%

*-Calculated on monthly cash flows

City of DuBois - Bureau of Water
General Obligations Bonds and Notes
Bonds Attributable to Bureau of Water
Effective Cost of Debt - Estimated S&T Bank Notes, Series of 2013

Expenses	$39,648.45			
Years	25			
		$1,196,450.15	G	25.65%
Rate	2.330%	1,760,390.98	S	37.74%
		1,707,681.87	W	36.61%
Amount	4,664,523.00	$4,664,523.00		

Payment Year	Payment Amount	Interest Paid	Principal Paid	Remaining Balance	IRR Cash Flow
					($4,624,874.55)
2013	185,479.29	82,210.45	103,268.84	4,561,254.16	185,479.29
2014	247,305.72	106,228.88	141,076.84	4,420,177.32	247,305.72
2015	247,305.72	102,859.82	144,445.90	4,275,731.42	247,305.72
2016	247,305.72	99,690.41	147,615.31	4,128,116.11	247,305.72
2017	247,305.72	95,885.08	151,420.64	3,976,695.47	247,305.72
2018	247,305.72	92,269.00	155,036.72	3,821,658.75	247,305.72
2019	247,305.72	88,566.56	158,739.16	3,662,919.59	247,305.72
2020	247,305.72	85,015.27	162,290.45	3,500,629.14	247,305.72
2021	247,305.72	80,900.03	166,405.69	3,334,223.45	247,305.72
2022	247,305.72	76,926.08	170,379.64	3,163,843.82	247,305.72
2023	247,305.72	72,857.24	174,448.48	2,989,395.34	247,305.72
2024	247,305.72	68,886.25	178,419.47	2,810,975.86	247,305.72
2025	247,305.72	64,430.38	182,875.34	2,628,100.52	247,305.72
2026	247,305.72	60,063.12	187,242.60	2,440,857.92	247,305.72
2027	247,305.72	55,591.57	191,714.15	2,249,143.77	247,305.72
2028	247,305.72	51,159.29	196,146.43	2,052,997.33	247,305.72
2029	247,305.72	46,329.04	200,976.68	1,852,020.66	247,305.72
2030	247,305.72	41,529.51	205,776.21	1,646,244.44	247,305.72
2031	247,305.72	36,615.35	210,690.37	1,435,554.08	247,305.72
2032	247,305.72	31,676.08	215,629.64	1,219,924.44	247,305.72
2033	247,305.72	26,434.38	220,871.34	999,053.10	247,305.72
2034	247,305.72	21,159.74	226,145.98	772,907.11	247,305.72
2035	247,305.72	15,759.13	231,546.59	541,360.52	247,305.72
2036	247,305.72	10,262.64	237,043.08	304,317.45	247,305.72
2037	247,305.72	4,568.71	242,737.01	61,580.44	247,305.72
2038	61,823.72	243.28	61,580.44	0.00	61,823.72
	6,182,640.29	1,518,117.29	4,664,523.00		
				Effective Cost *	2.44%

*-Calculated on monthly cash flows

City of DuBois - Bureau of Water
General Obligations Bonds and Notes
Bonds Attributable to Bureau of Water
Effective Cost of Debt - Estimated S&T Bank Notes, Series of 2015

Expenses	$242,880.00			
Years	25			
		$1,007,600.00	G	22.90%
Rate	2.790%	-	S	
		3,392,400.00	W	77.10%
Amount	4,400,000.00	$4,400,000.00		

Payment Year	Payment Amount	Interest Paid	Principal Paid	Remaining Balance	IRR Cash Flow
					($4,157,120.00)
2015	143,372.18	72,474.81	70,897.37	4,329,102.63	143,372.18
2016	245,780.88	121,184.98	124,595.90	4,204,506.73	245,780.88
2017	245,780.88	117,273.30	128,507.58	4,075,999.15	245,780.88
2018	245,780.88	113,590.64	132,190.24	3,943,808.90	245,780.88
2019	245,780.88	109,802.45	135,978.43	3,807,830.47	245,780.88
2020	245,780.88	106,205.36	139,575.52	3,668,254.95	245,780.88
2021	245,780.88	101,905.86	143,875.02	3,524,379.93	245,780.88
2022	245,780.88	97,782.82	147,998.06	3,376,381.88	245,780.88
2023	245,780.88	93,541.62	152,239.26	3,224,142.62	245,780.88
2024	245,780.88	89,432.11	156,348.77	3,067,793.85	245,780.88
2025	245,780.88	84,698.38	161,082.50	2,906,711.35	245,780.88
2026	245,780.88	80,082.22	165,698.66	2,741,012.69	245,780.88
2027	245,780.88	75,333.77	170,447.11	2,570,565.58	245,780.88
2028	245,780.88	70,650.49	175,130.39	2,395,435.19	245,780.88
2029	245,780.88	65,430.52	180,350.36	2,215,084.82	245,780.88
2030	245,780.88	60,262.19	185,518.69	2,029,566.14	245,780.88
2031	245,780.88	54,945.76	190,835.12	1,838,731.02	245,780.88
2032	245,780.88	49,620.00	196,160.88	1,642,570.14	245,780.88
2033	245,780.88	43,855.57	201,925.31	1,440,644.83	245,780.88
2034	245,780.88	38,068.97	207,711.91	1,232,932.93	245,780.88
2035	245,780.88	32,116.55	213,664.33	1,019,268.60	245,780.88
2036	245,780.88	26,071.38	219,709.50	799,559.10	245,780.88
2037	245,780.88	19,697.30	226,083.58	573,475.52	245,780.88
2038	245,780.88	13,218.40	232,562.48	340,913.04	245,780.88
2039	245,780.88	6,553.83	239,227.05	101,685.99	245,780.88
2040	102,409.01	723.02	101,685.99	-	102,409.01
	6,144,522.31	1,744,522.31	4,400,000.00		
				Effective Cost *	3.35%

*-Calculated on monthly cash flows

City of DuBois - Bureau of Water
General Obligations Bonds and Notes
Bonds Attributable to Bureau of Water
Total Debt Service

	2012 Issue Water @ 75.84% Payment Amount	2013 Issue Water @ 36.61% Payment Amount	2015 Issue Water @ 77.10% Payment Amount	Total Debt Service
2013	361,851.99	67,903.97		429,755.96
2014	361,851.99	90,538.62		452,390.61
2015	361,851.99	90,538.62	110,539.95	562,930.56
2016	361,851.99	90,538.62	189,497.06	641,887.67
2017	361,851.99	90,538.62	189,497.06	641,887.67
2018	361,851.99	90,538.62	189,497.06	641,887.67
2019	361,851.99	90,538.62	189,497.06	641,887.67
2020	361,851.99	90,538.62	189,497.06	641,887.67
2021	361,851.99	90,538.62	189,497.06	641,887.67
2022	361,851.99	90,538.62	189,497.06	641,887.67
2023	361,851.99	90,538.62	189,497.06	641,887.67
2024	361,851.99	90,538.62	189,497.06	641,887.67
2025	361,851.99	90,538.62	189,497.06	641,887.67
2026	361,851.99	90,538.62	189,497.06	641,887.67
2027	361,851.99	90,538.62	189,497.06	641,887.67
2028	361,851.99	90,538.62	189,497.06	641,887.67
2029	361,851.99	90,538.62	189,497.06	641,887.67
2030	361,851.99	90,538.62	189,497.06	641,887.67
2031	361,851.99	90,538.62	189,497.06	641,887.67
2032	361,851.99	90,538.62	189,497.06	641,887.67
2033	361,851.99	90,538.62	189,497.06	641,887.67
2034	361,851.99	90,538.62	189,497.06	641,887.67
2035	361,851.99	90,538.62	189,497.06	641,887.67
2036	361,851.99	90,538.62	189,497.06	641,887.67
2037	361,851.38	90,538.62	189,497.06	641,887.06

Water Group Followed by Analysts
Five Year Analysis
2011 - 2015 (1)

Ln #		2015	2014	2013	2012	2011	Average Ann. Chg(%)	
				(Millions of $)				
	Investor Provided Capital($)							
1	Permanent Capital	2,255.899	2,139.351	2,043.028	1,969.406	1,910.446	4.2	
2	Short-Term Debt	108.580	89.663	111.186	89.211	104.893		
3	Total Capital	2,364.479	2,229.014	2,154.214	2,058.617	2,015.339	4.1	
4	Total Revenue($)	699.406	679.010	656.639	644.943	593.898	4.2	
5	Construction($)	247.908	209.204	208.294	204.494	197.489	6.1	
							Five Year Average	Average Central Values(9)
6	Effective Income Tax Rate(%)	27.1	29.4	31.7	35.7	37.7	32.3	31.7
	Book Capitalization Ratios(%)							
7	Long-Term Debt	45.9	45.4	45.8	48.5	50.6	47.2	45.9
8	Preferred Stock	0.1	0.1	0.1	0.2	0.2	0.1	0.1
9	Common Equity	54.0	54.5	54.1	51.3	49.2	52.6	54.0
	Total	100.0	100.0	100.0	100.0	100.0		
10	Total Debt	47.6	47.1	47.8	50.9	52.7	49.2	47.8
11	Preferred Stock	0.1	0.1	0.1	0.1	0.2	0.1	0.1
12	Common Equity	52.2	52.8	52.1	48.9	47.1	50.6	52.1
	Total	100.0	100.0	100.0	100.0	100.0		
	Rates on Average Capital(2)(%)							
13	Total Debt	5.0	5.1	5.2	5.5	5.5	5.3	5.2
14	Long-Term Debt	4.0	4.0	4.1	4.9	3.7	4.1	4.0
15	Preferred Stock	5.4	5.3	4.4	5.3	5.3	5.2	5.3
	Coverage - Including AFC(3)(x)							
16	PreTax Interest	4.4	4.6	4.1	3.7	3.5	4.1	4.1
17	PreTax Interest + Pref. Div	4.4	4.6	4.0	3.7	3.5	4.0	4.0
18	PostTax Interest + Pref. Div	3.4	3.5	3.1	2.7	2.6	3.1	3.1
	Coverage - Excluding AFC(3)(x)							
19	PreTax Interest	4.3	4.5	4.0	3.7	3.5	4.0	4.0
20	PreTax Interest + Pref. Div	4.3	4.5	4.0	3.6	3.4	4.0	4.0
21	PostTax Interest + Pref. Div	3.4	3.5	3.0	2.7	2.5	3.0	3.0
22	GCF / Interest Coverage(4)(x)	5.8	6.1	5.3	4.7	4.4	5.3	5.3
23	Coverage of Common Dividends(5)(x)	3.7	4.2	3.6	3.9	3.5	3.8	3.7
24	Construction / Avg. Tot. Capital(%)	10.8	10.0	9.7	10.0	9.6	10.0	10.0
25	NCF / Construction(6)(%)	77.7	93.7	81.2	79.2	72.6	80.9	79.2
26	AFC / Income for Common Stock	2.7	2.1	2.5	3.3	3.8	2.9	2.7
27	GCF / Avg. Tot. Debt(7)(%)	23.6	26.3	21.6	20.5	18.4	22.1	21.6
28	GCF / Permanent Capital(8)(%)	11.4	12.7	10.9	11.0	10.1	11.2	11.0

See page 2 of this Schedule for notes.

Water Group Followed by Analysts
Five Year Analysis
2011-2015

Notes:

(1) Average of the achieved results for each individual company based upon the financials as originally reported.

(2) Computed by relating total debt interest, long-term debt interest and preferred dividend expense to average of beginning and ending balance of the respective capital outstanding.

(3) The coverage calculations, both including and excluding AFC, represent the number of times available earnings cover the various fixed charges. It should be noted that the pretax coverage including preferred dividends has been grossed up for the income tax paid on the preferred dividends.

(4) GCF or gross cash flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFC), plus interest charges, divided by interest charges.

(5) GCF (see note 4) less all preferred dividends which cover common dividends.

(6) The percent of GCF (see note 4) less all cash dividends which cover gross construction expenditures.

(7) GCF (see note 4) as a percentage of Permanent Capital (long-term debt, current maturities and preferred, preference and common equity).

(8) GCF (see note 4) as a percentage of average total debt.

(9) Average of the second, third and fourth quintile values.

Source of Information: Standard & Poor's and Annual Reports

S&P Utilities
Five Year Analysis
2011 - 2015 (1)

Ln #		2015	2014	2013	2012	2011	Average Ann. Chg(%)	
				(Millions of $)				
	Investor Provided Capital($)							
1	Permanent Capital	34,264.819	32,894.379	32,093.349	30,836.470	25,059.216	8.5	
2	Short-Term Debt	2,488.013	2,669.681	2,085.557	2,290.235	1,634.659		
3	Total Capital	36,752.832	35,564.060	34,178.906	33,126.705	26,693.875	8.7	
4	Total Revenue($)	13,805.877	14,504.170	13,849.946	13,181.742	12,917.003	1.8	
5	Construction($)	3,998.984	3,652.200	3,458.395	3,507.373	2,958.175	8.1	
							Five Year Average	Average Central Values(9)
6	Effective Income Tax Rate(%)	31.5	29.5	32.2	31.5	36.5	32.3	31.5
	Book Capitalization Ratios(%)							
7	Long-Term Debt	53.7	52.8	52.5	52.3	52.6	52.8	52.6
8	Preferred Stock	0.7	0.7	0.7	0.8	0.7	0.7	0.7
9	Common Equity	45.6	46.5	46.8	46.8	46.7	46.5	46.7
	Total	100.0	100.0	100.0	100.0	100.0		
10	Total Debt	56.7	56.3	55.5	55.6	55.5	55.9	55.6
11	Preferred Stock	0.7	0.7	0.7	0.8	0.7	0.7	0.8
12	Common Equity	42.6	43.1	43.8	43.6	43.8	43.4	43.6
	Total	100.0	100.0	100.0	100.0	100.0		
	Rates on Average Capital(2)(%)							
13	Total Debt	4.4	4.7	4.8	5.1	5.4	4.9	4.8
14	Long-Term Debt	5.0	4.9	5.1	5.5	5.7	5.3	5.1
15	Preferred Stock	3.6	3.6	3.0	2.7	4.6	3.5	3.6
	Coverage - Including AFC(3)(x)							
16	PreTax Interest	3.6	3.6	3.3	3.1	3.6	3.4	3.6
17	PreTax Interest + Pref. Div	3.6	3.5	3.3	3.0	3.6	3.4	3.5
18	PostTax Interest + Pref. Div	2.7	2.7	2.5	2.4	2.7	2.6	2.7
	Coverage - Excluding AFC(3)(x)							
19	PreTax Interest	3.5	3.5	3.2	3.0	3.5	3.4	3.5
20	PreTax Interest + Pref. Div	3.5	3.5	3.2	2.9	3.5	3.3	3.5
21	PostTax Interest + Pref. Div	2.6	2.6	2.4	2.3	2.6	2.5	2.6
22	GCF / Interest Coverage(4)(x)	5.5	5.3	5.0	4.7	5.1	5.1	5.1
23	Coverage of Common Dividends(5)(x)	3.5	4.1	3.7	3.7	3.8	3.8	3.7
24	Construction / Avg. Tot. Capital(%)	11.7	11.2	11.1	11.9	11.4	11.5	11.4
25	NCF / Construction(6)(%)	65.2	75.8	67.9	58.7	79.8	69.5	67.9
26	AFC / Income for Common Stock	4.8	6.3	7.4	2.7	40.8	12.4	6.3
27	GCF / Avg. Tot. Debt(7)(%)	19.0	19.7	18.5	18.1	21.7	19.4	19.0
28	GCF / Permanent Capital(8)(%)	11.1	11.5	10.8	10.5	12.5	11.3	11.1

See page 2 of this Schedule for notes.

S&P Public Utilities
Five Year Analysis
2011-2015

Notes:

(1) Market value weighted achieved results for each individual company based upon the financials as originally reported.

(2) Computed by relating total debt interest, long-term debt interest and preferred dividend expense to average of beginning and ending balance of the respective capital outstanding.

(3) The coverage calculations, both including and excluding AFC, represent the number of times available earnings cover the various fixed charges. It should be noted that the pretax coverage including preferred dividends has been grossed up for the income tax paid on the preferred dividends.

(4) GCF or gross cash flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFC), plus interest charges, divided by interest charges.

(5) GCF (see note 4) less all preferred dividends which cover common dividends.

(6) The percent of GCF (see note 4) less all cash dividends which cover gross construction expenditures.

(7) GCF (see note 4) as a percentage of Permanent Capital (long-term debt, current maturities and preferred, preference and common equity).

(8) GCF (see note 4) as a percentage of average total debt.

(9) Average of the second, third and fourth quintile values.

Source of Information: Standard & Poor's, Moody's and Annual Reports

Risk Measures for the Common Stock of
The Water Group Followed by Analysts and the S&P Utilities

	Recent S&P Issuer Credit Rating	Stock Exchange for Company	Recent S&P Common Stock Ranking	Value Line Beta	Recent Market Value (Mill $)	Recent S&P Market Size Index	Market Quartile	Market Quartile Name
Water Group Followed by Analysts								
American States Water Co	A+	New York Stock Exchange	High (A)	0.75	1,427.799	S&P SmallCap 600	3	Low-Cap
American Water Works Co Inc	A	New York Stock Exchange	-	0.70	13,168.607	S&P 500	1	Large-Cap
Aqua America Inc	A+	New York Stock Exchange	Highest (A+)	0.75	5,727.658	S&P MidCap 400	2	Mid-Cap
California Water Service Gp	A+	New York Stock Exchange	Above Average (A-)	0.75	1,398.442	S&P SmallCap 600	3	Low-Cap
Connecticut Water Svc Inc	A	NASDAQ/ NMS/ OTC Bul Brd	High (A)	0.60	530.530	NOT in a S&P Index	4	Mico-Cap
Middlesex Water Co	A	NASDAQ/ NMS/ OTC Bul Brd	Above Average (A-)	0.70	600.105	NOT in a S&P Index	3	Low-Cap
SJW Corp	A	New York Stock Exchange	Below Average (B)	0.75	704.493	NOT in a S&P Index	3	Low-Cap
York Water Co	A-	NASDAQ/ NMS/ OTC Bul Brd	High (A)	0.70	346.896	NOT in a S&P Index	4	Mico-Cap
Average	A		Above Average (A-)	0.71	1,051.468	NOT in a S&P Index	3	Low-Cap
S&P Public Utilities								
AES Corporation (The)	BB	New York Stock Exchange	Below Average (B)	1.15	7,308.321	S&P 500	2	Mid-Cap
AGL Resources Inc.	BBB+	New York Stock Exchange	Above Average (A-)	0.60	7,940.744	S&P 500	2	Mid-Cap
Ameren Corp	BBB+	New York Stock Exchange	Below Average (B)	0.75	12,022.564	S&P 500	1	Large-Cap
American Electric Power Co Inc	BBB	New York Stock Exchange	Above Average (A-)	0.70	31,802.691	S&P 500	1	Large-Cap
American Water Works Company Inc	A	New York Stock Exchange	-	0.70	13,168.607	S&P 500	1	Large-Cap
CenterPoint Energy Inc.	A-	New York Stock Exchange	Below Average (B)	0.85	9,701.846	S&P 500	2	Mid-Cap
CMS Energy Corp	BBB+	New York Stock Exchange	Average (B+)	0.70	11,708.011	S&P 500	1	Large-Cap
Consolidated Edison Inc.	A-	New York Stock Exchange	Average (B+)	0.55	22,186.059	S&P 500	1	Large-Cap
Dominion Resources Inc.	BBB+	New York Stock Exchange	Below Average (B)	0.70	44,521.750	S&P 500	1	Large-Cap
DTE Energy Co	BBB+	New York Stock Exchange	Above Average (A-)	0.70	16,271.166	S&P 500	1	Large-Cap
Duke Energy Corp	A-	New York Stock Exchange	Below Average (B)	0.60	53,892.961	S&P 500	1	Large-Cap
Edison International	BBB+	New York Stock Exchange	Below Average (B)	0.70	23,337.842	S&P 500	1	Large-Cap
Entergy Corp.	BBB	New York Stock Exchange	Average (B+)	0.70	13,570.017	S&P 500	1	Large-Cap
Eversource Energy	A	New York Stock Exchange	Above Average (A-)	0.75	17,522.516	S&P 500	1	Large-Cap
Exelon Corp	BBB	New York Stock Exchange	Below Average (B)	0.65	31,586.488	S&P 500	1	Large-Cap
FirstEnergy Corp.	BBB-	New York Stock Exchange	Below Average (B)	0.70	13,934.801	S&P 500	1	Large-Cap
NextEra Energy Inc	A-	New York Stock Exchange	High (A)	0.70	55,428.895	S&P 500	1	Large-Cap
NiSource Inc.	BBB+	New York Stock Exchange	Average (B+)	NMF	7,672.040	S&P 500	2	Mid-Cap
NRG Energy Inc	BB-	New York Stock Exchange	Below Average (B)	1.10	5,158.193	S&P 500	2	Mid-Cap
PG&E Corp	BBB	New York Stock Exchange	Below Average (B)	0.65	29,802.203	S&P 500	1	Large-Cap
Pinnacle West Capital Corp	A-	New York Stock Exchange	Average (B+)	0.70	8,178.792	S&P 500	2	Mid-Cap
PPL Corp	A-	New York Stock Exchange	Below Average (B)	0.70	26,089.461	S&P 500	1	Large-Cap
Public Service Enterprise Group Inc	BBB+	New York Stock Exchange	Average (B+)	0.75	22,640.322	S&P 500	1	Large-Cap
SCANA Corp	BBB+	New York Stock Exchange	High (A)	0.70	9,991.327	S&P 500	2	Mid-Cap
Sempra Energy	BBB+	New York Stock Exchange	Average (B+)	0.80	26,726.119	S&P 500	1	Large-Cap
Southern Co (The)	A-	New York Stock Exchange	Above Average (A-)	0.55	46,402.012	S&P 500	1	Large-Cap
TECO Energy Inc.	BBB+	New York Stock Exchange	Below Average (B)	0.80	6,487.047	S&P 500	2	Mid-Cap
WEC Energy Group Inc	A-	New York Stock Exchange	High (A)	0.65	18,983.010	S&P 500	1	Large-Cap
Xcel Energy Inc.	A-	New York Stock Exchange	Above Average (A-)	0.65	21,014.016	S&P 500	1	Large-Cap
Average	BBB+		Average (B+)	0.72	21,208.615	S&P 500	1	Large-Cap

Comparative Ratios
The Water Group Followed by Analysts,
S&P Utilities, and S&P 500
For the Years 2011-2015(1)

	2015	2014	2013	2012	2011	Five Year Average
Return on Common Equity(2)						
Water Group Followed by Analysts	10.4	11.2	9.9	10.1	9.2	10.2
S&P Utilities	8.4	10.0	8.9	8.1	11.2	9.3
S&P 500	12.0	14.4	14.7	13.7	14.8	13.9
Market/Book Multiple(3)						
Water Group Followed by Analysts	2.3	2.1	2.1	1.9	1.8	2.0
S&P Utilities	1.9	1.9	1.7	1.6	1.6	1.7
S&P 500	2.7	2.7	2.3	2.1	2.1	2.2
Earnings/Price Ratio(4)						
Water Group Followed by Analysts	4.7	5.4	4.8	5.5	5.1	5.1
S&P Utilities	4.0	5.4	5.2	5.1	7.1	5.4
S&P 500	4.4	5.4	6.3	6.4	7.2	5.9
Dividend Payout Ratio(5)						
Water Group Followed by Analysts	56.9	53.2	60.6	59.3	67.1	59.4
S&P Utilities	57.2	77.1	76.5	92.4	21.7	65.0
S&P 500	49.4	38.0	34.5	35.7	30.0	37.5
Dividend Yield(6)						
Water Group Followed by Analysts	2.6	2.8	2.8	3.2	3.4	3.0
S&P Utilities	3.7	3.6	4.0	4.2	4.3	4.0
S&P 500	2.2	2.1	2.2	2.3	2.2	2.2

See next page for Notes.

Comparative Ratios For
The Water Group Followed by Analysts,
The S&P Utilities, and the S&P 500
For the Years 2011-2015 (1)

Notes:

(1) The average of achieved results for the companies in each group. The information for the S&P Public Utilities is market weighted. The information for the S&P 500 is based upon per share information adjusted to price index level.

(2) Rate of Return on Average Book Common Equity - income available for common equity divided by average beginning and ending year's balance of book common equity.

(3) Market/Book Ratio - average of yearly high-low market price divided by the average of beginning and ending year's book value per share.

(4) Earnings/Price Ratio - reported earnings per share yearly divided by the average of yearly high-low market price.

(5) Dividend Payout Ratio is computed by dividing the yearly reported dividends paid by the yearly income available for common equity.

(6) Dividend Yield - yearly dividend per share divided by the average yearly high-low market price.

Source of Information: Standard & Poor's and Annual Reports

Capital Intensity and Capital Recovery
City of DuBois - Bureau of Water
The Water Group Followed by Analysts, and S&P Utilities
For the Year 2015

	Capital Intensity	Rate of Capital Recovery	Capital Recovery Years
City of DuBois - Bureau of Water	$6.94	0.00%	∞
Water Group Followed by Analysts	$5.68	2.23%	45.9
S&P Utilities	$3.82	3.20%	33.4

Relative Size of
City of DuBois - Bureau of Water
City of DuBois - Bureau of Water - Total Outside City
City of DuBois - Bureau of Water - Total Inside City
Versus the Water Group Followed by Analysts
For the Year 2015

	City of DuBois Bureau of Water	Water Group Followed by Analysts	Water Group Followed by Analysts Vs. City of DuBois Bureau of Water
City of DuBois - Bureau of Water			
Total Capitalization (000's)*	$14,976	$2,364,000	157.9 x
Total Operating Revenues (000's)	$2,877	$699,000	243.0 x
Number of Customers	4,501	688,103	152.9 x
City of DuBois - Bureau of Water - Total Outside City			
Total Capitalization (000's)*	$3,265	$2,364,000	723.9 x
Total Operating Revenues (000's)	$804	$699,000	869.4 x
Number of Customers	705	688,103	976.0 x
City of DuBois - Bureau of Water - Total Inside City			
Total Capitalization (000's)*	$11,711	$2,364,000	201.9 x
Total Operating Revenues (000's)	$2,073	$699,000	337.2 x
Number of Customers	3,796	688,103	181.3 x

* Capitalization is apportioned based on revenues and customers.

Institutional Holdings, Insider Holdings and Percentage of Shares Traded Annually for
The Water Group Followed by Analysts, and the S&P Utilities

	Water Group Followed by Analysts	S&P Public Utilities
Percentage of common shares held by insiders (1)	2.5%	0.4%
Percentage of common shares held by institutions (2)	54.1%	76.1%
Percentage Of Common Shares Traded In 2014	49%	177%
Percentage Of Common Shares Traded In 2015	86%	184%
Average Number Of Months For All Common Shares To Turnover (3)	14.5	6.8

Notes: (1) An insider is a director or an officer who has a policy-making role or a person who is directly or indirectly the beneficial owner of more than 10% of a certain company's stock. An insider may be either an individual or a corporation. Insiders are required to disclose their purchase/sale transactions to the SEC in which a change in beneficial ownership has occurred. The filings must be submitted before the end of the second business day following the day on which the transaction had been executed.

(2) Institutional holders are those investment managers having a fair market value of equity assets under management of $100 million or more. Certain banks, insurance companies, investment advisers, investment companies, foundations and pension funds are included in this category.

(3) Based on average turnover (shares traded) over the past five years.

Comparison of Variability of Common Shareholder Return Arising from Leverage and the Absences of an Income Tax Cushion

Line No.		A Water Group Followed by Analysts, 3/31/16	B City of DuBois - Bureau of Water, 12/31/16	C No Income Taxes - Water Group Followed by Analysts, 3/31/16	D No Income Taxes - City of DuBois - Bureau of Water, 12/31/16
1	Assumed Rate Base	$1,000,000	$1,000,000	$1,000,000	$1,000,000
2	Pre-Tax ROR (1)	11.09%	10.71%	7.40%	7.24%
3	Assumed Variability (2)				
4	10%	12.20%	11.78%	8.14%	7.96%
5	5%	11.64%	11.25%	7.77%	7.60%
6	-10%	9.98%	9.64%	6.66%	6.52%
7	-5%	10.54%	10.17%	7.03%	6.88%
8	8%	11.98%	11.57%	7.99%	7.82%
9	-8%	10.20%	9.85%	6.81%	6.66%
	Business Risk: (3)				
10	Average	11.09%	10.71%	7.40%	7.24%
11	Standard Deviation	0.96%	0.93%	0.64%	0.63%
12	Coeff of Variation	8.69%	8.69%	8.69%	8.69%
13	Pre-Tax Operating Income With Variability(4)				
14	10%	$121,990	$117,810	$81,400	$79,640
15	5%	116,445	112,455	77,700	76,020
16	-10%	99,810	96,390	66,600	65,160
17	-5%	105,355	101,745	70,300	68,780
18	8%	119,772	115,668	79,920	78,192
19	-8%	102,028	98,532	68,080	66,608
20	Pre-Tax Fixed				
21	Capital Charges (5)	$18,200	$19,900	$18,200	$19,900
22	Effective Corporate				
23	Tax Rate (1)	39.8000%	39.8000%	0.0000%	0.0000%
24	Common Equity Ratio (1)	54.30%	50.00%	54.30%	50.00%
25	Return On Common Equity With Variability (6)				
26	10%	11.51%	11.79%	11.64%	11.95%
27	5%	10.89%	11.14%	10.96%	11.22%
28	-10%	9.05%	9.21%	8.91%	9.05%
29	-5%	9.66%	9.85%	9.59%	9.78%
30	8%	11.26%	11.53%	11.37%	11.66%
31	-8%	9.29%	9.47%	9.19%	9.34%
	Equity Risk: (7)				
32	Average	10.28%	10.50%	10.28%	10.50%
33	Standard Deviation	1.07%	1.12%	1.18%	1.26%
34	**Coeff of Variation**	**10.40%**	**10.68%**	**11.53%**	**11.99%**

Notes : (1) Developed on page 2 of this Schedule.
(2) Changing the assumed variation will not change the conclusion regarding risk.
(3) Business risk is defined as the variability of pre-tax operating income or return. Business Risk as measured by the coefficient of variation is shown to be equal for each entity.
(4) Lines 4-9 multiplied by line 1.
(5) Pre-tax fixed capital cost rates, from page 2 of this Schedule, multiplied by line 1.
(6) Line 21 subtracted from lines 13-19; multiplied by 1 minus the tax rate (line 23); divided by the common equity ratio (line 24).
(7) Common equity risk is measured as the variability of income or return. The common equity risk arising from amounts of leverage and the absence of a income tax cushion are measured by the coefficient of variation, shown to be 11% to 12% higher without an income tax cushion. (11.53%÷10.40%=111%-100%=11% and 11.99%÷10.68%=112%-100%=12%)

Comparison of Capital Structure Ratios,
Cost Rates and Overall Rates of Return

	Structure	Cost	After-Tax Weighted Cost	Estimated Effective Corporate Tax Rate Complement	Pre-Tax Weighted Cost Rate
1	Water Group Followed by Analysts, 3/31/16				
Debt	45.60%	4.00%	1.82%		1.82%
Preferred Stock	0.10%	5.40%	0.01%	0.602000	0.02%
Common Equity	54.30%	10.25%	5.57%	0.602000	9.25%
	100.00%		7.40%		11.09%
2	City of DuBois - Bureau of Water, 12/31/16				
Debt	50.00%	3.98%	1.99%		1.99%
Preferred Stock	0.00%	0.00%	0.00%	0.602000	0.00%
Common Equity	50.00%	10.50%	5.25%	0.602000	8.72%
	100.00%		7.24%		10.71%
3	No Income Taxes - Water Group Followed by Analysts, 3/31/16				
Debt	45.60%	4.00%	1.82%		1.82%
Preferred Stock	0.10%	5.40%	0.01%	0.000000	0.01%
Common Equity	54.30%	10.25%	5.57%	0.000000	5.57%
	100.00%		7.40%		7.40%
4	No Income Taxes - City of DuBois - Bureau of Water, 12/31/16				
Debt	50.00%	3.98%	1.99%		1.99%
Preferred Stock	0.00%	0.00%	0.00%	0.000000	0.00%
Common Equity	50.00%	10.50%	5.25%	0.000000	5.25%
	100.00%		7.24%		7.24%

Bond and Credit Ratings for
City of DuBois
The Water Group Followed by Analysts

	S&P Credit Rating
City of DuBois	NA
Water Group Followed by Analysts	
American States Water Co	A+
American Water Works Co Inc	A
Aqua America Inc *	A+
California Water Service Gp **	A+
Connecticut Water Svc Inc	A
Middlesex Water Co	A
SJW Corp ***	A
York Water Co	A-
Average	A

* - The A+ bond rating is that for Aqua Pennsylvania, Inc.
** - The A+ bond rating is that for California Water Service, Inc.
*** - The A bond rating is that for San Jose Water Co.

Comparison of Standard & Poor's Measures of Financial Risk
For the Water Group Followed by Analysts(1)

Trend in Standard & Poor's Measures of
Financial Risk (Five-Year Average 2011-15)

	Water Group Followed by Analysts
PreTax Interest Coverage(2)(x)	4.0 x
Total Debt/Total Capital(%)	49.2 %
GCF / Interest Coverage(3)(x)	5.3 x
GCF / Average Total Debt(4)(%)	22.1 %
NCF / Construction(5)(%)	80.9 %

Spot in Standard & Poor's Measures of
Financial Risk (For the Year 2015)

	Water Group Followed by Analysts
PreTax Interest Coverage(2)(x)	4.3 x
Total Debt/Total Capital(%)	47.6 %
GCF / Interest Coverage(3)(x)	5.8 x
GCF / Average Total Debt(4)(%)	23.6 %
NCF / Construction(5)(%)	77.7 %

See the next page for notes.

Comparison of Standard & Poor's Measures of Financial Risk
For The Water Group Followed by Analysts

Notes:

(1) Average of the achieved results for each individual company based upon the financials as originally reported.

(2) Represents the number of times available earnings, excluding AFC, cover all interest charges.

(3) GCF or gross cash flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFC), plus interest charges, divided by interest charges.

(4) GCF (see note 3) as a percentage of average total debt.

(5) The percent of GCF (see note 3) less all cash dividends which cover gross construction expenditures.

Source of Information: Standard & Poor's, Moody's and Annual Reports

Distribution of Bond and Credit Ratings for
All Companies Contained in S&P's *Compustat* Database (1)

Number of Companies In Each Grouping	S&P Bond and Credit Ratings				Range of Reported Permanent Capital By Groupings (Million $)		
	Average	Median	Maximum	Minimum	Smallest	Median	Largest
100	B	B	A	Default	-2,694.095	365.342	574.654
100	BB-	B+	AA-	CC	579.395	751.135	933.600
100	BB-	BB-	AA-	Default	934.900	1,109.892	1,293.470
100	BB	BB	A+	Default	1,299.998	1,495.699	1,677.200
100	BB	BB	A+	Default	1,679.994	1,874.361	2,083.165
100	BB+	BB+	AA	CC	2,086.037	2,350.400	2,603.100
100	BB+	BBB-	A	Default	2,617.359	2,938.486	3,276.248
100	BBB-	BBB-	AA-	CCC+	3,280.000	3,557.658	3,874.100
100	BBB-	BBB-	A+	Default	3,877.061	4,320.109	4,795.300
100	BBB-	BBB-	AA	CCC+	4,799.285	5,417.822	6,016.343
100	BBB-	BBB-	AA-	B	6,017.644	6,713.500	7,582.618
100	BBB	BBB	AA-	CCC-	7,606.600	8,925.406	10,372.792
100	BBB	BBB+	AA-	CCC	10,413.308	11,855.950	14,035.900
100	BBB	BBB+	AA-	B	14,073.000	17,259.812	20,507.000
100	BBB+	BBB+	AAA	B+	20,532.000	24,993.901	31,943.000
100	A-	A-	AA+	B	32,627.000	47,021.000	83,027.914
61	A	A-	AAA	B+	83,420.000	143,440.000	557,329.000
Total 1,661							

Number of Companies In Each Grouping	Range of Reported Permanent Capital By Groupings (Million $)			Distribution of S&P Bond and Credit Ratings By Size Grouping								
	Smallest	Median	Largest	AAA	AA	A	BBB	BB	B	CCC	CC	Default
100	-2,694.095	365.342	574.654	0%	0%	5%	3%	19%	53%	15%	1%	4%
100	579.395	751.135	933.600	0%	1%	3%	15%	27%	50%	3%	1%	0%
100	934.900	1,109.892	1,293.470	0%	1%	5%	13%	35%	32%	12%	1%	1%
100	1,299.998	1,495.699	1,677.200	0%	0%	4%	21%	51%	19%	4%	0%	1%
100	1,679.994	1,874.361	2,083.165	0%	0%	7%	34%	25%	30%	1%	0%	3%
100	2,086.037	2,350.400	2,603.100	0%	1%	8%	38%	35%	16%	1%	1%	0%
100	2,617.359	2,938.486	3,276.248	0%	0%	11%	41%	36%	10%	1%	0%	1%
100	3,280.000	3,557.658	3,874.100	0%	1%	8%	48%	32%	10%	1%	0%	0%
100	3,877.061	4,320.109	4,795.300	0%	0%	13%	45%	27%	12%	2%	0%	1%
100	4,799.285	5,417.822	6,016.343	0%	2%	15%	47%	29%	6%	1%	0%	0%
100	6,017.644	6,713.500	7,582.618	0%	1%	18%	52%	22%	9%	0%	0%	0%
100	7,606.600	8,925.406	10,372.792	0%	1%	24%	52%	17%	4%	2%	0%	0%
100	10,413.308	11,855.950	14,035.900	0%	1%	34%	46%	14%	4%	1%	0%	0%
100	14,073.000	17,259.812	20,507.000	0%	1%	32%	47%	10%	10%	0%	0%	0%
100	20,532.000	24,993.901	31,943.000	1%	5%	38%	42%	12%	2%	0%	0%	0%
100	32,627.000	47,021.000	83,027.914	0%	11%	44%	35%	8%	2%	0%	0%	0%
61	83,420.000	143,440.000	557,329.000	3%	28%	36%	30%	2%	2%	0%	0%	0%
1,661												

Note: (1) Includes all companies contained in S&P's *Compustat* North American Database that have a S&P bond or credit ratings and reported permanent capital for the year 2015 (as of 6/16/16). Companies were sorted based on amount of reported permanent capital and then separated into groups of 100 companies from smallest to largest.

Debt Service Coverage Levels for the
The Water Group Followed by Analysts

Debt Service Coverage - As Reported

Water Group Followed by Analysts	2015	2014	2013	2012	2011	Average
American States Water Co	5.6	2.9	4.8	3.8	2.3	3.9
American Water Works Co Inc	2.8	2.1	1.4	1.4	2.5	2.0
Aqua America Inc	0.8	1.3	1.1	1.3	1.9	1.3
California Water Service Gp	3.7	3.9	1.7	3.5	3.4	3.2
Connecticut Water Svc Inc	4.6	3.7	1.6	0.5	4.1	2.9
Middlesex Water Co	3.2	3.2	2.0	3.0	2.7	2.8
SJW Corp	4.2	5.0	2.9	3.0	3.3	3.7
York Water Co	1.4	1.1	3.9	3.7	3.6	2.7
Average	3.3	2.9	2.4	2.5	3.0	2.8

Source of Information: Standard Poor's Research Insight

Municipal Water and Sewer Utility
Median Debt Service Levels for 2011, 2007 and 2004

2011 Water and Sewer Medians

	AAA	AA	A	All Credits
Sample Size (N=)	25	115	22	162
Coverage of Annual Debt Service	2.6	2.3	1.8	2.3
Coverage of Maximum Level of Debt Service	3.3	1.8	1.4	1.9
Minimum Covenanted Level of Debt Service	2.0	1.8	1.5	1.8

2007 Water and Sewer Medians

	AAA	AA	A	All Credits
Sample Size (N=)	11	67	75	153
Coverage of Annual Debt Service	3.0	2.5	2.1	2.3
Coverage of Maximum Level of Debt Service	2.5	1.9	1.9	1.9
Minimum Covenanted Level of Debt Service	2.2	1.9	1.5	1.8

2004 Water and Sewer Medians

	AAA	AA	A	All Credits
Sample Size (N=)	9	22	20	51
Coverage of Annual Debt Service	3.0	2.0	2.3	2.3
Coverage of Maximum Level of Debt Service	2.6	1.9	1.7	2.0
Minimum Covenanted Level of Debt Service	2.1	1.7	1.5	1.8

Source of Information: Fitch, Inc., Fitch Ratings Ltd. "2011 Water and Wastewater Medians", 1/18/11, Fitch, Inc., Fitch Ratings Ltd. "2007 Median Ratios for Water and Sewer Revenue Bonds — Retail Systems", 1/16/07

Debt Service Coverage Levels for
Pennsylvania Municipal Authorities
For the Years 2010 to 2015

		2015	2014	2013	2012	2011	2010	Summary 2011-2015	Summary 2010-2014
Water Municipal Authorities									
Number of Municipal Authorities Reporting		65	255	254	264	269	266	1107	1308
Percentiles:	10%	2.8	1.4	1.5	1.3	1.3	1.2	1.4	1.3
	25%	4.8	3.1	3.1	2.7	2.4	2.4	2.8	2.7
	50%	6.6	5.9	6.0	5.4	5.1	4.9	5.7	5.4
	75%	12.7	11.0	10.5	10.7	11.7	9.3	10.8	10.5
	90%	21.5	36.7	23.6	24.6	28.6	23.7	28.3	27.7
Sewer Municipal Authorities									
Number of Municipal Authorities Reporting		111	492	513	516	514	505	2146	2540
Percentiles:	10%	1.6	1.4	1.3	1.4	1.2	1.3	1.3	1.3
	25%	2.6	2.3	2.1	2.1	1.9	2.2	2.2	2.1
	50%	4.1	4.4	4.5	4.5	4.1	4.2	4.4	4.4
	75%	8.8	8.9	9.5	9.1	8.3	9.7	9.0	9.1
	90%	17.6	24.3	24.1	27.5	23.1	25.3	24.1	24.5
All Municipal Authorities									
Number of Municipal Authorities Reporting		196	825	853	859	866	856	3599	4259
Percentiles:	10%	1.6	1.3	1.3	1.3	1.2	1.1	1.3	1.2
	25%	2.9	2.4	2.2	2.1	2.0	2.1	2.3	2.2
	50%	5.2	4.8	4.9	4.7	4.3	4.3	4.7	4.6
	75%	9.5	9.9	9.8	9.8	9.2	9.5	9.7	9.7
	90%	20.4	27.7	24.0	27.9	24.8	25.9	25.4	26.0

Source of Information: Statistics for Municipal Authorities in Pennsylvania, 2010 - 2015

City of DuBois - Bureau of Water
Debt Service Coverage Levels for 2013 to 2015

	Actual 2015 As Reported	Actual 2014 As Reported	Actual 2013 As Reported
Operating Income (Available for Debt Service)	$1,542,017	$1,984,930	$1,066,454
Debt service principal	3,696,889	376,203	1,689,407
Debt service interest	498,426	342,062	352,703
Total Debt Service	$4,195,315	$718,265	$2,042,110
Debt Service Coverage	0.37	2.76	0.52

Comparison of Credit Market Financial Risk Metrics
For the City of DuBois - Bureau of Water
The Water Group Followed by Analysts
2013 - 2015 (1)

	City of DuBois - Bureau of Water			Water Group Followed by Analysts		
	2015	2014	2013	2015	2014	2013
Debt Service Coverage	0.4	2.8	0.5	3.3	2.9	2.4
Pre-Tax Interest Coverage - Including AFC(2)(x)	2.4	4.7	2.0	4.4	4.6	4.1
Post-Tax Interest Coverage - Including AFC(2)(x)	2.4	4.7	2.0	3.4	3.5	3.1
GCF / Interest Coverage(3)(x)	2.1	4.8	2.0	5.8	6.1	5.3
GCF / Tot. Debt(4)(%)	9.4	14.8	6.2	23.1	26.0	21.9
GCF / Construction(5)(%)	77.6	79.7	52.9	109.4	127.6	116.7

See the next page of this Schedule for notes.

Comparison of Credit Market Financial Risk Metrics
For the City of DuBois - Bureau of Water and
The Water Group Followed by Analysts
2013 - 2015

Notes:

(1) Average of the achieved results for each individual company based upon the financials as originally reported.

(2) Represents the number of times available earnings, including AFC, cover all interest charges.

(3) GCF or gross cash flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFC), plus interest charges, divided by interest charges.

(4) GCF (see note 3) as a percentage of total debt.

(5) The percent of GCF (see note 3) which cover gross construction expenditures.

Source of Information: Standard & Poor's, Moody's and Annual Reports

Interest Rate Trends for
Investor-Owned Public Utility Bonds
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	Aaa Rated	Aa Rated	A Rated	Baa Rated
	2010	NA	5.24	5.46	5.96
	2011	NA	4.78	5.04	5.57
	2012	NA	3.83	4.13	4.86
	2013	NA	4.24	4.47	4.98
	2014	NA	4.18	4.28	4.80
	Average	NA	4.45	4.68	5.23
Jan	2015	NA	3.52	3.58	4.39
Feb	2015	NA	3.62	3.67	4.44
Mar	2015	NA	3.67	3.74	4.51
Apr	2015	NA	3.63	3.75	4.51
May	2015	NA	4.05	4.17	4.91
Jun	2015	NA	4.29	4.39	5.13
Jul	2015	NA	4.27	4.40	5.22
Aug	2015	NA	4.13	4.25	5.23
Sep	2015	NA	4.25	4.39	5.42
Oct	2015	NA	4.13	4.29	5.47
Nov	2015	NA	4.22	4.40	5.57
Dec	2015	NA	4.16	4.35	5.55
Avg	2015	NA	4.00	4.12	5.03
Jan	2016	NA	4.09	4.27	5.49
Feb	2016	NA	3.94	4.11	5.28
Mar	2016	NA	3.93	4.16	5.12
Apr	2016	NA	3.74	4.00	4.75
May	2016 *E*	NA	3.66	3.91	4.76

Source of Information: MERGENT BOND RECORD

Credit Risk Spreads of
Investor-Owned Public Utility Bonds
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	Aa Over Aaa	A Over Aa	Baa Over A	Baa Over Aaa
	2010	NA	0.23	0.50	NA
	2011	NA	0.26	0.53	NA
	2012	NA	0.30	0.73	NA
	2013	NA	0.23	0.51	NA
	2014	NA	0.10	0.52	NA
	Average	NA	0.22	0.56	NA
Jan	2015	NA	0.06	0.81	NA
Feb	2015	NA	0.05	0.77	NA
Mar	2015	NA	0.07	0.77	NA
Apr	2015	NA	0.12	0.76	NA
May	2015	NA	0.12	0.74	NA
Jun	2015	NA	0.10	0.74	NA
Jul	2015	NA	0.13	0.82	NA
Aug	2015	NA	0.12	0.98	NA
Sep	2015	NA	0.14	1.03	NA
Oct	2015	NA	0.16	1.18	NA
Nov	2015	NA	0.18	1.17	NA
Dec	2015	NA	0.19	1.20	NA
Avg	2015	NA	0.12	0.91	NA
Jan	2016	NA	0.18	1.22	NA
Feb	2016	NA	0.17	1.17	NA
Mar	2016	NA	0.23	0.96	NA
Apr	2016	NA	0.26	0.75	NA
May	2016	NA	0.25	0.85	NA

Source of Information: MERGENT BOND RECORD

Interest Rate Trends
Of Long-Term Treasury Constant
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	10-Year T-Bond	20-Year T-Bond	30-Year T-Bond	Long-term T-Bond Yield
	2010	3.21	4.03	4.25	3.83
	2011	2.79	3.62	3.91	3.44
	2012	1.80	2.54	2.92	2.42
	2013	2.35	3.12	3.45	2.97
	2014	2.54	3.07	3.34	3.07
	Average	2.54	3.28	3.57	3.15
Jan	2015	1.88	2.20	2.46	2.33
Feb	2015	1.98	2.34	2.57	2.46
Mar	2015	2.04	2.41	2.63	2.52
Apr	2015	1.94	2.33	2.59	2.46
May	2015	2.20	2.69	2.96	2.83
Jun	2015	2.36	2.85	3.11	2.98
Jul	2015	2.32	2.77	3.07	2.92
Aug	2015	2.17	2.55	2.86	2.71
Sep	2015	2.17	2.62	2.95	2.79
Oct	2015	2.07	2.50	2.89	2.70
Nov	2015	2.26	2.69	3.03	2.86
Dec	2015	2.24	2.61	2.97	2.79
Avg	2015	2.14	2.55	2.84	2.70
Jan	2016	2.09	2.49	2.86	2.68
Feb	2016	1.78	2.20	2.62	2.41
Mar	2016	1.89	2.28	2.68	2.48
Apr	2016	1.81	2.21	2.62	2.42
May	2016	1.81	2.22	2.63	2.43

Source of Information: Federal Reserve Bulletin

Spread in Average Long-Term Bond Yields
Versus Public Utility Bond Yields
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Spread in Average Long-Term T-Bond Yields Versus Public Utility Bonds:				
	Years	Aaa Rated	Aa Rated	A Rated	Baa Rated
	2010	NA	1.41	1.63	2.13
	2011	NA	1.34	1.60	2.13
	2012	NA	1.41	1.71	2.44
	2013	NA	1.26	1.50	2.01
	2014	NA	1.11	1.21	1.73
	Average	NA	1.31	1.53	2.09
Jan	2015	NA	1.19	1.25	2.06
Feb	2015	NA	1.17	1.22	1.99
Mar	2015	NA	1.15	1.22	1.99
Apr	2015	NA	1.17	1.29	2.05
May	2015	NA	1.23	1.35	2.09
Jun	2015	NA	1.31	1.41	2.15
Jul	2015	NA	1.35	1.48	2.30
Aug	2015	NA	1.43	1.55	2.53
Sep	2015	NA	1.47	1.61	2.64
Oct	2015	NA	1.44	1.60	2.78
Nov	2015	NA	1.36	1.54	2.71
Dec	2015	NA	1.37	1.56	2.76
Avg	2015	NA	1.30	1.42	2.34
Jan	2016	NA	1.42	1.60	2.82
Feb	2016	NA	1.53	1.70	2.87
Mar	2016	NA	1.45	1.68	2.64
Apr	2016	NA	1.33	1.59	2.34
May	2016	NA	1.24	1.49	2.34

Comment: Derived from the information on pages 1 and 3 of this Schedule.

Interest Rate Trends for
Municipal Bonds
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	Aaa Rated	Aa Rated	A Rated	Baa Rated
	2010	3.88	4.05	4.63	5.60
	2011	4.26	4.52	5.16	5.95
	2012	3.14	3.39	3.94	4.79
	2013	3.47	3.91	4.23	4.82
	2014	3.41	3.66	4.11	4.61
	Average	3.63	3.90	4.41	5.15
Jan	2015	2.90	3.41	3.47	3.86
Feb	2015	3.05	3.29	3.62	4.01
Mar	2015	3.15	3.39	3.72	4.11
Apr	2015	3.20	3.41	3.79	4.17
May	2015	3.38	3.63	3.98	4.39
Jun	2015	3.42	3.64	3.94	4.35
Jul	2015	3.33	3.62	3.93	4.32
Aug	2015	3.31	3.54	3.92	4.31
Sep	2015	3.42	3.67	4.05	4.43
Oct	2015	3.22	3.52	3.84	4.22
Nov	2015	3.21	3.44	3.82	4.20
Dec	2015	3.10	3.31	3.57	4.06
Avg	2015	3.22	3.49	3.80	4.20
Jan	2016	2.91	3.14	3.49	3.84
Feb	2016	2.73	2.99	3.31	3.68
Mar	2016	2.92	3.16	3.51	3.87
Apr	2016	2.71	2.99	3.26	3.62
May	2016 *E*	2.64	2.90	3.21	3.57

Source of Information: MERGENT BOND RECORD

Credit Risk Spreads of
Municipal Bonds
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	Aa Over Aaa	A Over Aa	Baa Over A	Baa Over Aaa
	2010	0.17	0.58	0.97	1.72
	2011	0.26	0.64	0.79	1.69
	2012	0.25	0.55	0.85	1.65
	2013	0.45	0.32	0.60	1.36
	2014	0.25	0.45	0.50	1.20
	Average	0.28	0.51	0.74	1.52
Jan	2015	0.51	0.06	0.39	0.96
Feb	2015	0.24	0.33	0.39	0.96
Mar	2015	0.24	0.33	0.39	0.96
Apr	2015	0.21	0.38	0.38	0.97
May	2015	0.25	0.35	0.41	1.01
Jun	2015	0.22	0.30	0.41	0.93
Jul	2015	0.29	0.31	0.39	0.99
Aug	2015	0.23	0.38	0.39	1.00
Sep	2015	0.25	0.38	0.38	1.01
Oct	2015	0.30	0.32	0.38	1.00
Nov	2015	0.23	0.38	0.38	0.99
Dec	2015	0.21	0.26	0.49	0.96
Avg	2015	0.27	0.32	0.40	0.98
Jan	2016	0.23	0.35	0.35	0.93
Feb	2016	0.26	0.32	0.37	0.95
Mar	2016	0.24	0.35	0.36	0.95
Apr	2016	0.28	0.27	0.36	0.91
May	2016	0.26	0.31	0.36	0.93

Source of Information: MERGENT BOND RECORD

Spread in Average Long-Term Bond Yields
Versus Municipal Bond Yields
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

		Spread in Average Long-Term T-Bond Yields Versus Municipal Bonds:			
	Years	Aaa Rated	Aa Rated	A Rated	Baa Rated
	2010	(0.05)	(0.22)	(0.80)	(1.77)
	2011	(0.82)	(1.08)	(1.72)	(2.51)
	2012	(0.72)	(0.97)	(1.52)	(2.37)
	2013	(0.49)	(0.94)	(1.25)	(1.85)
	2014	(0.34)	(0.59)	(1.04)	(1.54)
	Average	(0.48)	(0.76)	(1.26)	(2.01)
Jan	2015	(0.57)	(1.08)	(1.14)	(1.53)
Feb	2015	(0.60)	(0.84)	(1.17)	(1.56)
Mar	2015	(0.63)	(0.87)	(1.20)	(1.59)
Apr	2015	(0.74)	(0.95)	(1.33)	(1.71)
May	2015	(0.56)	(0.81)	(1.16)	(1.57)
Jun	2015	(0.44)	(0.66)	(0.96)	(1.37)
Jul	2015	(0.41)	(0.70)	(1.01)	(1.40)
Aug	2015	(0.61)	(0.84)	(1.22)	(1.61)
Sep	2015	(0.64)	(0.89)	(1.27)	(1.65)
Oct	2015	(0.53)	(0.83)	(1.15)	(1.53)
Nov	2015	(0.35)	(0.58)	(0.96)	(1.34)
Dec	2015	(0.31)	(0.52)	(0.78)	(1.27)
Avg	2015	(0.53)	(0.79)	(1.11)	(1.51)
Jan	2016	(0.24)	(0.47)	(0.82)	(1.17)
Feb	2016	(0.32)	(0.58)	(0.90)	(1.27)
Mar	2016	(0.44)	(0.68)	(1.03)	(1.39)
Apr	2016	(0.30)	(0.58)	(0.85)	(1.21)
May	2016	(0.22)	(0.48)	(0.79)	(1.15)

Interest Rate Trends for
Federal Funds Rate and Prime Rate
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	Fed Funds Rate	Prime Rate
	2010	0.18	3.25
	2011	0.10	3.25
	2012	0.14	3.25
	2013	0.11	3.25
	2014	0.09	3.25
Average		0.12	3.25
Jan	2015	0.11	3.25
Feb	2015	0.11	3.25
Mar	2015	0.11	3.25
Apr	2015	0.12	3.25
May	2015	0.12	3.25
Jun	2015	0.13	3.25
Jul	2015	0.13	3.25
Aug	2015	0.14	3.25
Sep	2015	0.14	3.25
Oct	2015	0.12	3.25
Nov	2015	0.12	3.25
Dec	2015	0.24	3.37
Avg	2015	0.13	3.26
Jan	2016	0.34	3.50
Feb	2016	0.38	3.50
Mar	2016	0.36	3.50
Apr	2016	0.37	3.50
May	2016	0.37	3.50

Source of Information: Federal Reserve Bulletin

Blue Chip Financial Forecasts - June 1, 2016

	Second Quarter 2016	Third Quarter 2016	Fourth Quarter 2016	First Quarter 2017	Second Quarter 2017	Five Quarter Average
Prime Rate						
Top Ten Average	0.7 %	3.8 %	4.0 %	4.2 %	4.5 %	3.4 %
Group Average	0.6	3.7	3.8	4.0	4.2	3.3
Bottom Ten Average	0.6	3.5	3.6	3.8	3.9	3.1
Three-Month Treasury Bills						
Top Ten Average	0.4	0.6	0.9	1.2	1.5	0.9
Group Average	0.3	0.5	0.7	0.9	1.1	0.7
Bottom Ten Average	0.2	0.3	0.5	0.6	0.8	0.5
Ten Year Treasury Notes						
Top Ten Average	2.0	2.3	2.6	2.9	3.2	2.6
Group Average	1.9	2.1	2.2	2.4	2.6	2.2
Bottom Ten Average	1.8	1.8	1.9	2.0	2.0	1.9
Thirty Year Treasury Bonds						
Top Ten Average	2.8	3.1	3.3	3.6	3.8	3.3
Group Average	2.7	2.9	3.0	3.2	3.3	3.0
Bottom Ten Average	2.6	2.6	2.7	2.8	2.8	2.7
Aaa-Rated Corporate Bonds						
Top Ten Average	3.8	4.1	4.4	4.6	4.9	4.4
Group Average	3.7	3.9	4.1	4.3	4.4	4.1
Bottom Ten Average	3.6	3.7	3.8	3.9	4.0	3.8
Baa-Rated Corporate Bonds						
Top Ten Average	5.0	5.4	5.6	5.9	6.1	5.6
Group Average	4.9	5.1	5.2	5.4	5.5	5.2
Bottom Ten Average	4.7	4.8	4.9	5.0	5.0	4.9

Derived Public Utility Bond Yield Forecasts Based on Aaa and Baa Corporate Yields

Aa-Rated Public Utility Bonds						
Top Ten Average	3.9	4.2	4.5	4.7	5.0	4.5
Group Average	3.8	4.0	4.1	4.3	4.4	4.1
Bottom Ten Average	3.6	3.7	3.8	3.9	4.0	3.8
A-Rated Public Utility Bonds						
Top Ten Average	4.1	4.4	4.7	4.9	5.2	4.7
Group Average	4.0	4.2	4.3	4.5	4.6	4.3
Bottom Ten Average	3.8	3.9	4.0	4.1	4.2	4.0
Baa-Rated Public Utility Bonds						
Top Ten Average	5.1	5.4	5.7	5.9	6.2	5.7
Group Average	5.0	5.2	5.3	5.5	5.6	5.3
Bottom Ten Average	4.8	4.9	5.0	5.1	5.2	5.0

Settled Yields on Treasury Bond
Future Contracts
Traded on the Chicago Board of Trade
at the Close of June 16, 2016

Delivery Date	Treasury Bonds (CBOT)	
Jun-16	2.574	%
Sep-16	2.622	
Dec-16	2.680	
Average	2.626	%

Source of Information: Chicago Board of Trade

Market Value Discounted Cash Flow for
The Water Group Followed by Analysts

	Water Group Followed by Analysts
Dividend Yield(1)	2.5 %
Growth in Dividends(2)	0.1
Adjusted Dividend Yield	2.6
Stock Appreciation(3)	6.7
Market Value DCF Cost Rate	9.3 %

Notes: (1) Developed on page 2 of this Schedule.
(2) Equal to one-half the assumed growth in value.
(3) As explained in the direct testimony, the growth in value is supported by the information shown on Schedules 16 and 17.

Market Value Dividend Yield for
the Water Group Followed by Analysts
For the Twelve Months Ended May 2016

	Recent Dividend Yields(1)	Longer Term Dividend Yields(2)	Average Yields
Water Group Followed by Analysts			
American States Water Co	2.2 %	2.2 %	
American Water Works Co Inc	2.0	2.3	
Aqua America Inc	2.2	2.5	
California Water Service Gp	2.5	2.9	
Connecticut Water Svc Inc	2.4	2.8	
Middlesex Water Co	2.2	3.0	
SJW Corp	2.4	2.5	
York Water Co	2.2	2.5	
Average	2.3 %	2.6 %	2.5 %

Notes: (1) Computed by annualizing the current quarterly dividend per share and relating it to the monthly high-low average price per share of common stock for May 2016.

(2) Computed by annualizing the current quarterly dividend per share and relating it to the monthly high-low average price per share of common stock for the twelve months ended May 2016.

Source of Information: Standard & Poor's

Development of Long Term Projected Growth in Value
Based Upon Growth Over The Next Five Years
For the Water Group Followed by Analysts

	A	B	C	D	E	F	G	H
	Analysts' Projected Growth in EPS				Other Projected Growth			
	First Call EPS Growth	Reuters EPS Growth	ZACK's EPS Growth	Value Line EPS Growth	Value Line DPS Growth	Value Line Cash Flow Growth	Average EPS Growth	Average All Growth
Water Group Followed by Analysts								
American States Water Co	3.9 %	3.9 %	3.9 %	6.0 %	7.0 %	6.0 %	4.4 %	5.1 %
American Water Works Co Inc	7.3	7.3	7.2	8.0	10.5	5.5	7.4	7.6
Aqua America Inc	6.1	6.1	6.4	7.0	9.0	6.0	6.4	6.8
California Water Service Gp	9.1	9.1	9.1	6.0	6.5	5.0	8.3	7.5
Connecticut Water Svc Inc	5.0	5.0	5.0	4.5	4.5	4.0	4.9	4.7
Middlesex Water Co	2.7	NA	NA	3.5	3.0	5.0	3.1	3.6
SJW Corp	14.0	NA	NA	1.5	6.0	2.5	7.8	6.0
York Water Co	4.9	NA	NA	6.0	6.5	6.0	5.5	5.9
Average	6.6 %	6.2 %	6.3 %	5.3 %	6.6 %	5.0 %	6.0 %	5.9 %

Source of Information: Value Line Investment Survey, 4/15/16; Reuters Market Guide 6/16/16;
FirstCall 6/16/16; and
Zacks Investment Research 6/16/16

Recent Payout Ratios,
ROEs, P-E Multiples, Market/Book Multiples, and Market Value
For the Water Group Followed by Analysts

	Current Dividend Payout	Current Return on Equity	PE Mult	Market to Book Mult	Current Market Value (Mill $)
Water Group Followed by Analysts					
American States Water Co	54	12.3	24.9	3.05	1,427.799
American Water Works Co Inc	51	9.4	27.8	2.59	13,168.607
Aqua America Inc	60	11.9	28.1	3.25	5,727.658
California Water Service Gp	71	6.7	32.8	2.21	1,398.442
Connecticut Water Svc Inc	52	10.3	23.2	2.35	530.530
Middlesex Water Co	63	10.3	28.6	2.87	600.105
SJW Corp	42	9.8	19.2	1.83	704.493
York Water Co	62	11.5	28.1	3.15	346.896
Average	57	10.3	26.6	2.66	2,988.066

Source of Information: Quarterly Reports, Standard & Poor's and Value Line

Value Line Projected ROE Based on Year-End and Average,
Dividend Payout Ratio, and Common Equity Ratio for
The Water Group Followed by Analysts for 2019 - 2021

Water Group Followed by Analysts	Value Line Projected ROE	Projected Average ROE (1)	Value Line Projected Dividend Payout	Value Line Projected Common Equity Ratio
American States Water Co	13.5 %	13.5 %	55.6 %	43.0 %
American Water Works Co Inc	10.5	10.8	54.7	45.0
Aqua America Inc	13.5	13.9	85.7	48.0
California Water Service Gp	10.0	10.2	61.9	58.0
Connecticut Water Svc Inc	10.5	10.7	57.4	52.5
Middlesex Water Co	9.0	9.2	65.0	60.0
SJW Corp	9.0	9.3	52.5	48.5
York Water Co	12.5	12.6	68.0	53.0
Average	11.1 %	11.3 %	62.6 %	51.0 %

Notes: (1) Value Line ROE, which is a year-end ROE, is converted to average ROE by the factor derived from the following formula: 2((1+g)/(2+g)), where "g" is the rate of growth in common equity.

Source of Information: Value Line Investment Survey, 4/15/16

Illustration of the
Effect of Market-To-Book Ratio on Market Return

Ln #		Situation 1	Situation 2	Situation 3
1	M/B Ratio	50%	100%	200%
2	Market Purchase Price	$25.00	$50.00	$100.00
3	Book Value	$50.00	$50.00	$50.00
4	DCF Return	10.0%	10.0%	10.0%
5	DCF Dollar Return	$5.00	$5.00	$5.00
6	Dividend Yield	5.0%	5.0%	5.0%
7	DPS	$1.25	$2.50	$5.00
8	Dollar Growth in Value	$3.75	$2.50	$0.00
9	Market Sale Price	$28.75	$52.50	$100.00
10	Total Market Return	20.0%	10.0%	5.0%

"The simple numerical illustration....demonstrates the impact of market-to-book ratios on the DCF market return....The DCF cost rate of 10%, made up of a 5% dividend yield and a 5% growth rate, is applied to the book value rate base of $50 to produce $5.00 of earnings. Of the $5.00 of earnings, the full $5.00 are required for dividends to produce a dividend yield of 5.0% on a stock price of $100.00, and no dollars are available for growth. The investor's return is therefore only 5% versus his required return of 10%. A DCF cost rate of 10%, which implies $10.00 of earnings, translates to only $5.00 of earnings on book value, or a 5% return.....Therefore, the DCF cost rate understates the investor's required return when stock prices are well above book, as is the case presently."

The above illustration is taken from Roger A Morin, Regulatory Finance - Utilities' Cost of Capital, Public Utility Reports, Inc., 1994, pp. 236-237.

Differences in Book Value and Market Values for the
Water Group Followed by Analysts

	Recent Book Value Capitalization Ratios (3/31/16)	Recent Market Value Capitalization Ratios	Average Book Value of Common Equity (Millions)	Average Market Value of Common Equity (Millions)	Difference in Market Value and Book Value Common Equity
Water Group Followed by Analysts:					
Long Term Debt	45.6 %	24.6 %			
Preferred Stock	0.1	0.1			
Common Equity	54.3	75.3	$1,109.025	$2,988.066	$1,879.042
Total	100.0 %	100.0 %			

Financial Risk Adjustment Using the "Hamada Model"

Water Group Followed by Analysts

Market Value @ (3/31/16)

Line No.		DEBT (D)	PREF (P)	CE (E)	TAX (t)	BETA (Bl)
2.		24.6%	0.1%	75.3%	39.800%	0.71
3.		Bl = Bu (1+(1-t)D/E+P/E)				
4.		1-t =	0.6020			
5.		D/E =	0.3267			
6.		P/E =	0.0013			
7.		Bl =	Bu *	1.1980		
8.		Bu =	0.59			

Water Group Followed by Analysts

Book Value @ (3/31/16)

		DEBT (D)	PREF (P)	CE (E)	TAX (t)
11.		45.60%	0.10%	54.30%	39.800%
12.		Bl = Bu (1+(1-t)D/E+P/E)			
13.		1-t =	0.6020		
14.		D/E =	0.8398		
15.		P/E =	0.0018		
16.		Bl =	Bu *	1.5074	
17.		Bl =	0.89		

Cost Adjustment Based on Risk Premium

18.	Barometer Group's Beta		0.71
19.	Beta difference	=	0.18
20.	Risk premium	=	6.0
21.	Risk adjustment	=	1.08

Default Spread for
Aaa Rated Corporate Bonds and A Rated Investor-Owned Public Utility Bonds
Yearly for 2010-2014, Monthly for the Years 2015 and 2016

	Years	Corporate Aaa Rated	Public Utility A Rated	A Over Aaa
	2010	4.94	5.46	0.52
	2011	4.64	5.04	0.40
	2012	3.67	4.13	0.46
	2013	4.24	4.47	0.24
	2014	4.16	4.28	0.11
	Average	4.33	4.68	0.35
Jan	2015	3.46	3.58	0.12
Feb	2015	3.61	3.67	0.06
Mar	2015	3.64	3.74	0.10
Apr	2015	3.52	3.75	0.23
May	2015	3.98	4.17	0.19
Jun	2015	4.19	4.39	0.20
Jul	2015	4.15	4.40	0.25
Aug	2015	4.04	4.25	0.21
Sep	2015	4.07	4.39	0.32
Oct	2015	3.95	4.29	0.34
Nov	2015	4.06	4.40	0.34
Dec	2015	3.97	4.35	0.38
Avg	2015	3.89	4.12	0.23
Jan	2016	4.00	4.27	0.27
Feb	2016	3.96	4.11	0.15
Mar	2016	3.82	4.16	0.34
Apr	2016	3.62	4.00	0.38
May	2016 *E*	3.65	3.91	0.26

Source of Information: MERGENT BOND RECORD

Market Value CAPM for
The Water Group Followed by Analysts

	Water Group Followed by Analysts
Estimation Based Upon Historical Information	
Market Premium(1)	7.0 %
x Beta(2)	0.71
Risk Adjusted Market Premium	5.0
Size Adjustment Premium(2)	1.1
Plus Risk Free Rate(1)	2.7
Market Value CAPM Cost Rate	8.8 %
Estimation Based Upon Projected Information	
Market Premium(1)	9.9 %
x Beta(2)	0.71
Risk Adjusted Market Premium	7.0
Size Adjustment Premium(2)	1.1
Plus Risk Free Rate(1)	2.7
Market Value CAPM Cost Rate	10.8 %

Market Value CAPM is: 10.3%

Notes: (1) Developed on page 2 of this Schedule.
(2) Developed on page 4 of this Schedule.

Development of Market Premiums for Use in a CAPM Model

A	B	C	D	E	F	G	H
Value Line Summary & Index Month End Edition	Forecasted Market Dividend Yield	Stock Price Appreciation Next 3-5 Years	Annual Price Appreciation(1)	Annual Total Return(1)	Midpoint Market Return(2)	Average Market Return(3)	CAPM Projected Market Return(6)
March-16	2.3 %	50 %	10.7 %	13.0 %			
April-16	2.2	45	9.7	11.9			
May-16	2.3	50	10.7	13.0			
					12.5 %	12.6 %	12.6 %
						Less Risk Free Rate(4)	2.7
						Estimated Market Premium Based Upon Projected Information (1)	9.9 %
						Estimated Market Premium Based Upon Historical Information (5)	7.0 %

See next page of this Schedule for Notes.

CAPM
The Water Group Followed by Analysts

Notes: (1) A projected market premium is based upon the projected market return rate derived from the Value Line Summary and Index for the various dates shown. For example, Value Line projects (May-16) that the market will appreciate in price 50% over the next three to five years. Using a four-year midpoint estimate, Value Line's appreciation potential equates to 10.7% annually ([1.50]^.25). Additionally, Value Line estimates the market will have a dividend yield of 2.3%. Combining the market dividend yield of 2.3% with the market appreciation results in a projected market return rate of 13% (10.7% + 2.3%).

(2) Mid point of the month-end total market returns in Column E.

(3) Average total market return in Column E.

(4) As discussed in the direct testimony, the risk-free rate is 2.7%.

(5) The historical market premium is based upon studies conducted by Ibbotson Associates concerning asset returns. Ibbotson Associates' asset return studies are the most noted asset return rate studies available today. The results are widely disseminated throughout the investment public. Ibbotson Associates' long-term common stock total market return is 12.07% which, when reduced by the long-term historic risk-free rate of 5.07% results in a market premium of 7% (12.07% - 5.07%).

Recent Market Values and
Beta Adjusted Ibbotson Associates Size Premiums For
The Water Group Followed by Analysts

	1	2	3	4	5	6	7	8
	Recent Market Value (Mill $)	Market Quartile Name	Market Quartile	Quartile Size Premium	Quartile Beta	Value Line Beta	Beta Ratio	Beta Adjusted Quartile Size Premium
Water Group Followed by Analysts								
American States Water Co	$1,427.799	Low-Cap	3	1.80	1.22	0.75	61%	1.1
American Water Works Co Inc	13,168.607	Large-Cap	1	0.00	1.00	0.70	70%	0.0
Aqua America Inc	5,727.658	Mid-Cap	2	1.07	1.12	0.75	67%	0.7
California Water Service Gp	1,398.442	Low-Cap	3	1.80	1.22	0.75	61%	1.1
Connecticut Water Svc Inc	530.530	Mico-Cap	4	3.74	1.35	0.60	44%	1.6
Middlesex Water Co	600.105	Low-Cap	3	1.80	1.22	0.70	57%	1.0
SJW Corp	704.493	Low-Cap	3	1.80	1.22	0.75	61%	1.1
York Water Co	346.896	Mico-Cap	4	3.74	1.35	0.70	52%	1.9
Average		Low-Cap	3	1.80	1.22	0.71	59%	1.1

Source of Information: Stocks, Bonds, Bills, and Inflation, 2015 Yearbook and Value Line

Market Value Risk Premium
For the Water Group Followed by Analysts

	Water Group Followed by Analysts	
Prospective Public Utility Bond Yields(1)	4.3	%
Estimated Risk Premium(2)	6.0	
Market Value Risk Premium Indicated Cost Rate	10.3	%

Notes: (1) Based upon the current and prospective long-term debt cost rates, it is reasonable to expect that if the comparable group (i.e., Water Group) issued new long-term bonds, it would both be priced to yield about 4.3% based upon credit profiles of A for the Water Group.

(2) A 6% risk premium is concluded for the Group after reviewing the tabulation of risk spreads shown on pages 2, 3, 4 and 5 of this Schedule.

Development of the Projected Risk Premium

A	B	C	D	E	F	G	H	I
Value Line Summary & Index Month End Edition	Forecasted Market Dividend Yield	Stock Price Appreciation Next 3-5 Years	Annual Price Appreciation	Forecasted Annual Total Return	Less: Yield of Moody's A Rated Industrial Bonds	Forecasted Equity Premium	Estimated Risk Adjustment	Forecasted Risk Premium
March-16	2.3 %	50 %	10.7 %	13.0 %	4.16 %	8.8 %	90 %	8.0 %
April-16	2.2	45	9.7	11.9	3.95	8.0	90	7.2
May-16	2.3	50	10.7	13.0	3.88	9.1	90	8.2
		Midpoint of data		12.5		8.5		7.7 %
		Quarter's Average		12.6		8.6		7.8 %

Annual Total Returns and Risk Premiums of
S&P Public Utility Stocks and Bonds
for the Years 1996-2015, 1986-2015, 1976-2015, 1966-2015,1956-2015, 1946-2015 and 1928-2015

	Annual Total Returns						
			Public Utility Bonds				
Periods	Public Utility Stock	L-Term T-Bonds	AAA	AAA & AA	AA	A	BBB
			Average Annual Rates of Return				
1996 to 2015	0.1038	0.0813	0.0652	0.0819	0.0822	0.0748	0.0840
1986 to 2015	0.1226	0.0985	0.1082	0.1001	0.1006	0.0938	0.1018
1976 to 2015	0.1375	0.0995	0.1090	0.1036	0.1048	0.1010	0.1094
1966 to 2015	0.1141	0.0832	0.0850	0.0872	0.0881	0.0848	0.0915
1956 to 2015	0.1184	0.0718	0.0704	0.0758	0.0765	0.0743	0.0802
1946 to 2015	0.1170	0.0627	0.0612	0.0676	0.0683	0.0665	0.0724
1928 to 2015	0.1090	0.0583	0.0594	0.0653	0.0664	0.0665	0.0740
			Average Risk Premiums				
1996 to 2015		0.0225	0.0387	0.0219	0.0216	0.0291	0.0198
1986 to 2015		0.0241	0.0144	0.0226	0.0220	0.0288	0.0208
1976 to 2015		0.0380	0.0285	0.0340	0.0327	0.0366	0.0281
1966 to 2015		0.0466	0.0480	0.0427	0.0419	0.0441	0.0382
1956 to 2015		0.0466	0.0480	0.0427	0.0419	0.0441	0.0382
1946 to 2015		0.0544	0.0559	0.0494	0.0487	0.0505	0.0446
1928 to 2015		0.0507	0.0496	0.0437	0.0426	0.0425	0.0350

Annual Total Returns, Annual Income Returns and Risk Premiums of
S&P Public Utility Stocks and Bonds
for the Years 1996-2015, 1986-2015, 1976-2015, 1966-2015,1956-2015, 1946-2015 and 1928-2015

Periods	Annual Total Returns Public Utility Stock	Annual Income Returns					
			Public Utility Bonds				
		L-Term T-Bonds	AAA	AAA & AA	AA	A	BBB
		Average Rates of Return					
1996 to 2015	0.1038	0.0471	0.0737	0.0602	0.0603	0.0618	0.0663
1986 to 2015	0.1226	0.0579	0.0824	0.0698	0.0701	0.0720	0.0760
1976 to 2015	0.1375	0.0698	0.0941	0.0810	0.0816	0.0839	0.0883
1966 to 2015	0.1141	0.0686	0.0881	0.0794	0.0801	0.0824	0.0867
1956 to 2015	0.1184	0.0636	0.0781	0.0732	0.0738	0.0760	0.0799
1946 to 2015	0.1170	0.0580	0.0692	0.0669	0.0674	0.0694	0.0732
1928 to 2015	0.1090	0.0519	0.0609	0.0606	0.0614	0.0640	0.0688
		Average Risk Premiums					
1996 to 2015		0.0567	0.0301	0.0436	0.0435	0.0421	0.0375
1986 to 2015		0.0647	0.0402	0.0528	0.0525	0.0507	0.0466
1976 to 2015		0.0677	0.0434	0.0565	0.0559	0.0537	0.0492
1966 to 2015		0.0548	0.0404	0.0452	0.0446	0.0425	0.0385
1956 to 2015		0.0548	0.0404	0.0452	0.0446	0.0425	0.0385
1946 to 2015		0.0590	0.0479	0.0502	0.0496	0.0476	0.0439
1928 to 2015		0.0571	0.0481	0.0484	0.0476	0.0450	0.0403

Annual Total Returns, Annual Income Returns and Risk Premiums of
S&P Public Utility Stocks and Bonds
For the 44 Years of the Lowest Interest Rate Environment and the 44 Years of the Highest Interest Rate Environment
For The Years 1928-2015

Current Interest Rate Environment: 2.7%

Periods	Public Utility Stock	L-Term T-Bonds	Public Utility Bonds AAA	AAA & AA	AA	A	BBB
Annual Total Returns							
Low Interest Rate Environment:							
44 Years of the Lowest Interest Rates, Ranging from 2.0% to 4.2% with an Average Rate of 3.0%							
Average Rates of Return	0.1092	0.0316	0.0362	0.0456	0.0468	0.0481	0.0612
Average Risk Premiums		0.0776	0.0730	0.0636	0.0624	0.0611	0.0480
High Interest Rate Environment:							
44 Years of the Highest Interest Rates, Ranging from 4.2% to 13.5% with an Average Rate of 7.4%							
Average Risk Premiums	0.1088	0.0850	0.0827	0.0850	0.0860	0.0849	0.0867
Average Risk Premiums		0.0238	0.0262	0.0238	0.0228	0.0239	0.0221
Annual Income Returns							
Low Interest Rate Environment:							
44 Years of the Lowest Interest Rates, Ranging from 2.0% to 4.2% with an Average Rate of 3.0%							
Average Rates of Return	0.1092	0.0301	0.0349	0.0373	0.0380	0.0410	0.0467
Average Risk Premiums		0.0791	0.0743	0.0719	0.0711	0.0682	0.0625
High Interest Rate Environment:							
44 Years of the Highest Interest Rates, Ranging from 4.2% to 13.5% with an Average Rate of 7.4%							
Average Risk Premiums	0.1088	0.0737	0.0869	0.0839	0.0847	0.0870	0.0908
Average Risk Premiums		0.0352	0.0219	0.0249	0.0241	0.0219	0.0180

Annual Total Returns of
S&P Public Utility Stocks and Bonds
for the Years 1928-2015

	Annual Total Returns						
			Public Utility Bonds				
Years	Public Utility Stocks	L-Term T-Bonds	AAA	AAA & AA	AA	A	BBB
1928	0.5431	-0.0030	0.0370	0.0388	0.0406	0.0372	0.0392
1929	0.1376	0.0410	0.0209	0.0193	0.0178	0.0163	-0.0076
1930	-0.2149	0.0509	0.0917	0.0892	0.0869	0.0820	0.0378
1931	-0.3193	-0.0782	0.0058	-0.0059	-0.0171	-0.0608	-0.1089
1932	-0.0724	0.1736	0.1073	0.1037	0.1003	0.0685	0.0570
1933	-0.2170	0.0090	0.0142	-0.0145	-0.0401	-0.0686	-0.0601
1934	-0.1743	0.0962	0.1712	0.2000	0.2272	0.3264	0.4593
1935	0.6914	0.0610	0.1053	0.1243	0.1427	0.1760	0.2885
1936	0.2357	0.0691	0.0783	0.0916	0.1046	0.1079	0.1078
1937	-0.3337	-0.0091	0.0290	0.0323	0.0357	0.0272	-0.0626
1938	0.1020	0.0662	0.0720	0.0773	0.0825	0.0884	0.1505
1939	0.1538	0.0692	0.0435	0.0473	0.0510	0.0851	0.0923
1940	-0.1643	0.0910	0.0480	0.0506	0.0532	0.0949	0.1359
1941	-0.3050	0.0234	0.0255	0.0291	0.0327	0.0428	0.0681
1942	0.1079	-0.0735	0.0261	0.0287	0.0313	0.0314	0.0590
1943	0.4750	0.0228	0.0312	0.0346	0.0380	0.0405	0.0564
1944	0.1879	0.0268	0.0343	0.0353	0.0362	0.0303	0.0459
1945	0.5665	0.1075	0.0298	0.0349	0.0383	0.0683	0.0805
1946	-0.0130	-0.0006	0.0233	0.0238	0.0242	0.0267	0.0377
1947	-0.1236	-0.0165	-0.0139	-0.0187	-0.0234	-0.0213	-0.0105
1948	0.0451	0.0202	0.0287	0.0317	0.0347	0.0225	0.0073
1949	0.3074	0.0760	0.0718	0.0746	0.0773	0.0892	0.0757
1950	0.0152	-0.0034	0.0126	0.0131	0.0135	0.0107	0.0233
1951	0.2075	-0.0541	-0.0393	-0.0393	-0.0393	-0.0468	-0.0268
1952	0.1947	0.0101	0.0373	0.0390	0.0407	0.0442	0.0399
1953	0.0918	0.0062	0.0078	0.0063	0.0048	0.0107	0.0037
1954	0.2269	0.0676	0.0668	0.0701	0.0733	0.0745	0.0909
1955	0.1357	-0.0264	-0.0107	-0.0127	-0.0147	-0.0100	0.0146
1956	0.0416	-0.0484	-0.0703	-0.0703	-0.0703	-0.0714	-0.0816
1957	0.0541	0.0472	0.0246	0.0229	0.0213	0.0054	-0.0131
1958	0.3827	-0.0439	-0.0081	-0.0032	0.0017	0.0123	0.0339
1959	0.0958	-0.0320	-0.0231	-0.0234	-0.0237	-0.0120	-0.0102
1960	0.1680	0.1106	0.0764	0.0735	0.0705	0.0791	0.0994
1961	0.3646	0.0135	0.0432	0.0448	0.0464	0.0502	0.0442
1962	-0.0519	0.0650	0.0831	0.0829	0.0828	0.0852	0.0891
1963	0.1261	-0.0022	0.0171	0.0202	0.0232	0.0294	0.0329
1964	0.1685	0.0439	0.0394	0.0391	0.0387	0.0409	0.0396
1965	0.0489	-0.0064	-0.0010	-0.0014	-0.0018	-0.0044	0.0050
1966	-0.0504	0.0085	-0.0501	-0.0509	-0.0518	-0.0602	-0.0990
1967	-0.0216	-0.0650	-0.0525	-0.0539	-0.0553	-0.0592	-0.0271
1968	0.1419	0.0149	0.0268	0.0224	0.0181	0.0286	0.0243
1969	-0.1769	-0.0640	-0.0792	-0.0839	-0.0885	-0.0960	-0.0892
1970	0.1494	0.1537	0.0970	0.0978	0.0987	0.0952	0.0761
1971	0.0050	0.0999	0.1168	0.1241	0.1313	0.1510	0.1681
1972	0.1464	0.0661	0.0912	0.0980	0.1047	0.1103	0.1387
1973	-0.2106	-0.0893	0.0158	0.0138	0.0118	0.0156	0.0150
1974	-0.2135	0.0092	-0.0315	-0.0360	-0.0405	-0.0683	-0.1033
1975	0.4364	0.0465	0.0915	0.0863	0.0813	0.0872	0.0940
1976	0.3245	0.1955	0.1976	0.2017	0.2058	0.2475	0.2806
1977	0.1076	0.0074	0.0459	0.0545	0.0629	0.0683	0.0903
1978	-0.0174	-0.0189	-0.0083	-0.0055	-0.0027	-0.0026	0.0000
1979	0.1221	-0.0289	-0.0424	-0.0509	-0.0590	-0.0655	-0.0823
1980	0.1275	-0.0804	-0.0782	-0.0778	-0.0773	-0.0702	-0.0649
1981	0.1464	0.0472	0.0616	0.0674	0.0730	0.0416	0.0674
1982	0.2292	0.4323	0.3294	0.3750	0.3942	0.3708	0.3808
1983	0.2372	-0.0049	0.0721	0.0691	0.0763	0.1406	0.1347
1984	0.2219	0.1611	0.1770	0.1796	0.1768	0.1783	0.2075
1985	0.3232	0.3143	0.3473	0.3276	0.3259	0.3143	0.3098
1986	0.3575	0.3692	0.2994	0.2720	0.2698	0.2835	0.2933
1987	-0.0544	-0.1013	-0.1132	-0.0637	-0.0566	-0.0435	-0.0505
1988	0.1849	0.1026	0.2027	0.1615	0.1594	0.1643	0.1919
1989	0.4351	0.2176	0.1770	0.1743	0.1715	0.1692	0.1781
1990	0.0069	0.0482	0.0685	0.0689	0.0722	0.0738	0.0728
1991	0.0931	0.1472	0.1813	0.1647	0.1624	0.1715	0.1878
1992	0.1183	0.1093	0.1264	0.1312	0.1324	0.1355	0.1315
1993	0.1661	0.2162	0.1926	0.2126	0.2190	0.1429	0.1590
1994	-0.0825	-0.1075	-0.0802	-0.0656	-0.0657	0.0065	-0.0351
1995	0.3772	0.3268	0.2860	0.3074	0.3089	0.2164	0.2442
1996	0.0550	0.0020	0.0279	0.0211	0.0214	0.0279	0.0415
1997	0.1959	0.1454	0.1181	0.1157	0.1169	0.1238	0.1496
1998	0.1896	0.1786	0.1431	0.0365	0.0289	0.1074	0.0981
1999	-0.0998	-0.1062	-0.0792	-0.0275	-0.0237	-0.0921	-0.0684
2000	0.5475	0.1922	0.1076	0.1150	0.1146	0.1101	0.1196
2001	-0.2877	0.0596	0.0734	0.0788	0.0873	0.0780	0.0534
2002	-0.2934	0.1362		0.1851	0.1851	0.2461	0.1746
2003	0.2509	0.0488		0.1678	0.1678	0.1529	0.2329
2004	0.2763	0.0861		0.1162	0.1162	0.0782	0.0919
2005	0.2151	0.0520		0.0869	0.0869	0.0732	0.0541
2006	0.2323	0.0421		0.0486	0.0486	0.0596	0.0759
2007	0.1434	0.0814		0.0043	0.0043	0.0143	0.0042
2008	-0.3160	0.2953		0.0733	0.0733	0.0132	-0.1109
2009	0.1801	-0.1460		0.1159	0.1159	0.1662	0.3279
2010	0.0795	0.0755		0.0809	0.0809	0.0871	0.0893
2011	0.2051	0.3271		0.2701	0.2701	0.2385	0.2019
2012	0.1272	0.0622		0.0801	0.0801	0.0511	0.1287
2013	0.1363	-0.1592		-0.0850	-0.0850	-0.1159	-0.0494
2014	0.3017	0.2419		0.1577	0.1577	0.1373	0.1333
2015	-0.0629	0.0115		-0.0031	-0.0031	-0.0619	-0.0682

Annual Total Returns of S&P Public Utility Stocks
And Annual Income Returns of Bonds
for the Years 1928-2015

	Annual Total Returns	Income Returns					
			Public Utility Bonds				
Years	Public Utility Stocks	L-Term T-Bonds	AAA	AAA & AA	AA	A	BBB
1928	0.5431	0.0329	0.0451	0.0460	0.0470	0.0499	0.0541
1929	0.1376	0.0361	0.0468	0.0479	0.0490	0.0522	0.0578
1930	-0.2149	0.0332	0.0458	0.0470	0.0482	0.0514	0.0591
1931	-0.3193	0.0338	0.0434	0.0449	0.0463	0.0511	0.0635
1932	-0.0724	0.0350	0.0474	0.0504	0.0535	0.0640	0.0815
1933	-0.2170	0.0315	0.0436	0.0468	0.0499	0.0604	0.0833
1934	-0.1743	0.0306	0.0402	0.0436	0.0471	0.0559	0.0713
1935	0.6914	0.0278	0.0351	0.0376	0.0402	0.0466	0.0544
1936	0.2357	0.0273	0.0324	0.0343	0.0362	0.0415	0.0465
1937	-0.3337	0.0275	0.0320	0.0334	0.0347	0.0395	0.0486
1938	0.1020	0.0263	0.0303	0.0316	0.0329	0.0392	0.0510
1939	0.1538	0.0239	0.0286	0.0296	0.0305	0.0360	0.0448
1940	-0.1643	0.0224	0.0277	0.0285	0.0293	0.0331	0.0410
1941	-0.3050	0.0197	0.0269	0.0276	0.0283	0.0304	0.0366
1942	0.1079	0.0239	0.0272	0.0279	0.0287	0.0305	0.0358
1943	0.4750	0.0246	0.0264	0.0269	0.0273	0.0296	0.0338
1944	0.1879	0.0248	0.0265	0.0268	0.0272	0.0294	0.0333
1945	0.5665	0.0229	0.0256	0.0261	0.0266	0.0285	0.0318
1946	-0.0130	0.0208	0.0250	0.0254	0.0257	0.0268	0.0293
1947	-0.1236	0.0215	0.0257	0.0261	0.0264	0.0273	0.0297
1948	0.0451	0.0240	0.0282	0.0287	0.0292	0.0301	0.0327
1949	0.3074	0.0223	0.0270	0.0274	0.0277	0.0291	0.0324
1950	0.0152	0.0216	0.0262	0.0264	0.0267	0.0276	0.0312
1951	0.2075	0.0244	0.0285	0.0288	0.0291	0.0307	0.0334
1952	0.1947	0.0265	0.0300	0.0303	0.0305	0.0324	0.0351
1953	0.0918	0.0300	0.0325	0.0328	0.0331	0.0347	0.0371
1954	0.2269	0.0266	0.0296	0.0298	0.0301	0.0317	0.0348
1955	0.1357	0.0287	0.0307	0.0309	0.0311	0.0324	0.0341
1956	0.0416	0.0310	0.0335	0.0337	0.0340	0.0357	0.0374
1957	0.0541	0.0355	0.0397	0.0400	0.0403	0.0428	0.0452
1958	0.3827	0.0344	0.0384	0.0386	0.0389	0.0414	0.0447
1959	0.0958	0.0409	0.0445	0.0448	0.0451	0.0470	0.0494
1960	0.1680	0.0409	0.0450	0.0453	0.0455	0.0473	0.0489
1961	0.3646	0.0391	0.0442	0.0445	0.0449	0.0462	0.0476
1962	-0.0519	0.0401	0.0434	0.0437	0.0439	0.0450	0.0466
1963	0.1261	0.0403	0.0427	0.0429	0.0431	0.0437	0.0456
1964	0.1685	0.0419	0.0441	0.0442	0.0443	0.0450	0.0466
1965	0.0489	0.0424	0.0448	0.0450	0.0451	0.0458	0.0475
1966	-0.0504	0.0475	0.0513	0.0515	0.0518	0.0531	0.0552
1967	-0.0216	0.0494	0.0553	0.0556	0.0559	0.0576	0.0605
1968	0.1419	0.0543	0.0621	0.0627	0.0633	0.0651	0.0684
1969	-0.1769	0.0624	0.0706	0.0716	0.0725	0.0743	0.0778
1970	0.1494	0.0692	0.0822	0.0833	0.0844	0.0870	0.0913
1971	0.0050	0.0614	0.0766	0.0777	0.0789	0.0825	0.0868
1972	0.1464	0.0601	0.0744	0.0751	0.0758	0.0778	0.0815
1973	-0.2106	0.0701	0.0762	0.0767	0.0773	0.0789	0.0812
1974	-0.2135	0.0800	0.0849	0.0861	0.0873	0.0899	0.0929
1975	0.4364	0.0817	0.0894	0.0912	0.0929	0.0978	0.1057
1976	0.3245	0.0794	0.0864	0.0880	0.0895	0.0928	0.0987
1977	0.1076	0.0765	0.0814	0.0829	0.0845	0.0859	0.0896
1978	-0.0174	0.0840	0.0877	0.0888	0.0900	0.0917	0.0947
1979	0.1221	0.0921	0.0962	0.0978	0.0995	0.1017	0.1064
1980	0.1275	0.1115	0.1182	0.1211	0.1241	0.1271	0.1352
1981	0.1464	0.1349	0.1427	0.1458	0.1489	0.1529	0.1616
1982	0.2292	0.1309	0.1439	0.1448	0.1464	0.1532	0.1610
1983	0.2372	0.1115	0.1247	0.1229	0.1237	0.1298	0.1350
1984	0.2219	0.1247	0.1297	0.1339	0.1341	0.1374	0.1434
1985	0.3232	0.1104	0.1187	0.1179	0.1189	0.1228	0.1270
1986	0.3575	0.0802	0.0908	0.0930	0.0940	0.0973	0.1015
1987	-0.0544	0.0843	0.0934	0.0946	0.0953	0.0985	0.1027
1988	0.1849	0.0897	0.1013	0.1009	0.1014	0.1040	0.1083
1989	0.4351	0.0854	0.0938	0.0949	0.0955	0.0980	0.1001
1990	0.0069	0.0858	0.0943	0.0959	0.0964	0.0985	0.1009
1991	0.0931	0.0818	0.0891	0.0915	0.0921	0.0943	0.0961
1992	0.1183	0.0769	0.0822	0.0860	0.0869	0.0887	0.0897
1993	0.1661	0.0671	0.0737	0.0776	0.0780	0.0805	0.0816
1994	-0.0825	0.0730	0.0794	0.0799	0.0802	0.0826	0.0868
1995	0.3772	0.0708	0.0781	0.0774	0.0776	0.0813	0.0857
1996	0.0550	0.0672	0.0745	0.0742	0.0745	0.0762	0.0805
1997	0.1959	0.0670	0.0746	0.0743	0.0746	0.0747	0.0782
1998	0.1896	0.0572	0.0682	0.0674	0.0677	0.0687	0.0710
1999	-0.0998	0.0592	0.0710	0.0740	0.0748	0.0743	0.0766
2000	0.5475	0.0607	0.0790	0.0817	0.0821	0.0830	0.0839
2001	-0.2877	0.0557	0.0747	0.0777	0.0780	0.0787	0.0810
2002	-0.2934	0.0542		0.0730	0.0730	0.0754	0.0818
2003	0.2509	0.0496		0.0646	0.0646	0.0623	0.0673
2004	0.2763	0.0505		0.0608	0.0608	0.0617	0.0641
2005	0.2151	0.0465		0.0546	0.0546	0.0566	0.0592
2006	0.2323	0.0499		0.0583	0.0583	0.0607	0.0632
2007	0.1434	0.0493		0.0591	0.0591	0.0605	0.0629
2008	-0.3160	0.0448		0.0619	0.0619	0.0650	0.0711
2009	0.1801	0.0401		0.0579	0.0579	0.0610	0.0721
2010	0.0795	0.0405		0.0525	0.0525	0.0548	0.0598
2011	0.2051	0.0375		0.0489	0.0489	0.0514	0.0565
2012	0.1272	0.0256		0.0385	0.0385	0.0416	0.0490
2013	0.1363	0.0302		0.0417	0.0417	0.0441	0.0492
2014	0.3017	0.0316		0.0424	0.0424	0.0435	0.0485
2015	-0.0629	0.0254		0.0397	0.0397	0.0408	0.0496

Analysis of Tax Adjustment Factor
Based on Yield of G.O. Municipal Bonds and Investor-Owned Public Utility Bonds

	1	2	3	4	5	6	7	8	9	10	11	12
									Calculated Tax Factor			
		G.O. Municipal Bonds			Investor-Owned Public Utility Bonds				Municipal Aaa Over	Municipal Aa Over	Municipal A Over	Municipal Baa Over
	Years	Aaa Rated	Aa Rated	A Rated	Baa Rated	Aaa Rated	Aa Rated	A Rated	Baa Rated	Public Utility Aaa	Public Utility Aa	Public Utility A	Public Utility Baa
										[Ratio is converted to a tax factor by subtracting the ratio from 100%]			
May	2014	3.43	3.64	4.11	4.65	NA	4.16	4.26	4.69	NA	0.13	0.04	0.01
Jun	2014	3.42	3.64	4.08	4.58	NA	4.23	4.29	4.73	NA	0.14	0.05	0.03
Jul	2014	3.38	3.60	4.05	4.53	NA	4.16	4.23	4.66	NA	0.13	0.04	0.03
Aug	2014	3.28	3.50	3.92	4.39	NA	4.07	4.13	4.65	NA	0.14	0.05	0.06
Sep	2014	3.18	3.39	3.78	4.23	NA	4.18	4.24	4.79	NA	0.19	0.11	0.12
Oct	2014	3.11	3.54	3.90	4.35	NA	3.98	4.06	4.67	NA	0.11	0.04	0.07
Nov	2014	3.12	3.36	3.73	4.14	NA	4.03	4.09	4.75	NA	0.17	0.09	0.13
Dec	2014	3.02	3.26	3.60	4.00	NA	3.90	3.95	4.70	NA	0.16	0.09	0.15
Jan	2015	2.90	3.41	3.47	3.86	NA	3.52	3.58	4.39	NA	0.03	0.03	0.12
Feb	2015	3.05	3.29	3.62	4.01	NA	3.62	3.67	4.44	NA	0.09	0.01	0.10
Mar	2015	3.15	3.39	3.72	4.11	NA	3.67	3.74	4.51	NA	0.08	0.01	0.09
Apr	2015	3.20	3.41	3.79	4.17	NA	3.63	3.75	4.51	NA	0.06	(0.01)	0.08
May	2015	3.38	3.63	3.98	4.39	NA	4.05	4.17	4.91	NA	0.10	0.05	0.11
Jun	2015	3.42	3.64	3.94	4.35	NA	4.29	4.39	5.13	NA	0.15	0.10	0.15
Jul	2015	3.33	3.62	3.93	4.32	NA	4.27	4.40	5.22	NA	0.15	0.11	0.17
Aug	2015	3.31	3.54	3.92	4.31	NA	4.13	4.25	5.23	NA	0.14	0.08	0.18
Sep	2015	3.42	3.67	4.05	4.43	NA	4.25	4.39	5.42	NA	0.14	0.08	0.18
Oct	2015	3.22	3.52	3.84	4.22	NA	4.13	4.29	5.47	NA	0.15	0.10	0.23
Nov	2015	3.21	3.44	3.82	4.20	NA	4.22	4.40	5.57	NA	0.18	0.13	0.25
Dec	2015	3.10	3.31	3.57	4.06	NA	4.16	4.35	5.55	NA	0.20	0.18	0.27
Jan	2016	2.91	3.14	3.49	3.84	NA	4.09	4.27	5.49	NA	0.23	0.18	0.30
Feb	2016	2.73	2.99	3.31	3.68	NA	3.94	4.11	5.28	NA	0.24	0.19	0.30
Mar	2016	2.92	3.16	3.51	3.87	NA	3.93	4.16	5.12	NA	0.20	0.16	0.24
Apr	2016	2.71	2.99	3.26	3.62	NA	3.74	4.00	4.75	NA	0.20	0.19	0.24
May	2016	2.64	2.90	3.21	3.57	NA	3.66	3.91	4.76	NA	0.21	0.18	0.25
								Average Per Credit Rating		0.15	0.09	0.15
								Average Tax Factor			0.13	

City of DuBois - Bureau of Water
Demographic Information for the City of DuBois and
Communities Outside the City of DuBois - Bureau of Water That are Jurisdictional Being Provided Water Service

	Median household income*	Median family income*	Percent unemployment rate	Percentage in poverty for families	Percentage in poverty for individuals
City of DuBois - Bureau of Water	$33,611	$47,188	5.1	20.2	22.1
Communities Provided Service Outside City of DuBois - Bureau of Water					
Sandy Township	$47,523	$56,619	6.5	4.6	8.9
Sykesville Borough	$33,788	$39,688	6.5	20.6	23.0
Union Township	$50,568	$64,844	4.9	2.9	3.3
Outside Average	$43,960	$53,717	6.0	9.4	11.7
Outside as a Percentage of Inside	131%	114%	117%	46%	53%
Clearfield County, Pennsylvania	$41,510	$51,982	4.8	11.2	15.0
Pennsylvania	$53,115	$67,521	5.4	9.3	13.5

* = Reported in 2014 dollars

Source of Information: 2014 American Community Survey Estimates.

City of DuBois - Bureau of Water
Common Equity Cost Rate Summary

	Water Group Followed by Analysts		
	DCF(1)	CAPM(2)	RP(3)
Common Equity Cost Rate Range	10.00 %	11.00 %	11.00 %
Investment Risk and Other Adjustments (4)	0.25	0.25	0.25
City of DuBois - Bureau of Water Adjusted Common Equity Cost Rate Range:	10.25	11.25	11.25
City of DuBois - Bureau of Water Recommended Common Equity Cost Rate (5)		10.50 %	
LESS : Personal Income Tax Adjustment(6)		0.94	
Recommendation after personal income taxes for City of DuBois - Bureau of Water		9.56 %	
Check of Reasonableness of Common Equity Cost Rate (7)		11.1 % to 11.3 %	

Notes: (1) From Schedule 15 and explained in the Direct Testimony.
(2) From Schedule 20 and explained in the Direct Testimony.
(3) From Schedule 21 and explained in the Direct Testimony.
(4) As explained in the Direct Testimony.
(5) As explained in the Direct Testimony, the recommendation is only applicable to a rate making common equity ratio of 50%.
(6) See Schedule 22.
(7) See page 2 of Schedule 17.

City of DuBois - Bureau of Water
Recommended Fair Rate of Return and Summary of Alternative Overall Rates of Return
Recommended Rate Making Ratios at December 31, 2016

	Recommended Ratios	Cost Rates(1)	Recommended Weighted Cost	9% Tax Adjusted Equity Cost Rate (2)	Tax-Adjusted Weighted Cost
Recommendation based on Industry Average Hypothetical Capital Structure (3)					
Debt	50.0	3.02	1.51	--	1.51
Fund Equity	50.0	10.50	5.25	9.56	4.78
Overall	100.0		6.76		6.29
City of DuBois - Bureau of Water Per-Books Capital Structure (4)					
Debt	0.0	3.02	0.00	--	0.00
Fund Equity	100.0	9.82	9.82	8.94	8.94
Overall	100.0		9.82		8.94

Notes: (1) Debt cost is from Schedule 3 and Equity Cost rates are from page 2 of this Schedule.
(2) See Schedule 22.
(3) As explained in the direct testimony.
(4) See page 1 of Schedule 2.

City of DuBois - Bureau of Water
Common Equity Cost Rate Summary and Alternative Common Equity Cost Rates

	Common Equity Cost Rates:	
	Recommendation Based on Industry Average Hypothetical Capital Structure	City of DuBois - Bureau of Water Per-Books Capital Structure
Common Equity Ratios	50.00	100.00
Minimum Common Equity Cost Rate is only applicable to a rate making common equity ratio of 50% (1).	10.50	10.50
Required Financial Risk Adjustments (2)	0.00	-0.68
Recommended Common Equity Cost Rate City of DuBois - Bureau of Water	10.50	9.82
LESS : Personal Income Tax Adjustment(3)	0.94	0.88
Recommendation after personal income taxes for City of DuBois - Bureau of Water	9.56	8.94

Notes: (1) See Schedule 24.
(2) The Brigham financial risk adjustment is explained in the Direct Testimony.
(3) See Schedule 23.

Financial Risk Adjustment
Estimated Change in Common Equity Cost Rate
Due to Differences in the Actual Common Equity Ratio (1)
Of City of DuBois - Bureau of Water and Recommended Common Equity Ratio

Common Equity Ratio	Reported Change In Cost Rates	Estimated Constant Change In Cost Rates	Estimated Constant Basis Point Change	Estimated Compound Change In Cost Rates	Estimated Compound Basis Point Change
100		0.7778	0.8889	0.1014	0.0090
99		0.7778	0.8889	0.1104	0.0098
98		0.7778	0.8889	0.1202	0.0106
97		0.7778	0.8889	0.1308	0.0116
96		0.7778	0.8889	0.1423	0.0126
95		0.7778	0.8889	0.1549	0.0137
94		0.7778	0.8889	0.1686	0.0149
93		0.7778	0.8889	0.1835	0.0162
92		0.7778	0.8889	0.1997	0.0177
91		0.7778	0.8889	0.2174	0.0192
90		0.7778	0.8889	0.2366	0.0209
89		0.7778	0.8889	0.2575	0.0228
88		0.7778	0.8889	0.2803	0.0248
87		0.7778	0.8889	0.3050	0.0270
86		0.7778	0.8889	0.3320	0.0293
85		0.7778	0.8889	0.3613	0.0319
84		0.7778	0.8889	0.3933	0.0348
83		0.7778	0.8889	0.4280	0.0378
82		0.7778	0.8889	0.4658	0.0412
81		0.7778	0.8889	0.5070	0.0448
80		0.7778	0.8889	0.5518	0.0488
79		0.7778	0.8889	0.6006	0.0531
78		0.7778	0.8889	0.6536	0.0578
77		0.7778	0.8889	0.7114	0.0629
76		0.7778	0.8889	0.7743	0.0684
75		0.7778	0.8889	0.8427	0.0745
74		0.7778	0.8889	0.9172	0.0811
73		0.7778	0.8889	0.9982	0.0882
72		0.7778	0.8889	1.0864	0.0960
71		0.7778	0.8889	1.1824	0.1045
70		0.7778	0.8889	1.2869	0.1137
69		0.7778	0.8889	1.4007	0.1238
68		0.7778	0.8889	1.5244	0.1347
67		0.7778	0.8889	1.6592	0.1466
66		0.7778	0.8889	1.8058	0.1596
65		0.7778	0.8889	1.9654	0.1737
64		0.7778	0.8889	2.1390	0.1890
63		0.7778	0.8889	2.3281	0.2057
62		0.7778	0.8889	2.5338	0.2239
61		0.7778	0.8889	2.7577	0.2437
60		0.7778	0.8889	3.0014	0.2652
59		0.7778	0.8889	3.2667	0.2887
58		0.7778	0.8889	3.5553	0.3142
57		0.7778	0.8889	3.8695	0.3420
56		1.6667	0.8889	4.2115	0.3722
55		2.5556	0.8889	4.5837	0.4051
54		3.4444	0.8889	4.9887	0.4409
53		4.3333	0.8889	5.4296	0.4798
52		5.2222	0.8889	5.9094	0.5222
51		6.1111	0.8889	6.4316	0.5684
50	7	7.0000	0.8889	7.0000	0.6186
49		7.8889	0.8889	7.6186	0.6733
48		8.7778	0.8889	8.2919	0.7328
47		9.6667	0.8889	9.0246	0.7975
46		10.5556	0.8889	9.8221	0.8680
45	12	11.4444	0.8889	10.6901	0.9447
44		12.3333	0.8889	11.6348	1.0282
43		13.2222	0.8889	12.6630	1.1190
42		14.1111	0.8889	13.7821	1.2179
41	15	15	8	15	1.3256
40		15.8889	0.8889	16.3256	1.4427
Difference in Equity Ratio		49		49	
Estimated Average Change in Cost Rate		1.15		1.56	
Estimated Total Change in Cost Rate Per Study		58		78	

Note: (1) Eugene F. Brigham, Louis C. Gapenski, and Dana A. Aberwald, "Capital Structure, Cost of Capital, and Revenue Requirements," *Public Utilities Fortnightly*, 8 January 1987, pp. 15-24. They found that the average change in common equity is 12-basis points per percentage point change in common equity ratios between 40% and 50% equity ratios. Further, the change at the upper end of the common equity ratio range, 49% to 50%, was 7-basis points and 15-basis points at the lower end of the common equity ratio range, 49% to 50%, was 7-basis points and 15-basis points at the lower end of the common equity ratio range, 41% to 40%.

6

June 30, 2016

NOTICE OF PROPOSED RATE CHANGES

TO OUR CUSTOMERS:

The City of DuBois ("City") is filing a request with the Pennsylvania Public Utility Commission ("PUC" or "Commission") to increase your water rates as of August 29, 2016. This notice describes the City rate request, the PUC's role, and what actions you can take. Please note that only customers located in Sandy Township are impacted by the City's PUC filing.

The City has requested an overall rate increase of $257,604 per year. The City last increased water rates on January 1, 2014. While the City has maintained the present rates since January 1, 2014, additional revenues are now required to meet rising operational costs and fund various system improvements. The additional revenues will enable the City to improve pipeline integrity and replace aging pipelines.

If the City's entire request is approved, the total bill for a residential customer using 3,800 gallons per month with a 5/8-inch meter would increase from $25.57 to $34.17 per month, or by 33.6%.

The total bill for a commercial customer using 18,250 gallons per month with a 5/8-inch meter would increase from $99.99 to $137.49 per month, or by 37.5%.

Rates for an industrial customer using 475,000 gallons per month with a 2-inch meter would increase from $1,969.75 to $2,675.30 month, or by 35.8%.

To find out your customer class or how the requested increase may affect your water bill, contact the City of DuBois at (814) 371-2000. The rates requested by the City may be found in Supplement No. 22 to Tariff Water- Pa. P.U.C. No. 4. You may examine the material filed with the PUC which explains the requested increase and the reasons for it. A copy of this material is kept at the City of DuBois's office. Upon request, the City will send you the Statement of Reasons for Supplement No. 22 to Tariff Water-Pa. P.U.C. No. 4, explaining why the rate increase has been requested.

The state agency which approves rates for public utilities is the PUC. The PUC will examine the requested rate increase and can prevent existing rates from changing until it investigates and/or holds hearings on the request. The City must prove that the requested rates are reasonable. After examining the evidence, the PUC may grant all, some, or none of the request or may reduce existing rates.

The PUC may change the amount of the rate increase or decrease requested by the utility for each customer class. As a result, the rate charged to you may be different than the rate requested by the City and shown above.

There are three (3) ways to challenge the City's request to change its rates:

1. You can file a formal complaint. If you want a hearing before a judge, you must file a formal complaint. By filing a formal complaint, you assure yourself the opportunity to take part in hearings about the rate increase request. All complaints should be filed with the PUC before August 29, 2016. If no formal complaints are filed, the Commission may grant all, some, or none of the requests without holding a hearing before a judge.

2. You can send us a letter telling why you object to the requested rate increase. Sometimes there is information in the letters that makes us aware of problems with the City's service or management. This information can be helpful when we investigate the rate request. Send your letter or request for a formal complaint form to the Pennsylvania Public Utility Commission, P.O. Box 3265, Harrisburg, PA, 17105-3265.

3. You can be a witness at a public input hearing. Public input hearings are held if the Commission opens an investigation of the City's rate increase request and if there is a large number of customers interested in the case. At these hearings, you have the opportunity present your views in person to the PUC judge hearing the case and the City representatives. All testimony given "under oath" becomes part of the official rate case record. These hearings are held in the service area of the City.

CITY OF DUBOIS

7

John "Herm" Suplizio, City Manager

City of DuBois
Clearfield County, PA
(814) 371-2000

PRESS RELEASE

(For Immediate Release)

The City of DuBois ("City"), today, June 30, 2016, filed a new tariff with the Pennsylvania Public Utility Commission ("PUC") for an increase in water rates applicable to customers residing outside the City. The City last increased water rates on January 1, 2014. While the City has maintained the present rates since January 1, 2014, additional revenues are now required to meet rising operational costs and fund various system improvements. The additional revenues will enable the City to improve pipeline integrity and replace aging pipelines. The new water rates are scheduled to become effective on August 29, 2016, and will increase the City's revenues by $257,604 per year. The total bill for an average residential customer will increase by $8.60, from $25.57 to $34.17 per month. The total bill for an average commercial customer will increase by $37.50, from $99.99 to $137.49 per month. The total bill for an average industrial customer will increase by $705.55, from $1,969.75 to $2,675.30 per month. Questions regarding the water rate increase can be directed to the City Office at (814) 371-2000.

8

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
) ss:
COUNTY OF CLEARFIELD)

JOHN SUPLIZIO, being duly sworn according to law, deposes and says that he is the City Manager of the City of DuBois; that he is authorized to and does make this affidavit for it; and that the facts set forth are true and correct to the best of his knowledge, information and belief.

John Suplizio
City Manager, City of DuBois

SWORN TO and subscribed
before me this 28 day
of June, 2016.

Thomas M. Nowak Jr.
Notary Public

(SEAL)

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Thomas M. Nowak Jr, Notary Public
DuBois City, Clearfield County
My Commission Expires November 29, 2018

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
) ss:
COUNTY OF CLEARFIELD)

JOHN SUPLIZIO, being duly sworn according to law, deposes and says that he is the City Manager of the City of DuBois; that he is authorized to and does make this affidavit for it; and that the customer notice was mailed this 29th day of the month of June in the year of 2016.

John Suplizio
City Manager, City of DuBois

SWORN TO and subscribed
before me this 29 day
of June, 2016.

Thomas M. Nowak Jr.
Notary Public

(SEAL)

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Thomas M. Nowak Jr, Notary Public
DuBois City, Clearfield County
My Commission Expires November 29, 2018