EXHIBIT _____

BEFORE
THE TENNESSEE REGULATORY AUTHORITY

In The Matter Of The Petition Of	)	
Tennessee American Water Company To	)	
Change And Increase Certain Rates and	)	
Charges So As To Permit It To Earn A	)	Docket No. 10-00189
Fair And Adequate Rate Of Return On Its	)	
Property Used and Useful In Furnishing	)	
Water Service To Its Customers.	)	

DIRECT TESTIMONY
of
WILLIAM H. NOVAK

ON BEHALF OF
THE CONSUMER ADVOCATE AND PROTECTION DIVISION
OF THE
TENNESSEE ATTORNEY GENERAL'S OFFICE

January 5, 2011

TABLE OF CONTENTS

ATTACHMENTS

1   **Q1.**   ***PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND OCCUPATION***

2   ***FOR THE RECORD.***

3   **A1.**   My name is William H. Novak. My business address is 19 Morning Arbor Place,

4   The Woodlands, TX, 77381. I am the President of WHN Consulting, a utility

5   consulting and expert witness services company.

6

7   **Q2.**   ***PLEASE PROVIDE A SUMMARY OF YOUR BACKGROUND AND***

8   ***PROFESSIONAL EXPERIENCE.***

9   **A2.**   A detailed description of my educational and professional background is provided

10   in Attachment WHN-1 to my testimony. Briefly, I have both a Bachelors degree

11   in Business Administration with a major in Accounting, and a Masters degree in

12   Business Administration from Middle Tennessee State University. I am a

13   Certified Management Accountant, and am also licensed to practice as a Certified

14   Public Accountant.

15

16   My work experience has centered on regulated utilities for over 25 years. Before

17   establishing WHN Consulting, I was Chief of the Energy & Water Division of the

18   Tennessee Regulatory Authority where I had either presented testimony or advised

19   the Authority on a host of regulatory issues for over 19 years. In addition, I was

20   previously the Director of Rates & Regulatory Analysis for two years with Atlanta

21   Gas Light Company, a natural gas distribution utility with operations in Georgia

22   and Tennessee. I also served for two years as the Vice President of Regulatory

1   Compliance for Sequent Energy Management, a natural gas trading and

2   optimization entity in Texas, where I was responsible for ensuring the firm's

3   compliance with state and federal regulatory requirements.

4

5   **Q3.   ON WHOSE BEHALF ARE YOU TESTIFYING?**

6   *A3.*   I am testifying on behalf of the Consumer Advocate & Protection Division

7   ("CAPD" or "the Consumer Advocate") of the Tennessee Attorney General's

8   Office.

9

10 **Q4.   HAVE YOU PRESENTED TESTIMONY IN ANY PREVIOUS TAWC RATE**

11   **CASES?**

12 A4.   Yes. I presented testimony in Dockets U-86-7402, U-87-7534, 89-15388, 91-

13   05224 and 93-06946 concerning Tennessee-American Water Company ("TAWC"

14   or "the Company") rate cases as well as other generic tariff and rulemaking

15   matters. In addition, I have advised the TRA on issues in other TAWC rate cases

16   in dockets where I did not present testimony.

17

18 **Q5.   WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**

19   **PROCEEDING?**

20 *A5.*   My testimony will support and address the CAPD's positions and concerns with

21   respect to the Company's Petition. Specifically, I will address the following:

22   i.   CAPD's proposed test period;

1   ii.   CAPD's position on TAWC's proposed Cost of Service Study; and

2   iii.   CAPD's position on TAWC's proposed Weather Normalization

3   Adjustment.

4

5 **Q6.**   ***WHAT DOCUMENTS HAVE YOU REVIEWED IN PREPARATION OF***

6   ***YOUR TESTIMONY?***

7 **A6.**   I have reviewed the Company's Rate Case Application as filed on September 17,

8   2010, along with the testimony and exhibits presented with their filing. In

9   addition, I have reviewed the Company's workpapers related to the Cost of

10   Service and Weather Normalization calculations supporting their filings. I have

11   also reviewed the Company's responses to the relevant data requests submitted by

12   the TRA as well the Company's responses to CAPD's discovery requests in these

13   same areas. Finally, I have reviewed the testimony and exhibits of all parties

14   relating to Cost of Service and Weather Normalization in the Company's last rate

15   case.[1]

16

17   **I. TEST PERIOD**

18

19 **Q7.**   ***WHAT TEST PERIOD IS THE CAPD PROPOSING IN THIS CASE?***

20 A7.   The CAPD is proposing to use the twelve months ended September 30, 2010 as

21   the appropriate test period, with adjustments for known and reasonably anticipated

---

[1] TRA Docket No. 08-00039.

1   changes through the attrition year ending December 31, 2011. The CAPD's

2   proposed test period utilizes the most recent information that the Company did not

3   have available at the time they filed their case.

4

5   **Q8.**   **IS THERE A PRECEDENT FOR UPDATING THE TEST PERIOD WITHIN**

6   **A RATE CASE?**

7   A8.   Yes. The TRA and its predecessor the Tennessee Public Service Commission

8   have often updated the test period within a rate case when it may not be reflective

9   of future operating conditions.[2] This is due to the fact that the operating results

10   within the test period can become "stale" between the date that the rate case is

11   first filed by the Company and the time that a decision is made and an order is

12   developed. Updating the test period to reflect the most recent operating results

13   helps to eliminate any concerns over obsolete data.

14

15   **Q9.**   **HAVE YOU REVIEWED THE COMPANY'S TESTIMONY REGARDING**

16   **THE USE OF MULTIPLE TEST PERIODS?**

17   A9.   Yes. The Company expresses several concerns over the TRA's use of multiple

18   test periods in their last rate case.[3] However, the underlying cause of the

19   Company's concerns with multiple test periods appears to rest with the

20   normalization adjustments that either may, or may not have been taken into

---

[2] See Attachment WHN-2 for examples from Dockets 93-06946, 92-02987 and 89-10491.
[3] Direct testimony of Company witness Miller, Page 17.

1   account in order to produce the attrition period or going level amounts to set rates

2   with.

3

4   In this case, both the Company and the CAPD have used the same attrition period

5   for setting rates (the twelve months ending December 31, 2011) even though they

6   are proposing two different test periods. Naturally, the normalizing adjustments

7   (eg. compound growth rates, compound inflation rates) would be not be identical

8   since the starting point of the test period adjustments are different, even though

9   the attrition period is the same. It therefore appears to me that the Company's

10   arguments against the use of multiple test periods are really just an excuse to

11   avoid investigating another party's normalizing adjustments.

12

13   Again, the CAPD would urge the TRA to completely adopt its proposed test

14   period for the twelve months ended September 30, 2010 which contains the most

15   recent and relevant information for setting rates during the attrition period.

16   However, if the TRA is inclined to consider the use of multiple test periods, then

17   the CAPD would urge the TRA to closely examine the underlying normalization

18   adjustments from each party.

19

20

21

1   **II.   COST OF SERVICE STUDY**

2

3   ***Q10.*** ***PLEASE BRIEFLY EXPLAIN THE PURPOSE OF THE ALLOCATION***

4   ***PROCESS IN THE COMPANY'S COST OF SERVICE STUDY.***

5   ***A10.*** The purpose of any Cost of Service Study ("COSS") is to arrive at the cost of

6   serving each customer class and present a systematic approach to allocating this

7   cost (or total revenue requirement) to the different classes of customers. The

8   COSS then provides a measure of guidance for the TRA to consider how to best

9   adjust individual rates for each customer class to produce the total revenue

10   requirement. In this case, the Company has developed a COSS using twenty-three

11   (23) separate allocation factors.[4]

12

13   ***Q11.*** ***DO YOU AGREE WITH THE COMPANY'S COSS METHODOLOGY IN***

14   ***THIS CASE?***

15   ***A11.*** No. Many components of the 23 allocation factors used in the Company's COSS

16   are based on judgment without any substantiation whatsoever.[5] In my opinion, it

17   is unacceptable to use "judgment factors" for a COSS because the result is a

18   COSS that cannot be independently verified or corroborated.

19

20   However, the Company has chosen not to implement the results of its COSS for

21   setting proposed rates. Instead, the Company proposes to "…increase service

1   charges and volumetric rates so that each class receives approximately the same

2   increase.[6] This approach to rate design is also acceptable to the Consumer

3   Advocate. Therefore, our objection to the Company's COSS becomes a moot

4   issue for this case since its results are not proposed to be implemented.

5   Nevertheless, the CAPD would still like to go on record in this docket as opposing

6   the Company's COSS methodology in order to avoid Company objections to its

7   implementation in future rate cases.

8

9   **III.   WEATHER NORMALIZATION ADJUSTMENT**

10

11   *Q12.*   *MR. NOVAK, ARE YOU FAMILIAR WITH THE WEATHER*

12   *NORMALIZATION MECHANISMS ADOPTED BY TRA REGULATED*

13   *UTILITIES?*

14   *A12.*   Yes. I helped develop the current Weather Normalization Adjustment (WNA)

15   rules for gas utilities in Tennessee.[7] I also presented testimony on the

16   development for the first ever approved WNA for a public utility in the state of

17   Virginia.[8] In addition, I developed the TRA Staff's WNA model, and I have

18   testified on weather normalization issues and procedures in a number of rate

19   cases.

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[4] Direct testimony and exhibits of Company witness Herbert, Schedule C.
[5] Direct testimony of Company witness Herbert, page 10, lines 1 – 5.
[6] Direct testimony of Company witness Herbert, page 11, lines 8 – 10.
[7] Docket G-86-1.
[8] Case Number PUE-02-00237 before the Virginia State Corporation Commission.

1

2   **Q13. HAS THIS AGENCY EVER EXPLICITLY OR TACITLY APPROVED A**

3   **WEATHER NORMALIZATION ADJUSTMENT FOR TAWC?**

4   *A13*. No. To my knowledge neither the TRA nor the Tennessee Public Service

5   Commission ("TPSC") have ever directly addressed or approved a WNA for

6   TAWC. The Company has discussed this issue at length in their direct testimony[9]

7   and many of their conclusions are incorrect. I believe that I have some unique

8   information on the history of this issue that may help the TRA better understand

9   its evolution into the current case.

10

11   **Q14. PLEASE DISCUSS THE CONSIDERATION OF WEATHER**

12   **NORMALIZATION IN THE COMPANY'S 1989 RATE CASE.**

13   A14. In Docket 89-15388, the Company filed a rate case for an increase of $2,609,365

14   in revenues. Unfortunately for the Company, they made a number of calculation

15   errors to their own detriment in their development of this case which they never

16   corrected. [10] Although not a part of their filed rate case, the Company attempted

17   to demonstrate to the Staff the unfavorable impact of abnormal weather on their

18   financial results in order to alleviate certain omissions from their case. **This was**

19   **the first occasion that a weather adjustment for TAWC had ever been**

20   **discussed by the Company**.

21

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[9] Direct testimony of Company witness Miller, page 50.

1   In order to fully examine the impact of weather on the Company's rate case, I

2   adapted the Staff's weather normalization model for gas utilities. The Staff's

3   weather model considered the impact of heating degree days, cooling degree days

4   and rainfall on the Company's residential and commercial sales per customer

5   through a series of linear regressions. The results of this study would have

6   actually been to ***<u>increase</u>*** rather than reduce the Company's pro forma revenues

7   (with a resulting decrease to the amount of the revenue request). However, the

8   correlation factors from my analysis were too poor to suggest a direct causal

9   relationship between weather and customer water usage, so I therefore disregarded

10   its results.

11

12   I provided a copy of my analysis to the Company in order to dispute their claims

13   as to the impact of abnormal weather on water sales. However, the other

14   adjustments to the Company's case that were being considered by the Staff in this

15   case were not enough to overcome the impact of the Company's own detrimental

16   omissions. As a result, I recommended that the Company's rate request be

17   granted in full as stated earlier, and therefore the issue of weather normalization

18   was moot.

19

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[10] See Attachment WHN-3.

1   ***Q15.*** ***PLEASE DISCUSS THE CONSIDERATION OF WEATHER***

2   ***NORMALIZATION IN THE COMPANY'S 1991, 1993 AND 1996 RATE***

3   ***CASES.***

4   A15.   In Dockets 91-05224, 93-02943 and 96-00969 the Company witnesses adopted

5   the Staff's weather normalization model that I had provided to them in the 1989

6   rate case.[11] However, my own recollection is that the Staff continued to exclude

7   the impacts of weather since the resulting linear regression correlations continued

8   to show no material direct causal relationship between weather and water sales.

9   In any event, the issues in these three cases were settled between the parties **with**

10 **no recognition of weather normalization**.

11

12 ***Q16.*** ***WHY IS IT IMPORTANT FOR THE TRA TO BE AWARE OF THE***

13 ***CONSIDERATION OF WEATHER NORMALIZATION IN THESE OLDER***

14 ***CASES?***

15 A16.   Because the Company now states in their direct testimony that the TRA Staff first

16 proposed a weather adjustment for TAWC.[12] In addition, the Company has stated

17 in testimony before the Kentucky Public Service Commission that weather

18 normalization has been used in Tennessee since 1989.[13] As described above, this

19 is certainly not the case. Also, while the Company may well have indeed <u>filed</u>

20 each of their rate cases since 1991 with adjustments for weather, all of these rate

---

[11] See Attachment WHN-4
[12] Direct testimony of Company witness Miller, page 50, lines 2 – 16.
[13] See CAPD Data Request #123.

1   cases except for the last two were resolved through "black box" settlements with

2   no specific resolution of any weather normalization issue. In addition, in the 2006

3   and 2008 rate cases that were fully litigated, the Company's proposed WNA

4   adjustments were never explicitly adopted by the TRA.

5

6   ***Q17.   HAVE YOU REVIEWED THE WNA PROPOSED BY COMPANY WITNESS***

7   ***SPITZNAGEL IN THE CURRENT CASE?***

8   A17.   Yes. Dr. Spitznagel uses a series of regression analyses based upon the individual

9   months of the year and the Palmer Modified Drought Index. Based on Dr.

10   Spitznagel's weather study, the Company has reduced the residential and

11   commercial water sales for their test period by 98,697 cubic feet, resulting in a

12   corresponding revenue reduction of $318,523.[14]

13

14   ***Q18.   DO YOU AGREE WITH DR. SPITZNAGEL'S PROPOSED WEATHER***

15   ***NORMALIZATION ADJUSTMENT?***

16   A18.   No. In my opinion, the results of Dr. Spitznagel's proposed weather

17   normalization adjustments are of insufficient quality for consideration within a

18   rate case. Specifically, the correlation factors from Dr. Spitznagel's regression

19   analyses are too low to support a direct causal link between weather and customer

20   sales volumes. Interestingly, this is exactly the same conclusion that I first came

21   to in the Company's 1989 rate case described above.

---

[14] See TRA Data Request #102.

1

2   ***Q19.*** ***PLEASE FURTHER EXPLAIN THE TERM "CORRELATION" AS IT IS***

3   ***APPLIED HERE FOR WEATHER NORMALIZATION STUDIES.***

4   A19.   Simply put, correlation refers to the variations in sales volumes that can be

5   explained by changes in weather. A correlation factor of 1.00 would mean that

6   100% of the variation in sales volume is explained by weather. Likewise, a

7   correlation of 0.00 would mean that weather has no impact on sales volumes.

8

9   ***Q20.*** ***WHAT CORRELATION FACTOR WAS ACHIEVED BY THE COMPANY'S***

10   ***PROPOSED WEATHER NORMALIZATION?***

11   A20.   The Company's weather normalization produces an average correlation of 55.70%

12   for residential sales and 30.28% for commercial sales as shown in the table below.

13   In my opinion, these correlation averages are materially deficient to be used as a

14   basis for setting customer rates.

Tennessee-American Water Company Company Weather Normalization Regression Correlation Factors[15]		
Month	**Residential**	**Commercial**
January	63.48%	23.97%
February	34.16%	2.66%
March	46.00%	9.71%
April	61.95%	26.89%
May	57.85%	7.51%
June	30.21%	12.76%
July	18.63%	51.23%
August	61.43%	31.55%
September	61.78%	74.80%
October	73.79%	42.71%

---

[15] Direct testimony of Company witness Spitznagel, Appendix B.

November	87.68%	64.44%
December	71.48%	15.10%
Average	**55.70%**	**30.28%**

1

2 **Q21.** **WHAT IS YOUR BASIS FOR STATING THAT THESE CORRELATION**

3 **AVERAGES ARE TOO LOW FOR USE IN SETTING CUSTOMER RATES?**

4 A21. The TRA has long recognized a causal relationship between weather and sales for

5 gas utilities. As shown in the table below, the weather normalization correlation

6 averages from the last rate cases[16] for the major gas utilities under the TRA's

7 jurisdiction are 96.63%, 97.72% and 97.46%. These superior correlation factors

8 indicate a strong causal link between gas sales and weather. Although weather

9 can help explain a portion of water sales variances for TAWC (on average 55.70%

10 for residential and 30.28% for commercial), it is not significant enough to be used

11 as a basis for setting customer rates.

12

Comparison of Gas Utility Weather Normalization Regression Correlation Factors	
Utility/Customer Class	**Correlation Factor**
Chattanooga Gas Company:[17]	
Residential	99.94%
Commercial	99.35%
C-1	96.58%
C-2	99.32%
Multi-Family	87.98%
Average	**96.63%**

---

[16] Weather normalization was discontinued in the 2009 rate case for Chattanooga Gas Company with the implementation of a decoupling mechanism. The data presented is from their 2006 rate case.
[17] Attachment WHN-5.

Nashville Gas Company:[18]	
Residential	98.65%
Residential-Value	98.32%
Residential-Standard	98.47%
Commercial	99.17%
Small General Service-Value	97.81%
Small General Service-Standard	98.41%
Medium General Service-Value	93.00%
Medium General Service-Standard	97.94%
Average	**97.72%**
Atmos Energy Corporation:[19]	
Residential-Bristol	97.45%
Residential-Knoxville	98.78%
Residential-Nashville	97.49%
Residential-Paducah	98.88%
Commercial-Bristol	97.43%
Commercial-Knoxville	94.79%
Commercial-Nashville	97.16%
Commercial-Paducah	97.73%
Average	**97.46%**

1

2   **Q22.   DOES THIS COMPLETE YOUR TESTIMONY?**

3   **A22.**   Yes it does. However I reserve the right to incorporate any new information that

4   may subsequently become available.

5

6

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[18] Attachment WHN-6.
[19] Attachment WHN-7.

CERTIFICATE OF SERVICE

I hereby certify that a copy of *Direct Testimony of William H. Novak on Behalf of the Consumer Advocate & Protection Division of the Tennessee Attorney General's Office* was provided to the persons listed below via first class U.S. Mail, postage prepaid, this 5th day of January, 2011.

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Ryan McGhee

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ATTACHMENT WHN-1

William H. Novak Vitae

William H. Novak

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Areas of Specialization

Over twenty-five years of experience in regulatory affairs and forecasting of financial information in the rate setting process for electric, gas, water and wastewater utilities. Presented testimony and analysis for state commissions on regulatory issues in four states and has presented testimony before the FERC on electric issues.

Relevant Experience

WHN Consulting – September 2004 to Present

In 2004, established WHN Consulting to provide utility consulting and expert testimony for energy and water utilities. Complete needs consultant to provide the regulatory and financial expertise that enabled a number of small gas and water utilities to obtain their Certificate of Public Convenience and Necessity (CCN) that included forecasting the utility investment and income. Also provided the complete analysis and testimony for utility rate cases including revenues, operating expenses, taxes, rate base, rate of return and rate design for utilities in Tennessee. Assisted American Water Works Company in preparing rate cases in Ohio and Iowa. Provided commercial and industrial tariff analysis and testimony for an industrial intervenor group in a large gas utility rate case. Industry spokesman for water utilities dealing with utility commission rulemaking. Consultant for the North Carolina and Illinois Public Utility Commissions in carrying out their oversight functions of Duke Energy and Peoples Gas Light and Coke Company through focused management audits. Also provide continual utility accounting services and preparation of utility commission annual reports for water and gas utilities.

Sequent Energy Management – February 2001 to July 2003

Vice-President of Regulatory Compliance for approximately two years with Sequent Energy Management, a gas trading and optimization affiliate of AGL Resources. In that capacity, directed the duties of the regulatory compliance department, and reviewed and analyzed all regulatory filings and controls to ensure compliance with federal and state regulatory guidelines. Engaged and oversaw the work of a number of regulatory consultants and attorneys in various states where Sequent has operations. Identified asset management opportunities and regulatory issues for Sequent in various states. Presented regulatory proposals and testimony to eliminate wholesale gas rate fluctuations through hedging of all wholesale gas purchases for utilities. Also prepared testimony to allow gas marketers to compete with utilities for the transportation of wholesale gas to industrial users.

Atlanta Gas Light Company – April 1999 to February 2001
Director of Rates and Regulatory Analysis for approximately two years with AGL Resources, a public utility holding company serving approximately 1.9 million customers in Georgia, Tennessee, and Virginia. In that capacity, was instrumental in leading Atlanta Gas Light Company through the most complete and comprehensive gas deregulation process in the country that involved terminating the utility's traditional gas recovery mechanism and instead allowing all 1.5 million AGL Resources customers in Georgia to choose their own gas marketer. Also responsible for all gas deregulation filings, as well as preparing and defending gas cost recovery and rate filings. Initiated a weather normalization adjustment in Virginia to track adjustments to company's revenues based on departures from normal weather. Analyzed the regulatory impacts of potential acquisition targets.

Tennessee Regulatory Authority – Aug. 1982 to Apr 1999; Jul 2003 to Sep 2004
Employed by the Tennessee Regulatory Authority (formerly the Tennessee Public Service Commission) for approximately 19 years, culminating as Chief of the Energy and Water Division. Responsible for directing the division's compliance and rate setting process for all gas, electric, and water utilities. Either presented analysis and testimony or advised the Commissioners/Directors on policy setting issues, including utility rate cases, electric and gas deregulation, gas cost recovery, weather normalization recovery, and various accounting related issues. Responsible for leading and supervising the purchased gas adjustment (PGA) and gas cost recovery calculation for all gas utilities. Responsible for overseeing the work of all energy and water consultants hired by the TRA for management audits of gas, electric and water utilities. Implemented a weather normalization process for water utilities that was adopted by the Commission and adopted by American Water Works Company in regulatory proceedings outside of Tennessee.

Education
    B.A, Accounting, Middle Tennessee State University, 1981
    MBA, Middle Tennessee State University, 1997

Professional
    Certified Public Accountant (CPA), Tennessee Certificate # 7388
    Certified Management Accountant (CMA), Certificate # 7880
    Former Vice-Chairman of National Association of Regulatory Utility Commission's Subcommittee on Natural Gas

ATTACHMENT WHN-2

Updated Test Period Samples

Before The

PUBLIC SERVICE COMMISSION

Of The

STATE OF TENNESSEE

in re:

CHATTANOOGA GAS COMPANY

(Docket No. 93-06946)

****

Testimony

of

William H. Novak

****

December 1993

1		historical test period is therefore adjusted to compensate for the net effects of all
2		known and reasonably anticipated changes which might occur.
3	Q.	**What test period and adjusted test period have you adopted for this case?**
4	A.	The Company has used the twelve months ended March 31, 1993 as its test period,
5		with adjustments through the 12 months ending December 31, 1994.
6		. This
7		test period includes more current information that the Company did not have
8		available at the time they filed their case. The Staff then made adjustments through
9		the 12 months ending January 31, 1995, since this is the first year any new rates
10		granted by the Commission would be in effect.
11	Q.	**Have you caused to be filed a multi-page document consisting of 15**
12		**schedules?**
13	A.	Yes. (Introduce Exhibit #-- with 15 schedules).
14	Q.	**Would you explain Schedule 1 of the Staff's Exhibit and summarize the**
15		**Staff's findings in this case?**
16	A.	Schedule 1 shows the Staff's calculation of the Company's results of operations
17		under presently approved rates. The Staff's attrition average rate base is
18		$78,126,922 or $482,617 more than the Company's amount of $77,644,305. The
19		Staff's attrition net operating income is $5,907,673 or $1,584,961 more than the
20		Company's calculation of $4,322,712. The Staff's return on rate base under
21		present rates is 7.56% or 199 basis points higher than the Company's return of
22		5.57%. The Company has requested a $5,659,969 increase in gas rates to produce
23		an 10.05% overall return. The Staff's analysis indicates that an increase of
24		$2,597,553 in gas rates will be necessary to produce the 9.61% return as
25		recommended by Dr. Klein.
26		Of the total $3.0 million difference in revenue deficiency between the Staff and
27		Company's case, approximately <$54 thousand> is related to Rate Base; $818

Before The

PUBLIC SERVICE COMMISSION

Of The

STATE OF TENNESSEE

in re:

UNITED CITIES GAS COMPANY

(Docket No. 92-02987)

****

Testimony

of

William H. Novak

****

August 1992

1 Q. What test period and adjusted test period have you

2   adopted for this case?

3 A. The Company has used the twelve months ended November

4   30, 1991, as its test period with adjustments through

5   the 12 months ending September 30, 1993, since this is

6   the first year any new rates granted by the Commission

7   would be in effect.

8

9   This test period includes more current information that

10   the Company did not have available at the time they

11   filed their case, and made it possible for the Staff to

12   tie the test period amounts to the Company's year end

13   annual report. The Staff then also made adjustment's

14   through the 12 months ending September 30, 1993.

15 Q. Have you caused to be filed a multi-page document

16   consisting of 15 schedules?

17 A. Yes. (Introduce Exhibit #-- with 15 schedules).

18 Q. Would you explain Schedule 1 of the Staff's Exhibit and

19   summarize the Staff's findings in this case?

20 A. Schedule 1 shows the Staff's calculation of the

21   Company's results of operations under presently approved

22   rates.   The Staff's attrition average rate base is

23    $92,808,224 or $9,904,684 **more** than the Company's amount

24   of $82,903,540.   The Staff's attrition net operating

25   income is $10,587,887 or $3,247,166 **more** than the

26   Company's calculation of $7,340,721. The Staff's return

27   on rate base under present rates is 11.41% or 256 basis

Before The

PUBLIC SERVICE COMMISSION

Of The

STATE OF TENNESSEE

in re:

NASHVILLE GAS COMPANY

(Docket No. 89-10491)

****

Testimony

of

William H. Novak

****

November 3, 1989

set rates which are just and reasonable, i.e., rates which are sufficient to cover the operating expenses of a utility, and to allow a reasonable return on its investments used in providing services to its customers. The Staff normally analyzes a twelve month historical period of operations called a "test period." This test period is based on the Company's books, to determine a utility's earnings under present rates. The revenues, expenses, and rate base may then be adjusted as necessary to properly reflect the Company's historical earnings. Since rates are set for the future, the Staff then attempts to determine what future events are likely to transpire which will change or alter the historical test year results. Changes can occur which cause either an increase or a decrease in earnings. Changes can also occur which cause the Company's investment to increase or decrease. The historical test period is therefore adjusted to compensate for the net effects of all known and reasonably anticipated changes which might occur.

Q. What test period and adjusted test period have you adopted for this case?

A. In the Company's filing, it used a 12 month test period ended December 31, 1988. This test period includes more current information that the Company did not have available at the time they filed their case. We then made adjustments to reflect known and reasonably anticipated changes. Throughout my testimony, I will refer to an

3

ATTACHMENT WHN-3

Direct Testimony of

William H. Novak

In Docket 89-15388

Before The

PUBLIC SERVICE COMMISSION

Of The

STATE OF TENNESSEE

in re:

TENNESSEE-AMERICAN WATER COMPANY

(Docket No. 89-15388)

****

Testimony

of

William H. Novak

****

April, 1990

1   Q.   State your name for the record, please?

2   A.   My name is William H. Novak.

3   Q.   By whom are you employed, Mr. Novak, and what is your

4   position?

5   A.   I am an Accounting Division Manager for the Tennessee

6   Public Service Commission.

7   Q.   How long have you been employed by the Commission?

8   A.   Approximately seven years. Prior to my employment by

9   this Commission, I was employed as an auditor with the

10   Tennessee Department of Audit.

11   Q.   What is your educational background and what degrees

12   and licenses do you hold?

13   A.   I have a Bachelors degree in Business Administration

14   from Middle Tennessee State University with a major in

15   Accounting. I am licensed to practice as a Certified

16   Public Accountant and as a Certified Managerial

17   Accountant in Tennessee. I am also a member of the

18   American Institute of Certified Public Accountants and

19   the National Association of Accountants.

20   Q.   Mr. Novak, have you ever testified in a case involving

21   Tennessee-American Water Company?

22   A.   Yes. I previously presented testimony before this

23   Commission in dockets U-86-7402 and U-87-7534.

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

25   A.   The purpose of my testimony is to present information

26   to the Commission on what the Staff considers to be the

27   appropriate test period and test period adjustment

1   methodology. I will present testimony regarding the

2   Company's income, rate base, and results of operations.

3   I will also present testimony regarding rate design and

4   depreciation rates.

5   Q. Would you please explain the overall procedures used by

6   the Staff in this case?

7   A. Yes. We first reviewed the Company's financial

8   exhibits and underlying workpapers. In addition, we

9   prepared information requests for data that was not

10 included in the Company's exhibits or workpapers. We

11 also conducted on-site audits at the Company's regional

12 corporate offices in Charleston, West Virginia, and the

13 local office in Chattanooga, during which we reviewed

14 the Company's financial records. Our normal approach

15 is to adjust the historical test period to compensate

16 for the net effects of all known and reasonably

17 anticipated changes which might occur.

18 The primary concern of the Commission in setting rates

19 is to set rates which are just and reasonable, i.e.,

20 rates which are sufficient to cover the operating

21 expenses of a utility and to allow a reasonable return

22 on its investments used in providing services to its

23 customers. The Staff normally analyzes a twelve month

24 historical period of operations called a "test period."

25 This test period is based on the Company's books, to

26 determine a utility's earnings under present rates.

27 The revenues, expenses, and rate base may then be

1   adjusted as necessary to properly reflect the Company's

2   historical earnings. Since rates are set for the

3   future, the Staff then attempts to determine what

4   future events are likely to transpire which will change

5   or alter the historical test year results. Changes can

6   occur which cause either an increase or a decrease in

7   earnings. Changes can also occur which cause the

8   Company's investment to increase or decrease. The

9   historical test period is therefore adjusted to

10 compensate for the net effects of all known and

11 reasonably anticipated changes which might occur.

12 Q. What test period and adjusted test period have you

13   adopted for this case?

14 A. We have accepted the Company's proposed test period for

15   the 12 months ended July 31, 1989, and have made

16   adjustments for changes through April 30, 1991, since

17   this is the first year any new rates granted by the

18   Commission would be in effect.

19 Q. Have you caused to be filed a multi-page document

20   consisting of 7 schedules?

21 A. Yes. (Introduce Exhibit #-- with 6 schedules).

22 Q. Would you please explain Schedule 1 of the Staff's

23   Exhibit and summarize the Staff's findings in this

24   case?

25 A. The Company filed its petition for an increase of

26      $2,609,365 in revenues. The Staff has examined the

27   Company's filing as described above. From our

3   Novak, Direct

investigation, the Company's filing appears reasonable and we recommend that the Company's request be granted in full. We have included Schedule 1 in our Exhibit only to document that the Staff is recommending the Company's case be granted in full.

Q. Why is a rate increase of approximately $2.6 million necessary at this time?

A. The Staff believes that a material piece of the Company's rate request is due to the construction of several non-revenue producing projects. For example, the Company has spent approximately $2,000,000 on the construction or expansion of a water quality laboratory, chlorine room relocation, chemical feed changes, and chlorine scrubbers. In addition, the Company plans to spend approximately $1,300,000 to replace small diameter mains, eliminate private domestic service lines, and construct additional pumping stations. While all of these projects have been reviewed by the Commission in the Company's comprehensive planning study, they will produce almost no immediate incremental revenue.

Another reason for the need to increase rates is the low growth in customer additions in the Chattanooga area. The Staff has forecasted attrition year customer growth to be an increase of approximately 0.8% of existing residential and commercial customers. Inflation however, is expected to float between 4% and

4   Novak, Direct

ATTACHMENT WHN-4
Company Testimony in
Dockets 91-05224 & 96-00959

TENNESSEE-AMERICAN WATER COMPANY
CASE NO. 96-_____
Direct Testimony
Edward J. Grubb

1 Q. **WILL YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS FOR**
2   **THE RECORD.**
3 A. My name is Edward J. Grubb and my business address is 200 East Park Drive, Suite 600,
4   Mt. Laurel, New Jersey 08054   **32**

                                                                                                    3

5 Q. **BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**
6 A. I am employed by the American Water Works Service Co., Inc. ("Service Company") as
7   the Assistant Director - Rates and Revenues.

8 Q. **WHAT ARE YOUR RESPONSIBILITIES IN THIS POSITION?**
9 A. My responsibilities include the preparation and presentation of rate filings requested by
10   the eight operating companies, which comprise the Regional Office of the American
11   Water Works Service Co., Inc. of which Tennessee-American Water Company is
12   included.

13 Q. **HAVE YOU PREVIOUSLY PARTICIPATED IN REGULATORY MATTERS?**
14 A. Yes, I have prepared rate cases and presented testimony before the Maryland Public
15   Service Commission, West Virginia Public Service Commission, Tennessee Public
16   Service Commission, Illinois Commerce Commission, Missouri Public Service
17   Commission, Iowa Utilities Board, Virginia State Corporation Commission and the
18   Kentucky Public Service Commission.

19 Q. **WOULD YOU PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND**
20   **AND BUSINESS EXPERIENCE?**
21 A. In June 1978, I was awarded a Bachelor of Science Degree in Business Administration
22   from Drexel University with a major in accounting. In May 1989, I was awarded a

1   Masters of Business Administration from the University of West Virginia College of

2   Graduate Studies. I have attended Programs II and III of Depreciation Programs, Inc.

3   Seminars on Life and Salvage Estimation. I have also attended the NARUC Water

4   Utility Rate Seminar in 1989. In September 1993, I successfully completed the Certified

5   Management Accounting Program and received my certificate as a Certified Management

6   Accountant (CMA).

7   I began my career in 1978 with American Water Works Service Co., Inc. as an Internal

8   Auditor. As an Internal Auditor, I conducted financial and procedural audits of American

9   System operating companies.

10   In 1983, I was promoted to Rate Analyst. In 1984, I was promoted to Revenue

11   Requirement Specialist and in 1988, I was promoted to Assistant Director - Rates and

12   Revenues. In these three positions, I have assisted, prepared and presented testimony and

13   accounting exhibits before regulatory bodies concerning rate increase applications.

14 **Q.**   **WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?**

15 **A.**   The purpose of my testimony is to 1) sponsor the Company's Exhibits which support the

16   proposed revenue increase of $2,448,943 and 2) support the Company's attrition year

17   level of Regulatory Expense; Insurance, Other Than Group; Customer Accounting;

18   Rents; General Office Expense; Miscellaneous Expense; Maintenance Expense; Interest

19   on Customer Deposits; AFUDC; Income Taxes and the Lead/Lag Study. I will also

20   address the Company's Weather Normalization adjustment used to adjust revenues.

21 **Q.**   **WHAT IS THE TEST PERIOD REFLECTED IN THIS CASE?**

22 **A.**   The Company has used a historical test period of the twelve months ending December 31,

23   1995. The Company has adjusted the test period for two levels of adjustments. The first

24   adjustment normalizes the test year. The next level adjusts the normalized year to arrive

25   at the attrition year which is the twelve months ended October 31, 1997. Various

1   witnesses will address specific aspects of the normalized and attrition year adjustments.

2 Q.   MR. GRUBB, ARE THERE ANY EXHIBITS YOU WISH TO SPONSOR BEFORE

3   YOU CONTINUE?

4 A.   Yes. I would like to briefly discuss the accounting schedules which details and supports

5   the rate base, revenues, expenses, capitalization and bill analysis for the test year and

6   attrition year.

7   Exhibit 1 is a financial summary of the filing which details how the Company derived the

8   amount of the requested revenue increase. There is also a rate base summary for the test

9   year and the attrition year along with supporting schedules.

10   Exhibit 2 is an operating income summary for the test year and the attrition year with

11   supporting schedules that are broken-down by major account group.

12   Exhibit 3 provides a cost of capital summary for the attrition year and supporting

13   schedules providing detail on each component of the capital structure.

14   Exhibit 4 provides a bill analysis for the attrition year at both present and proposed rates.

15 Q   MR. GRUBB, YOU STATED EARLIER IN YOUR TESTIMONY THAT YOU

16   WILL BE ADDRESSING THE WEATHER NORMALIZATION ISSUE IN THIS

17   CASE. IS THAT CORRECT?

18 A.   Yes it is.

19 Q.   WOULD YOU PLEASE EXPLAIN.

20 A.   I used a regression analysis model to develop a weather normalization adjustment for

21   Tennessee-American. The model was developed by the Tennessee Public Service

22   Commission Staff and has been used by the Staff in the last three rate cases. The purpose

23   of the weather normalization model is an attempt to "predict" or "forecast" a level of water

24   sales based on weather patterns considered to be "normal." Therefore, the calculation of

25   a normalized level of sales will be based on a level of "average" weather for a specific

26   period of time.

1   **Q.**   **WOULD YOU PLEASE EXPLAIN WHAT A REGRESSION ANALYSIS IS.**

2   **A.**   Regression analysis is a statistical tool that uses the relation between two or more

3   quantitative variables so that one variable can be predicted from the other. In a weather

4   normalization adjustment, we are trying to determine if there is a relationship or

5   correlation between the amount of water that the Company sells and the weather in the

6   Company's service territory.

7   **Q.**   **WOULD YOU PLEASE EXPLAIN HOW YOU WENT ABOUT USING THE**

8   **MODEL.**

9   **A.**   I started with the basic regression analysis function of $Y=M(x)+B$ where Y is the

10   dependent variable water sales and M is the regression coefficient or slope of the

11   regression line. It indicates the change in the value of Y(dependent variable) per unit

12   increase in X (independent variable). X is the independent variable (weather) and B is the

13   constant in the regression function.

14   **Q.**   **WHAT IS THE SOURCE OF THE WEATHER DATA IN THE MODEL?**

15   **A.**   The Company obtained from the "National Oceanic and Atmospheric Administration

16   (NOAA)," a copy of the monthly weather report for the Chattanooga, Tennessee area.

17   The Company used rainfall in inches, cooling degree days and heating degree days as the

18   variables in the analysis.

19   **Q.**   **PLEASE CONTINUE.**

20   **A.**   Rainfall is self-explanatory. It represents the number of inches of rain that fell in the

21   Chattanooga area during a specific month. Heating and cooling degree days are the

22   aggregate of the temperature variances over or under a base of 65 degrees fahrenheit

23   during a specific month.

24   **Q.**   **HOW MUCH DATA DID THE COMPANY COLLECT?**

25   **A.**   The Company has collected 27 years of weather history data for cooling degree days and

1   30 years of weather history data for rainfall and heating degree days. The company also

2   assembled water sales and customer history data for the years 1984-1995. The analysis

3   was performed for the period ending December 31, 1995.

4 **Q. WOULD YOU PLEASE EXPLAIN HOW YOU WENT ABOUT YOUR**

5 **CALCULATION OF NORMALIZED SALES?**

6 A. The Company is using a series of Symphony spreadsheets that were developed by the

7   Tennessee Commission Staff. The spreadsheets have been used in the last three

8   Tennessee-American Water Company rate cases to forecast water sales for its residential

9   and commercial customers. The spreadsheets are broken down between weather files,

10   customer files, sales files and an analyze file. The "Analyze" Spreadsheet calculates the

11   regression analysis using either one, two or three independent variables.

12 **Q. WHAT WERE THE RESULTS OF YOUR ANALYSIS?**

13 A. I performed the regression analysis on the following customer classes: monthly residential

14   and monthly commercial customers. The results of the analysis were measured based on

15   the coefficient of determination R^2. This coefficient is a measure of variation in the

16   dependent variable which is based on the independent variables used in the analysis. The

17   higher the R^2 factor approaches 100% the better the correlation between the dependent

18   and independent variables.

19 **Q. IS THERE ANYTHING SPECIFIC ABOUT YOUR CALCULATIONS THAT YOU**

20 **WOULD LIKE TO DISCUSS?**

21 A. Yes. In using the model, I performed two sets of regression calculations. The first was

22   based on "calendar" weather data. This means that billed water sales for a specific month

23   were regressed against weather patterns for that month in which the weather occurred, and

24   the sales were billed to the customer. However, in reality, water sales are not only

25   affected by weather in the month in which sales are billed but also prior month(s), where

26   the customer actually used the water but had yet to be billed. Therefore, a second

1   regression analysis was performed. This was done on "cycle" weather data. This means

2   that for a monthly account that was billed in July, this data was regressed against weather

3   data that was averaged for the month of June and July. As the results will show, the use

4   of cycle weather data generates a higher correlation factor than calendar weather data.

5   For each of the customer classes noted above, I performed a regression analysis using one,

6   two and three independent variables. The Company utilized a three independent variable

7   analysis. Based on this analysis, test year sales for the residential class were reduced by

8   42,992 CCF and commercial sales were reduced by 63,760 CCF. The resulting impact on

9   revenue is a reduction of $102,698 for residential and $94,503 for commercial.

10

11   **Q.**   **MR. GRUBB, YOU LISTED A NUMBER OF EXPENSE CATEGORIES THAT**

12   **YOU WILL BE SUPPORTING. WOULD YOU PLEASE DISCUSS EACH ONE?**

13   **A.**   Yes. Each of the following expense categories were reviewed for the test year and then

14   appropriately adjusted to reflect the level of expense for the attrition year. Some of the

15   expenses were adjusted for a cost trend factor of 4.02%.

16   **Q.**   **HOW WAS THE 4.02% FACTOR CALCULATED?**

17   **A.**   The factor was calculated based on forecasted levels of inflation by six financial

18   institutions through the third quarter of 1997. Average inflation factors were calculated

19   for the attrition year and the test year. The increase in the factor for the attrition year over

20   the test year was 4.02%. This increase represents an increase over a twenty-two month

21   period of approximately 2% annually.

22   **Regulatory Expense**

23   The Company has estimated the cost of the preparation and presentation of this current

24   filing to be $215,000. The Company is proposing to amortize these costs over a two-year

25   period resulting in an annual cost of $107,500. Also, included in the attrition year cost is

26   two months amortization totaling $2,284 for the cost of a depreciation study that was

Grubb - 6

TENNESSEE-AMERICAN WATER COMPANY
DIRECT TESTIMONY
EDWIN L. OXLEY

1. Q. WILL YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

   A. My name is Edwin L. Oxley and my business address is 1325 Virginia Street, East, Charleston, WV 25322.

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

   A. I am employed by the American Water Works Service Company, Inc. as a Revenue Requirement Specialist.

3. Q. WHAT ARE YOUR RESPONSIBILITIES AS A REVENUE REQUIREMENT SPECIALIST?

   A. My responsibilities include the preparation and presentation of rate filings requested by the six operating companies which comprise the Southern Region of American Water Works. In addition to Tennessee, these companies are located in the States of Kentucky, West Virginia, Maryland and Virginia.

4. Q. WOULD YOU DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE?

   A. I received a Bachelor of Business Administration degree from Marshall University (major in accounting with a minor in finance) in May 1978.

   I was employed by the West Virginia Public Service Commission as a Rate Analyst and Senior Rate Analyst from October 1978 to March

1984. In March 1984, I was hired by the American Water Works Service Company, Inc., Southern Region Office, as a Revenue Requirement Specialist.

In August 1981, I attended the NARUC regulatory course held at Michigan State University.

In October 1989, I attended the Annual Eastern Utility Rate Seminar held in Hollywood, Florida.

5. Q. HAVE YOU PREVIOUSLY PARTICIPATED IN REGULATORY MATTERS?

A. Yes. I have prepared rate case filings and presented testimony before state regulatory commissions in Tennessee, Kentucky, West Virginia, Virginia and Maryland. While employed by the Public Service Commission of West Virginia, I performed audits and presented testimony in numerous electric, gas, motor carrier, water and sewer company rate proceedings.

6. Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. The purpose of my testimony is to sponsor information contained in the accounting exhibits which have been filed by Tennessee–American in support of its proposed tariffs.

7. Q. WHAT ASPECTS OF THE ACCOUNTING INFORMATION DO YOU INTEND TO SPONSOR?

A. I will sponsor operating revenues and Federal/State income taxes.

Direct Testimony
Edwin L. Oxley
Page Three

8. **Q. HOW DID THE COMPANY DETERMINE ITS ATTRITION YEAR OPERATING REVENUES?**

A. Billing determinants from the twelve months ended January 1991 was employed as a basis for attrition year revenues. This twelve-month period differs from the historical test year ended March 1991 by two months.

9. **Q. WHY WASN'T THE TEST PERIOD DATA USED?**

A. Tennessee-American initiated a re-routing of its meter reading schedules during the month of February 1991. This procedure has resulted in more efficient operation by reducing three full-time meter reading positions from the Company's labor force since the Company's last rate case. However, the change in customer meter reading dates caused fluctuations in billed days from prior billings. Thus, affected customers' billing determinants for the test year do not conform to a 365 billing period normally used in setting rates.

10. **Q. DID THE COMPANY UTILIZE A NORMALIZATION METHOD TO FORECAST WATER SALES?**

A. Yes. Tennessee-American was impressed by a normalization study used by the Commission staff in the Company's last rate case. After the completion of that case, the Company requested a copy of the study which has been updated for this rate filing. The study

Direct Testimony
Edwin L. Oxley
Page Four

analyzes the correlation between weather data and residential and commercial customer's water usage. Historical weather information is then inserted into a formula to yield a normalized level of water sales.

11. Q. HOW DID THE COMPANY FORECAST WATER SALES FOR ITS OTHER CLASSES OF WATER CUSTOMERS?

A. The actual sales experienced for the Industrial, Other Public Authority and Sale for Resale classes during the twelve months ended January 1991 was used with the following exception. A major customer, Central Soya, has announced that it will cease operations and no longer purchase water from the Company. This loss in sales of approximately $171,000 will be partially offset by the addition of a new customer (ADM). Tennessee-American has been informed by ADM of its projected water needs (roughly 50% of Central Soya) and that it will begin operations this summer.

12. Q. HOW WAS FIRE SERVICE REVENUES DETERMINED?

A. Private and Public fire service revenues were calculated by using the projected number of fire service facilities and hydrants at June 30, 1992, the mid-point of the attrition test period.

13. Q. WHAT IS THE BASIS FOR OTHER OPERATING REVENUES?

ATTACHMENT WHN-5

Calculation of WNA Factors

For Chattanooga Gas Company

In TRA Docket 06-00175

Chattanooga Gas Company
Weather Normalization Adjustment (WNA) Factors

Calculation of Base Load and Heat Sensitive Factor

	Use per Customer	Normal Sales (Heating) Degree Days
Jan-07	143.1	790
Feb-07	128.9	714
Mar-07	91.2	487
Apr-07	53.7	268
May-07	26.5	105
Jun-07	15.3	19
Jul-07	12.1	0
Aug-07	12.2	0
Sep-07	12.1	1
Oct-07	21.5	70
Nov-07	53.9	265
Dec-07	105.7	567
Total	676.2	3,286

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.999693659
Adjusted R Square	0.999326153
Standard Error	1.264652948
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	26092.03653	26092.03653	16314.18	2.12351E-17
Residual	10	15.99347079	1.599347079		
Total	11	26108.03			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	10.99415907	0.50928861	21.58728637	1.02E-09	9.859393341	12.12892481
Heat Sensitivity	0.165633016	0.001296774	127.7269754	2.12E-17	0.162743624	0.168522409

Calulation of Weighted Base Rate - R

	Winter Commodity Charge Revenue	Winter therms	Weighted Base Rate
2007	$8,459,700	30,438,800	0.277925

SUMMARY	
Base Load - BL	10.994
Heat Sensitive Factor - HSF	0.165633
Weighted Base Rate - R	0.277925

Chattanooga Gas Company
Weather Normalization Adjustment (WNA) Factors

Calculation of Base Load and Heat Sensitive Factor

	Use per Customer	Normal Sales (Heating) Degree Days
Jan-07	737.5	790
Feb-07	663.1	714
Mar-07	491.9	487
Apr-07	331.3	268
May-07	225.6	105
Jun-07	203.2	19
Jul-07	186.3	0
Aug-07	188.8	0
Sep-07	186.7	1
Oct-07	215.6	70
Nov-07	340.0	265
Dec-07	565.8	567
Total	4,335.8	3,286

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.996740515
Adjusted R Square	0.99284082
Standard Error	17.08210781
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	445426.9926	445426.9926	1526.489	2.88161E-12
Residual	10	2917.984073	291.7984073		
Total	11	448344.9767			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	173.9175669	6.87913863	25.28188139	2.15E-10	158.5898909	189.2452429
Heat Sensitivity	0.684354594	0.017515978	39.07030551	2.88E-12	0.645326564	0.723382624

Calulation of Weighted Base Rate - R

	Winter Commodity Charge Revenue	Winter therms	Weighted Base Rate
2007	$5,955,680	26,796,700	0.222254

SUMMARY	
Base Load - BL	173.918
Heat Sensitive Factor - HSF	0.684355
Weighted Base Rate - R	0.222254

Chattanooga Gas Company
Weather Normalization Adjustment (WNA) Factors

Calculation of Base Load and Heat Sensitive Factor

	Use per Customer	Normal Sales (Heating) Degree Days
Jan-07	230.1	790
Feb-07	212.5	714
Mar-07	132.4	487
Apr-07	62.5	268
May-07	20.5	105
Jun-07	18.8	19
Jul-07	10.1	0
Aug-07	8.8	0
Sep-07	8.9	1
Oct-07	13.2	70
Nov-07	27.7	265
Dec-07	115.4	567
Total	860.9	3,286

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.982771988
Adjusted R Square	0.87493169
Standard Error	20.46208024
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	130223.646	130223.646	311.0214	7.31384E-09
Residual	11	4605.664005	418.6967277		
Total	12	134829.31			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0					
Normal Sales (Heati	0.265249529	0.015040403	17.63579906	2.05E-09	0.232145824	0.298353233

Calulation of Weighted Base Rate - R

	Winter Commodity Charge Revenue	Winter therms	Weighted Base Rate
2007	$1,697,650	5,245,800	0.323621

SUMMARY	
Base Load - BL	0
Heat Sensitive Factor - HSF	0.26525
Weighted Base Rate - R	0.323621

Chattanooga Gas Company
Weather Normalization Adjustment (WNA) Factors

Calculation of Base Load and Heat Sensitive Factor

	Use per Customer	Normal Sales (Heating) Degree Days
Jan-07	2,671.4	790
Feb-07	2,398.6	714
Mar-07	1,872.5	487
Apr-07	1,354.1	268
May-07	986.2	105
Jun-07	867.1	19
Jul-07	810.1	0
Aug-07	821.9	0
Sep-07	808.5	1
Oct-07	927.2	70
Nov-07	1,460.1	265
Dec-07	2,240.2	567
Total	17,217.9	3,286

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.996599408
Adjusted R Square	0.992531417
Standard Error	59.67442295
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	5209213.855	5209213.855	1462.836	3.56091E-12
Residual	10	35610.36755	3561.036755		
Total	11	5244824.223			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	793.9618089	24.03149732	33.03838285	1.52E-11	740.4162962	847.5073215
Heat Sensitivity	2.340340321	0.061190098	38.24704311	3.56E-12	2.204000286	2.476680355

Calulation of Weighted Base Rate - R

	Winter Commodity Charge Revenue	Winter therms	Weighted Base Rate
2007	$4,258,030	21,550,900	0.19758

SUMMARY	
Base Load - BL	793.962
Heat Sensitive Factor - HSF	2.34034
Weighted Base Rate - R	0.19758

Chattanooga Gas Company
Weather Normalization Adjustment (WNA) Factors

Calculation of Base Load and Heat Sensitive Factor

	Use per Unit	Normal Sales (Heating) Degree Days
Jan-07	68.8	790
Feb-07	63.4	714
Mar-07	60.8	487
Apr-07	28.0	268
May-07	23.9	105
Jun-07	21.2	19
Jul-07	17.0	0
Aug-07	17.0	0
Sep-07	17.1	1
Oct-07	14.9	70
Nov-07	55.1	265
Dec-07	55.1	567
Total	442.3	3,286

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.938010451
Adjusted R Square	0.867849967
Standard Error	7.839977854
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4501.636639	4501.636639	73.23872	6.49286E-06
Residual	10	614.6525275	61.46525275		
Total	11	5116.289167			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	18.01904674	3.157238855	5.707216832	0.000196	10.98428021	25.05381326	10.98428021	25.05381326
Normal Sales (Heat	0.068798369	0.008039106	8.557962567	6.49E-06	0.050886124	0.086710613	0.050886124	0.086710613

Calulation of Weighted Base Rate - R

	Winter Commodity Charge Revenue	Winter therms	Weighted Base Rate
2007	$12,544	61,243	0.204823

SUMMARY	
Base Load - BL	18.019
Heat Sensitive Factor - HSF	0.068798
Weighted Base Rate - R	0.204823

ATTACHMENT WHN-6

Calculation of WNA Factors

For Nashville Gas Company

In TRA Docket 03-00313

NASHVILLE GAS COMPANY DIVISION

BASE FACTOR   1.068210221
HEAT FACTOR   0.017748

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
849.6	2002	Jan	130,147	139,024	1,962,463	2,101,487
815.3		Feb	130,694	139,609	1,891,149	2,030,758
520.2		Mar	130,851	139,776	1,208,092	1,347,869
338.2		Apr	130,770	139,690	784,936	924,626
118.2		May	130,000	138,867	272,718	411,585
14.6		Jun	128,900	137,692	33,401	171,093
0.2		Jul	128,598	137,370	456	137,826
0		Aug	128,640	137,415	0	137,415
2		Sep	128,501	137,266	4,561	141,827
93.2		Oct	128,993	137,792	213,371	351,162
325.2		Nov	131,041	139,979	756,329	896,308
578.3		Dec	133,042	142,117	1,365,509	1,507,626
3,655.0		TOTAL	1,560,177	1,666,597	8,492,986	10,159,583

	Actual	Normal
WINTER VOLUME	8,093,203	7,884,048
SUMMER VOLUME	2,270,115	2,275,535
	10,363,318	10,159,583

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
325.2	Nov-2003	136,661	145,983	788,765	934,748
578.3	Dec-2003	138,748	148,212	1,424,072	1,572,283
849.6	Jan-2004	135,729	144,987	2,046,626	2,191,613
815.3	Feb-2004	136,299	145,596	1,972,255	2,117,851
520.2	Mar-2004	136,463	145,771	1,259,904	1,405,674
338.2	Apr-2004	136,378	145,681	818,600	964,280
118.2	May-2004	135,575	144,823	284,414	429,237
14.6	Jun-2004	134,428	143,597	34,833	178,431
0.2	Jul-2004	134,113	143,261	476	143,737
0	Aug-2004	134,157	143,308	0	143,308
2	Sep-2004	134,012	143,153	4,757	147,910
93.2	Oct-2004	134,525	143,701	222,521	366,223
3655.0	TOTAL	1,627,088	1,738,072	8,857,223	10,595,295

	Actual	Normal & Grown
WINTER VOLUME	8,093,203	8,222,169
SUMMER VOLUME	2,270,115	2,373,126
	10,363,318	10,595,295

NASHVILLE GAS COMPANY DIVISION

REVISED 8-26-03

BASE FACTOR	11.68387763	
HEAT FACTOR	0.072458	

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
849.6	2002	Jan	16,585	193,777	1,020,972	1,214,749
815.3		Feb	16,667	194,735	984,598	1,179,333
520.2		Mar	16,664	194,700	628,107	822,807
338.2		Apr	16,524	193,064	404,923	597,988
118.2		May	16,330	190,798	139,858	330,656
14.6		Jun	16,205	189,337	17,143	206,480
0.2		Jul	16,131	188,473	234	188,706
0		Aug	16,015	187,117	0	187,117
2		Sep	15,959	186,463	2,313	188,776
93.2		Oct	15,955	186,416	107,745	294,161
325.2		Nov	16,245	189,805	382,784	572,589
578.3		Dec	16,603	193,987	695,703	889,690
3,655.0		TOTAL	195,883	2,288,673	4,384,380	6,673,053

	Actual	Normal
WINTER VOLUME	4,813,742	4,679,169
SUMMER VOLUME	1,962,334	1,993,884
	6,776,076	6,673,053

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
325.2	November-03	16,592	193,864	390,970	584,834
578.3	December-03	16,958	198,136	710,581	908,716
849.6	January-04	16,940	197,921	1,042,806	1,240,727
815.3	February-04	17,023	198,900	1,005,654	1,204,553
520.2	March-04	17,020	198,864	641,539	840,403
338.2	April-04	16,877	197,193	413,583	610,776
118.2	May-04	16,679	194,878	142,849	337,727
14.6	June-04	16,552	193,386	17,510	210,896
0.2	July-04	16,476	192,503	239	192,742
0	August-04	16,357	191,119	0	191,119
2	September-04	16,300	190,451	2,362	192,813
93.2	October-04	16,296	190,403	110,049	300,452
3655.0	TOTAL	200,072	2,337,617	4,478,141	6,815,758

	Actual	Normal & Grown
WINTER VOLUME	4,813,742	4,779,234
SUMMER VOLUME	1,962,334	2,036,524
	6,776,076	6,815,758

NASHVILLE GAS COMPANY DIVISION **REV-6**

| BASE FACTOR | 1.066168065 |
| HEAT FACTOR | 0.018356 |

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	130,147	138,759	2,010,546	2,149,305
807.2		Feb	130,694	139,342	1,936,471	2,075,812
510.1		Mar	130,851	139,509	1,225,199	1,364,708
330.3		Apr	130,770	139,423	792,850	932,272
113.8		May	130,000	138,602	271,556	410,158
14.5		Jun	128,900	137,429	34,308	171,737
0.2		Jul	128,598	137,107	472	137,579
0		Aug	128,640	137,152	0	137,152
2		Sep	128,501	137,004	4,717	141,721
91		Oct	128,993	137,528	215,467	352,996
318.5		Nov	131,041	139,712	766,109	905,821
573		Dec	133,042	141,845	1,399,321	1,541,167
3,602.2		TOTAL	1,560,177	1,663,411	8,657,017	10,320,428

	Actual	Normal
WINTER VOLUME	8,093,203	8,036,812
SUMMER VOLUME	2,270,115	2,283,615
	10,363,318	10,320,428

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	Nov-2003	136,661	145,704	798,965	944,669
573	Dec-2003	138,748	147,928	1,459,334	1,607,262
841.6	Jan-2004	135,729	144,709	2,096,772	2,241,481
807.2	Feb-2004	136,299	145,318	2,019,520	2,164,837
510.1	Mar-2004	136,463	145,492	1,277,743	1,423,236
330.3	Apr-2004	136,378	145,402	826,852	972,255
113.8	May-2004	135,575	144,546	283,202	427,748
14.5	Jun-2004	134,428	143,323	35,779	179,102
0.2	Jul-2004	134,113	142,987	492	143,480
0	Aug-2004	134,157	143,034	0	143,034
2	Sep-2004	134,012	142,879	4,920	147,799
91	Oct-2004	134,525	143,426	224,708	368,135
3602.2	TOTAL	1,627,088	1,734,749	9,028,289	10,763,038

	Actual	Normal & Grown
WINTER VOLUME	8,093,203	8,381,486
SUMMER VOLUME	2,270,115	2,381,552
	10,363,318	10,763,038

NASHVILLE GAS COMPANY DIVISION   **REV-7**

BASE FACTOR	11.66599328
HEAT FACTOR	0.074970

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	16,585	193,480	1,046,430	1,239,910
807.2		Feb	16,667	194,437	1,008,620	1,203,057
510.1		Mar	16,664	194,402	637,270	831,672
330.3		Apr	16,524	192,769	409,178	601,947
113.8		May	16,330	190,506	139,321	329,827
14.5		Jun	16,205	189,047	17,616	206,663
0.2		Jul	16,131	188,184	242	188,426
0		Aug	16,015	186,831	0	186,831
2		Sep	15,959	186,178	2,393	188,570
91		Oct	15,955	186,131	108,850	294,981
318.5		Nov	16,245	189,514	387,898	577,412
573		Dec	16,603	193,690	713,231	906,921
3,602.2		TOTAL	195,883	2,285,170	4,471,048	6,756,218

			Actual	Normal
	WINTER VOLUME		4,813,742	4,758,973
	SUMMER VOLUME		1,962,334	1,997,245
			6,776,076	6,756,218

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	November-03	16,592	193,567	396,194	589,761
573	December-03	16,958	197,833	728,483	926,316
841.6	January-04	16,940	197,618	1,068,808	1,266,426
807.2	February-04	17,023	198,595	1,030,189	1,228,784
510.1	March-04	17,020	198,559	650,898	849,458
330.3	April-04	16,877	196,891	417,929	614,820
113.8	May-04	16,679	194,580	142,301	336,880
14.5	June-04	16,552	193,090	17,993	211,083
0.2	July-04	16,476	192,208	247	192,456
0	August-04	16,357	190,826	0	190,826
2	September-04	16,300	190,159	2,444	192,603
91	October-04	16,296	190,111	111,177	301,289
3602.2	TOTAL	200,072	2,334,039	4,566,663	6,900,701

			Actual	Normal & Grown
	WINTER VOLUME		4,813,742	4,860,744
	SUMMER VOLUME		1,962,334	2,039,957
			6,776,076	6,900,701

NASHVILLE GAS COMPANY DIVISION   **REV-8**

BASE FACTOR   2.281420349
HEAT FACTOR   0.021864

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	46,678	106,492	858,902	965,394
807.2		Feb	46,823	106,823	826,354	933,177
510.1		Mar	46,916	107,035	523,241	630,276
330.3		Apr	47,019	107,270	339,553	446,823
113.8		May	47,101	107,457	117,192	224,649
14.5		Jun	47,222	107,733	14,971	122,704
0.2		Jul	47,391	108,119	207	108,326
0		Aug	47,245	107,786	0	107,786
2		Sep	47,001	107,229	2,055	109,284
91		Oct	47,003	107,234	93,517	200,751
318.5		Nov	47,035	107,307	327,534	434,840
573		Dec	47,171	107,617	590,956	698,573
3,602.2		TOTAL	564,605	1,288,101	3,694,482	4,982,583

		Actual	Normal
WINTER VOLUME		3,677,466	3,662,260
SUMMER VOLUME		1,322,477	1,320,323
		4,999,943	4,982,583

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	Nov-2003	49,052	111,909	341,581	453,489
573	Dec-2003	49,194	112,232	616,300	728,533
841.6	Jan-2004	48,680	111,059	895,737	1,006,797
807.2	Feb-2004	48,831	111,404	861,793	973,198
510.1	Mar-2004	48,928	111,626	545,681	657,307
330.3	Apr-2004	49,035	111,871	354,115	465,986
113.8	May-2004	49,121	112,066	122,218	234,284
14.5	Jun-2004	49,247	112,354	15,613	127,966
0.2	Jul-2004	49,423	112,756	216	112,972
0	Aug-2004	49,271	112,408	0	112,408
2	Sep-2004	49,017	111,828	2,143	113,971
91	Oct-2004	49,019	111,833	97,528	209,361
3602.2	TOTAL	588,819	1,343,344	3,852,926	5,196,270

		Actual	Normal & Grown
WINTER VOLUME		3,677,466	3,819,323
SUMMER VOLUME		1,322,477	1,376,947
		4,999,943	5,196,270

NASHVILLE GAS COMPANY DIVISION   **REV-9**

BASE FACTOR   0.371244129
HEAT FACTOR   0.016351

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	83,875	31,138	1,154,216	1,185,354
807.2		Feb	84,234	31,271	1,111,776	1,143,048
510.1		Mar	84,401	31,333	703,966	735,300
330.3		Apr	83,718	31,080	452,145	483,225
113.8		May	82,724	30,711	153,930	184,641
14.5		Jun	81,348	30,200	19,287	49,487
0.2		Jul	80,788	29,992	264	30,256
0		Aug	80,896	30,032	0	30,032
2		Sep	81,093	30,105	2,652	32,757
91		Oct	81,805	30,370	121,723	152,092
318.5		Nov	84,402	31,334	439,553	470,887
573		Dec	86,284	32,033	808,414	840,446
3,602.2		TOTAL	995,572	369,600	4,967,925	5,337,526

		Actual	Normal
WINTER VOLUME		4,415,736	4,375,034
SUMMER VOLUME		947,639	962,491
		5,363,375	5,337,526

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	Nov-2003	88,022	32,678	458,404	491,081
573	Dec-2003	89,985	33,406	843,084	876,490
841.6	Jan-2004	87,472	32,474	1,203,717	1,236,190
807.2	Feb-2004	87,847	32,613	1,159,457	1,192,069
510.1	Mar-2004	88,021	32,677	734,157	766,834
330.3	Apr-2004	87,309	32,413	471,536	503,949
113.8	May-2004	86,272	32,028	160,532	192,560
14.5	Jun-2004	84,837	31,495	20,114	51,609
0.2	Jul-2004	84,253	31,279	276	31,554
0	Aug-2004	84,366	31,320	0	31,320
2	Sep-2004	84,571	31,397	2,766	34,162
91	Oct-2004	85,314	31,672	126,943	158,615
3602.2	TOTAL	1,038,269	385,451	5,180,984	5,566,435

		Actual	Normal & Grown
WINTER VOLUME		4,415,736	4,562,665
SUMMER VOLUME		947,639	1,003,770
		5,363,375	5,566,435

NASHVILLE GAS COMPANY DIVISION　　　　　　　　**REV-10**

BASE FACTOR　　　　　　　　　0
HEAT FACTOR　　　　　　　　0.080700

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	13,130	0	891,752	891,752
807.2		Feb	13,168	0	857,778	857,778
510.1		Mar	13,136	0	540,745	540,745
330.3		Apr	12,960	0	345,452	345,452
113.8		May	12,755	0	117,138	117,138
14.5		Jun	12,596	0	14,739	14,739
0.2		Jul	12,532	0	202	202
0		Aug	12,410	0	0	0
2		Sep	12,369	0	1,996	1,996
91		Oct	12,387	0	90,966	90,966
318.5		Nov	12,695	0	326,299	326,299
573		Dec	13,291	0	614,591	614,591
3,602.2		TOTAL	153,429	0	3,801,659	3,801,659

			Actual	Normal
WINTER VOLUME			3,277,914	3,231,165
SUMMER VOLUME			539,114	570,494
			3,817,028	3,801,659

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	November-03	12,966	0	333,277	336,165
573	December-03	13,575	0	627,734	627,734
841.6	January-04	13,411	0	910,823	910,823
807.2	February-04	13,450	0	876,122	876,122
510.1	March-04	13,417	0	552,309	552,309
330.3	April-04	13,237	0	352,839	347,000
113.8	May-04	13,028	0	119,643	119,643
14.5	June-04	12,865	0	15,054	15,054
0.2	July-04	12,800	0	207	207
0	August-04	12,675	0	0	0
2	September-04	12,634	0	2,039	2,039
91	October-04	12,652	0	92,912	92,912
3602.2	TOTAL	156,710	0	3,882,958	3,880,007

			Actual	Normal & Grown
WINTER VOLUME			3,277,914	3,303,152
SUMMER VOLUME			539,114	576,855
			3,817,028	3,880,007

NASHVILLE GAS COMPANY DIVISION
SMALL GENERAL SERVICE - VALUE

REV-11

BASE FACTOR	48.52970248	
HEAT FACTOR	0.053207	
CORRELATION	97.81%	

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	3,427	166,311	153,456	319,768
807.2		Feb	3,471	168,447	149,074	317,520
510.1		Mar	3,500	169,854	94,992	264,846
330.3		Apr	3,536	171,601	62,142	233,743
113.8		May	3,547	172,135	21,477	193,612
14.5		Jun	3,583	173,882	2,764	176,646
0.2		Jul	3,573	173,397	38	173,435
0		Aug	3,579	173,688	0	173,688
2		Sep	3,564	172,960	379	173,339
91		Oct	3,543	171,941	17,154	189,095
318.5		Nov	3,524	171,019	59,719	230,737
573		Dec	3,290	159,663	100,303	259,966
3,602.2		TOTAL	42,137	2,044,896	661,500	2,706,396

		Actual	Normal
	WINTER VOLUME	1,402,856	1,392,838
	SUMMER VOLUME	1,305,556	1,313,558
		2,708,412	2,706,396

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	November-03	3,599	174,676	60,996	235,672
573	December-03	3,360	163,077	102,448	265,526
841.6	January-04	3,500	169,868	156,738	326,606
807.2	February-04	3,545	172,049	152,262	324,311
510.1	March-04	3,575	173,486	97,024	270,510
330.3	April-04	3,612	175,271	63,471	238,742
113.8	May-04	3,623	175,816	21,936	197,752
14.5	June-04	3,660	177,600	2,823	180,424
0.2	July-04	3,649	177,105	39	177,144
0	August-04	3,656	177,402	0	177,402
2	September-04	3,640	176,659	387	177,046
91	October-04	3,619	175,618	17,521	193,139
3602.2	TOTAL	43,038	2,088,627	675,646	2,764,273

		Actual	Normal & Grown
	WINTER VOLUME	1,402,856	1,422,624
	SUMMER VOLUME	1,305,556	1,341,648
		2,708,412	2,764,273

NASHVILLE GAS COMPANY DIVISION   **REV-12**

BASE FACTOR   219.9091139
HEAT FACTOR   1.813435

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	3	660	4,579	5,238
807.2		Feb	3	660	4,391	5,051
510.1		Mar	3	660	2,775	3,435
330.3		Apr	3	660	1,797	2,457
113.8		May	3	660	619	1,279
14.5		Jun	2	440	53	492
0.2		Jul	2	440	1	441
0		Aug	2	440	0	440
2		Sep	2	440	7	447
91		Oct	2	440	330	770
318.5		Nov	2	440	1,155	1,595
573		Dec	2	440	2,078	2,518
3,602.2		TOTAL	29	6,377	17,785	24,162

					Actual	Normal
		WINTER VOLUME			17,968	17,837
		SUMMER VOLUME			6,125	6,325
					24,094	24,162

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	November-03	2	449	1,180	1,629
573	December-03	2	449	2,123	2,572
841.6	January-04	3	674	4,676	5,350
807.2	February-04	3	674	4,485	5,159
510.1	March-04	3	674	2,834	3,508
330.3	April-04	3	674	1,835	2,509
113.8	May-04	3	674	632	1,306
14.5	June-04	2	449	54	503
0.2	July-04	2	449	1	450
0	August-04	2	449	0	449
2	September-04	2	449	7	457
91	October-04	2	449	337	786
3602.2	TOTAL	30	6,514	18,165	24,679

				Actual	Normal & Grown
	WINTER VOLUME			17,968	18,219
	SUMMER VOLUME			6,125	6,460
				24,094	24,679

NASHVILLE GAS COMPANY DIVISION   **REV-13**

BASE FACTOR   621.8046493
HEAT FACTOR   0.551621

NORMALIZED

NORMAL DD		MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
841.6	2002	Jan	25	15,545	11,606	27,151
807.2		Feb	25	15,545	11,132	26,677
510.1		Mar	25	15,545	7,035	22,580
330.3		Apr	25	15,545	4,555	20,100
113.8		May	25	15,545	1,569	17,114
14.5		Jun	24	14,923	192	15,115
0.2		Jul	24	14,923	3	14,926
0		Aug	24	14,923	0	14,923
2		Sep	24	14,923	26	14,950
91		Oct	23	14,302	1,155	15,456
318.5		Nov	24	14,923	4,217	19,140
573		Dec	20	12,436	6,322	18,758
3,602.2		TOTAL	288	179,080	47,811	226,890

		Actual	Normal
WINTER VOLUME		115,003	114,305
SUMMER VOLUME		111,539	112,585
		226,543	226,890

NORMALIZED AND GROWN

NORMAL DD	MONTH	BASE CUST	BASE VOL	HEAT VOL	TOTAL VOL
318.5	November-03	25	15,242	4,307	19,549
573	December-03	20	12,702	6,457	19,159
841.6	January-04	26	15,878	11,854	27,732
807.2	February-04	26	15,878	11,370	27,247
510.1	March-04	26	15,878	7,185	23,063
330.3	April-04	26	15,878	4,652	20,530
113.8	May-04	26	15,878	1,603	17,480
14.5	June-04	25	15,242	196	15,439
0.2	July-04	25	15,242	3	15,245
0	August-04	25	15,242	0	15,242
2	September-04	25	15,242	27	15,269
91	October-04	23	14,607	1,179	15,787
3602.2	TOTAL	294	182,909	48,833	231,742

		Actual	Normal & Grown
WINTER VOLUME		115,003	116,750
SUMMER VOLUME		111,539	114,993
		226,543	231,742

ATTACHMENT WHN-7

Calculation of WNA Factors

For Atmos Energy Corporation

In TRA Docket 07-00105

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.987169429
Adjusted R Square	0.883594391
Standard Error	12.63900866
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	67161.62956	67161.62956	420.4314567	1.68201E-09
Residual	11	1757.189938	159.7445398		
Total	12	68918.8195			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.112571787	0.005490122	20.50442529	4.09044E-10	0.100488111	0.124655463	0.100488111	0.124655463

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.987114718
Adjusted R Square	0.883486375
Standard Error	55.06875592
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	1269467.533	1269467.533	418.6114159	1.7181E-09
Residual	11	33358.24666	3032.567878		
Total	12	1302825.78			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.489417785	0.023920718	20.4599955	4.18685E-10	0.43676864	0.542066931	0.43676864	0.542066931

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.993897521
Adjusted R Square	0.896923192
Standard Error	8.185997562
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	59842.53808	59842.53808	893.0315099	4.11718E-11
Residual	11	737.116117	67.01055609		
Total	12	60579.6542			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.122328965	0.004093511	29.88363281	6.9548E-12	0.113319209	0.131338721	0.113319209	0.131338721

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.973600314
Adjusted R Square	0.85698848
Standard Error	55.42490445
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	614760.6127	614760.6127	200.1225963	6.13101E-08
Residual	11	33791.12037	3071.920033		
Total	12	648551.7331			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.392082371	0.027715917	14.14646939	2.10817E-08	0.331080049	0.453084692	0.331080049	0.453084692

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.98737587
Adjusted R Square	0.884002018
Standard Error	13.97348909
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	83461.45544	83461.45544	427.4410552	1.55125E-09
Residual	11	2147.842372	195.2583974		
Total	12	85609.29781			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.14709118	0.007114568	20.67464764	3.7428E-10	0.131432122	0.162750238	0.131432122	0.162750238

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SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.985711325
Adjusted R Square	0.880717725
Standard Error	47.86672071
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	863080.8015	863080.8015	376.6900122	2.87752E-09
Residual	11	25203.45247	2291.222952		
Total	12	888284.254			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.473008977	0.024371223	19.4085036	7.37328E-10	0.419368276	0.526649678	0.419368276	0.526649678

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99440727
Adjusted R Square	0.897936727
Standard Error	8.937926232
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	77903.51782	77903.51782	975.1771967	2.66302E-11
Residual	11	878.7517786	79.88652533		
Total	12	78782.2696			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.124184849	0.003976737	31.22782728	4.30878E-12	0.11543211	0.132937588	0.11543211	0.132937588

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.988593099
Adjusted R Square	0.886407225
Standard Error	43.03494255
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	877721.4307	877721.4307	473.930051	9.35322E-10
Residual	11	20372.06908	1852.00628		
Total	12	898093.4998			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0.416839082	0.019147466	21.76993457	2.14794E-10	0.374695793	0.45898237	0.374695793	0.45898237