Exhibit No.:
Issues: *Weather Normalization*

Witness: *Dennis L. Patterson*
Sponsoring Party: *MO PSC Staff*
Type of Exhibit: *Direct Testimony*
Case No.: *WR-2007-0216*
Date Testimony Prepared: *June 5, 2007*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

DENNIS L. PATTERSON

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2007-0216

STAFF Exhibit No. 21
Case No(s). WR-2007-0216
Date 8-14-07 Rptr RF

Jefferson City, Missouri
June 2007

STAFF-21

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Missouri-American Water Company's request for Authority to Implement a General Rate Increase for Water Service provided in Missouri Service Areas	)))))	Case No. WR-2007-0216

AFFIDAVIT OF DENNIS L. PATTERSON

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Dennis L. Patterson, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 19 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Dennis L. Patterson

Subscribed and sworn to before me this 4th day of June, 2007.

Notary Public

DAWN L. HAKE
My Commission Expires
March 16, 2009
Cole County
Commission #05407643

My commission expires_____

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DIRECT TESTIMONY

OF

DENNIS L. PATTERSON

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2007-0216

DIRECT TESTIMONY

OF

DENNIS L. PATTERSON

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2007-0216

Q. Please state your name and business address.

A. My name is Dennis L. Patterson and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, MO 65102.

Q. What is your present position with the Missouri Public Service Commission (Commission)?

A. I am a Regulatory Economist in the Water and Sewer Department of the Utility Operations Division.

Q. Please review your educational background and work experience.

A. I was trained as an officer and aviator in the U.S. Army. I studied economics, math, sciences, and languages at the University of Missouri (Columbia), receiving a B.A. in Latin American Studies (1983) and an M.S. in Agricultural Economics (1989). I joined the Staff of the Commission in April, 1986. I established the Staff's centralized weather data base and have continued to maintain and improve it by employing data and methods from reliable sources. I have been employed by the Commission, the Missouri Army National Guard, the University of Missouri, the U.S. Army Reserves, and the U.S. Army.

PURPOSE

Q. What is the purpose of your direct testimony?

A. The purpose of my direct testimony is to support my projections of service area customer counts and estimates of weather-normalized water consumption, expressed as gallons per customer per day (GCD). My testimony will address the special measures I used to address the Company's reports of customer counts and reports of water sales in thousands of gallons (Mgallons). As a result of these special measures, my GCD estimates are only appropriate for my projections of customer counts, and in some cases, projections of water sales.

Q. How are your estimates used in this case?

A. I furnished these estimates to Staff witness Roberta Grissum, for use in her calculations of customer counts and weather normalized water sales volumes.

Q. What are the service areas and rate classes for which you calculated weather normalized GCD and projections of customer counts?

A. I analyzed sales for the Residential and Commercial rate classes in the service areas of Joplin, St. Charles, St. Joseph, and St. Louis County.

Q. Why do you believe it was necessary to adjust the Company's reports of customer counts and Mgallon sales?

A. Staff could not verify the Company's reports of customer numbers with the required degree of confidence. For example, St. Louis County Water Quarterly Residential Customer counts from 2002-2005 were 317,639; 303,890; 320,918; and 321,262 (Dr. Spitznagel's Direct Testimony in this case). The customer count for 2006 was initially reported as 340,698 (Company's monthly STAT13 reports); it was later

amended to 315,905 (Cust Annual.xls spreadsheet), and again to 318,372 (2006 Bill Analysis STL April Update From Thakadiyil.xls). These customer counts are illustrated at Schedule 1-1. It was not advisable to rely on Company's reports of Mgallon sales given the instability in reported customer counts.

Q. What do you believe is the cause of the unreliable reports?

A. Staff believes that the situation arose because the Company's account closing schedule did not correspond with the requirements of Article 8 entitled "Weather Reporting" of the Stipulation and Agreement As To Revenue Requirement in their most recent rate case, Case No. WR-2003-0500 (Stipulation). This lack of correspondence would make it very difficult for the Company itself to crosscheck its own results.

Q. What does Article 8 of the Stipulation require?

A. Article 8 states in part:

> "Weather Reporting. The Company agrees to provide monthly/quarterly aggregations of *billing cycle data (i.e., number of customers or accounts billed, billing cycle sales volumes in M-gallons, and rate revenue)* for all of its Missouri service areas, regularly transmitted to the Staff *by district, rate class, billing month, billing cycle number, beginning read-date and ending read-date...*" (Italics added for emphasis).

Q. Has the Company complied with the Stipulation?

A. No. Instead of providing the billing cycle data in the form that it had specifically agreed to, the Company instead provided data in a different format. The Company separately describes their 4-4-5 account closing schedule, where books are closed in the 4th, 8th and 13th weeks, four times each year. (For example, please see the question and answer beginning at Page 5, Line 5 of the Direct Testimony of Edward L.

Spitznagel, Jr. in the present case.) The result is that the Company's data is not readily usable and Staff has had to reconstruct, project and estimate the necessary billing determinants.

AGGREGATE RESULTS

Q. What are your estimates of weather-adjusted Residential and Commercial GCD by service area for the 12 billing months ending December, 2006?

A. These estimates are presented in Schedule 2-1 attached to my direct testimony. Since Staff could not verify Company's reports of customer numbers and sales with confidence, Schedule 2-1 also includes projections of customer numbers, as well as projections of actual and normalized annual water sales that result.

Q. What are the aggregate results of your analysis?

A. I have calculated conservative projections for the Company's four largest service areas in Joplin, St. Charles, St. Joseph, and St. Louis (St. Louis County Quarterly Billed Customers Only). The aggregated results are presented at Schedule 2-2 through 2-9. The table at Schedule 2-2 shows that the projection of the Company's 2006 actual Residential sales were 39,839,208 Mgallons for the largest four operations., and that the corresponding projection of normalized 2006 Residential sales was 37,963,934 Mgallons, implying a downward weather adjustment of (1,875,274) Mgallons. Schedules 2-3, 2-4 and 2-5 illustrate the annual changes in projected Residential customer counts; projections of actual and normal Residential GCD; and projections of actual and normal Residential Mgallons respectively. An estimate of the effect of the Company's weather normalization was not included because Staff believes that the

Company's estimate was based on deficient data where both customers and volumes were undercounted and were analyzed with respect to an inappropriate weather variable whose true normal value is not known.

The table at Schedule 2-6 shows the Staff's conservative projection of the Company's 2006 Commercial sales for the largest four service areas is 10,554,922 Mgallons, and that the Staff's estimate of normalized 2006 Commercial sales is 9,917,985 Mgallons, a downward adjustment of (637,137) Mgallons. Schedules 2-7, 2-8 and 2-9 illustrate the annual changes in projected Commercial customer counts; projected actual and normal Commercial GCD; and projected actual and normal Commercial Mgallons respectively. In this instance also, an estimate of the effect of the Company's weather normalization was not included because Staff believes that the Company's estimate was based on deficient data where both customers and volumes were undercounted and were analyzed with respect to an inappropriate weather variable whose true normal value is not known.

Q. Why do you believe that the Staff's estimates are conservative?

A. Because the Staff's current projections are based in most cases on the Company's 2002 reports that may be questionable, and because the Staff only recently began crosschecks using meters-in-use as reported in Company's Annual Reports to the Public Service Commission. Staff now intends to more thoroughly examine the relationship of Residential and Commercial customer counts with annual average meters-in-use by service area (as illustrated at Schedule 1-1). This relationship would be partially determined by the number of meters serving multiple customers and the numbers of such customers.

GENERAL METHOD OF ANALYSIS

Q. How did you calculate weather-normalized GCD for the service areas and rate classes?

A. In order to perform the analysis of weather effects with accuracy for the years preceding a projection, it was necessary to account for other important effects as well. Fortunately, the Company's regularly expected shifts in customer usage behavior, occasional large billing adjustments, and year-to-year trends in usage per customer were evident in the years before 2002, and were easily addressed by introducing trend and indicator variables. Not so fortunately, the expected seasonal patterns and expected billing anomalies were masked by very large variations in month-to-month, quarter-to-quarter and year-to-year reports of customer counts and Mgallon sales for all years after 2001. In addition, it appears that not enough customers and not enough Mgallons were reported, particularly for the test year.

Q. Did you request clarification of the suspect reports from the Company?

A. Yes. The Staff requested clarification of the Company's customer counts and Mgallon sales dating from 2002 in Data Request Number S-0206 (Schedule 1-2, Page 2). The Company responded in due time, but the Staff did not find the Company's response to be helpful. (Ibid., P. 3.)

Q. With no helpful response from the Company, how were you able to address the problems you perceived in the Company's reports of customer counts and Mgallon sales dating from 2002?

A. I used customer information provided by Dr. Spitznagel in the most recent rate case, WR-2003-0500, coupled with linear regression analysis, to discover when the

cited problems had occurred. In such instances, the analysis was performed by first calculating projections of customer counts dating from before 2002, and then by calculating projections of actual Mgallon sales after 2002 when the reported quantities did not correspond with the projected customer counts. For example, this technique was used for the St. Louis County Water Residential rate class quarterly customer counts for the billing years after 2001. In other cases, I used the linear regression analysis directly to examine historical annual GCD with respect to reported or projected customer counts, to reported annual sales volumes, and to the summer weather of each year. Finally, I combined the results to calculate weather-normalized GCD and Mgallons for the test year which corresponded to my projections of customer numbers and my weather response equations. The special methods of analysis just mentioned are described in more detail below.

Q. How were shifts and trends in usage per customer analyzed?

A. Shifts were analyzed with indicator variables that equaled 0.0 before and after the shift, and which equaled 1.0 or some smaller fraction (with the appropriate sign) during the shift period. Trends were analyzed with variables that equaled 0.0 in the final year of the trend, -1.0 in the prior year, and so on backward to where observations began. Each trend would be assigned the annual value of zero after that trend had ended. These techniques allowed the test year estimates to be yielded directly by the regression model results. The appropriate trend parameters were also utilized to perform an end-of-test year annualization for the upcoming true-up.

Q. How were the GCD regression models specified?

A. For Residential and Commercial rate classes, the GCD regression models were specified to calculate coefficients for billing adjustments, shift adjustments, trend adjustments and for weather effects. These coefficients were then used to adjust Test Year GCD for the 2006 departures from normal weather. This process is described in the sections below, headed Weather Response in GCD, Adjustments, Trends and Shifts and Projections of Normal Weather GCD and Normal Weather Sales.

SPECIAL METHODS OF ANALYSIS

Q. Did you employ any special measures to calculate your projections of customer counts and your estimates of weather normalized GCD?

A. Yes. I first calculated projections of customer numbers for the years 2002-2006, based on known and measurable billing quantities dating from 1990-2001. I was then able to calculate base usage and weather response for the years 2002-2006, since known and measurable weather does exist for the years since 2002. These combined results allowed me to calculate projections of actual GCD and weather-normalized GCD for 2006 and the intervening billing years, using 365.25 days as the nominal billing cycle year for the calculations.

Q. Was GCD usage uniform for all customers in every rate class?

A. No. For the St. Louis Quarterly Residential customers, information was used from Dr. Spitznagel's surrebuttal testimony in the most recent Company rate case, Case No. WR-2003-0500 was used to make this determination. The footnote data from Schedule ELS-3SR attached to Dr. Spitznagel's surrebuttal testimony yields a ratio of

0.7517 based on projected GCD for "old" customers in 2002, using actual weather data for that year.

	2002 Observed GCD	2002 Customers
Old Customers	279.46	
Florissant	190.31	14500
Webster Groves	243.41	8600
New Customers	210.08	23100
New/Old GCD Ratio	**0.752**	

Q. Do you have more confidence in your projections than in the Company's reports?

A. Yes. I crosschecked the projected St. Louis County Residential and Commercial customer counts against Company's Meters In Use reports for the St. Louis County Operating District, found on page W-16 of Company's Annual Reports to the Commission, dating from 1998 through 2006. Staff's projections of customer counts for St. Louis County Monthly and Quarterly Residential and Commercial customers hold steady at about 99.4% of Company's customers in use for the years 2002-2006, as illustrated the chart at Schedule 1-1. Staff is continuing to examine this relationship, both for St. Louis and for remaining service areas.

Q. How does the Company's reported customer counts compare with reports of meters-in-use?

A. There is considerable variation. It can be calculated from the data that underlies Schedule 1-1 that the Company's reported customer counts for these classes vary from about 97.6% of customers in use (2006) to about 99.5% of customers in use (2002), implying that thousands of Company's customers are lost in one year, and thousands more are gained in a following one. This is contrary to the well-established statistical behavior of customer counts in the many years leading up to 2002, which follow a logarithmic growth curve very closely with only a few small departures, and which follow meters-in-use very closely between 1998 and 2001. As a service to the Company, I have provided copies of page W-16 for the St. Louis County Water operational district for the years 1998-2006 in my working papers, in addition to the data underlying the chart at Schedule 1-1.

BILLING DATA

Q. What data did you use to make your analyses?

A. As a basis for my analysis, I used the historical data provided by Dr. Spitznagel in his direct testimony for the years 1989 through 2005, with 2006 updates provided in April 2007 by Company representative Mr. Peter J. Thakadiyil.

Q. Could you please describe the billing data provided by Dr. Spitznagel and Mr. Thakadiyil?

A. Yes. The annual average customer count, annual Mgallon volumes and annual average GCD billing data are tabulated by service area and rate class for Joplin, St. Charles, St. Louis and St. Joseph Residential and Commercial Customers, at Schedule 3-1 through 3-4, attached to my direct testimony. I used observed customer

counts and Mgallon sales data from the earliest available billing years through the 2006 billing year to perform my analysis wherever possible, but found it necessary to use projections for years after 2001 in many cases.

Q. What were the earliest billing years available?

A. For Joplin, St. Charles, and St. Joseph the earliest available year was 1984. For St. Louis County, I used data from 1990 forward because the Company furnished customer count information from these years for the rate class components the Company used in this case, but not for earlier years. However, data from earlier years for aggregated St. Louis County rate classes were available for crosschecking. These may be found in my work papers in the St. Louis County rate case, Case No. WR-2000-844, which I have provided to Missouri-American Water Company as part of my working papers in the most recent Company rate case, Case No. WR-2003-0500. As a service to Company, I have again provided these data in my working papers in the current case.

Q. What are the sources of observed annual GCD?

A. These were calculated from annual volumes and annual average customer counts, using the nominal year length of 365.25 days. The volumes and customer counts for 1989 through 2005 were read from the working papers of Company witness Dr. Edward L. Spitznagel in the present case. The annual data for 2006 were provided by Mr. Thakadiyil. Some data for earlier years were read from my working papers and the working papers of current and former Company witnesses, which corresponded to past rate cases for the various components of the current Missouri-American Water Company. These have also been furnished as part of my working papers.

Q. Did you adjust any of the customer count information provided by the Company?

A. Yes. I substituted projections of customer counts in the billing years after 2001 for the St. Louis County Residential rate class quarterly customers and for some other rate classes and service areas. The analyses of customer counts are discussed below. Once again, the Staff is still examining these conservative projections and their relationship with Company's reports of meters-in-use, and therefore reserve the right to modify projections of customer counts and the consequent effect on projections of total Mgallon sales.

PROJECTION OF CUSTOMER COUNTS

Q. What are your projections of customer counts after 2001?

A. The analyses of customer counts are presented by service area for Joplin Residential and Commercial, St. Charles Residential and Commercial, St. Joseph Residential and Commercial, and St. Louis County Residential and Commercial at Schedules 4-1 through 4-8 respectively, attached to my direct testimony. Due to the usual qualities of billing data, some customer counts were also smoothed for earlier years as an initial step in the calculation of weather response in GCD. These projections were necessarily conservative, since they were largely based on the single 2002 billing year, which may include underreported quantities from the Company. Staff continues to examine the relationships between class customer counts and reports of meters-in-use.

Q. How are the projections of customer counts used?

A. The results presented in Schedules 4-1 through 4-8 are used in the calculation of the quantities in Schedules 2-1 through 2-9 as described above. Estimates of GCD water usage for observed and normal weather are multiplied by projections of customer counts and nominal billing days to arrive at projections of annual Mgallon water sales.

WEATHER DATA

Q. What was the weather used to model annual weather-sensitive GCD water sales?

A. The models used annual weather data for Joplin, St. Joseph, St. Charles and St. Louis. These data are presented at Schedules 5-1 through 5-4. The billing data depicted on these schedules are preliminary data for Residential customers, but the weather information reflects the optimization process described below. Although St. Charles and St. Louis County annual weather are both based on daily reports at St. Louis-Lambert Airport, they are not identical because the response by customers from these areas is different. Weather variables were optimized for Residential customers, but used to calculate weather response for Commercial customers as well. The daily data underlying the annual calculations are quite voluminous and have been forwarded to the Company with my working papers as computer files.

WEATHER VARIABLE

Q. What was the weather variable used to model annual weather-sensitive GCD water usage?

A. The weather variable was precipitation shortfall ("Shortfall").

Q. How is Shortfall defined?

A. Shortfall is specified as the difference between the sum of daily summer moisture requirements ("Required") for a billing year and sum of daily summer moisture that was available for evapotranspiration ("Dryup") during a billing year.

Q. How was Shortfall calculated?

A. Shortfall is calculated as inches of precipitation and can only be positive or zero. That is,

Shortfall = MAX (0 , Required – Dryup)

Q. How is precipitation shortfall information used to calculate weather adjustments?

A. First, for each rate class, a regression analysis was calculated for weather-sensitive GCD as a function of independent variables that included indicators for billing adjustments, trends, shifts, indicators, and annual values for Shortfall. These regressions are presented at Schedules 6-1 through 6-8.

Weather adjustments would then be calculated for each rate class, as the regression coefficient for Shortfall ("Bshortfall") times the difference between observed Shortfall and normal shortfall ("Nshortfall"):

Weather Adjustment = (Bshortfall) X (Shortfall – Nshortfall)

However, in the regression models, the shortfall data are replaced with departures from the 1971-2000 average shortfall, using the variable Dnshortfall that would equal zero in a normal year. Since most other variables were also coded to equal zero in the test year, the intercept term of the regression model serves as the normal GCD with no other calculations needed.

Q. How did you calculate the Required variable (moisture requirement)?

A. For each day, moisture requirement is calculated as the product of a base daily lawn growth moisture requirement in inches ("Base Requirement"), a quadratic function of that day's high temperature ("Evap") and that day's hours of daylight ("Light"). That is:

Required = (Base Requirement)(Evap)(Light)

The best fit Base Requirement was selected by iteration.

For each day, Evap is calculated as that day's quadratic function of high temperature and is expressed in the data as a percentage of the 30-year summer average of the daily quadratic function of high temperatures. For each day, Light is also calculated as that day's daylight hours and is expressed as a percentage of the 30-year summer average of daylight hours per day.

For the average summer day, Evap = Light = 1, and Required would then simply be the Base Requirement. The exact calculations of the Evap variable, the Light variable, and the Base Requirement are described in greater detail in my working papers.

Q. How did you calculate Dryup (moisture for evapotranspiration)?

A. Moisture for evapotranspiration (moisture that could "dry up" today) is calculated as the product of moisture available ("Available") on the current day, a base drying rate in percent ("Dryrate"), Evap as just specified, and Light as just specified. The daily Dryup variable is calculated by:

Dryup = (Available)(Dryrate)(Evap)(Light)

Through daily soil moisture accounting, today's moisture Available is the sum of yesterday's soil water on hand and today's precipitation, minus the sum of today's runoff

losses, yesterday's drainage losses, and yesterday's evapotranspiration losses. Daily soil moisture accounting is also described in detail in my working papers.

Q. In estimating Shortfall, did you use official weather data from the National Oceanic and Atmospheric Administration ("NOAA") for your analysis?

A. Yes. The daily precipitation observations were presented as published, and contained only isolated adjustments and replacements for missing data. However, the daily temperatures were extensively adjusted to correspond with the adjusted monthly temperatures found in the publication, "1971-2000 Monthly Station Normals of Temperatures, Precipitation, and Heating and Cooling Degree-Days," published by NOAA. The monthly station normals, underlying monthly temperature data with NOAA's adjustments, and calculations of adjusted daily temperatures are presented electronically in my working papers for each weather station.

WEATHER RESPONSE IN GCD, BILLING ADJUSTMENTS, TRENDS AND SHIFTS

Q. What is the numerical response to weather variables, trends and the indicator variables that quantify shifts and billing adjustments?

A. These responses are quantified by regression model parameters for Joplin, St. Charles, St. Joseph, and St. Louis Residential and Commercial customers in Schedules 6-1 through 6-8. In general, the shifts and billing adjustments occurred in years before 2002, while trends were calculated over these earlier years and then projected after 2001. For some classes, however, the years after 2002 were included in these calculations. For all classes, Staff will continue to examine the relationship

between customer counts and meters-in-use, and to refine its analyses as soon as practicable.

Q. Was weather response calculated only after other adjustments had been calculated for billing errors, price effects and trends?

A. No. All types of response were calculated at the same time for each rate class and service area, using a single regression model for each to analyze GCD water sales.

Q. Is the weather variable calculated independently from weather response in GCD?

A. No. Since the customer himself determines his response to the weather, it is necessary to optimize the specification of the weather variable by calculating multiple linear regressions using a grid of trial specifications, or by selecting departures from an initial set of values when the approximate specification has been already been established. This process is described at length in my working papers.

PROJECTIONS OF NORMAL WEATHER GCD AND NORMAL WEATHER SALES

Q. How did you project usage per customer for years after 2001 in those rate classes where this was done?

A. These calculations are presented in Schedules 7-1 through 7-8, attached to my direct testimony. In the case of St. Louis Quarterly Residential customers, the calculations made use of the knowledge that a "new" customer added in 2002 exhibited

about 75% of the usage of the average "old" customer. In other cases, all customers were treated as if the usage were uniform within each rate class and service area.

Q. How were normal weather Mgallon sales calculated?

A. These were calculated as the product of projected customer counts, normal weather GCD and nominal annual billing days, expressed as Mgallons (Schedules 7-1 through 7-8). I have provided these calculations to Staff Witness Roberta M. Grissum, and have made them available to the Company in my working papers.

SUMMARY

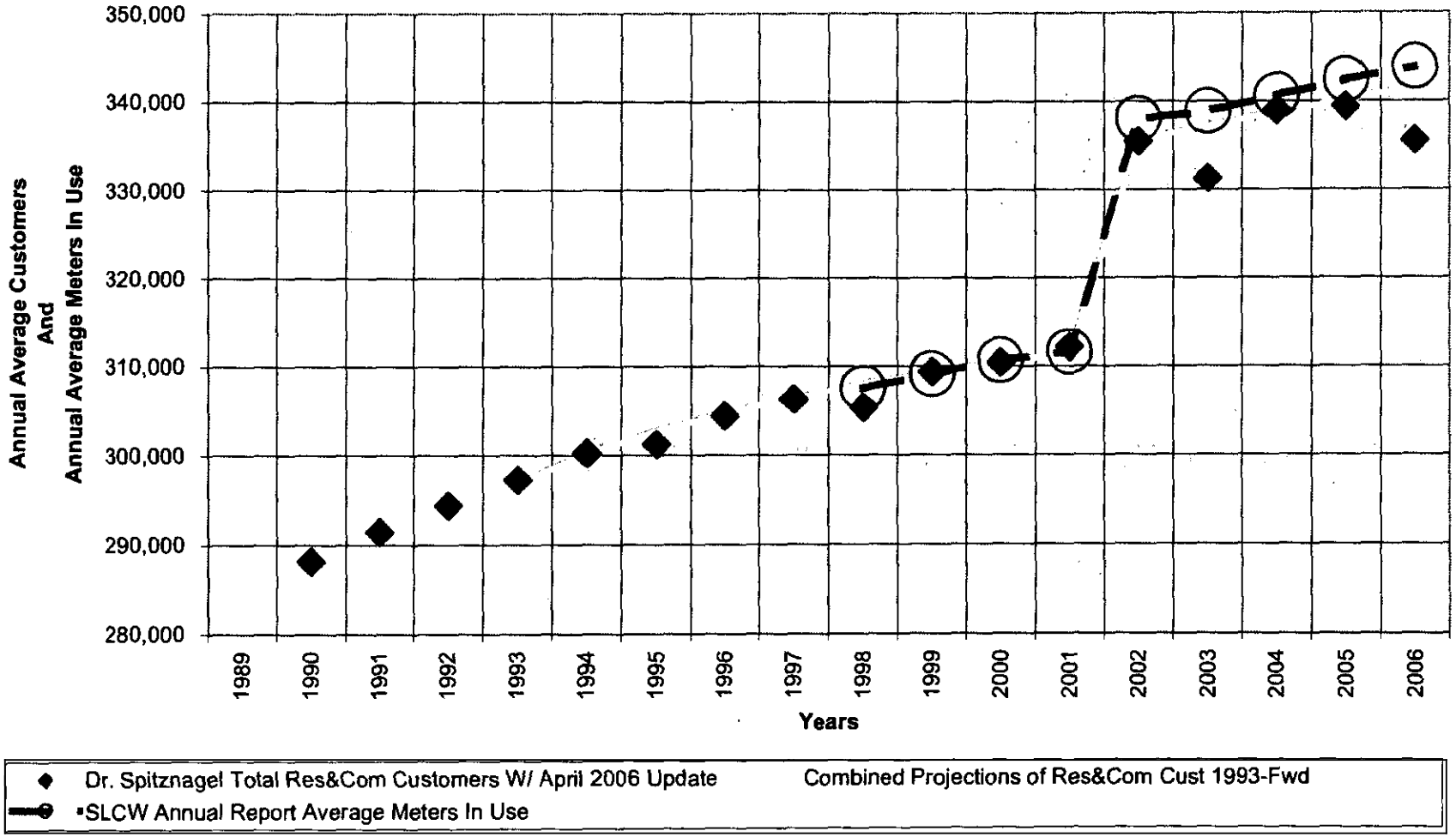
Q. Would you please summarize your analysis?

A. Yes. I began by assembling the Company's billing data from the present case, along with updates for the test year. I then assembled properly adjusted historical weather data and weather normals for the four major service areas of the Company. The preceding information was tabulated, and additional information about the data was then obtained from Company reports and from the testimony of Company witnesses in the current rate case as well as earlier rate cases. I then performed analyses that yielded estimates of growth in customer counts, declines in average individual customer water usage and the combined effect on rate class water sales, under observed and normal weather conditions, for Residential and Commercial customers in the Joplin, St. Charles, St. Joseph and St. Louis County service areas. Finally, I calculated time-dependent customer counts, weather normalized GCD and weather normalized Mgallons for the test year, as well as for a 12-month period centered on 31 December 2007 (the last day of the test year). These quantities are displayed at Schedule 2-1, which was introduced above.

Q. Does this conclude your direct testimony?

A. Yes, it does.

Missouri-American Water Company
St. Louis County Operational District (SLCW)
Combined Residential and Commercial Customers Vs. Annual Average Meters In Use



Schedule 1-1

Missouri Public Service Commission

Respond Data Request

Data Request No.	0206
Company Name	Missouri-American Water Company-(Water)
Case/Tracking No.	WR-2007-0216
Date Requested	4/17/2007
Issue	Revenue - Weather Normalization
Requested From	Donald J Petry
Requested By	Roberta McKiddy
Brief Description	Customer Counts and Consumptions for STL Operating District
Description	See attached Word Document and attached Excel Spreadsheet
Response	Please see attachment S0206-R1.
Objections	NA

The attached information provided to **Missouri Public Service Commission** Staff in response to the above data information request is accurate and complete, and contains no material misrepresentations or omissions, based upon present facts of which the undersigned has knowledge, information or belief. The undersigned agrees to immediately inform the **Missouri Public Service Commission** if, during the pendency of Case No. **WR-2007-0216** before the Commission, any matters are discovered which would materially affect the accuracy or completeness of the attached information. If these data are voluminous, please (1) identify the relevant documents and their location (2) make arrangements with requestor to have documents available for inspection in the **Missouri-American Water Company-(Water)** office, or other location mutually agreeable. Where identification of a document is requested, briefly describe the document (e.g. book, letter, memorandum, report) and state the following information as applicable for the particular document: name, title number, author, date of publication and publisher, addresses, date written, and the name and address of the person(s) having possession of the document. As used in this data request the term "document(s)" includes publication of any format, workpapers, letters, memoranda, notes, reports, analyses, computer analyses, test results, studies or data, recordings, transcriptions and printed, typed or written materials of every kind in your possession, custody or control or within your knowledge. The pronoun "you" or "your" refers to **Missouri-American Water Company-(Water)** and its employees, contractors, agents or others employed by or acting in its behalf.

Security :	Public
Rationale :	NA

With Proprietary and Highly Confidential Data Requests a Protective Order must be on file.

PSC STAFF DATA REQUEST
Missouri-American Water Company
Case No. WR-2007-0216

Requested From: Donald Petry

Requested By: Dennis Patterson, MoPSC Staff

Date Requested: April 17,2007

Information Requested:

In the St. Louis County Water Division, quarterly residential customers, approximately 23100 "new" customers were added to the existing "old" customers in 2002, after the purchase of service areas in Florissant and Webster Groves, according to Dr. Spitznagel's figures in 2003. Dr. Spitznagel's 2003 figures also indicate that the average "new" customer exhibits about 3/4 the usage of an "old" one. Staff assumes that the "old" customer base has continued to grow as it has before 2002, and that the "new" customer base has also grown in a similar pattern.

Staff has calculated "old" projected customers for the years 2002 through 2006, the "new" projected customers, and their sum, "all" projected customers for the same period, where Staff is aware that "new" customers came online in mid-2002, and where allowance was made for the change in account closing periods beginning in late 2003. Staff has also projected backcasts and forecasts of usage in Mgallons for "old", "new" and "all" projected customers, based on the weather-sensitive behavior "old" customer base prior to 2002, and the knowledge that the "new" customer exhibits about 3/4 the usage of an "old" one.

The Staff's data and methodology are included in the attached Excel spreadsheet. Please note that Dr. Spitznagel's volumes for "all" St. Louis quarterly residential customers are much lower than projected volumes for "all" customers, and are even lower than projections for only the "old" customers in some years.

1. Please explain why customer counts from Dr. Spitznagel's data vary considerably from the Staff's projections in the years 2002 - 2006, apart from expected small variations in 2002 and 2003

2. Please explain why annual volumes for the years after 2002 are considerably smaller than the Staff's projections, apart from the expected small variations in 2002 and 2003.

3. Please furnish updated data where Dr. Spitznagle's quantities are not the correct ones.

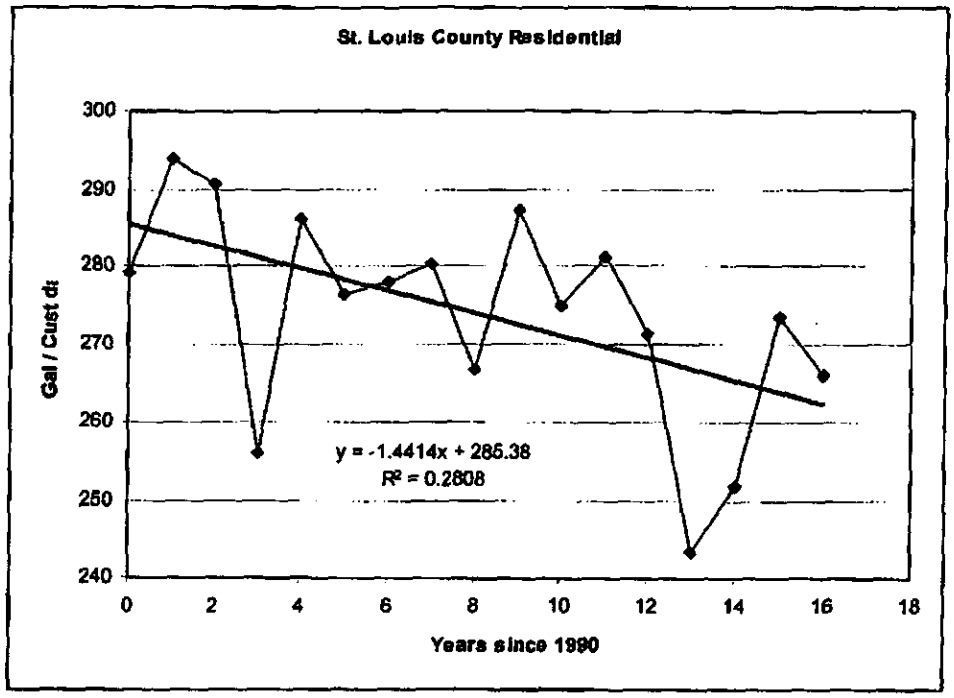
4. Staff appreciates the updated billing data that the Company recently provided for the Joplin, St. Charles and St. Joseph service areas, where similar anomalies were evident.

Missouri-American Water Company
Case No. WR-2007-0216
S0206R-1

1. In 2003, the Company began utilizing a 4-4-5 reporting structure for revenues and expenses. Mr. Spitznagel's study and analysis removed the impact of 4-4-5 reporting and converted it to a normal monthly reporting process. Starting in January 2007, the Company returned to the monthly reporting process.

2. This may be a consequence of Staff's assumption that the customer base experienced the same growth for Florissant, Webster Groves, and the rest of St. Louis County. It should also be noted that according to the weather variable Mr. Spitznagel used, the Palmer Drought Severity Index averaged over May through December, the years 2003 and 2004 were wetter than usual, so actual consumption is expected to be lower than normal for those years.

3. Professor Spitznagel has reviewed his computations and has found no error in them. He believes his weather-normalized estimate of 260.681 gallons per customer day for the year 2007 under the assumption of average weather is correct. As a reality check, see the following graph showing the declining trend in consumption from the year 1990 to 2006 (not weather-normalized, but running over 17 years of weather). It passes though the value 260.876 for the year 2007, which is in quite good agreement with Mr. Spitznagel weather-normalized estimate.



4. I will be happy to answer questions from Staff regarding discrepancies they find between their estimates and mine.

Missouri-American Water Company Case No. WR-2007-0216
Staff's Weather Normalized Usage Per Customer Per Day
For The Company's Four Largest Operations
Based On 1971-2000 Normal Weather

District	Billing	Center Of 12-Month Period	Residential Customers	Residential GCD	Residential Mgallons	Commercial Customers	Commercial GCD	Commercial Mgallons	Combined Customers	Combined Mgallons
Joplin	Monthly	30-Jun-06	20,251	173.37	1,282,326	3,125	860.29	982,024	23,376	2,264,350
St. Charles	Monthly	30-Jun-06	28,406	273.63	2,839,002	956	1237.30	431,969	29,361	3,270,971
St. Joseph	Monthly	30-Jun-06	28,431	159.62	1,657,531	2,950	787.00	847,844	31,380	2,505,375
St. Louis County	Quarterly	30-Jun-06	323,105	272.72	32,185,076	17,927	1169.24	7,655,947	341,032	39,841,023
Sums		**30-Jun-06**	**400,192**	**259.72**	**37,963,934**	**24,957**	**1087.99**	**9,917,785**	**425,150**	**47,881,719**
Joplin	Monthly	31-Dec-06	20,393	170.94	1,273,173	3,127	860.29	982,457	23,520	2,255,630
St. Charles	Monthly	31-Dec-06	28,598	273.63	2,858,225	963	1231.75	433,191	29,561	3,291,417
St. Joseph	Monthly	31-Dec-06	28,511	158.12	1,646,572	2,913	780.35	830,365	31,424	2,476,937
St. Louis County	Quarterly	31-Dec-06	323,686	272.46	32,212,282	17,968	1181.92	7,756,743	341,654	39,969,025
Sums		**31-Dec-06**	**401,189**	**259.26**	**37,990,253**	**24,970**	**1096.75**	**10,002,756**	**426,159**	**47,993,008**

Schedule 2-1

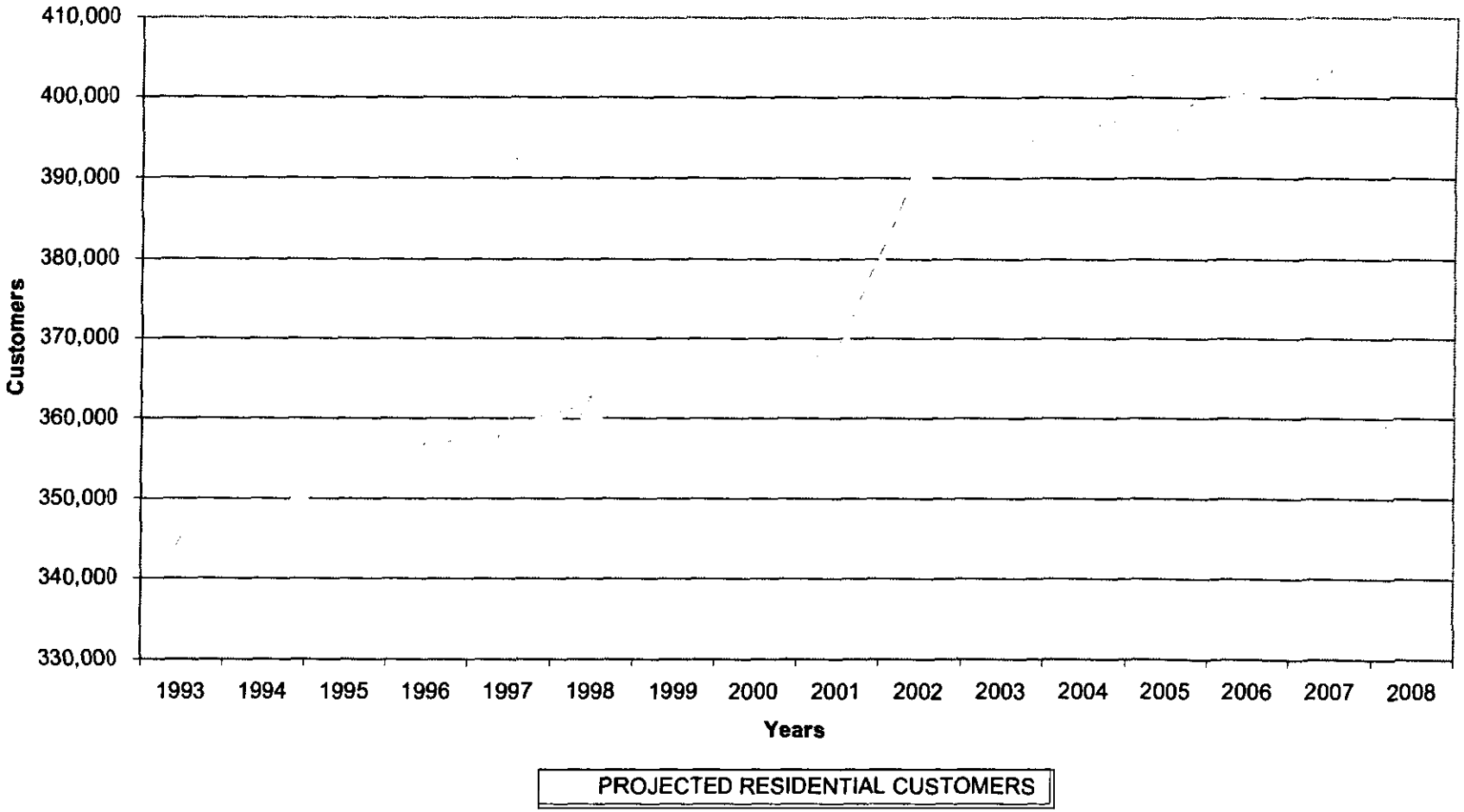
Missouri-American Water Company
Case No. WR-2007-0216
Projected Actual Residential Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

BILLING YEAR	PROJECTED ACTUAL RESIDENTIAL MGALLONS	PROJECTED RESIDENTIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED ACTUAL RESIDENTIAL GCD
1993	31,252,773	343,723	365.25	248.94
1994	34,479,827	348,060	365.25	271.22
1995	33,903,206	352,383	365.25	263.41
1996	34,117,100	355,848	365.25	262.49
1997	35,429,765	358,774	365.25	270.37
1998	33,507,189	361,364	365.25	253.86
1999	36,332,186	363,715	365.25	273.49
2000	35,370,815	365,827	365.25	264.72
2001	36,090,076	367,836	365.25	268.62
2002	37,805,518	391,051	365.25	264.69
2003	36,450,434	393,355	365.25	253.70
2004	37,627,086	395,880	365.25	260.22
2005	39,420,985	398,079	365.25	271.12
2006	39,839,208	400,192	365.25	272.55
2007	**38,016,571**	**402,185**	**365.25**	**258.80**
2008	**38,057,939**	**404,066**	**365.25**	**257.87**

Missouri-American Water Company
Case No. WR-2007-0216
Projected Normal Residential Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

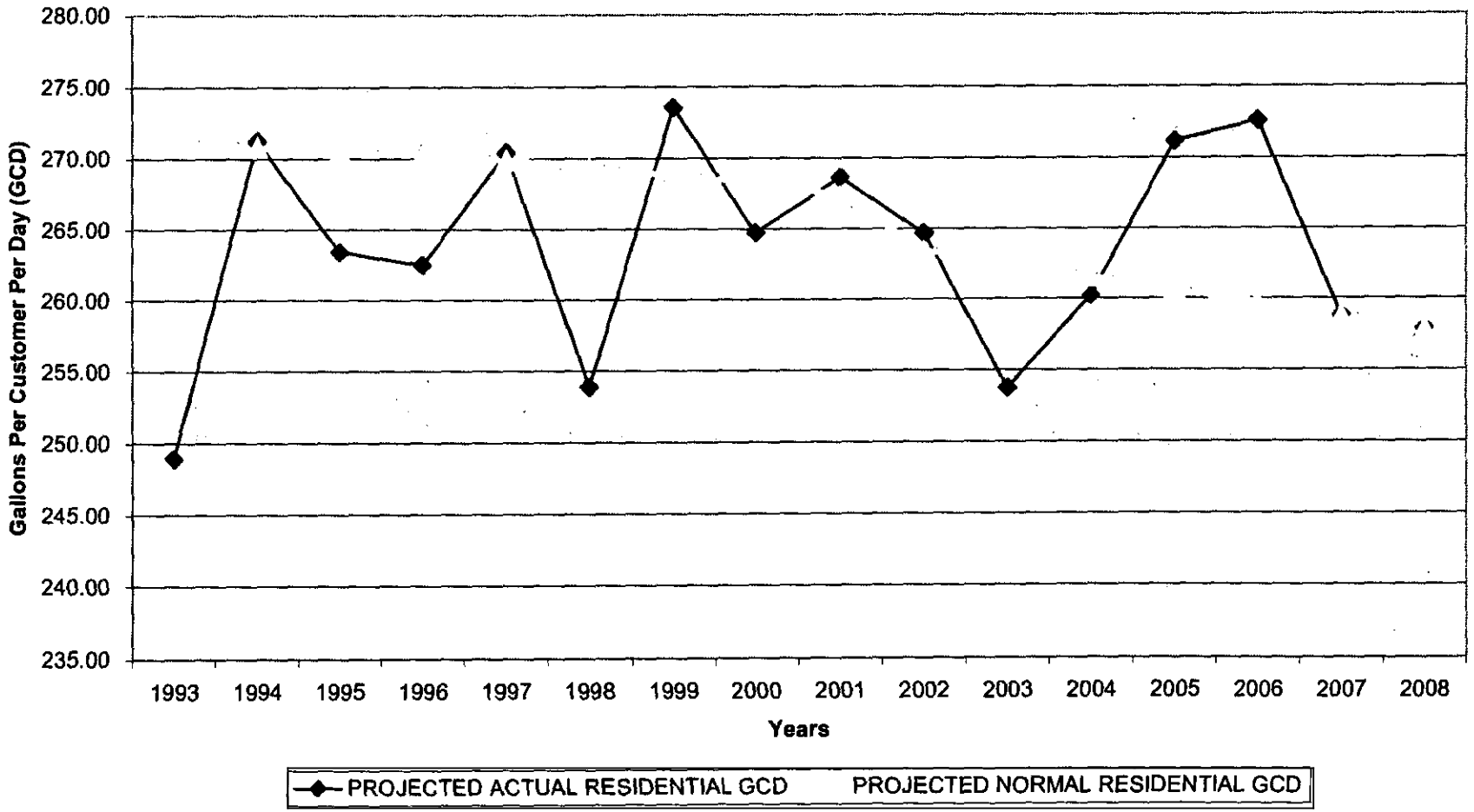
BILLING YEAR	PROJECTED NORMAL RESIDENTIAL MGALLONS	PROJECTED RESIDENTIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED NORMAL RESIDENTIAL GCD
1993	34,035,656	343,723	365.25	271.10
1994	34,428,522	348,060	365.25	270.82
1995	34,814,453	352,383	365.25	270.49
1996	35,117,468	355,848	365.25	270.19
1997	35,366,859	358,774	365.25	269.89
1998	35,550,828	361,364	365.25	269.35
1999	35,708,976	363,715	365.25	268.80
2000	35,843,061	365,827	365.25	268.25
2001	35,924,192	367,836	365.25	267.39
2002	37,628,072	391,051	365.25	263.44
2003	37,721,019	393,355	365.25	262.55
2004	37,823,614	395,880	365.25	261.58
2005	37,899,021	398,079	365.25	260.66
2006	37,963,934	400,192	365.25	259.72
2007	**38,016,571**	**402,185**	**365.25**	**258.80**
2008	**38,057,939**	**404,066**	**365.25**	**257.87**

Missouri-American Water Company
Case No. WR-2007-0216
Projected Residential Customers For Joplin, St. Charles,
St. Joseph and St. Louis County Quarterly Customers



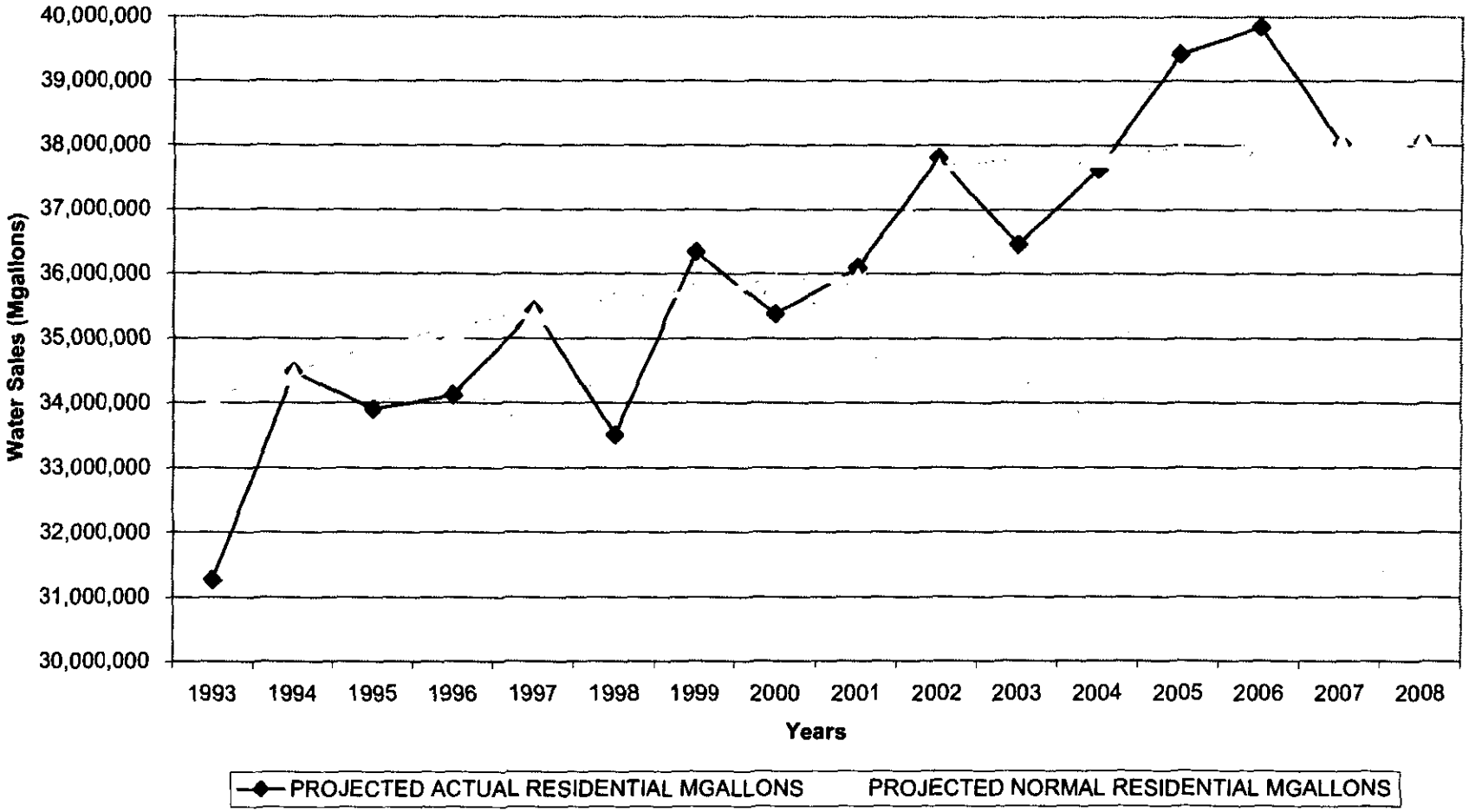
Schedule 2-3

Missouri-American Water Company
Case No. WR-2007-0216
Projected Residential Gallons Per Customer Per Day (GCD) For
Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Schedule 2-4

Missouri-American Water Company
Case No. WR-2007-0216
Projected Residential Water Sales (Mgallons) For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Schedule 2-5

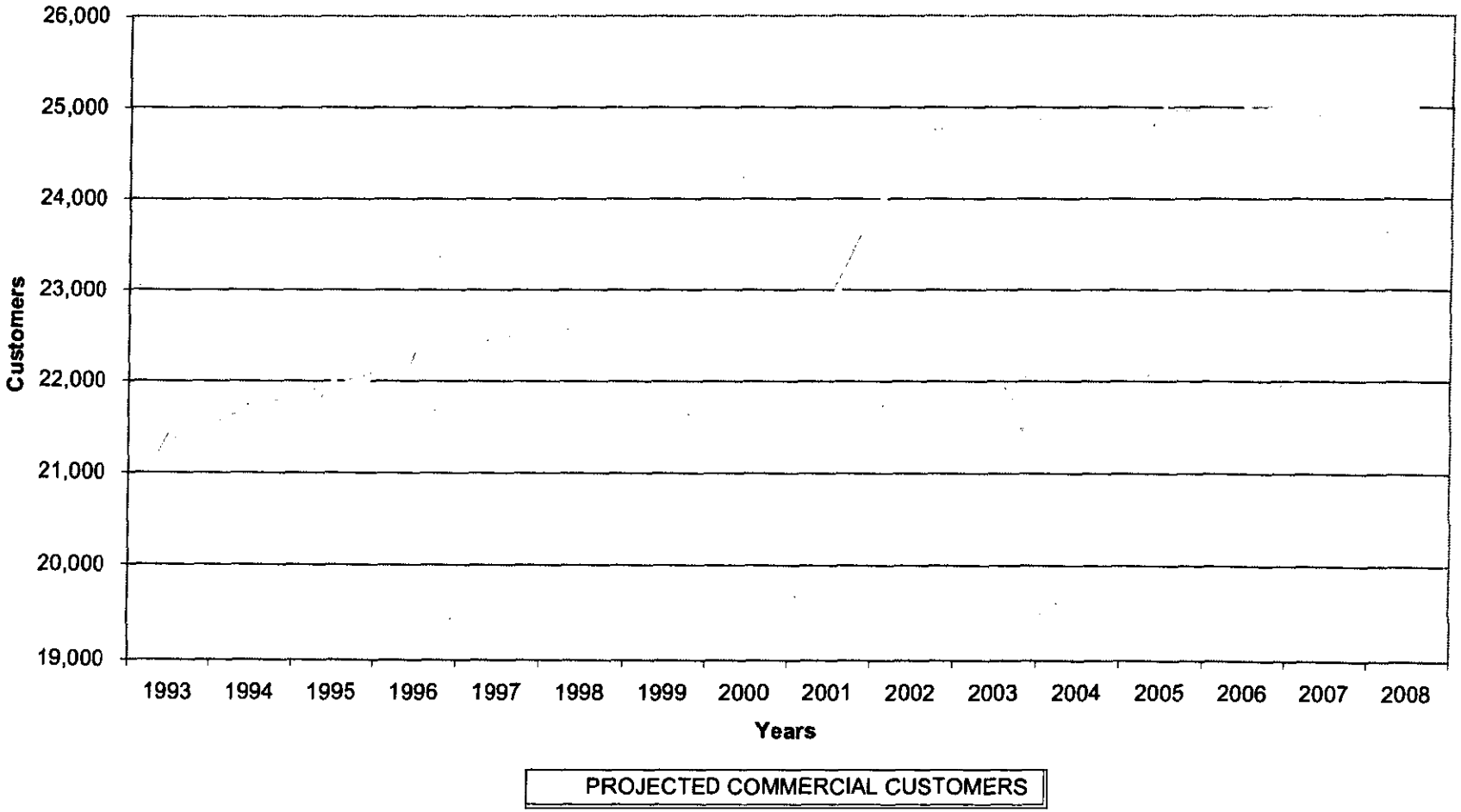
Missouri-American Water Company
Case No. WR-2007-0216
Projected Actual Commercial Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

BILLING YEAR	PROJECTED ACTUAL COMMERCIAL MGALLONS	PROJECTED COMMERCIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED ACTUAL COMMERCIAL GCD
1993	7,378,578	21,299	365.25	948.46
1994	7,442,177	21,662	365.25	940.63
1995	7,364,809	21,921	365.25	919.84
1996	7,483,560	22,177	365.25	923.90
1997	7,793,334	22,428	365.25	951.38
1998	7,940,788	22,533	365.25	964.84
1999	8,407,152	22,634	365.25	1,016.95
2000	8,372,268	22,757	365.25	1,007.26
2001	8,544,983	22,851	365.25	1,023.81
2002	9,266,618	24,691	365.25	1,027.51
2003	9,035,434	24,793	365.25	997.76
2004	9,553,265	24,857	365.25	1,052.24
2005	10,004,639	24,911	365.25	1,099.57
2006	10,554,922	24,957	365.25	1,157.88
2007	**10,087,727**	**24,983**	**365.25**	**1,105.51**
2008	**10,264,342**	**25,018**	**365.25**	**1,123.30**

Missouri-American Water Company
Case No. WR-2007-0216
Projected Normal Commercial Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

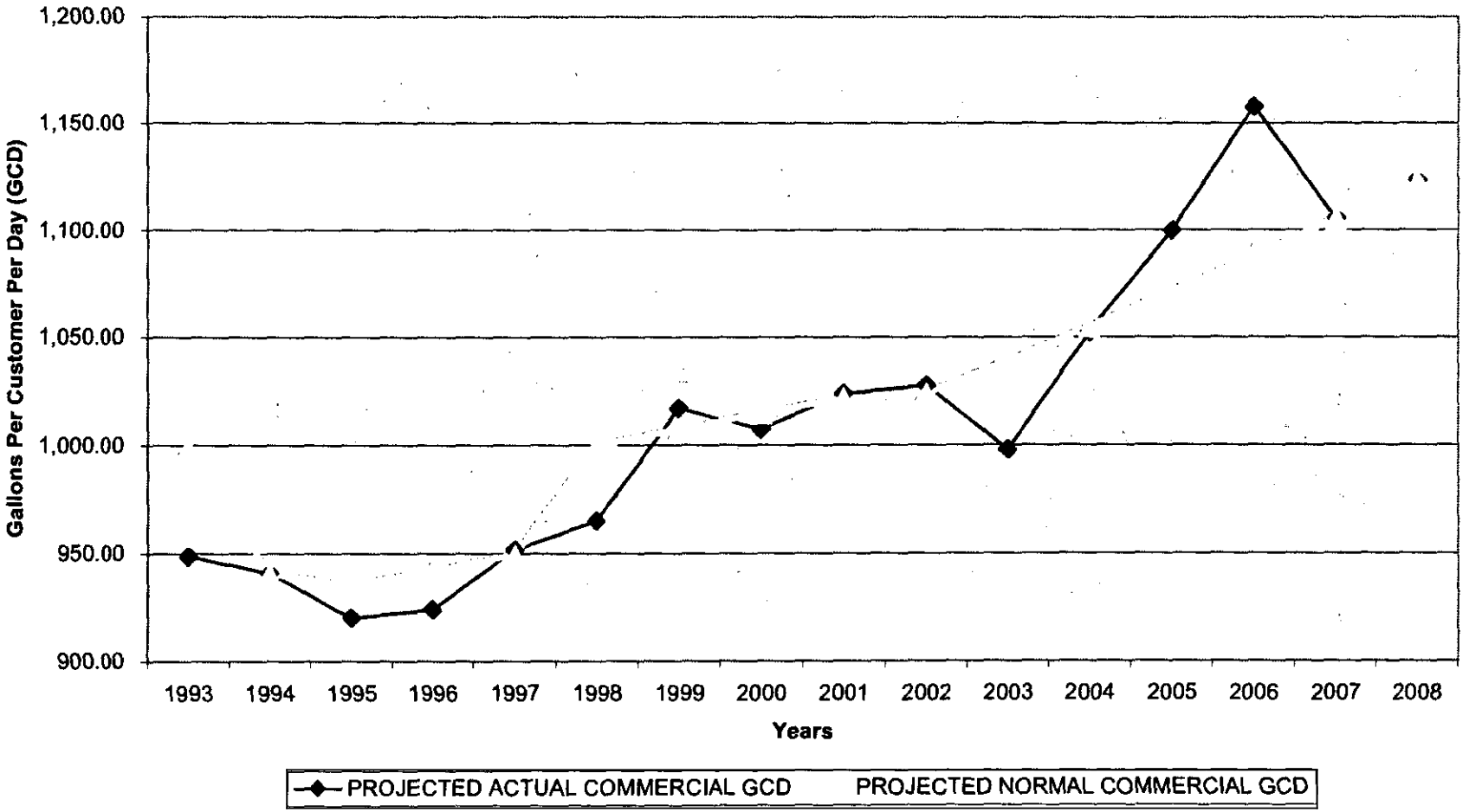
BILLING YEAR	PROJECTED NORMAL COMMERCIAL MGALLONS	PROJECTED COMMERCIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED NORMAL COMMERCIAL GCD
1993	7,770,415	21,299	365.25	998.83
1994	7,441,380	21,662	365.25	940.53
1995	7,485,618	21,921	365.25	934.93
1996	7,627,773	22,177	365.25	941.70
1997	7,774,542	22,428	365.25	949.08
1998	8,228,731	22,533	365.25	999.82
1999	8,327,544	22,634	365.25	1,007.32
2000	8,432,329	22,757	365.25	1,014.48
2001	8,527,235	22,851	365.25	1,021.69
2002	9,235,313	24,691	365.25	1,024.04
2003	9,409,002	24,793	365.25	1,039.02
2004	9,576,462	24,857	365.25	1,054.80
2005	9,745,917	24,911	365.25	1,071.14
2006	9,917,785	24,957	365.25	1,087.99
2007	**10,087,727**	**24,983**	**365.25**	**1,105.51**
2008	**10,264,342**	**25,018**	**365.25**	**1,123.30**

Missouri-American Water Company
Case No. WR-2007-0216
Projected Commercial Customers For Joplin, St. Charles,
St. Joseph and St. Louis County Quarterly Customers



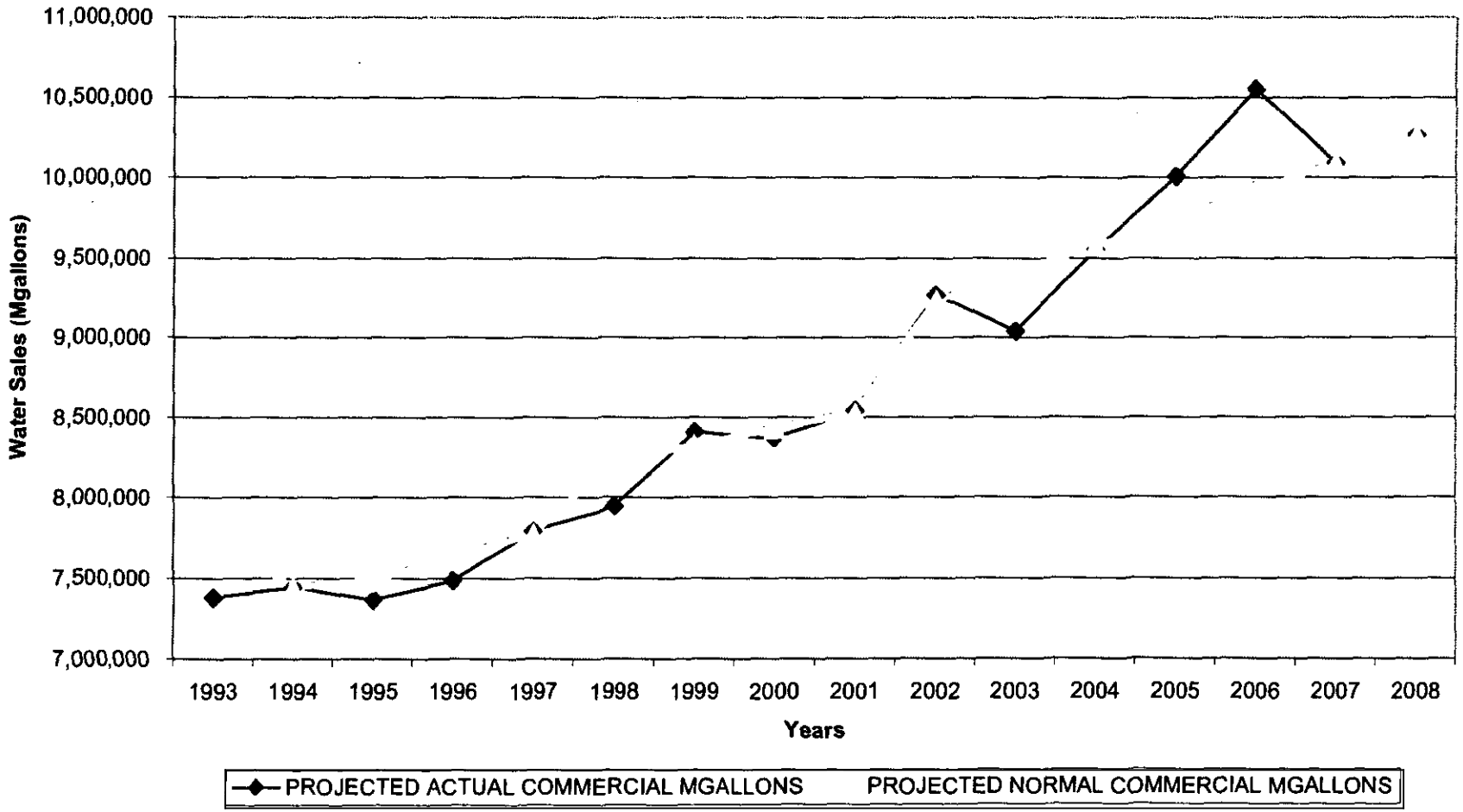
Schedule 2-7

Missouri-American Water Company
Case No. WR-2007-0216
Projected Commercial Water Gallons Per Customer Per Day For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Schedule 2-8

Missouri-American Water Company
Case No. WR-2007-0216
Projected Commercial Water Sales (Mgallons) For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Schedule 2-9

Missouri-American Water Company Rate Case No. WR-2007-0216
Joplin Operational District

Year	Joplin Residential gpd	Joplin Residential Customers	Joplin Residential Mgal	Joplin Commercial gpd	Joplin Commercial Customers	Joplin Commercial Mgal
1980						
1981						
1982						
1983						
1984	193.8	14,320	1,013,651	874.3	2,407	768,634
1985	185.4	14,559	985,762	871.4	2,441	776,883
1986	186.3	14,820	1,008,541	860.0	2,465	774,276
1987	187.9	15,172	1,041,177	916.0	2,498	835,795
1988	197.4	15,634	1,127,210	875.2	2,468	788,925
1989	187.6	15,951	1,093,075	918.8	2,370	795,208
1990	189.7	16,142	1,118,202	885.5	2,406	778,207
1991	205.4	16,319	1,224,537	909.7	2,397	796,417
1992	180.9	16,661	1,100,665	845.7	2,471	763,236
1993	178.0	17,038	1,107,828	872.3	2,573	819,602
1994	198.3	17,330	1,255,333	855.2	2,731	852,948
1995	198.4	17,716	1,283,993	865.8	2,848	900,486
1996	200.8	17,935	1,315,562	859.2	2,966	930,837
1997	209.1	18,091	1,381,456	853.0	3,099	965,413
1998	196.6	18,262	1,311,483	843.3	3,107	957,142
1999	199.1	18,458	1,342,470	869.8	3,097	983,790
2000	207.0	18,626	1,408,159	882.9	3,115	1,004,562
2001	199.6	18,862	1,375,106	848.1	3,118	965,905
2002	192.2	19,092	1,340,481	911.5	3,108	1,034,712
2003	180.9	19,194	1,268,403	836.7	2,922	892,980
2004	189.9	19,687	1,364,143	921.6	2,780	935,651
2005	183.4	19,945	1,335,896	985.2	2,735	984,202
2007						
2008						

			Bills	Mgallons				Bills	Mgallons
JPLN	RES	1984	14,320	1,013,651	JPLN	COM	1984	2,407	768,634
JPLN	RES	1985	14,559	985,762	JPLN	COM	1985	2,441	776,883
JPLN	RES	1986	14,820	1,008,541	JPLN	COM	1986	2,465	774,276
JPLN	RES	1987	15,172	1,041,177	JPLN	COM	1987	2,498	835,795
JPLN	RES	1988	15,634	1,127,210	JPLN	COM	1988	2,468	788,925
JPLN	RES	1989	15,951	1,093,075	JPLN	COM	1989	2,370	795,208
JPLN	RES	1990	16,142	1,118,202	JPLN	COM	1990	2,406	778,207
JPLN	RES	1991	16,319	1,224,537	JPLN	COM	1991	2,397	796,417
JPLN	RES	1992	16,661	1,100,665	JPLN	COM	1992	2,471	763,236
JPLN	RES	1993	17,038	1,107,828	JPLN	COM	1993	2,573	819,602
JPLN	RES	1994	17,330	1,255,333	JPLN	COM	1994	2,731	852,948
JPLN	RES	1995	17,716	1,283,993	JPLN	COM	1995	2,848	900,486
JPLN	RES	1996	17,935	1,315,562	JPLN	COM	1996	2,966	930,837
JPLN	RES	1997	18,091	1,381,456	JPLN	COM	1997	3,099	965,413
JPLN	RES	1998	18,262	1,311,483	JPLN	COM	1998	3,107	957,142
JPLN	RES	1999	18,253	1,322,555	JPLN	COM	1999	3,116	962,497
JPLN	RES	2000	18,832	1,337,072	JPLN	COM	2000	3,208	1,011,202

Schedule 3-1

Missouri-American Water Company Rate Case No. WR-2007-0216
St. charles Operational District

Year	St. Charles Residential gmd	St. Charles Residential Customers	St. Charles Residential Mgal	St. Charles Commercial gmd	St. Charles Commercial Customers	St. Charles Commercial Mgal
1980						
1981						
1982						
1983						
1984	277.2	12,038	1,218,899	1,414.8	378	195,335
1985	257.3	12,846	1,207,469	1,326.5	422	204,460
1986	280.8	13,738	1,409,220	1,317.7	475	228,606
1987	297.5	15,033	1,633,284	1,407.6	531	273,005
1988	313.7	15,919	1,824,191	1,412.4	566	291,993
1989	279.4	16,489	1,682,898	1,261.5	599	280,524
1990	255.0	17,005	1,583,612	1,376.2	599	301,257
1991	278.5	17,530	1,783,167	1,439.7	599	315,163
1992	273.8	18,113	1,811,527	1,471.5	599	322,118
1993	235.3	18,768	1,612,803	1,461.6	599	319,964
1994	279.9	19,671	2,011,009	1,556.8	599	341,230
1995	279.2	21,046	2,146,503	1,367.1	599	299,271
1996	270.9	22,020	2,178,820	1,630.7	599	356,974
1997	275.3	23,081	2,320,674	1,714.2	599	375,258
1998	258.0	24,141	2,274,780	1,671.8	599	365,963
1999	284.1	24,970	2,591,401	1,818.2	599	398,013
2000	260.5	25,584	2,434,554	1,794.8	599	392,897
2001	268.5	25,987	2,529,186	1,939.7	599	424,611
2002	276.9	26,375	2,667,699	1,858.4	599	406,819
2003	239.0	27,502	2,400,504	1,835.9	599	401,885
2004	253.3	27,962	2,586,840	1,985.7	599	434,682
2005	287.8	27,637	2,905,384	1,964.9	599	430,134
2006	302.0	28,037	3,092,825	2,083.4	599	456,072
2007						
2008						

STCH	RES	1984	12,038	1,218,899	STCH	COM	1984	378	195,335
STCH	RES	1985	12,846	1,207,469	STCH	COM	1985	422	204,460
STCH	RES	1986	13,738	1,409,220	STCH	COM	1986	475	228,606
STCH	RES	1987	15,033	1,633,284	STCH	COM	1987	531	273,005
STCH	RES	1988	15,919	1,824,191	STCH	COM	1988	566	291,993
STCH	RES	1989	16,489	1,682,898	STCH	COM	1989	599	280,524
STCH	RES	1990	17,005	1,583,612	STCH	COM	1990	618	301,257
STCH	RES	1991	17,530	1,783,167	STCH	COM	1991	636	315,163
STCH	RES	1992	18,113	1,811,527	STCH	COM	1992	650	322,118
STCH	RES	1993	18,768	1,612,803	STCH	COM	1993	723	319,964
STCH	RES	1994	19,671	2,011,009	STCH	COM	1994	818	341,230
STCH	RES	1995	21,046	2,146,503	STCH	COM	1995	587	299,271
STCH	RES	1996	22,020	2,178,820	STCH	COM	1996	700	356,974
STCH	RES	1997	23,081	2,320,674	STCH	COM	1997	750	375,258
STCH	RES	1998	24,141	2,274,780	STCH	COM	1998	778	365,963
STCH	RES	1999	24,330	2,276,352	STCH	COM	1999	784	370,527
STCH	RES	2000	25,548	2,504,317	STCH	COM	2000	824	395,160

Schedule 3-2

Missouri-American Water Company Rate Case No. WR-2007-0216
St. Joseph Operational District

Year	St. Joseph Residential gmd	St. Joseph Residential Meters	St. Joseph Residential Mgal	St. Joseph Commercial gmd	St. Joseph Commercial Meters	St. Joseph Commercial Mgal
1980						
1981						
1982						
1983						
1984	186.0	23,362	1,587,311	778.7	3,158	898,243
1985	177.3	23,551	1,524,753	743.0	3,142	852,635
1986	177.5	23,671	1,534,806	748.0	3,120	852,352
1987	182.8	23,733	1,584,798	756.3	3,139	867,136
1988	205.5	23,878	1,792,504	834.1	3,137	955,664
1989	194.1	24,066	1,705,993	778.9	3,138	892,727
1990	187.3	24,193	1,654,782	779.0	3,138	892,727
1991	195.3	24,227	1,728,498	778.3	3,121	887,070
1992	181.7	25,362	1,683,422	852.5	3,144	979,061
1993	176.2	26,281	1,691,082	790.0	3,174	915,854
1994	186.5	26,436	1,800,800	772.1	3,185	898,211
1995	184.2	26,653	1,792,798	819.4	3,175	950,189
1996	182.3	26,813	1,785,153	807.3	3,190	940,736
1997	187.1	26,958	1,842,196	807.0	3,172	934,916
1998	178.1	27,105	1,762,985	840.7	3,149	966,800
1999	179.5	27,250	1,786,146	817.1	3,156	941,795
2000	195.1	27,592	1,965,978	865.2	3,168	1,001,054
2001	160.0	27,743	1,621,197	885.6	3,175	1,027,086
2002	175.7	27,822	1,785,085	870.5	3,156	1,003,364
2003	168.1	27,957	1,716,166	837.0	3,121	954,243
2004	163.8	28,111	1,682,239	804.8	3,065	901,039
2005	167.2	28,212	1,722,790	796.5	2,957	860,175
2007						
2008						

STJO	RES	1984	23,362	1,587,311	STJO	COM	1984	3,158	898,243
STJO	RES	1985	23,551	1,524,753	STJO	COM	1985	3,142	852,635
STJO	RES	1986	23,671	1,534,806	STJO	COM	1986	3,120	852,352
STJO	RES	1987	23,733	1,584,798	STJO	COM	1987	3,139	867,136
STJO	RES	1988	23,878	1,792,504	STJO	COM	1988	3,137	955,664
STJO	RES	1989	24,066	1,705,993	STJO	COM	1989	3,138	892,727
STJO	RES	1990	24,193	1,654,782	STJO	COM	1990	3,121	887,070
STJO	RES	1991	24,227	1,728,498	STJO	COM	1991	3,144	979,061
STJO	RES	1992	25,362	1,683,422	STJO	COM	1992	3,174	915,854
STJO	RES	1993	26,281	1,691,082	STJO	COM	1993	3,185	898,211
STJO	RES	1994	26,436	1,800,800	STJO	COM	1994	3,175	950,189
STJO	RES	1995	26,653	1,792,798	STJO	COM	1995	3,190	940,736
STJO	RES	1996	26,813	1,785,153	STJO	COM	1996	3,172	934,916
STJO	RES	1997	26,958	1,842,196	STJO	COM	1997	3,149	966,800
STJO	RES	1998	27,105	1,762,985	STJO	COM	1998	3,156	941,795
STJO	RES	1999	27,069	1,766,397	STJO	COM	1999	3,177	954,104
STJO	RES	2000	27,351	1,848,873	STJO	COM	2000	3,247	948,399

Schedule 3-3

Missouri-American Water Company Rate Case No. WR-2007-0216
St. Louis County Operational District (Quarterly Billed Customers)

Year	calculated stlq res gmd sptz	stlq res cus sptz	stlq res mgal sptz	calculated stlq com gmd sptz	stlq com cus sptz	stl com mgal sptz
1980						
1981						
1982						
1983						
1984						
1985						
1986						
1987						
1988						
1989						
1990	279.0	272,751	27,779,574	1115.6	14,366	5,849,659
1991	293.9	275,713	29,576,416	1158.1	14,784	6,249,612
1992	290.7	278,976	29,599,456	1015.7	14,968	5,549,124
1993	256.0	281,891	26,337,508	943.5	14,965	5,153,617
1994	286.1	284,722	29,729,856	975.0	15,004	5,339,279
1995	276.2	285,443	28,771,525	942.2	15,248	5,243,830
1996	277.8	288,512	29,250,936	954.3	15,349	5,346,264
1997	280.3	290,306	29,698,300	984.9	15,420	5,543,026
1998	266.5	289,530	28,162,554	1008.8	15,381	5,663,193
1999	287.4	293,280	30,760,506	1077.8	15,587	6,131,810
2000	274.7	294,286	29,511,009	1061.1	15,619	6,049,274
2001	281.2	295,906	30,367,468	1088.2	15,726	6,246,176
2002	271.3	317,639	31,454,872	1084.3	17,375	6,876,553
2003	243.4	313,914	27,889,513	974.6	18,839	6,701,410
2004	251.7	320,881	29,482,896	1125.5	17,651	7,250,919
2005	273.4	321,347	32,063,233	1198.5	17,632	7,712,903
2006	284.6	318,372		1235.6		
2007						
2008						

Schedule 3-4

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF JOPLIN RESIDENTIAL ANNUAL CUSTOMER COUNTS

YYYY	TREND	Dummies	CUSTOMERS	REGRESSION LINE	BACKCAST CUSTOMERS	PROJECTED CUSTOMERS	ALL CUSTOMERS
1971	(35)	-			11,107		11,107
1972	(34)	-			11,369		11,369
1973	(33)	-			11,631		11,631
1974	(32)	-			11,893		11,893
1975	(31)	-			12,155		12,155
1976	(30)	-			12,417		12,417
1977	(29)	-			12,679		12,679
1978	(28)	-			12,941		12,941
1979	(27)	-			13,203		13,203
1980	(26)	-			13,464		13,464
1981	(25)	-			13,726		13,726
1982	(24)	-			13,988		13,988
1983	(23)	-			14,250		14,250
1984	(22)	-	14,320	14,512			14,320
1985	(21)	-	14,559	14,774			14,559
1986	(20)	-	14,820	15,036			14,820
1987	(19)	-	15,172	15,298			15,172
1988	(18)	-	15,634	15,560			15,634
1989	(17)	-	15,951	15,822			15,951
1990	(16)	-	16,142	16,084			16,142
1991	(15)	-	16,319	16,346			16,319
1992	(14)	-	16,661	16,607			16,661
1993	(13)	-	17,038	16,869			17,038
1994	(12)	-	17,330	17,131			17,330
1995	(11)	-	17,718	17,393			17,718
1996	(10)	-	17,935	17,655			17,935
1997	(9)	-	18,091	17,917			18,091
1998	(8)	-	18,262	18,179			18,262
1999	(7)	-	18,458	18,441			18,458
2000	(6)	-	18,626	18,703			18,626
2001	(5)	-	18,862	18,965			18,862
2002	(4)	-	19,092	19,227			19,092
2003	(3)	-	19,194	19,488			19,194
2004	(2)	-	19,667	19,750			19,667
2005	(1)	-	19,945	20,012			19,945
2006	-	-	20,251	20,274		20,274	20,251
2007	1	-	20,536			20,536	20,536
2008	2	-	20,798			20,798	20,798

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.995733231
R Square	0.991484667
Adjusted R Square	0.991079175
Standard Error	168.4983832
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	69421667.3	69421667.3	2445.139842	3.19503E-23
Residual	21	596225.6667	28391.69841		
Total	22	70017892.97			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	20274.2038	68.03735197	297.9863739	1.4448E-39	20132.71239	20415.69522	20132.71239	20415.69522
X Variable 1	261.9131258	5.296700667	49.44835328	3.19503E-23	250.8980338	272.9282178	250.8980338	272.9282178

Schedule 4-1

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF JOPLIN COMMERCIAL ANNUAL CUSTOMER COUNTS

YYYY	TREND	Dummies		CUSTOMERS	REGRESSION LINE	BACKCAST CUSTOMERS	FORECAST CUSTOMERS	PROJECTED CUSTOMERS
1971	(35)	-				2,111		2,111
1972	(34)	-				2,134		2,134
1973	(33)	-				2,157		2,157
1974	(32)	-				2,180		2,180
1975	(31)	-				2,202		2,202
1976	(30)	-				2,225		2,225
1977	(29)	-				2,248		2,248
1978	(28)	-				2,271		2,271
1979	(27)	-				2,293		2,293
1980	(26)	-				2,316		2,316
1981	(25)	-				2,339		2,339
1982	(24)	-				2,362		2,362
1983	(23)	-				2,384		2,384
1984	(22)	-		2,407		2,407		2,407
1985	(21)	-		2,441		2,441		2,441
1986	(20)	-		2,465		2,465		2,465
1987	(19)	-		2,498		2,498		2,498
1988	(18)	-		2,468		2,468		2,468
1989	(17)	-		2,370		2,370		2,370
1990	(16)	-		2,406		2,406		2,406
1991	(15)	-		2,397		2,397		2,397
1992	(14)	-		2,471		2,471		2,471
1993	(13)	-		2,573		2,573		2,573
1994	(12)	-		2,731		2,731		2,731
1995	(11)	-		2,848		2,848		2,848
1996	(10)	-		2,966		2,966		2,966
1997	(9)	-		3,099	3,100	3,099	3,100	3,099
1998	(8)	-		3,107	3,103		3,103	3,107
1999	(7)	-		3,097	3,106		3,106	3,097
2000	(6)	-		3,115	3,109		3,109	3,115
2001	(5)	-		3,118	3,111		3,111	3,118
2002	(4)	-		3,108	3,114		3,114	3,108
2003	(3)	-		2,922	3,117		3,117	3,117
2004	(2)	-		2,780	3,120		3,120	3,120
2005	(1)	-		2,735	3,122		3,122	3,122
2006	-	-		2,721	3,125		3,125	3,125
2007	1	-		3,128	3,128		3,128	3,128
2008	2	-		3,131	3,131		3,131	3,131

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.600532468
R Square	0.360639245
Adjusted R Square	0.200799056
Standard Error	7.672017829
Observations	6

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	132.8024802	132.8024802	2.256248889	0.207489085
Residual	4	235.439418	58.8598545		
Total	5	368.2418981			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3125.253175	12.32535929	253.5628456	1.45132E-09	3091.032491	3159.473858	3091.032491	3159.473858
X Variable 1	2.754761905	1.833982992	1.502081512	0.207489085	-2.337135668	7.846659477	-2.33713567	7.846659477

Schedule 4-2

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF ST CHARLES RESIDENTIAL ANNUAL CUSTOMER COUNTS

YYYY	TREND	Observed Customers		Nat Log of Year Minus 1990	Indicators	Backcast Customers	Forecast Regression Line	Projected Customers	Continuous Customers
1971	(35.00)					1,972			1,972
1972	(34.00)					2,747			2,747
1973	(33.00)					3,521			3,521
1974	(32.00)					4,295			4,295
1975	(31.00)					5,070			5,070
1976	(30.00)					5,844			5,844
1977	(29.00)					6,618			6,618
1978	(28.00)					7,392			7,392
1979	(27.00)					8,167			8,167
1980	(26.00)					8,941			8,941
1981	(25.00)					9,715			9,715
1982	(24.00)					10,489			10,489
1983	(23.00)					11,264			11,264
1984	(22.00)	12,038				12,038			12,038
1985	(21.00)	12,846							12,846
1986	(20.00)	13,738							13,738
1987	(19.00)	15,033							15,033
1988	(18.00)	15,919							15,919
1989	(17.00)	16,489							16,489
1990	(16.00)	17,005							17,005
1991	(15.00)	17,530							17,530
1992	(14.00)	18,113							18,113
1993	(13.00)	18,768							18,768
1994	(12.00)	19,871		1.3863	-		19,609	19,609	19,609
1995	(11.00)	21,046		1.6094	-		21,025	21,025	21,025
1996	(10.00)	22,020		1.7918	-		22,182	22,182	22,182
1997	(9.00)	23,081		1.9459	-		23,160	23,160	23,160
1998	(8.00)	24,141		2.0794	-		24,007	24,007	24,007
1999	(7.00)	24,970		2.1972	0.50		24,949	24,756	24,756
2000	(6.00)	25,584		2.3026	-		25,423	25,423	25,423
2001	(5.00)	25,987		2.3979	-		26,028	26,028	26,028
2002	(4.00)	26,375		2.4849	-		26,580	26,580	26,580
2003	(3.00)	27,502		2.5649	1.00		27,477	27,066	27,066
2004	(2.00)	27,962		2.6391	1.00		27,947	27,556	27,556
2005	(1.00)	27,637		2.7081	(1.00)		27,607	27,990	27,990
2006	0.00	28,037		2.7726	(1.00)		28,017	28,424	28,424
2007	1.00			2.8332			28,798	28,798	28,798
2008	2.00			2.8904			29,155	29,155	29,155

BACKCAST
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99371666
R Square	0.98747284
Adjusted R Square	0.986876306
Standard Error	605.3929897
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	608689854.4	608689854.4	1660.35755	1.84337E-21
Residual	21	7696514.112	366500.672		
Total	22	614386168.5			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	28451.39493	244.4494472	120.4805013	2.58064E-31	28943.03442	29959.75543	28943.03442	29959.75543
X Variable 1	774.2710804	19.03038558	40.68508545	1.84337E-21	734.6952688	813.846892	734.6952688	813.846892

FORECAST
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99930643
R Square	0.99861334
Adjusted R Square	0.998336008
Standard Error	112.7537837
Observations	13

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	91556617.38	45778308.68	3600.787519	5.12684E-15
Residual	10	127134.1573	12713.41573		
Total	12	91683751.52			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10812.42436	169.2436792	63.8867248	2.14844E-14	10435.32594	11189.52277	10435.32594	11189.52277
X Variable 1	6345.41506	74.77661925	84.85827688	1.26298E-15	6178.80237	6512.02775	6178.80237	6512.02775
X Variable 2	389.015659	55.05490818	7.065958077	3.43235E-05	266.3456841	511.685634	266.3456841	511.685634

Schedule 4-3

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF ST CHARLES COMMERCIAL ANNUAL CUSTOMER COUNTS

YYYY	TREND	Observed Customers	Nat Log of Year Minus 1992	Backcast Indicators	Backcast Regression Line	Backcast Customers	Nat Log of Year Minus 1992	Forecast Indicators	Forecast Regression Line	Projected Customers	Continuous Customers
1971	(35.00)										
1972	(34.00)										
1973	(33.00)										
1974	(32.00)										
1975	(31.00)										
1976	(30.00)										
1977	(29.00)										
1978	(28.00)										
1979	(27.00)										
1980	(26.00)										
1981	(25.00)										
1982	(24.00)										
1983	(23.00)		-								
1984	(22.00)	378	0.8931	-	368	368					368
1985	(21.00)	422	1.0986	-	439	439					439
1986	(20.00)	475	1.3863	-	489	489					489
1987	(19.00)	531	1.6094	-	528	528					528
1988	(18.00)	566	1.7918	-	580	580					580
1989	(17.00)	599	1.9459	-	587	587					587
1990	(16.00)	618	2.0794	-	610	610					610
1991	(15.00)	636	2.1972	-	631	631					631
1992	(14.00)	650	2.3026	-	649	649					649
1993	(13.00)	723	2.3979	0.40	722	666					666
1994	(12.00)	816	2.4849	1.00	821	651					651
1995	(11.00)	687	2.5649	(0.75)	590	695					695
1996	(10.00)	700	2.6391	-	708	708	1.3863	-	700	700	
1997	(9.00)	750					1.6094	-	715	715	715
1998	(8.00)	778					1.7918	-	729	729	729
1999	(7.00)	806					1.9459	-	814	814	814
2000	(6.00)	842					2.0794	-	841	841	841
2001	(5.00)	887					2.1972	0.50	864	864	864
2002	(4.00)	894					2.3026	-	887	887	887
2003	(3.00)	936					2.3979	1.00	887	887	887
2004	(2.00)	927					2.4849	0.25	934	934	934
2005	(1.00)	933					2.5649	(0.25)	938	941	941
2006	0.00	925					2.6391	(1.00)	958	958	958
2007	1.00						2.7081	-	978	978	978
2008	2.00						2.7726	-	997	997	997

BACKCAST
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.997316355
R Square	0.994639913
Adjusted R Square	0.993567895
Standard Error	9.789090303
Observations	13

ANOVA

	df	SS	MS	F	Significance F
Regression	2	177819.2168	88909.60841	927.8206365	4.42445E-12
Residual	10	958.2628895	95.82628895		
Total	12	178777.4797			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	248.2324403	9.552418627	25.7760728	1.77437E-10	224.9483249	267.5165557	224.9483249	267.5165557
X Variable 1	175.1084097	4.741133074	36.93387361	5.03863E-12	164.544507	185.6723125	164.544507	185.6723125
X Variable 2	139.9234813	7.58552859	18.44487179	4.8049E-09	123.0864332	156.7805294	123.0864332	156.7805294

FORECAST
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.996470063
R Square	0.992942466
Adjusted R Square	0.99517808 2
Standard Error	5.129311127
Observations	11

ANOVA

	df	SS	MS	F	Significance F
Regression	2	66628.86982	34314.43491	1304.243755	8.73947E-11
Residual	8	210.4786611	26.30983263		
Total	10	66839.34848			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	416.0660553	8.694800487	47.8522832	4.02294E-11	396.0158094	436.1163011	396.0158094	436.1163011
X Variable 1	204.5354915	4.013335214	50.96396902	2.43391E-11	195.280724	213.7902591	195.280724	213.7902591
X Variable 2	30.83931004	3.366585487	9.160466404	1.62704E-05	23.07599611	38.60262397	23.07599611	38.60262397

Schedule 4-4

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF ST JOSEPH RESIDENTIAL ANNUAL CUSTOMER COUNTS

YYYY	TREND	INDICATORS	CUSTOMERS	REGRESSION LINE	BACKCAST CUSTOMERS	PROJECTED CUSTOMERS	ALL CUSTOMERS
1971	(35)	(1)			21,185	21,185	21,185
1972	(34)	(1)			21,345	21,345	21,345
1973	(33)	(1)			21,506	21,506	21,506
1974	(32)	(1)			21,666	21,666	21,666
1975	(31)	(1)			21,827	21,827	21,827
1976	(30)	(1)			21,988	21,988	21,988
1977	(29)	(1)			22,148	22,148	22,148
1978	(28)	(1)			22,309	22,309	22,309
1979	(27)	(1)			22,470	22,470	22,470
1980	(26)	(1)			22,630	22,630	22,630
1981	(25)	(1)			22,791	22,791	22,791
1982	(24)	(1)			22,951	22,951	22,951
1983	(23)	(1)			23,112	23,112	23,112
1984	(22)	(1)	23,362	23,273		23,273	23,273
1985	(21)	(1)	23,551	23,433		23,433	23,433
1986	(20)	(1)	23,671	23,594		23,594	23,594
1987	(19)	(1)	23,733	23,754		23,754	23,754
1988	(18)	(1)	23,878	23,915		23,915	23,915
1989	(17)	(1)	24,056	24,076		24,076	24,076
1990	(16)	(1)	24,193	24,236		24,236	24,236
1991	(15)	(1)	24,227	24,397		24,397	24,397
1992	(14)	(1)	25,362	25,370		25,370	25,370
1993	(13)	-	26,281	26,343		26,343	26,281
1994	(12)	-	26,436	26,504		26,504	26,436
1995	(11)	-	26,853	26,664		26,664	26,853
1996	(10)	-	26,813	26,825		26,825	26,813
1997	(9)	-	26,958	26,986		26,986	26,958
1998	(8)	-	27,105	27,146		27,146	27,105
1999	(7)	-	27,250	27,307		27,307	27,250
2000	(6)	-	27,592	27,467		27,467	27,592
2001	(5)	-	27,743	27,628		27,628	27,743
2002	(4)	-	27,822	27,789		27,789	27,822
2003	(3)	-	27,957	27,949		27,949	27,957
2004	(2)	-	28,111	28,110		28,110	28,111
2005	(1)	-	28,212	28,270		28,270	28,212
2006	-	-	28,489	28,431		28,431	28,489
2007	1	-	28,592			28,592	28,592
2008	2	-	28,752			28,752	28,752

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.999222624
R Square	0.998445853
Adjusted R Square	0.998290438
Standard Error	74.70112652
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	71699562.44	35849781.22	6424.397272	8.22094E-29
Residual	20	111808.1861	5590.259304		
Total	22	71811197.61			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*	*Upper 99%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	28430.84404	35.88495314	796.7207895	1.69842E-48	28356.50653	28505.38154	28356.50653	28505.38154	267.5165557	224.9483249	267.5165557
X Variable 1	160.6022345	4.532382442	35.43439804	1.59325E-19	151.1478504	170.0566186	151.1478504	170.0566186	185.6723125	184.544507	185.6723125
X Variable 2	1625.178136	63.79134948	25.47646585	1.01788E-16	1492.111713	1758.244559	1492.111713	1758.244559	156.7805294	123.0664332	156.7805294

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF ST JOSEPH COMMERCIAL ANNUAL CUSTOMER COUNTS

YYYY	TREND	Dummies	COMMERCIAL CUSTOMERS	REGRESSION LINE	BACKCAST COMMERCIAL CUSTOMERS	PROJECTED COMMERCIAL CUSTOMERS	ALL COMMERCIAL CUSTOMERS
1971	(35)	(1)			3,142	3,142	3,142
1972	(34)	(1)			3,142	3,142	3,142
1973	(33)	(1)			3,142	3,142	3,142
1974	(32)	(1)			3,142	3,142	3,142
1975	(31)	(1)			3,142	3,142	3,142
1976	(30)	(1)			3,142	3,142	3,142
1977	(29)	(1)			3,142	3,142	3,142
1978	(28)	(1)			3,142	3,142	3,142
1979	(27)	(1)			3,142	3,142	3,142
1980	(26)	(1)			3,142	3,142	3,142
1981	(25)	(1)			3,142	3,142	3,142
1982	(24)	(1)			3,142	3,142	3,142
1983	(23)	(1)			3,142	3,142	3,142
1984	(22)	(1)	3,158			3,158	3,158
1985	(21)	(1)	3,142			3,142	3,142
1986	(20)	(1)	3,120			3,120	3,120
1987	(19)	(1)	3,139			3,139	3,139
1988	(18)	(1)	3,137			3,137	3,137
1989	(17)	(1)	3,138			3,138	3,138
1990	(16)	(1)	3,138			3,138	3,138
1991	(15)	(1)	3,121			3,121	3,121
1992	(14)	(1)	3,144			3,144	3,144
1993	(13)	-	3,174			3,174	3,174
1994	(12)	-	3,185			3,185	3,185
1995	(11)	-	3,175			3,175	3,175
1996	(10)	-	3,190			3,190	3,190
1997	(9)	-	3,172			3,172	3,172
1998	(8)	-	3,149			3,149	3,149
1999	(7)	-	3,156			3,156	3,156
2000	(6)	-	3,168			3,168	3,168
2001	(5)	-	3,175			3,175	3,175
2002	(4)	-	3,156	3,165		3,165	3,156
2003	(3)	-	3,121	3,107		3,107	3,121
2004	(2)	-	3,085	3,050		3,050	3,085
2005	(1)	-	2,957	2,992		2,992	2,957
2006	-	-	2,950	2,934		2,934	2,950
2007	1	-	2,877			2,877	2,877
2008	2	-	2,819			2,819	2,819

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.971240767
R Square	0.943308627
Adjusted R Sq	0.924411503
Standard Erro	25.83657238
Observations	5

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	33321.75825	33321.75825	49.91810482	0.005829313
Residual	3	2002.585417	667.5284722		
Total	4	35324.34167			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	2934.25	20.01292291	146.6177636	6.99581E-07	2870.559947	2997.940053	2870.559947	2997.940053
X Variable 1	-57.725	8.170241564	-7.065274575	0.005829313	-83.7263551	-31.72364492	-83.72635508	-31.7236449

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF ST LOUIS QUARTERLY RESIDENTIAL ANNUAL CUSTOMER COUNTS

	stlq res cus aptz w/2006 from stat13	stlq res cus aptz w/apr 2006 update	calculate stlq com gmd aptz	lnewcus	LOGN(Year-1990)	lnewcus*Logn	I59803	I2006	Projected Old Cust w/growth	Projected New Cust w/growth	Regression Total Customers	Forecast Total Customers	Smoothed Total Customers
1971													
1972													
1973													
1974													
1975													
1976													
1977													
1978													
1979													
1980													
1981													
1982													
1983													
1984													
1985													
1986													
1987													
1988													
1989													
1990													
1991													
1992	stlq res cus aptz w/2006 from stat13	stlq res cus aptz w/apr 2006 update	stlq res mgal aptz	lnewcus	LOGN(Year-1990)	lnewcus*Logn	I59803	I2006	Projected Old Cust w/growth	Projected New Cust w/growth	Regression Total Customers	Forecast Total Customers	Smoothed Total Customers
1993	281890.5	281,891		0	1.09861229	0	0	0	281,574	-	281,574		281,574
1994	284722.0	284,721		0	1.38629436	0	0	0	284,817	-	284,817		284,817
1995	285442.6	285,443		0	1.60943791	0	0.25	0	286,978	-	285,638		286,978
1996	288511.5	288,512		0	1.79175946	0	0	0	288,906	-	288,906		288,906
1997	290308.0	290,308		0	1.94591015	0	0	0	290,537	-	290,537		290,537
1998	289530.3	289,530		0	2.07944154	0	0.4	0	291,949	-	289,802		291,949
1999	293280.3	293,280		0	2.19722457	0	0	0	293,195	-	293,195		293,195
2000	294265.8	294,266		0	2.30258509	0	0	0	294,310	-	294,310		294,310
2001	295908.0	295,908		0	2.39789527	0	0	0	295,318	-	295,318		295,318
2002	317839.3	317,839		1	2.48490665	2.48490665	0	0	296,239	21,351	317,590	317,590	317,590
2003	313914.0	313,914		1	2.56494935	2.56494935	1	0	297,085	22,039	313,751	319,124	319,124
2004	320681.0	320,681		1	2.63905733	2.63905733	0	0	297,869	22,676	320,545	320,545	320,545
2005	321346.5	321,347		1	2.70805020	2.70805020	0	0	298,599	23,269	321,868	321,868	321,868
2006	340686.8	318,372		1	2.77258872	2.77258872	0	1	299,282	23,823	318,372	323,105	323,105
2007				1	2.83321334	2.83321334			299,923	24,344		324,267	324,267
2008				1	2.89037176	2.89037176			300,529	24,835		325,363	325,363
					year 0 of log fn								
					1990								

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.9997963
R Square	0.9995592442
Adjusted R Square	0.9994411305
Standard Error	364.6446564
Observations	14

ANOVA

	df	SS	MS	F	Significance F
Regression	4	2935049357	733762339.2	5518.432187	3.08247E-15
Residual	9	1198891.629	132965.7255		
Total	13	2936248048			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	265552.2154	582.7219571	470.7257543	3.78324E-21	264879.2498	271225.1809	264879.2498	271225.1809
LOGN(Year-1990)	10578.45217	293.8663408	35.99749514	4.87668E-11	9913.680328	11243.22402	9913.680328	11243.22402
lnewcus*Logn	8592.389278	120.9984744	71.01237699	1.10077E-13	8318.871713	8866.106843	8318.871713	8866.106843
I59803	-5387.570514	378.0611861	-14.19762385	1.81677E-07	-6222.804332	-4512.336695	-6222.804332	-4512.336695
I2006	-4733.537955	426.1363336	-11.10803652	1.48249E-06	-5697.525312	-3769.550597	-5697.525312	-3769.550597

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ANALYSIS OF ST LOUIS QUARTERLY COMMERCIAL ANNUAL CUSTOMER COUNTS

Year	calculated stq com grwd sptz	stq com cus sptz	stq com mgal sptz		Inewcus	LOGN of (Year-1990)	Inewcus * Logn	I2003	Projected Old Cust w/growth	Est. of Added New Cust	Regression Total Customers	Forecast Total Customers	Projected Total Customers
1971													
1972													
1973													
1974													
1975													
1976													
1977													
1978													
1979													
1980													
1981													
1982													
1983													
1984													
1985													
1986													
1987													
1988													
1989													
1990													
1991													
1992		stq com cus sptz	stq com mgal sptz		Inewcus	LOGN of (Year-1990)	Inewcus * Logn	I2003	Projected Old Cust w/growth	Est. of Added New Cust	Regression Total Customers	Forecast Total Customers	Projected Total Customers
1993		14,965			0	1.098612289	0	0		-	14,687		14,687
1994		15,004			0	1.386294361	0	0		-	15,065		15,065
1995		15,248			0	1.609437912	0	0		-	15,203		15,203
1996		15,349			0	1.791759469	0	0		-	15,316		15,316
1997		15,420			0	1.945910149	0	0		-	15,412		15,412
1998		15,381			0	2.079441542	0	0		-	15,494		15,494
1999		15,567			0	2.197224577	0	0		-	15,567		15,567
2000		15,819			0	2.302585093	0	0		-	15,833		15,833
2001		15,726			0	2.397895273	0	0	15,692	-	15,692		15,692
2002		17,375			1	2.48490665	2.4849	0	15,746	1,795	17,541		17,541
2003		16,639			1	2.564949357	2.5649	1	15,795	1,853	16,839		17,648
2004		17,651			1	2.63905733	2.6391	0	15,841	1,906	17,748		17,748
2005		17,632			1	2.708050201	2.7081	0	15,884	1,956	17,840		17,840
2006		18,372			1	2.772588722	2.7726	0	15,924	2,003	17,927		17,927
2007					1	2.833213344	2.8332	0	15,962	2,047	18,009		18,009
2008					1	2.890371758	2.8904	0	15,997	2,088	18,085		18,085
						year zero for log fn							
						1990							

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.993568029
R Square	0.987177428
Adjusted R Square	0.983330656
Standard Error	175.0331065
Observations	14

ANOVA

	df	*SS*	*F*	*Significance F*
Regression	3	23586335.58	256.6249141	9.33332E-10
Residual	10	306165.8836		
Total	13	23892701.46		

	Coefficients	*Standard Error*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	14205.64447	268.9455034	1.43223E-13	13608.39855	14804.89239
LOGN(Year-1990)	619.7773788	140.8742006	0.001323128	306.3357284	933.2190292
Inewcus*Logn	722.3594701	57.60316163	1.92798E-07	594.0250848	850.7138554
I2003	1191.066834	194.8231119	0.000112703	757.4195184	1624.714149

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
JOPLIN RESIDENTIAL CUSTOMERS ANNUAL WEATHER

YYYY	GCD	CUSTOMERS	MGAL	MDT	PRCP	LITE	EVAP	OPEN	GAIN	LOSS	CLOSE	AVAIL	NEEDS	SHORT	NSHORT	DNSHORT
1971				58.6	37.5	320	275	1.118	22.98	22.91	1.186	5.72	9.33	3.61	2.91	0.70
1972				57.8	39.3	321	273	1.186	21.43	21.32	1.297	5.20	9.44	4.25	2.91	1.34
1973				57.8	62.0	320	264	1.297	35.31	34.88	1.724	6.83	8.80	1.97	2.91	-0.94
1974				56.6	47.0	320	254	1.724	26.51	26.58	1.652	5.55	8.51	2.97	2.91	0.06
1975				56.9	44.1	320	264	1.652	26.36	26.18	1.828	6.09	8.92	2.83	2.91	-0.08
1976				54.9	42.1	321	248	1.828	19.71	20.84	0.700	5.62	8.14	2.53	2.91	-0.38
1977				57.5	46.3	320	267	0.700	28.00	27.82	0.883	7.04	9.14	2.10	2.91	-0.81
1978				56.6	39.7	320	282	0.883	23.71	23.72	0.876	6.80	9.54	2.75	2.91	-0.16
1979				55.6	41.4	320	266	0.876	23.05	23.14	0.785	6.89	8.83	1.95	2.91	-0.96
1980				59.3	29.9	321	302	0.785	18.33	18.55	0.569	5.21	10.76	5.55	2.91	2.64
1981				58.2	38.6	320	264	0.569	22.31	22.09	0.792	6.20	9.01	2.81	2.91	-0.10
1982				57.9	38.4	320	274	0.792	24.58	23.55	1.818	6.21	9.11	2.89	2.91	-0.01
1983				57.2	45.6	320	281	1.818	25.94	25.75	2.011	5.77	9.64	3.87	2.91	0.96
1984	193.80	14,320	1,013,651	57.9	46.2	321	271	2.011	28.14	28.87	1.280	5.48	9.34	3.86	2.91	0.95
1985	185.37	14,559	985,762	56.9	65.3	320	269	1.280	31.21	30.92	1.574	6.53	9.21	2.68	2.91	-0.22
1986	186.32	14,820	1,008,541	59.1	51.1	320	274	1.574	26.09	27.00	0.665	6.86	9.47	2.61	2.91	-0.29
1987	187.88	15,172	1,041,177	58.8	48.2	320	277	0.665	27.37	25.98	2.058	7.00	9.73	2.73	2.91	-0.17
1988	197.40	15,634	1,127,210	57.4	44.8	321	281	2.058	25.36	25.54	1.880	5.77	9.78	4.00	2.91	1.09
1989	187.62	15,951	1,093,075	55.9	34.4	320	263	1.880	20.68	21.91	0.646	6.30	8.54	2.24	2.91	-0.67
1990	189.66	16,142	1,118,202	59.0	63.6	320	274	0.846	34.23	33.01	1.863	6.97	9.13	2.17	2.91	-0.74
1991	205.45	16,319	1,224,537	59.0	33.0	320	282	1.863	23.87	24.18	1.550	5.65	9.78	4.14	2.91	1.23
1992	180.87	16,661	1,100,665	57.1	61.4	321	247	1.550	31.69	31.26	1.977	6.88	8.08	1.20	2.91	-1.71
1993	178.02	17,038	1,107,828	56.4	59.8	320	256	1.977	30.78	31.85	0.903	7.26	8.85	1.59	2.91	-1.31
1994	198.32	17,330	1,255,333	58.4	48.6	320	276	0.903	27.48	27.32	1.068	6.23	9.46	3.23	2.91	0.32
1995	198.43	17,716	1,283,993	58.2	42.9	320	278	1.068	27.57	27.13	1.509	6.78	9.21	2.43	2.91	-0.48
1996	200.82	17,935	1,315,562	57.5	45.7	321	274	1.509	22.11	22.89	0.725	6.26	9.28	3.02	2.91	0.11
1997	209.07	18,091	1,381,456	57.4	44.2	320	266	0.725	28.65	27.53	1.846	7.15	8.95	1.80	2.91	-1.11
1998	196.62	18,262	1,311,483	58.8	47.6	320	275	1.846	27.57	28.52	0.899	6.57	9.50	2.93	2.91	0.02
1999	199.13	18,458	1,342,470	59.1	53.3	320	276	0.899	26.13	25.98	1.051	6.44	9.15	2.71	2.91	-0.20
2000	206.98	18,626	1,408,159	58.2	36.6	321	283	1.051	23.34	23.10	1.294	5.81	9.65	3.84	2.91	0.93
2001	199.60	18,862	1,375,106	59.4	43.9	320	282	1.294	23.88	23.83	1.345	6.92	10.32	3.40	2.91	0.49
2002	192.22	19,092	1,340,481	58.7	40.8	320	278	1.345	22.10	22.31	1.131	6.30	10.37	4.07	2.91	1.16
2003	180.93	19,194	1,268,403	58.4	36.9	320	280	1.131	23.79	23.52	1.399	6.99	10.21	3.22	2.91	0.32
2004	189.91	19,667	1,364,143	58.7	48.5	321	268	1.399	28.60	28.85	1.149	7.01	9.67	2.66	2.91	-0.25
2005	183.38	19,945	1,335,896	59.5	32.8	320	290	1.149	21.40	22.10	0.448	6.70	10.56	3.86	2.91	0.95
2006	225.60	20,251	1,668,629	60.8	32.4	320	296	0.448	18.94	17.85	1.541	5.86	10.88	5.02	2.91	2.11
2007	168.52	20,536												2.91	2.91	0.00
2008	163.67	20,798												2.91	2.91	0.00

Schedule 5-1

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST CHARLES RESIDENTIAL CUSTOMERS ANNUAL WEATHER

YYYY	GCD	CUSTOMERS	MGAL	MDT	PRCP	LITE	EVAP	OPEN	GAIN	LOSS	CLOSE	AVAIL	NEEDS	SHORT	NSHORT	DNSHORT
1970				55.1	36.2	320	265	3.426	17.67	20.39	0.709	5.52	11.04	5.52	6.19	-0.67
1971				56.8	35.9	320	280	0.709	15.00	14.55	1.159	4.02	11.40	7.37	6.19	1.18
1972				55.2	34.2	321	272	1.159	16.45	16.46	1.146	4.53	11.45	6.92	6.19	0.73
1973				57.3	38.7	320	266	1.146	20.66	20.48	1.324	4.81	10.79	5.98	6.19	-0.21
1974				56.2	39.3	320	262	1.324	20.34	20.75	0.914	5.62	10.59	4.97	6.19	-1.22
1975				56.7	39.9	320	267	0.914	19.33	19.31	0.941	5.12	10.93	5.81	6.19	-0.38
1976				55.3	24.0	321	269	0.941	13.16	13.61	0.492	3.68	10.98	7.30	6.19	1.11
1977				56.7	47.1	320	283	0.492	19.08	18.72	0.846	5.32	11.81	6.49	6.19	0.30
1978				54.7	35.4	320	273	0.846	17.12	17.15	0.824	4.87	11.27	6.40	6.19	0.21
1979				54.7	32.8	320	276	0.824	14.99	15.11	0.703	4.12	11.31	7.19	6.19	1.00
1980				56.9	24.1	321	289	0.703	13.71	14.00	0.412	4.21	12.45	8.24	6.19	2.05
1981				56.6	46.4	320	260	0.412	19.71	19.15	0.980	6.28	10.55	4.27	6.19	-1.92
1982				55.4	46.4	320	261	0.980	23.13	23.01	1.104	6.44	10.44	4.00	6.19	-2.19
1983				56.2	43.5	320	279	1.104	17.97	17.80	1.277	4.64	11.60	6.96	6.19	0.77
1984	277.22	12,038	1,218,899	56.6	43.2	321	266	1.277	20.29	20.74	0.825	4.27	11.14	6.87	6.19	0.68
1985	257.35	12,846	1,207,469	55.5	52.1	320	265	0.825	21.21	20.49	1.547	5.28	10.75	5.47	6.19	-0.72
1986	280.84	13,738	1,409,220	57.9	38.9	320	276	1.547	17.09	18.02	0.613	4.73	11.70	6.97	6.19	0.78
1987	297.46	15,033	1,633,284	58.5	40.4	320	277	0.613	15.75	14.86	1.500	3.70	11.84	8.14	6.19	1.96
1988	313.74	15,919	1,824,191	56.5	37.4	321	287	1.500	14.91	15.47	0.944	3.40	12.34	8.95	6.19	2.76
1989	279.43	16,489	1,682,898	55.3	29.1	320	268	0.944	14.19	14.64	0.495	4.40	10.71	6.31	6.19	0.12
1990	254.97	17,005	1,583,612	58.1	46.4	320	268	0.495	18.92	18.23	1.187	4.71	10.76	6.05	6.19	-0.14
1991	278.50	17,530	1,783,167	58.3	31.0	320	281	1.187	18.53	18.84	0.875	4.83	11.82	6.99	6.19	0.80
1992	273.82	18,113	1,811,527	56.2	33.6	321	248	0.875	16.93	16.73	1.077	3.73	10.07	6.34	6.19	0.15
1993	235.27	18,768	1,612,803	54.7	58.7	320	247	1.077	24.42	24.70	0.793	7.02	10.30	3.28	6.19	-2.91
1994	279.90	19,671	2,011,009	56.8	42.1	320	266	0.793	19.04	19.02	0.818	4.79	10.82	6.02	6.19	-0.16
1995	279.23	21,046	2,146,503	56.2	48.3	320	265	0.818	19.99	19.95	0.862	5.67	10.80	5.13	6.19	-1.06
1996	270.91	22,020	2,178,820	55.0	48.7	321	257	0.862	19.53	19.70	0.692	5.50	10.41	4.92	6.19	-1.27
1997	275.28	23,081	2,320,674	55.2	39.9	320	253	0.692	20.67	20.29	1.069	4.99	10.17	5.17	6.19	-1.01
1998	257.99	24,141	2,274,780	58.8	53.4	320	269	1.069	24.12	24.42	0.766	6.92	11.06	4.14	6.19	-2.05
1999	284.14	24,970	2,591,401	58.0	33.9	320	271	0.766	15.63	16.00	0.395	3.82	11.06	7.24	6.19	1.05
2000	260.53	25,584	2,434,554	56.2	39.3	321	265	0.395	16.84	16.58	0.656	4.87	10.64	5.76	6.19	-0.42
2001	266.46	25,987	2,529,186	57.8	35.3	320	270	0.656	18.57	18.05	1.173	5.53	11.87	6.34	6.19	0.15
2002	276.92	26,375	2,667,699	57.9	41.0	320	270	1.173	18.41	18.90	0.688	5.59	12.21	6.62	6.19	0.43
2003	238.97	27,502	2,400,504	56.6	46.1	320	263	0.688	20.75	20.49	0.952	6.28	11.43	5.15	6.19	-1.04
2004	253.28	27,962	2,586,840	57.6	42.3	321	261	0.952	18.30	18.40	0.854	5.30	11.40	6.10	6.19	-0.09
2005	287.82	27,637	2,905,384	58.0	37.9	320	277	0.854	17.51	17.40	0.966	4.91	12.31	7.40	6.19	1.21
2006	302.01	28,037	3,092,825	58.6	29.6	320	274	0.966	15.71	15.73	0.948	4.49	12.20	7.70	6.19	1.52
2007														6.19	6.19	0.00
2008														6.19	6.19	0.00

Schedule 5-2

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST JOSEPH RESIDENTIAL CUSTOMERS ANNUAL WEATHER

YYYY	GCD	CUSTOMERS	MGAL	MDT	PRCP	LITE	EVAP	OPEN	GAIN	LOSS	CLOSE	AVAIL	NEEDS	SHORT	NSHORT	DNSHORT
1971				54.3	28.3	320	282	1.061	17.71	17.12	1.649	4.99	9.65	4.66	3.38	1.28
1972				53.0	32.9	321	273	1.649	20.23	20.46	1.415	6.64	9.50	2.86	3.38	-0.52
1973				54.9	55.6	320	269	1.415	27.40	27.16	1.657	6.63	9.19	2.56	3.38	-0.83
1974				53.8	29.4	320	272	1.657	18.16	18.59	1.230	4.48	9.37	4.89	3.38	1.51
1975				54.4	33.2	320	282	1.230	18.85	18.96	1.126	5.55	9.77	4.22	3.38	0.83
1976				54.1	22.1	321	279	1.126	12.31	13.10	0.331	3.81	9.62	5.81	3.38	2.42
1977				55.6	43.3	320	281	0.331	20.07	19.43	0.970	6.27	9.79	3.51	3.38	0.13
1978				53.1	37.6	320	282	0.970	22.40	22.56	0.814	6.55	9.75	3.20	3.38	-0.18
1979				51.5	31.2	320	266	0.814	19.17	19.55	0.430	6.42	8.82	2.40	3.38	-0.98
1980				54.9	27.7	321	298	0.430	16.49	16.00	0.915	5.04	10.66	5.61	3.38	2.23
1981				54.6	35.2	320	265	0.915	19.05	18.95	1.014	6.31	8.97	2.66	3.38	-0.72
1982				51.4	48.8	320	249	1.014	24.02	23.32	1.709	6.71	8.10	1.40	3.38	-1.99
1983				53.1	31.7	320	268	1.709	20.35	19.87	2.189	4.95	9.14	4.19	3.38	0.81
1984	186.02	23,362	1,587,311	54.8	36.2	321	264	2.189	22.76	23.63	1.326	5.41	9.14	3.73	3.38	0.35
1985	177.26	23,551	1,524,753	51.4	47.2	320	255	1.326	25.43	24.65	2.108	6.52	8.62	2.10	3.38	-1.28
1986	177.52	23,671	1,534,806	55.3	49.3	320	267	2.108	24.34	25.54	0.908	6.93	9.27	2.34	3.38	-1.05
1987	182.82	23,733	1,584,798	56.1	36.2	320	273	0.908	21.51	20.82	1.597	6.66	9.67	3.00	3.38	-0.38
1988	205.53	23,878	1,792,504	55.1	17.2	321	291	1.597	12.73	13.42	0.900	4.39	10.29	5.90	3.38	2.52
1989	194.08	24,066	1,705,993	53.4	27.4	320	278	0.900	16.33	16.46	0.764	5.18	9.30	4.12	3.38	0.73
1990	187.27	24,193	1,654,782	56.5	38.2	320	277	0.764	22.76	22.36	1.160	6.18	9.39	3.21	3.38	-0.17
1991	195.33	24,227	1,728,498	55.7	34.2	320	287	1.160	19.65	19.23	1.578	5.30	10.00	4.70	3.38	1.31
1992	181.73	25,362	1,683,422	54.0	39.0	321	245	1.578	25.69	24.94	2.321	6.34	8.22	1.88	3.38	-1.50
1993	176.17	26,281	1,691,082	51.9	40.9	320	241	2.321	29.05	30.50	0.873	7.64	8.22	0.58	3.38	-2.81
1994	186.50	26,436	1,800,800	54.1	26.8	320	264	0.873	16.60	16.68	0.795	5.25	9.01	3.76	3.38	0.37
1995	184.16	26,653	1,792,798	53.5	41.8	320	258	0.795	22.07	21.97	0.892	6.62	8.69	2.07	3.38	-1.32
1996	182.28	26,813	1,785,153	51.8	35.2	321	250	0.892	18.80	18.83	0.863	6.01	8.39	2.38	3.38	-1.00
1997	187.09	26,958	1,842,196	53.0	35.4	320	255	0.863	20.28	18.86	2.284	5.32	8.62	3.30	3.38	-0.09
1998	178.08	27,105	1,762,985	55.9	39.0	320	266	2.284	23.80	25.34	0.748	7.15	9.22	2.07	3.38	-1.31
1999	179.46	27,250	1,786,146	55.1	29.0	320	261	0.748	17.28	17.32	0.704	5.23	8.72	3.48	3.38	0.10
2000	195.08	27,592	1,965,978	54.6	27.1	321	277	0.704	15.23	15.09	0.846	4.58	9.52	4.93	3.38	1.55
2001	159.99	27,743	1,621,197	55.7	38.6	320	259	0.846	19.71	20.28	0.275	6.72	9.46	2.73	3.38	-0.65
2002	175.66	27,822	1,785,085	55.7	20.8	320	265	0.275	11.47	11.54	0.202	3.63	10.05	6.42	3.38	3.04
2003	168.07	27,957	1,716,166	54.8	26.1	320	263	0.202	16.00	15.55	0.654	5.24	9.74	4.50	3.38	1.11
2004	163.84	28,111	1,682,239	54.7	28.5	321	249	0.654	20.37	20.56	0.460	6.86	8.94	2.08	3.38	-1.31
2005	167.19	28,212	1,722,790	54.3	39.0	320	267	0.460	19.06	18.50	1.016	6.21	9.73	3.52	3.38	0.14
2006	182.67	28,489	1,900,776	56.2	29.6	320	268	1.016	17.73	17.62	1.128	6.02	9.94	3.92	3.38	0.53
2007	156.75	28,592												3.38	3.38	0.00
2008	153.76	28,752												3.38	3.38	0.00

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST LOUIS COUNTY QUARTERLY RESIDENTIAL CUSTOMERS ANNUAL WEATHER

YYYY	Historical GCD Old + New Cus Smooth	Smooth Old + New Cus	Spitz Mgal	MDT	PRCP	LITE	EVAP	OPEN	GAIN	LOSS	CLOSE	AVAIL	NEEDS	SHORT	NSHORT	DNSHORT
1970				54.8	36.2	320	265	3.426	21.56	23.07	1.917	7.19	12.88	5.68	6.43	-0.75
1971				56.8	33.7	320	280	1.917	19.77	19.00	2.684	5.79	13.30	7.51	6.43	1.08
1972				55.2	33.7	321	272	2.684	20.96	20.46	3.183	6.12	13.36	7.24	6.43	0.81
1973				57.3	39.8	320	266	3.183	24.51	24.47	3.225	6.61	12.59	5.98	6.43	-0.44
1974				56.2	36.8	320	262	3.225	22.83	23.98	2.072	6.44	12.36	5.92	6.43	-0.51
1975				56.7	40.2	320	267	2.072	24.60	24.22	2.449	7.92	12.75	4.83	6.43	-1.59
1976				55.3	23.5	321	269	2.449	14.76	15.87	1.338	4.56	12.81	8.26	6.43	1.83
1977				56.7	43.4	320	283	1.338	21.95	20.71	2.577	6.68	13.78	7.09	6.43	0.67
1978				54.7	37.7	320	273	2.577	20.72	20.84	2.455	6.91	13.14	6.23	6.43	-0.20
1979				54.7	29.5	320	276	2.455	18.07	18.67	1.851	6.04	13.19	7.16	6.43	0.73
1980				56.9	27.5	321	289	1.851	16.84	17.43	1.259	6.00	14.53	8.53	6.43	2.10
1981				56.6	45.5	320	260	1.259	23.47	22.77	1.961	7.70	12.31	4.62	6.43	-1.81
1982				55.4	55.0	320	261	1.961	27.36	25.65	3.674	7.67	12.19	4.52	6.43	-1.91
1983				56.2	44.8	320	279	3.674	23.78	23.61	3.843	6.44	13.54	7.09	6.43	0.67
1984				56.6	51.7	321	266	3.843	27.66	27.63	3.881	6.18	13.00	6.83	6.43	0.40
1985				55.5	50.7	320	265	3.881	25.25	24.81	4.325	7.37	12.54	5.18	6.43	-1.25
1986				57.9	34.9	320	276	4.325	21.14	23.57	1.891	6.37	13.65	7.28	6.43	0.86
1987				58.5	38.4	320	277	1.891	20.40	18.85	3.443	5.59	13.82	8.23	6.43	1.80
1988				56.5	33.9	321	287	3.443	18.49	18.70	3.238	4.55	14.40	9.85	6.43	3.42
1989				55.3	28.6	320	268	3.238	18.39	20.31	1.317	6.05	12.49	6.44	6.43	0.01
1990				58.1	45.1	320	268	1.317	24.71	23.21	2.813	6.93	12.55	5.62	6.43	-0.81
1991				58.3	33.5	320	281	2.813	21.77	21.48	3.100	5.58	13.79	8.21	6.43	1.78
1992				56.2	33.5	321	248	3.100	20.65	21.15	2.599	5.28	11.75	6.47	6.43	0.04
1993	256.09	281,574	26,337,508	54.7	54.8	320	247	2.599	29.46	29.19	2.865	8.96	12.02	3.06	6.43	-3.37
1994	285.98	284,617	29,729,856	56.8	34.7	320	266	2.865	22.02	22.54	2.347	6.14	12.62	6.48	6.43	0.05
1995	274.49	286,978	28,771,525	56.2	41.7	320	265	2.347	22.38	22.46	2.263	7.21	12.60	5.38	6.43	-1.04
1996	277.20	288,906	29,250,936	55.0	43.7	321	257	2.263	22.55	22.53	2.286	6.89	12.15	5.26	6.43	-1.17
1997	279.86	290,537	29,698,300	55.2	31.2	320	253	2.286	19.41	19.55	2.149	5.19	11.86	6.67	6.43	0.24
1998	264.10	291,949	28,162,554	58.8	43.6	320	269	2.149	27.96	28.61	1.500	8.90	12.90	4.01	6.43	-2.42
1999	287.24	293,195	30,760,506	58.0	34.1	320	271	1.500	19.67	19.84	1.332	5.77	12.90	7.14	6.43	0.71
2000	274.53	294,310	29,511,009	56.2	37.4	321	265	1.332	21.29	20.60	2.020	6.67	12.41	5.74	6.43	-0.68
2001	281.53	295,318	30,367,468	57.8	35.3	320	270	2.020	23.17	22.10	3.094	7.22	13.85	6.63	6.43	0.20
2002	271.16	317,590	31,454,872	57.9	41.0	320	270	3.094	22.92	24.07	1.942	7.83	14.24	6.42	6.43	-0.01
2003	239.27	319,124	27,889,513	56.6	46.1	320	263	1.942	25.55	24.83	2.665	8.42	13.34	4.92	6.43	-1.51
2004	251.82	320,545	29,482,896	57.6	42.3	321	261	2.665	22.67	22.45	2.886	7.04	13.30	6.26	6.43	-0.16
2005	272.73	321,868	32,063,233	58.0	37.9	320	277	2.886	21.09	21.59	2.387	6.27	14.36	8.09	6.43	1.66
2006	260.24	323,105	33,071,834	58.6	29.6	320	274	2.387	19.05	18.94	2.492	5.83	14.23	8.40	6.43	1.98
2007	0.00	324,267	0											6.43	6.43	0.00
2008	0.00	325,363	0											6.43	6.43	0.00

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
JOPLIN RESIDENTIAL CUSTOMERS WEATHER RESPONSE

					2006	2000				Weather &				
YYYY	GCD	SHORT	NSHORT	DNSHORT	TREND2006	TREND2000	DUMMIES	Regression Line	Residual	Dummy Adj	Projected Normal	Hot&Dry: 1988	Cool & Wet: 1993	Dummy Adj
1984	193.8	3.86	2.91	0.95	(22.0)	(16.0)	0.0	192.08	1.72	188.58		192.87	179.63	193.80
1985	185.4	2.68	2.91	-0.22	(21.0)	(15.0)	0.0	186.60	(1.22)	186.61		193.84	180.60	185.37
1986	186.3	2.61	2.91	-0.29	(20.0)	(14.0)	0.0	187.19	(0.87)	187.94		194.82	181.58	186.32
1987	187.9	2.73	2.91	-0.17	(19.0)	(13.0)	0.0	188.82	(0.94)	188.84		195.80	182.55	187.88
1988	197.4	4.00	2.91	1.09	(18.0)	(12.0)	0.0	196.77	0.63	191.39		196.77	183.53	197.40
1989	187.6	2.24	2.91	-0.67	(17.0)	(11.0)	0.0	188.07	(0.45)	191.26		197.75	184.51	187.62
1990	189.7	2.17	2.91	-0.74	(16.0)	(10.0)	0.0	188.63	1.04	193.75		198.72	185.48	189.66
1991	205.4	4.14	2.91	1.23	(15.0)	(9.0)	0.2	208.29	(2.85)	190.84		199.70	186.46	197.59
1992	180.9	1.20	2.91	-1.71	(14.0)	(8.0)	(0.1)	181.33	(0.46)	194.20		200.68	187.43	184.80
1993	178.0	1.59	2.91	-1.31	(13.0)	(7.0)	(0.3)	176.63	1.39	197.02		201.65	188.41	189.79
1994	198.3	3.23	2.91	0.32	(12.0)	(6.0)	0.0	198.38	(0.05)	196.56		202.63	189.39	198.32
1995	198.4	2.43	2.91	-0.48	(11.0)	(5.0)	0.0	194.96	3.47	201.06		203.60	190.36	198.43
1996	200.8	3.02	2.91	0.11	(10.0)	(4.0)	0.0	199.19	1.63	200.20		204.58	191.34	200.82
1997	209.1	1.80	2.91	-1.11	(9.0)	(3.0)	0.4	209.15	(0.08)	199.46		205.55	192.31	193.36
1998	196.6	2.93	2.91	0.02	(8.0)	(2.0)	(0.1)	196.70	(0.08)	200.44		206.53	193.29	200.55
1999	199.1	2.71	2.91	-0.20	(7.0)	(1.0)	0.0	200.41	(1.28)	200.21		207.51	194.26	199.13
2000	207.0	3.84	2.91	0.93	(6.0)	0.0	0.0	207.58	(0.60)	201.87		208.48	195.24	206.98
2001	199.6	3.40	2.91	0.49	(5.0)	0.0	0.0	200.34	(0.73)	196.88		209.63	190.39	199.60
2002	192.2	4.07	2.91	1.16	(4.0)	0.0	(0.2)	191.30	0.92	193.69		198.78	185.54	200.08
2003	180.9	3.22	2.91	0.32	(3.0)	0.0	(0.2)	181.81	(0.88)	187.04		193.93	180.69	188.78
2004	189.9	2.66	2.91	-0.25	(2.0)	0.0	0.3	191.53	(1.62)	181.45		189.08	175.84	180.09
2005	183.4	3.86	2.91	0.95	(1.0)	0.0	0.0	183.44	(0.06)	178.16		184.23	170.99	183.38
2006	225.6	5.02	2.91	2.11	0.0	0.0	1.0	224.22	1.38	174.75	173.37	179.38	166.14	186.33
2007		2.91	2.91	0.00	1.0	0.00	0.00				168.52	174.53	161.29	
2008		2.91	2.91	0.00	W 2.0	0.00	0.00				163.67	169.99	156.44	
					(247.0)									

5.00	0.50	4.00%	0.05	0.9808
OPENING	GAIN	DRAINED	NEEDS	R-BarSQ

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.992128503
R Square	0.984318966
Adjusted R Square	0.980834292
Standard Error	1.517088362
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	2600.4914	650.1228	282.470876	5.65196E-16
Residual	18	41.428028	2.301557		
Total	22	2641.9194			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	173.3679705	1.2564398	137.9835	1.11E-28	170.7282885	176.0076525	170.728288	176.007653
DNSHORT	5.496195651	0.409094	13.43993	7.9758E-11	4.638721079	6.357670224	4.63872108	6.35767022
TREND2006	-4.850265171	0.2628638	-18.45162	3.8528E-13	-5.402521626	-4.298008716	-5.4025216	-4.29800872
TREND2000	5.826214887	0.3057624	19.05471	2.2182E-13	5.183831913	6.468597861	5.18383191	6.46859786
DUMMIES	39.2652072	1.5242001	25.76119	1.1721E-15	36.06298159	42.46743281	36.0629816	42.4674328

Schedule 6-1

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
JOPLIN COMMERCIAL CUSTOMERS WEATHER RESPONSE

2006

YYYY	GCD (Observed Cust)	GCD (Smooth Cust)	SHORT	NSHORT	DNSHORT	SHIFT	DUMMIES	TREND	Regressio n Line	Residual	Shift & Dummy Adj	Projected Normal	Hot&Dry: 1988	Cool&Wet: 1993
1984	874.3	874.3	3.86	2.91	0.95	-	-		866.48	7.80	868.10		867.42	851.73
1985	871.4	871.4	2.68	2.91	(0.22)	-	-		858.83	12.53	872.82		867.42	851.73
1986	860.0	860.0	2.61	2.91	(0.29)	-	-		858.37	1.61	861.90		867.42	851.73
1987	916.0	916.0	2.73	2.91	(0.17)	1	0.20		919.38	(3.34)	856.96		867.42	851.73
1988	875.2	875.2	4.00	2.91	1.09	1	(0.60)		869.20	5.98	866.26		867.42	851.73
1989	918.8	918.8	2.24	2.91	(0.67)	1	0.20		916.18	2.58	862.87		867.42	851.73
1990	865.5	865.5	2.17	2.91	(0.74)	1	(0.20)		866.46	(1.01)	859.26		867.42	851.73
1991	909.7	909.7	4.14	2.91	1.23	1	-		913.91	(4.21)	856.08		867.42	851.73
1992	845.7	845.7	1.20	2.91	(1.71)	-	-		849.18	(3.44)	856.85		867.42	851.73
1993	872.3	872.3	1.59	2.91	(1.31)	-	0.30		873.65	(1.39)	858.90		867.42	851.73
1994	855.2	855.2	3.23	2.91	0.32	-	-		862.38	(7.17)	853.13		867.42	851.73
1995	865.8	865.8	2.43	2.91	(0.48)	-	-		857.16	8.56	868.87		867.42	851.73
1996	859.2	859.2	3.02	2.91	0.11	-	-		861.03	(1.82)	858.47		867.42	851.73
1997	853.0	853.0	1.80	2.91	(1.11)	-	-		853.07	(0.10)	860.20		867.42	851.73
1998	843.3	843.3	2.93	2.91	0.02	-	(0.20)		845.82	(2.51)	857.78		867.42	851.73
1999	869.8	869.8	2.71	2.91	(0.20)	-	0.20		873.62	(3.82)	856.47		867.42	851.73
2000	882.9	882.9	3.84	2.91	0.93	-	0.20		880.96	1.93	862.22		867.42	851.73
2001	848.1	848.1	3.40	2.91	0.49	-	(0.20)		848.90	(0.83)	859.48	860.29	867.42	851.73
2002	911.5	911.5	4.07	2.91	1.16	-	0.60		911.68	(0.15)	860.14	860.29	867.42	851.73
2003	836.7	784.4	3.22	2.91	0.32	-	(1.00)		789.31	(4.95)	855.35	860.29	867.42	851.73
2004	921.6	821.1	2.66	2.91	(0.25)	-	(0.50)		822.16	(1.05)	859.25	860.29	867.42	851.73
2005	985.2	863.0	3.86	2.91	0.95	-	-		866.47	(3.51)	856.78	860.29	867.42	851.73
2006	1,085.7	945.3	5.02	2.91	2.11	-	1.00		947.06	(1.71)	858.58	860.29	867.42	851.73
2007			2.91	2.91							860.29	860.29	867.42	851.73
2008			2.91	2.91							860.29	860.29	867.42	851.73

(1)

5.00	0.50	4.00%	0.05		0.977872
OPENING	GAIN	DRAINED	NEEDS		R-BarSQ

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.990398423
R Square	0.980889036
Adjusted R Square	0.977871515
Standard Error	5.134675663
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	25710.878	8570.293	325.064562	1.68375E-16
Residual	19	500.93299	26.36489		
Total	22	26211.811			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	860.2937046	1.2166244	707.1153	1.8389E-43	857.7472804	862.8401287	857.74728	862.840129
DNSHORT	6.511478361	1.2126392	5.369673	3.5052E-05	3.973393275	9.049559447	3.97339327	9.04955945
SHIFT	45.61535518	2.6144621	17.44732	3.7517E-13	40.14322306	51.0874873	40.1432231	51.0874873
DUMMIES	73.04520151	2.6877107	25.29519	4.2885E-16	67.00115347	79.08924955	67.0011535	79.0892496

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST CHARLES RESIDENTIAL CUSTOMERS WEATHER RESPONSE

				2006	2000							
YYYY	GCD	SHORT	NSHORT	DNSHORT	DUMMIES	gression Line	Residual	Weather& Dummy Adj	Projected Normal	Hot&Dry: 1988	Cool&Wet: 1993	Dummy Adj
1984	277.2	6.87	6.19	0.68	-	279.78	(2.56)	271.07		295.96	244.81	279.78
1985	257.3	5.47	6.19	-0.72	(0.35)	260.09	(2.74)	270.89		295.78	244.63	267.16
1986	280.8	6.97	6.19	0.78	-	280.67	0.17	273.61		298.70	247.55	280.67
1987	297.5	8.14	6.19	1.96	0.25	296.33	1.13	274.76		299.65	248.50	291.28
1988	313.7	8.95	6.19	2.76	0.75	313.68	0.06	273.70		298.58	247.43	298.52
1989	279.4	6.31	6.19	0.12	0.25	279.79	(0.37)	273.27		298.16	247.01	274.74
1990	255.0	6.05	6.19	-0.14	(1.00)	252.16	2.80	276.44		301.33	250.18	272.37
1991	278.5	6.99	6.19	0.80	-	280.85	(2.35)	271.28		296.17	245.02	280.85
1992	273.8	6.34	6.19	0.15	-	275.01	(1.19)	272.44		297.33	248.18	275.01
1993	235.3	3.28	6.19	-2.91	(0.50)	237.27	(2.00)	271.64		296.52	245.37	247.37
1994	280.8	6.02	6.19	-0.16	0.50	282.26	(1.47)	272.16		297.05	245.90	272.15
1995	279.5	5.13	6.19	-1.06	0.50	274.20	5.32	278.96		303.84	252.69	264.10
1996	268.9	4.92	6.19	-1.27	0.50	272.24	(3.32)	270.32		295.21	244.06	262.14
1997	274.3	5.17	6.19	-1.01	0.50	274.59	(0.25)	273.39		298.27	247.12	264.48
1998	259.4	4.14	6.19	-2.05	-	255.13	4.29	277.92		302.81	251.66	255.13
1999	286.6	7.24	6.19	1.05	-	283.13	3.48	277.11		302.00	250.85	283.13
2000	262.2	5.76	6.19	-0.42	(0.50)	259.70	2.48	276.11		301.00	249.85	269.80
2001	266.0	6.34	6.19	0.15	(0.50)	264.88	1.16	274.79		299.68	248.53	274.98
2002	274.8	6.82	6.19	0.43	-	277.55	(2.77)	270.87		295.75	244.60	277.55
2003	242.6	5.15	6.19	-1.04	(1.00)	244.08	(1.45)	272.16		297.07	245.92	264.26
2004	257.0	6.10	6.19	-0.09	(0.75)	257.65	(0.65)	272.98		297.87	246.72	272.80
2005	284.1	7.40	6.19	1.21	-	284.57	(0.44)	273.19		298.08	246.93	284.57
2006	298.1	7.70	6.19	1.52	0.50	297.41	0.69	274.32	270.87	299.21	248.06	287.31
2007		6.19	6.19			273.83		273.83	270.87	298.52	247.37	273.83438
2008		6.19	6.19			273.83		273.83	270.87	298.52	247.37	273.83438
					(0.9)							

5.00	0.30	5.00%	0.06		0.980396
OPENING	GAIN	DRAINED	NEEDS		R-Bar\SQ

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.991048847
R Square	0.982177817
Adjusted R Square	0.980395596
Standard Error	2.496527749
Observations	23

ANOVA

	df	SS	MS	F	Significance F
Regression	2	6869.6088	3434.804	551.09848	3.23303E-18
Residual	20	124.65302	6.232651		
Total	22	6994.2618			

	Coefficients	Standard Erro	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	273.6343816	0.5228551	523.3465	7.5894E-43	272.5437251	274.7250381	272.543725	274.725038
DNSHORT	9.02515663	0.4389586	20.56038	6.3683E-15	8.109505133	9.940808127	8.10950513	9.94080813
DUMMIES	20.20346278	1.1474393	17.60744	1.2111E-13	17.80994642	22.59697913	17.8099464	22.5969791
TREND2000	5.826214887	0.3057624	19.05471	2.2182E-13	5.183831913	6.468597861	5.18383191	6.46859786
DUMMIES	39.2652072	1.5242001	25.76119	1.1721E-15	36.06298159	42.46743281	36.0629816	42.4674328

Schedule 6-3

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST CHARLES COMMERCIAL CUSTOMERS WEATHER RESPONSE

2006

YYYY	GCD	SHORT	NSHORT	DNSHORT	TREND	DUMMIES	Regressio n Line	Residual	Weather& Dummy Adj	Projected Normal	Hot&Dry: 1988	Cool&Wet: 1993
1984	1,454.8	13.48	12.52	0.96	(11.00)	0.50	1,456.70	(1.90)	1,359.42		1,414.90	1,296.50
1985	1,276.3	11.41	12.52	-1.11	(11.00)	(0.50)	1,259.88	16.38	1,359.42		1,433.18	1,314.78
1986	1,280.0	13.94	12.52	1.42	(11.00)	(0.50)	1,298.48	(18.50)	1,359.42		1,396.30	1,279.89
1987	1,415.5	15.29	12.52	2.78	(11.00)	-	1,401.79	13.67	1,359.42		1,430.48	1,312.07
1988	1,427.6	16.28	12.52	3.76	(11.00)	-	1,416.80	10.80	1,359.42		1,427.60	1,309.20
1989	1,308.5	12.49	12.52	-0.02	(11.00)	(0.20)	1,325.98	(17.53)	1,359.42		1,399.27	1,280.87
1990	1,351.3	11.98	12.52	-0.53	(11.00)	-	1,351.28	0.05	1,359.42		1,416.85	1,298.45
1991	1,367.5	14.13	12.52	1.61	(11.00)	-	1,384.00	(16.50)	1,359.42		1,400.30	1,281.90
1992	1,358.0	12.43	12.52	-0.09	(11.00)	-	1,358.08	(0.12)	1,359.42		1,416.69	1,298.28
1993	1,315.1	8.52	12.52	-4.00	(11.00)	0.10	1,314.93	0.16	1,359.42		1,416.97	1,298.56
1994	1,371.1	12.21	12.52	-0.31	(11.00)	0.10	1,371.22	(0.08)	1,359.42		1,416.72	1,298.32
1995	1,178.3	10.76	12.52	-1.76	(11.00)	(1.00)	1,167.29	11.00	1,359.42		1,427.80	1,309.40
1996	1,388.3	10.46	12.52	-2.06	(10.00)	0.40	1,383.04	5.26	1,348.31		1,410.96	1,292.56
1997	1,378.6	11.02	12.52	-1.50	(9.00)	0.40	1,380.45	(1.86)	1,337.21		1,392.74	1,274.33
1998	1,280.4	9.79	12.52	-2.73	(8.00)	-	1,284.45	(4.06)	1,326.11		1,379.42	1,261.02
1999	1,338.6	13.89	12.52	1.38	(7.00)	-	1,336.03	2.55	1,315.01		1,374.94	1,256.54
2000	1,278.5	11.83	12.52	-0.68	(6.00)	(0.10)	1,276.98	1.50	1,303.91		1,362.79	1,244.39
2001	1,343.2	13.12	12.52	0.60	(5.00)	0.20	1,335.09	8.12	1,292.81		1,358.31	1,239.91
2002	1,255.7	13.39	12.52	0.88	(4.00)	(0.20)	1,262.03	(6.36)	1,281.70		1,332.73	1,214.32
2003	1,213.8	11.31	12.52	-1.20	(3.00)	(0.20)	1,219.16	(5.40)	1,270.60		1,322.59	1,204.19
2004	1,287.5	12.56	12.52	0.05	(2.00)	0.15	1,285.03	2.51	1,259.50		1,319.40	1,200.99
2005	1,251.9	14.75	12.52	2.24	(1.00)	(0.15)	1,257.77	(5.88)	1,248.40		1,299.90	1,181.50
2006	1,306.3	15.01	12.52	2.49	-	0.15	1,300.14	6.20	1,237.30	1,237.30	1,300.86	1,182.48
2007		8.19	12.52		1.00	0.00	1,226.20		1,226.20	1,226.20	1,283.68	1,165.18
2008		8.19	12.52		2.00	0.00	1,215.09		1,215.09	1,215.09	1,272.48	1,164.06
						(0.9)						

5.00	0.40	5.00%	0.1		0.978815
OPENING	GAIN	DRAINED	NEEDS		R-BarSQ

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99080982
R Square	0.981704099
Adjusted R Square	0.978815272
Standard Error	9.973356016
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	101405.86	33801.95	339.82799	1.11331E-16
Residual	19	1889.8888	99.46783		
Total	22	103295.75			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1237.297575	5.1303367	241.1728	1.3788E-34	1226.559656	1248.035493	1226.55966	1248.03549
DNSHORT	15.26200998	1.1555888	13.20713	5.0501E-11	12.84333478	17.68068518	12.8433348	17.6806852
TREND	-11.10171177	0.5760488	-19.27217	6.2413E-14	-12.30739569	-9.896027856	-12.307396	-9.89602786
DUMMIES	165.27432	6.6206211	24.96357	5.4723E-16	151.4172007	179.1314393	151.417201	179.131439

Schedule 6-4

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST JOSEPH RESIDENTIAL CUSTOMERS WEATHER RESPONSE
2006 2000

YYYY	GMD	SHORT	NSHORT	DNSHORT	DUMMIES	TREND02	TREND97	Regression Line	Residual	Weather& Dummy Adj	Projected Normal	Hot&Dry: 1988	Cool&Wet: 1993
1984	166.0	3.73	3.38	0.35	0.0	(18.0)	(13.0)	186.56	(0.54)	184.84		193.89	175.87
1985	177.3	2.10	3.38	-1.28	(0.2)	(17.0)	(12.0)	176.90	0.36	185.82		193.98	175.96
1986	177.5	2.34	3.38	-1.05	(0.2)	(16.0)	(11.0)	177.79	(0.27)	185.29		194.08	176.05
1987	182.8	3.00	3.38	-0.38	0.0	(15.0)	(10.0)	184.36	(1.53)	184.12		194.17	176.14
1988	205.5	5.90	3.38	2.52	0.5	(14.0)	(9.0)	204.82	0.70	186.45		194.26	176.24
1989	194.1	4.12	3.38	0.73	0.3	(13.0)	(8.0)	194.65	(0.57)	185.27		194.35	176.33
1990	187.3	3.21	3.38	-0.17	0.0	(12.0)	(7.0)	185.34	1.92	187.85		194.45	176.42
1991	195.3	4.70	3.38	1.31	0.2	(11.0)	(6.0)	194.69	0.64	186.66		194.54	176.51
1992	181.7	1.88	3.38	-1.50	0.0	(10.0)	(5.0)	181.02	0.70	186.81		194.63	176.61
1993	176.2	0.58	3.38	-2.81	0.0	(9.0)	(4.0)	176.70	(0.53)	185.68		194.72	176.70
1994	186.5	3.76	3.38	0.37	0.0	(8.0)	(3.0)	187.55	(1.05)	185.24		194.82	176.79
1995	184.2	2.07	3.38	-1.32	0.0	(7.0)	(2.0)	181.94	2.22	188.61		194.91	176.88
1996	182.3	2.38	3.38	-1.00	0.0	(6.0)	(1.0)	183.08	(0.60)	185.68		195.00	176.98
1997	187.1	3.30	3.38	-0.09	0.0	(5.0)	0.0	186.28	0.81	187.39		195.09	177.07
1998	178.1	2.07	3.38	-1.31	0.0	(4.0)	0.0	179.13	(1.06)	182.52		192.10	174.07
1999	179.5	3.48	3.38	0.10	0.0	(3.0)	0.0	180.92	(1.46)	179.12		189.10	171.08
2000	195.1	4.93	3.38	1.55	0.6	(2.0)	0.0	195.50	(0.42)	177.17		186.11	168.08
2001	180.0	2.73	3.38	-0.65	(0.8)	(1.0)	0.0	159.71	0.28	174.88		183.11	165.09
2002	175.7	6.42	3.38	3.04	(0.3)	0.0	0.0	175.53	0.13	171.73		180.12	162.09
2003	168.1	4.50	3.38	1.11	(0.2)	1.0	0.0	168.15	(0.08)	168.52		177.12	159.10
2004	163.8	2.08	3.38	-1.31	0.1	2.0	0.0	163.30	0.54	166.15		174.13	156.10
2005	167.2	3.52	3.38	0.14	0.2	3.0	0.0	167.31	(0.12)	162.49		171.13	153.11
2006	182.7	3.92	3.38	0.53	1.0	4.0	0.0	182.54	0.12	159.74	159.75	168.14	150.11
2007		3.38	3.38	0.00	0.00	5.0	0.0				159.75	165.14	147.12
2008		3.38	3.38	0.00	0.00	6.0	0.0				159.75	162.14	144.12
					0.3								

5.00	0.46	3.50%	0.05		0.99037
OPENING	GAIN	DRAINED	NEEDS		R-BarSQ

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99605246
R Square	0.992120503
Adjusted R Square	0.990369503
Standard Error	1.047011173
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	2484.5117	621.1279	566.60241	1.16251E-18
Residual	18	19.732183	1.096232		
Total	22	2504.2439			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	171.5987088	0.3373655	508.6434	7.0799E-39	170.8899302	172.3074873	170.88993	172.307487
DNSHORT	3.38419893	0.1733624	19.52096	1.4632E-13	3.019978118	3.748419743	3.01997812	3.74841974
DUMMIES	21.12454701	0.7432838	28.42057	2.0821E-16	19.5629657	22.68612833	19.5629657	22.6861283
TREND02	-2.99534006	0.0978163	-30.62206	5.5782E-17	-3.200844553	-2.789835567	-3.2008446	-2.78983557
TREND97	3.08776931	0.1431684	21.5674	2.6084E-14	2.786983681	3.38855494	2.78698368	3.38855494

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST JOSEPH COMMERCIAL CUSTOMERS WEATHER RESPONSE

						2006	2000							
YYYY	GCD	SHORT	NSHORT	DNSHORT	TREND2001	TREND2006	DUMMIES	Regressio n Line	Residual	Weather& Dummy Adj	Projected Normal	Hot&Dry: 1988	Cool&Wet: 1993
1984	778.74	3.73	3.38	0.35	(17.00)	(22.00)	0.40	776.23	2.51	746.87		794.65	748.36
1985	742.96	2.10	3.38	(1.28)	(16.00)	(21.00)	0.00	739.88	3.08	753.87		772.18	726.91
1986	747.95	2.34	3.38	(1.05)	(15.00)	(20.00)	0.00	748.29	(0.34)	756.88		778.60	733.33
1987	756.32	3.00	3.38	(0.38)	(14.00)	(19.00)	0.00	760.38	(4.06)	759.57		785.02	739.75
1988	834.07	5.90	3.38	2.52	(13.00)	(18.00)	0.60	834.79	(0.72)	789.33		834.79	789.52
1989	778.89	4.12	3.38	0.73	(12.00)	(17.00)	0.00	782.69	(3.80)	772.87		797.87	752.60
1990	778.97	3.21	3.38	(0.17)	(11.00)	(16.00)	0.00	781.43	(2.46)	780.44		804.29	759.02
1991	778.29	4.70	3.38	1.31	(10.00)	(15.00)	(0.40)	771.60	6.70	796.01		781.82	736.55
1992	852.52	1.88	3.38	(1.50)	(9.00)	(14.00)	1.00	855.20	(2.68)	793.06		869.37	844.10
1993	790.00	0.58	3.38	(2.81)	(8.00)	(13.00)	0.00	778.29	11.72	813.68		823.56	778.29
1994	772.15	3.76	3.38	0.37	(7.00)	(12.00)	(0.50)	775.62	(3.47)	805.11		793.86	748.59
1995	819.45	2.07	3.38	(1.32)	(6.00)	(11.00)	0.25	821.89	(2.44)	812.57		854.46	809.19
1996	807.29	2.38	3.38	(1.00)	(5.00)	(10.00)	0.00	812.89	(5.60)	815.83		842.83	797.56
1997	807.00	3.30	3.38	(0.09)	(4.00)	(9.00)	(0.25)	809.06	(2.07)	825.79		831.19	785.92
1998	840.67	2.07	3.38	(1.31)	(3.00)	(8.00)	0.25	841.17	(0.50)	833.78		873.73	828.46
1999	817.10	3.48	3.38	0.10	(2.00)	(7.00)	(0.25)	823.49	(6.39)	834.31		844.04	798.76
2000	865.25	4.93	3.38	1.55	(1.00)	(6.00)	0.00	860.28	4.97	852.09		868.52	823.25
2001	885.83	2.73	3.38	(0.65)	0.00	(5.00)	0.50	884.12	1.51	855.06		911.06	865.79
2002	870.49	6.42	3.38	3.04	0.00	(4.00)	0.00	866.04	4.46	844.70		861.63	816.36
2003	836.98	4.50	3.38	1.11	0.00	(3.00)	0.00	836.39	0.59	827.52		848.32	803.05
2004	804.82	2.08	3.38	(1.31)	0.00	(2.00)	0.00	802.51	2.31	815.93		835.02	789.74
2005	783.10	3.52	3.38	0.14	0.00	(1.00)	(0.20)	787.04	(3.95)	796.37		807.28	761.99
2006	806.62	3.92	3.38	0.53	0.00	0.00	0.20	805.98	0.65	787.65	787.00	822.85	777.58
2007		3.38	3.38	0.00	0.00	1.00	0.00				779.70	796.06	748.82
2008		3.38	3.38	0.00	0.00	2.00	0.00				780.39	781.78	756.51
							1.6						

5.00	0.46	3.50%	0.05		0.985463
OPENING	GAIN	DRAINED	NEEDS		R-Bar/SQ

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.994035188
R Square	0.988105956
Adjusted R Square	0.985462835
Standard Error	4.749126247
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	33726.705	8431.676	373.84062	4.71294E-17
Residual	18	405.9756	22.5542		
Total	22	34132.68			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	787.0049481	3.295001	238.8482	5.7327E-33	780.0824078	793.9274884	780.082408	793.927488
DNSHORT	8.499711847	0.7497308	11.33702	1.2529E-09	6.924585805	10.07483789	6.9245858	10.0748379
TREND2001	19.73101487	0.9614828	20.52144	6.1739E-14	17.71101441	21.75101532	17.7110144	21.7510153
TREND2006	-13.30832653	0.837862	-15.88367	4.928E-12	-15.06860928	-11.54804378	-15.068609	-11.5480438
DUMMIES	72.23648283	3.1224443	23.13459	7.6944E-15	65.67647076	78.7964949	65.6764708	78.7964949

Schedule 6-6

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST LOUIS QUARTERLY RESIDENTIAL CUSTOMERS WEATHER RESPONSE
2006 2000

YYYY	GCD(Old Cus)	SHORT	NSHORT	DNSHORT	Trend 2006	old swaps	Regressio n Line	Residual	Dummy Adj	Wx Adjusted	wx adjusted 2006
1984											
1985											
1986											
1987											
1988											
1989	GCD(Old Cus)	SHORT	NSHORT	DNSHORT	Trend 2006	old swaps	Regressio n Line	Residual	Dummy Adj	Wx Adjusted	wx adjusted 2006
1990	278.8	5.82	6.43	-0.81	(16.0)	0.0	279.01	(0.16)	272	284.59	
1991	293.7	8.21	6.43	1.78	(15.0)	(1.0)	293.52	0.18	290	284.49	
1992	290.5	6.47	6.43	0.04	(14.0)	1.5	289.38	1.11	278	284.99	
1993	256.1	3.06	6.43	-3.37	(13.0)	(1.0)	256.00	0.09	254	283.54	
1994	286.0	6.48	6.43	0.05	(12.0)	1.0	286.85	(0.86)	278	282.15	
1995	274.5	5.38	6.43	-1.04	(11.0)	0.0	275.18	(0.67)	270	281.91	
1996	277.2	5.26	6.43	-1.17	(10.0)	1.0	277.29	(0.09)	269	282.06	
1997	279.9	6.67	6.43	0.24	(9.0)	(1.0)	279.97	(0.11)	280	281.60	
1998	264.1	4.01	6.43	-2.42	(8.0)	0.0	264.04	0.06	261	281.34	
1999	287.2	7.14	6.43	0.71	(7.0)	0.5	287.63	(0.39)	283	280.45	
2000	274.5	5.74	6.43	-0.68	(6.0)	(0.5)	273.80	0.73	273	281.14	
2001	281.5	6.63	6.43	0.20	(5.0)	0.0	281.43	0.10	279	280.08	
2002		6.42	6.43	-0.01	(4.0)	0.0	279.46				279.54
2003		4.92	6.43	-1.51	(3.0)	0.0	268.38				279.11
2004		6.26	6.43	-0.16	(2.0)	0.0	277.52				278.67
2005		8.09	6.43	1.66	(1.0)	0.0	290.08				278.24
2006		6.40	6.43	1.98	0.0	0.0	291.87				277.81
2007		[illegible]	[illegible]	-0.00	1.00						277.32
2008		[illegible]	[illegible]	0.00	2.00						276.84

5	0.42	0.02	0.07		
Opening	Gain	Drained	Needs		

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.998727792
R Square	0.997457202
Adjusted R Square	0.996503652
Standard Error	0.633064955
Observations	12

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	1257.6764	419.2255	1046.04678	1.02779E-10
Residual	8	3.2061699	0.400771		
Total	11	1260.8826			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	277.8073654	0.5906415	470.3485	4.6752E-19	276.4453436	279.1693871	276.445344	279.169387
DNSHORT	7.117339526	0.1385295	51.37779	2.2818E-11	6.797889903	7.436789149	6.7978899	7.43678915
Trend 2006	-0.433580785	0.0529765	-8.184096	3.7058E-05	-0.555749322	-0.311412248	-0.5557493	-0.31141225
old swaps	3.464836968	0.2289808	15.13156	3.6011E-07	2.936806331	3.992867606	2.93680633	3.99286761

Schedule 6-7

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
ST LOUIS QUARTERLY COMMERCIAL CUSTOMERS WEATHER RESPONSE
2006 2000

YYYY	GCD(Old Cus)	SHORT	NSHORT	DNSHORT	Trend 1993	Trend 2006	i94567	old swaps	Regression Line	Residual	Dummy Adj	Wx&Dummy Adjusted	wx adjusted 2006	Hot&Dry: 1988	Cool&Wet: 1993
1984															
1985															
1986															
1987															
1988															
1989	GCD(Old Cus)	SHORT	NSHORT	DNSHORT	Trend 1993	Trend 2006	i94567	old swaps	Regression Line	Residual	Dummy Adj	Wx & Dummy Adjusted	wx adjusted 2006	Hot&Dry: 1988	Cool&Wet: 1993
1990	1,114.8	5.62	6.43	-0.81	(3.00)	(16.00)	-	-	1,114.73	0.07	1,114.80	1,130.12		1,195.09	1,066.11
1991	1,157.3	8.21	6.43	1.78	(2.00)	(15.00)	-	1.00	1,157.41	(0.07)	1,123.06	1,089.24		1,154.22	1,025.24
1992	1,015.0	8.47	6.43	0.04	(1.00)	(14.00)	-	(1.00)	1,015.06	(0.07)	1,049.30	1,048.49		1,113.47	984.49
1993	947.8	3.06	6.43	-3.37	-	(13.00)	-	-	943.81	4.01	947.83	1,011.83		1,076.80	947.83
1994	870.3	8.48	6.43	0.05	-	(12.00)	0.70	-	874.30	(3.95)	1,014.14	1,013.15		1,078.13	949.15
1995	944.3	5.38	6.43	-1.04	-	(11.00)	1.00	-	944.03	0.31	1,008.90	1,026.70		1,091.68	962.70
1996	955.7	5.26	6.43	-1.17	-	(10.00)	1.00	-	950.91	4.77	1,018.24	1,040.45		1,105.42	976.45
1997	984.7	6.67	6.43	0.24	-	(9.00)	1.00	-	987.02	(2.31)	1,047.27	1,042.66		1,107.63	978.85
1998	1,000.7	4.01	6.43	-2.42	-	(8.00)	-	-	1,008.25	(7.57)	1,000.68	1,046.68		1,111.66	982.68
1999	1,078.4	7.14	6.43	0.71	-	(7.00)	-	-	1,077.03	1.37	1,078.40	1,064.91		1,129.89	1,000.91
2000	1,059.4	5.74	6.43	-0.68	-	(6.00)	-	-	1,059.62	(0.38)	1,059.44	1,072.45		1,137.43	1,008.45
2001	1,089.8	6.83	6.43	0.20	-	(5.00)	-	-	1,085.99	3.82	1,089.81	1,085.94		1,150.91	1,021.93
2002	[redacted]				-	(4.00)	-	-	1,091.18			1,091.41	1,091.41	1,156.39	1,027.40
2003					-	(3.00)	-	-	1,072.01				1,100.06	1,165.07	1,036.69
2004					-	(2.00)	-	-	1,109.89				1,109.98	1,174.98	1,045.90
2005					-	(1.00)	-	-	1,100.47				1,119.27	1,184.35	1,055.27
2006					-	-	-	-	1,128.06				1,128.06	1,193.93	1,064.94
2007		6.43	6.43			1.00			1,137.84				1,137.84	1,202.82	1,073.84
2008		6.43	6.43			2.00			1,147.13				1,147.13	1,212.11	1,083.13

	Max h2o Gain	Drainage Rate	H2O Needs (in)
5.00	0.42	2.00%	0.07

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.998812169
R Square	0.99762575
Adjusted R Square	0.995647208
Standard Error	4.722544727
Observations	12

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	56226.9508	11245.39	504.222869	6.75967E-08
Residual	6	133.814572	22.30243		
Total	11	56360.7652			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1128.556084	5.73483634	196.7896	1.1618E-12	1114.523425	1142.588703	1114.52342	1142.5887
DNSHORT	18.99475737	1.16939319	15.97012	3.6277E-06	16.08441706	21.90509768	16.0844171	21.9050977
Trend 1993	-50.03232554	2.82068944	-17.73637	2.0633E-06	-56.93479333	-43.12985775	-56.9347933	-43.1298577
Trend 2006	9.287662428	0.68442833	13.56996	9.9372E-06	7.612928643	10.96239821	7.61292664	10.9623982
i94567	-62.58540957	3.74549503	-16.70418	2.9383E-06	-71.73030573	-53.40051342	-71.7303057	-53.4005134
old swaps	34.29099836	3.53666417	9.695859	6.9056E-05	25.63709292	42.94490381	25.6370929	42.9449038

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR JOPLIN RESIDENTIAL CUSTOMERS

2006 2000

YYYY	GCD Regression Line	Backcast GCD	Observed Customers	Customers Regression Line	Backcast Customers	Forecast Customers	Observed & Projected Customers	Projected GCD	Mgallons From Cust & GCD Regression Lines	Backcast Mgallons	Projected Mgallons	Normal Weather GCD	Normal Weather Mgallons (Observed Customers)	Weather Adjusted GCD	Weather Adjusted Mgallons	Spitznagel Normal GCD	Spitznagel Normal Mgallons	SHORT	NSHORT	DNSHORT	TREND2006	TREND2000	DUMMIES
1971		178.03			11,107		11,107	178.03		722,250	722,250							3.61	2.91	0.70	(35.00)	(29.00)	0
1972		182.50			11,369		11,369	182.50		757,833	757,833							4.25	2.91	1.34	(34.00)	(28.00)	0
1973		170.96			11,631		11,631	170.96		726,274	726,274							1.97	2.91	-0.94	(33.00)	(27.00)	0
1974		177.42			11,893		11,893	177.42		770,694	770,694							2.97	2.91	0.06	(32.00)	(26.00)	0
1975		177.64			12,155		12,155	177.64		788,631	788,631							2.83	2.91	-0.08	(31.00)	(25.00)	0
1976		178.95			12,417		12,417	178.95		802,509	802,509							2.53	2.91	-0.38	(30.00)	(24.00)	0
1977		175.58			12,679		12,679	175.58		813,080	813,080							2.10	2.91	-0.81	(29.00)	(23.00)	0
1978		180.11			12,941		12,941	180.11		851,315	851,315							2.75	2.91	-0.16	(28.00)	(22.00)	0
1979		176.68			13,203		13,203	176.68		851,969	851,969							1.95	2.91	-0.96	(27.00)	(21.00)	0
1980		197.46			13,464		13,464	197.46		971,096	971,096							5.55	2.91	2.64	(26.00)	(20.00)	0
1981		183.39			13,726		13,726	183.39		919,451	919,451							2.81	2.91	-0.10	(25.00)	(19.00)	0
1982		184.82			13,988		13,988	184.82		944,297	944,297							2.89	2.91	-0.01	(24.00)	(18.00)	0
1983		191.15			14,250		14,250	191.15		994,936	994,936							3.87	2.91	0.96	(23.00)	(17.00)	0
1984	192.06		14,320	14,512			14,320	192.06	1,004,646		1,004,646	186.65	977,319					3.66	2.91	0.95	(22.00)	(16.00)	0
1985	186.60		14,559	14,774			14,559	186.60	992,265		992,265	187.63	996,621					2.88	2.91	-0.22	(21.00)	(15.00)	0
1986	187.19		14,820	15,036			14,820	187.19	1,013,236		1,013,236	188.61	1,022,009					2.61	2.91	-0.29	(20.00)	(14.00)	0
1987	188.82		15,172	15,298			15,172	188.82	1,046,371		1,046,371	189.76	1,051,692					2.73	2.91	-0.17	(19.00)	(13.00)	0
1988	196.77		15,634	15,560			15,634	196.77	1,123,627		1,123,627	190.76	1,089,290					4.00	2.91	1.09	(18.00)	(12.00)	0
1989	188.07		15,951	15,822			15,951	188.07	1,095,718		1,095,718	191.73	1,117,039					2.24	2.91	-0.67	(17.00)	(11.00)	0
1990	188.63		16,142	16,084			16,142	188.63	1,112,098		1,112,098	192.71	1,136,169					2.17	2.91	-0.74	(16.00)	(10.00)	0
1991	208.29		16,319	16,346			16,319	200.44	1,241,518		1,194,710	193.69	1,154,445					4.14	2.91	1.23	(15.00)	(9.00)	0.2
1992	181.33		16,661	16,607			16,661	185.26	1,103,476		1,127,372	194.66	1,184,590					1.20	2.91	-1.71	(14.00)	(8.00)	-0.1
1993	176.63		17,038	16,869			17,038	186.41	1,099,206		1,172,513	195.64	1,217,496					1.59	2.91	-1.31	(13.00)	(7.00)	-0.3
1994	198.38		17,330	17,131			17,330	198.38	1,255,671		1,255,671	196.61	1,244,511					3.23	2.91	0.32	(12.00)	(6.00)	0
1995	194.96		17,716	17,393			17,716	194.96	1,261,541		1,261,541	197.59	1,278,540					2.43	2.91	-0.48	(11.00)	(5.00)	0
1996	199.19		17,935	17,655			17,935	199.19	1,304,855		1,304,855	198.57	1,300,781					3.02	2.91	0.11	(10.00)	(4.00)	0
1997	209.15		18,091	17,917			18,091	193.44	1,382,008		1,278,226	199.54	1,318,525	215.25	1,422,308	185.77	1,227,525	1.80	2.91	-1.11	(9.00)	(3.00)	0.4
1998	196.70		18,262	18,179			18,262	200.63	1,312,023		1,338,213	200.52	1,337,456	196.59	1,311,265	185.77	1,239,088	2.93	2.91	0.02	(8.00)	(2.00)	-0.1
1999	200.41		18,458	18,441			18,458	200.41	1,351,126		1,351,126	201.49	1,358,439	201.49	1,358,439	185.77	1,252,433	2.71	2.91	-0.20	(7.00)	(1.00)	0
2000	207.58		18,626	18,703			18,626	207.58	1,412,219		1,412,219	202.47	1,377,442	202.47	1,377,442	185.77	1,263,832	3.84	2.91	0.93	(6.00)	0.00	0
2001	200.34		18,862	18,965			18,862	200.34	1,380,169		1,380,169	197.62	1,361,444	197.62	1,361,444	185.77	1,279,811	3.40	2.91	0.49	(5.00)	0.00	0
2002	191.30		19,092	19,227			19,092	199.15	1,334,036		1,368,800	192.77	1,344,276	184.82	1,289,513	185.77	1,295,466	4.07	2.91	1.16	(4.00)	0.00	-0.2
2003	181.81		19,194	19,488			19,194	189.66	1,274,545		1,329,599	187.92	1,317,402	180.07	1,262,348	185.77	1,302,338	3.22	2.91	0.32	(3.00)	0.00	-0.2
2004	191.53		19,667	19,750			19,667	181.71	1,375,767		1,305,255	183.07	1,315,016	192.86	1,386,526	185.77	1,334,421	2.66	2.91	-0.25	(2.00)	0.00	0.25
2005	183.44		19,945	20,012			19,945	183.44	1,338,310		1,338,310	178.22	1,298,293	178.22	1,298,293	185.77	1,353,307	3.86	2.91	0.95	(1.00)	0.00	0
2006	224.22		20,251	20,274		20,251	20,251	184.95	1,658,431		1,388,004	173.37	1,282,326	212.63	1,572,753	185.77	1,374,058	5.02	2.91	2.11	0.00	0.00	1
2007	[illegible]					[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]			185.77	[illegible]	[illegible]	2.91	0.00	1.00	0.00	0
2008	[illegible]					[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]			185.77	[illegible]	[illegible]	[illegible]	0.00	2.00	0.00	0.00

Schedule 7-1

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR JOPLIN COMMERCIAL CUSTOMERS

YYYY	GCD Regression Line	Backcast GCD	Observed Customers	Customers Regression Line	Backcast Customers	Projected Customers	Mgallons From Cust & GCD Regression Lines	Backcast Mgallons	Projectd GCD (Hist Wx, Projected Customers)	Projectd Mgallons (Hist Wx, Projected Customers)	Normal Weather GCD (Projected Customers)	Normal Weather Mgallons (Projected Customers)	Weather Adjusted GCD	Weather Adjusted Mgallons	Spitznagel Normal GCD	Spitznagel Normal Mgallons (Smoothed Customers)	Spitznagel Normal Mgallons (Observed Customers)	SHORT	NSHORT	DNSHORT	SHIFT	DUMMIES
1971		864.87			2,111	2,111		666,929										3.61	2.91	0.70	0.00	0.00
1972		869.00			2,134	2,134		677,338										4.25	2.91	1.34	0.00	0.00
1973		854.18			2,157	2,157		672,884										1.97	2.91	-0.94	0.00	0.00
1974		860.88			2,180	2,180		685,153										2.97	2.91	0.06	0.00	0.00
1975		859.78			2,202	2,202		691,882										2.83	2.91	-0.08	0.00	0.00
1976		857.81			2,225	2,225		697,126										2.53	2.91	-0.38	0.00	0.00
1977		855.03			2,248	2,248		701,970										2.10	2.91	-0.81	0.00	0.00
1978		859.24			2,271	2,271		712,572										2.75	2.91	-0.16	0.00	0.00
1979		854.02			2,293	2,293		715,338										1.95	2.91	-0.96	0.00	0.00
1980		877.48			2,316	2,316		742,276										5.55	2.91	2.64	0.00	0.00
1981		859.66			2,339	2,339		734,347										2.81	2.91	-0.10	0.00	0.00
1982		860.20			2,362	2,362		741,854										2.89	2.91	-0.01	0.00	0.00
1983		866.54			2,384	2,384		754,626										3.87	2.91	0.96	0.00	0.00
1984	864.46		2,407			2,407												3.86	2.91	0.95	0.00	0.00
1985	858.83		2,441			2,441												2.68	2.91	-0.22	0.00	0.00
1986	856.37		2,465			2,465												2.61	2.91	-0.29	0.00	0.00
1987	904.77		2,498			2,498												2.73	2.91	-0.17	1.00	0.00
1988	913.03		2,468			2,468												4.00	2.91	1.09	1.00	0.00
1989	901.57		2,370	2,370		2,370	780,332		862.87	746,834								2.24	2.91	-0.67	1.00	0.00
1990	901.07		2,406	2,406		2,406	791,938		859.28	755,206								2.17	2.91	-0.74	1.00	0.00
1991	913.91		2,397	2,397		2,397	800,104		856.08	749,478								4.14	2.91	1.23	1.00	0.00
1992	849.16		2,471	2,471		2,471	766,342		856.85	773,286	860.29	776,391						1.20	2.91	-1.71	0.00	0.00
1993	851.73		2,573	2,573		2,573	800,319		858.90	807,055	860.29	808,363						1.59	2.91	-1.31	0.00	0.00
1994	862.38		2,731	2,731		2,731	860,093		853.13	850,863	860.29	858,010						3.23	2.91	0.32	0.00	0.00
1995	851.18		2,848	2,848		2,848	891,664		868.87	903,722	860.29	894,800						2.43	2.91	-0.48	0.00	0.00
1996	861.03		2,966	2,966		2,966	932,807		858.47	930,039	860.29	932,009						3.02	2.91	0.11	0.00	0.00
1997	853.07		3,099	3,100		3,099	965,521		860.20	973,568	860.29	973,696	860.29	973,696	960.65	1,087,286	1,087,286	1.80	2.91	-1.11	0.00	0.00
1998	860.43		3,107	3,103		3,107	976,572		857.78	973,570	860.29	976,420	860.29	976,420	960.65	1,090,327	1,090,327	2.93	2.91	0.02	0.00	0.00
1999	859.01		3,097	3,106		3,097	971,569		856.47	968,719	860.29	973,042	860.29	973,042	960.65	1,088,555	1,088,555	2.71	2.91	-0.20	0.00	0.00
2000	866.35		3,115	3,109		3,115	985,743		862.22	981,051	860.29	976,855	860.29	976,855	960.65	1,093,046	1,093,046	3.84	2.91	0.93	0.00	0.00
2001	862.51		3,118	3,111		3,118	983,490		859.46	978,878	860.29	979,824	860.29	979,824	960.65	1,094,128	1,094,128	3.40	2.91	0.49	0.00	0.00
2002	867.86		3,108	3,114		3,108	985,134		860.14	976,379	860.29	976,660	860.29	976,550	960.65	1,090,473	1,090,473	4.07	2.91	1.16	0.00	0.00
2003	862.35		2,922			3,117	981,773		855.35	973,796	860.29	979,427	860.29		960.65	1,093,656	1,025,268	3.22	2.91	0.32	0.00	0.00
2004	856.68		2,780			3,120	976,458		859.25	979,102	860.29	980,293	860.29		960.65	1,094,652	975,297	2.66	2.91	-0.25	0.00	0.00
2005	866.47		2,735			3,122	988,207		856.78	977,153	860.29	981,159	860.29		960.65	1,095,619	959,712	3.86	2.91	0.95	0.00	0.00
2006	874.01		2,721			3,125	997,684		858.58	980,069	860.29	982,024	860.29		960.65	1,096,585	954,829	5.02	2.91	2.11	0.00	0.00
2007	860.29		2,721			[illegible]	[illegible]		860.29	[illegible]	860.29	[illegible]			960.65	[illegible]	[illegible]	2.91	2.91	0.00	0.00	0.00
2008	860.29		[illegible]			3,131	[illegible]		860.29	[illegible]	860.29	[illegible]			960.65	[illegible]	[illegible]	2.91	2.91	0.00	0.00	0.00

Schedule 7-2

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST CHARLES RESIDENTIAL CUSTOMERS

YYYY	GCD Regression Line	Projected Customers	Mgal Regression Line	Weather Adjusted GCD	Weather Adjusted Mgal	Projected GCD	Projectd Mgal	Forecast Adjusted GCD	Forecast Adjusted Mgal	Spitznagel Normal GCD	Projected Spitznagel Normal Mgallons	Projected GCD 1988 Weather	Projected Mgal 1988 Weather	Projected GCD 1993 Weather	Projected Mgal 1993 Weather	SHORT	NSHORT	DNSHORT	Dummies
1971	264.32	1,972	204,837	273.63	197,139	264.32	204,837									7.37	6.19	1.18	0.00
1972	280.20	2,747	281,107	273.63	274,524	280.20	281,107									6.92	6.19	0.73	0.00
1973	271.75	3,521	349,480	273.63	351,908	271.75	349,480									5.98	6.19	-0.21	0.00
1974	262.65	4,295	412,067	273.63	429,292	262.65	412,067									4.97	6.19	-1.22	0.00
1975	270.18	5,070	500,285	273.63	506,677	270.18	500,285									5.81	6.19	-0.38	0.00
1976	283.69	5,844	605,517	273.63	584,061	283.69	605,517									7.30	6.19	1.11	0.00
1977	276.35	6,618	668,003	273.63	661,446	276.35	668,003									6.49	6.19	0.30	0.00
1978	275.53	7,392	743,947	273.63	738,830	275.53	743,947									6.40	6.19	0.21	0.00
1979	282.68	8,167	843,211	273.63	816,215	282.68	843,211									7.19	6.19	1.00	0.00
1980	292.15	8,941	954,068	273.63	893,599	292.15	954,068									8.24	6.19	2.05	0.00
1981	256.31	9,715	909,506	273.63	970,984	256.31	909,506									4.27	6.19	-1.92	0.00
1982	253.91	10,489	972,789	273.63	1,048,368	253.91	972,789									4.00	6.19	-2.19	0.00
1983	280.82	11,264	1,154,511	273.63	1,125,753	280.82	1,154,511									6.96	6.19	0.77	0.00
1984	279.78	12,038	1,230,176	273.63	1,203,137	279.78	1,230,176					298.52	1,312,567	247.37	1,087,671	6.87	6.19	0.68	0.00
1985	260.09	12,846	1,220,327	266.56	1,250,715	267.16	1,253,505					298.52	1,400,668	247.37	1,160,676	5.47	6.19	-0.72	(0.35)
1986	280.67	13,738	1,408,354	273.63	1,373,044	280.67	1,408,354					298.52	1,497,927	247.37	1,241,271	6.97	6.19	0.78	0.00
1987	296.33	15,033	1,627,092	278.69	1,530,206	291.28	1,599,359					298.52	1,639,128	247.37	1,358,278	8.14	6.19	1.96	0.25
1988	313.68	15,919	1,823,837	288.79	1,679,127	298.52	1,735,733					298.52	1,735,733	247.37	1,438,331	8.95	6.19	[redacted]	0.75
1989	279.79	16,489	1,685,101	278.69	1,678,429	274.74	1,654,682					298.52	1,797,902	247.37	1,489,848	6.31	6.19	0.12	0.25
1990	252.16	17,005	1,566,196	253.43	1,574,071	272.37	1,691,680					298.52	1,854,136	247.37	1,536,447	6.05	6.19	-0.14	(1.00)
1991	280.85	17,530	1,798,212	273.63	1,752,043	280.85	1,798,212					298.52	1,911,398	247.37	1,583,898	6.99	6.19	0.80	0.00
1992	275.01	18,113	1,819,404	273.63	1,810,303	275.01	1,819,404					298.52	1,974,957	247.37	1,636,566	6.34	6.19	0.15	0.00
1993	237.27	18,768	1,626,507	263.53	1,808,528	247.37	1,695,755					298.52	2,046,384	247.37	1,695,755	3.28	6.19	[redacted]	(0.50)
1994	282.26	19,609	2,021,572	283.74	2,032,175	272.15	1,949,221	273.63	1,959,824	270.55	1,937,733	298.52	2,138,078	247.37	1,771,738	6.02	6.19	-0.16	0.50
1995	274.20	21,025	2,105,678	283.74	2,176,915	264.10	2,028,103	273.63	2,101,340	270.55	2,077,654	298.52	2,292,485	247.37	1,899,672	5.13	6.19	-1.06	0.50
1996	272.24	22,182	2,205,680	283.74	2,298,811	262.14	2,123,836	273.63	2,216,967	270.55	2,191,978	298.52	2,418,609	247.37	2,004,202	4.92	6.19	-1.27	0.50
1997	274.59	23,160	2,322,779	283.74	2,400,161	264.48	2,237,327	273.63	2,314,728	270.55	2,288,637	298.52	2,525,261	247.37	2,092,581	5.17	6.19	-1.01	0.50
1998	255.13	24,007	2,237,165	273.63	2,399,413	255.13	2,237,165	273.63	2,399,413	270.55	2,372,367	298.52	2,617,648	247.37	2,169,138	4.14	6.19	-2.05	0.00
1999	283.13	24,755	2,559,968	273.63	2,474,110	283.13	2,559,968	273.63	2,474,110	270.55	2,446,222	298.52	2,699,139	247.37	2,236,667	7.24	6.19	1.05	0.00
2000	259.70	25,423	2,411,556	263.53	2,447,126	269.80	2,505,360	273.63	2,540,929	270.55	2,512,288	298.52	2,772,036	247.37	2,297,073	5.76	6.19	-0.42	(0.50)
2001	264.88	26,028	2,518,167	263.53	2,505,339	274.98	2,614,202	273.63	2,601,374	270.55	2,572,051	298.52	2,837,978	247.37	2,351,717	6.34	6.19	0.15	(0.50)
2002	277.55	26,580	2,694,576	273.63	2,656,556	277.55	2,694,576	273.63	2,656,556	270.55	2,626,611	298.52	2,898,179	247.37	2,401,603	6.62	6.19	0.43	0.00
2003	244.08	27,088	2,414,896	253.43	2,507,427	264.28	2,614,788	273.63	2,707,318	270.55	2,676,802	298.52	2,953,559	247.37	2,447,494	5.15	6.19	-1.04	(1.00)
2004	257.65	27,558	2,593,431	258.46	2,601,796	272.80	2,745,953	273.63	2,754,317	270.55	2,723,271	298.52	3,004,832	247.37	2,489,982	6.10	6.19	-0.09	(0.75)
2005	284.57	27,996	2,909,897	273.63	2,798,072	284.57	2,909,897	273.63	2,798,072	270.55	2,766,532	298.52	3,052,567	247.37	2,529,537	7.40	6.19	1.21	0.00
2006	287.41	28,406	3,085,716	283.74	2,943,809	287.31	2,980,908	**273.63**	**2,839,002**	270.55	2,807,001	298.52	3,097,219	247.37	2,566,539	7.70	6.19	1.52	0.50
2007	273.63	28,790	2,877,440	273.63	2,877,440	273.63	2,877,440	273.63	2,877,440	270.55	2,845,018	298.52	3,139,110	247.37	2,601,287	6.19	6.19	0.00	0.00
2008	273.63	29,183	2,919,699	273.63	2,919,699	273.63	2,919,699	273.63	2,919,699	270.55	2,886,659	298.52	3,179,710	247.37	2,664,004	6.19	6.19	0.00	0.00

Schedule 7-3

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216

PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST CHARLES COMMERCIAL CUSTOMERS

YYYY	GCD Regression Line	Projected Customers	Mgal Regression Line (Projected Customers)	Weather Adjusted GCD	Weather Adjusted Mgal	Projected Acutal GCD	Projected Actual Mgal (Projected Customers)	Forecast Wx Adjusted GCD	Forecast Wx Adjusted Mgal	Spitznagel Normal GCD	Projected Spitznagel Normal Mgallons	Projected GCD 1988 Weather	Projected Mgal 1988 Weather	Projected GCD 1993 Weather	Projected Mgal 1993 Weather	SHORT	NSHORT	DNSHORT	
1971																14.00	12.52	1.48	-11.00
1972																13.73	12.52	1.21	-11.00
1973																12.34	12.52	-0.18	-11.00
1974																10.89	12.52	-1.63	-11.00
1975																11.99	12.52	-0.52	-11.00
1976																13.91	12.52	1.39	-11.00
1977																13.25	12.52	0.74	-11.00
1978																12.90	12.52	0.38	-11.00
1979																13.96	12.52	1.45	-11.00
1980																15.70	12.52	3.19	-11.00
1981																9.75	12.52	-2.76	-11.00
1982																9.56	12.52	-2.95	-11.00
1983																13.60	12.52	1.08	-11.00
1984	1456.70	368	195,590	1,442	193,623	1,374	184,494	1,359.42	182,527			1416.80	190,232	1298.40	174,335	13.48	12.52	0.96	-11.00
1985	1259.88	439	201,836	1,277	204,542	1,343	215,074	1,359.42	217,781			1416.80	226,974	######	208,006	11.41	12.52	-1.11	-11.00
1986	1298.48	489	231,911	1,277	228,035	1,381	246,670	1,359.42	242,794			1416.80	253,043	######	231,896	13.94	12.52	1.42	-11.00
1987	1401.79	528	270,368	1,359	262,195	1,402	270,368	1,359.42	262,195			1416.80	273,263	######	250,427	15.29	12.52	2.78	-11.00
1988	1416.80	560	289,785	1,359	278,047	1,417	289,785	1,359.42	278,047			1416.80	289,785	######	265,567	16.28	12.52	[redacted]	-11.00
1989	1325.98	587	284,282	1,326	284,363	1,359	291,369	1,359.42	291,450			1416.80	303,753	######	278,368	12.49	12.52	-0.02	-11.00
1990	1351.28	610	301,246	1,359	303,060	1,351	301,246	1,359.42	303,060			1416.80	315,853	######	289,457	11.98	12.52	-0.53	-11.00
1991	1384.00	631	316,966	1,359	313,301	1,384	316,966	1,359.42	313,301			1416.80	326,526	######	299,238	14.13	12.52	1.61	-11.00
1992	1358.08	649	322,146	1,359	322,462	1,358	322,146	1,359.42	322,462			1416.80	336,074	######	307,988	12.43	12.52	-0.09	-11.00
1993	1314.93	686	319,924	1,378	334,770	1,298	315,903	1,359.42	330,748			1416.80	344,710	######	315,903	8.52	12.52	[redacted]	-11.00
1994	1371.22	681	341,250	1,376	342,427	1,355	337,137	1,359.42	338,314	1,215.55	302,510	1416.80	352,595	######	323,129	12.21	12.52	-0.31	-11.00
1995	1167.29	695	296,477	1,194	303,296	1,333	338,454	1,359.42	345,273	1,215.55	308,733	1416.80	359,848	######	329,776	10.76	12.52	-1.76	-11.00
1996	1383.04	704	355,622	1,414	363,691	1,317	338,623	1,348.31	346,692	1,215.55	312,554	1405.70	361,447	######	331,002	10.46	12.52	-2.06	-10.00
1997	1360.45	745	375,765	1,403	381,990	1,314	357,769	1,337.21	363,994	1,215.55	330,877	1394.60	379,615	######	347,385	11.02	12.52	-1.50	-9.00
1998	1284.45	783	367,128	1,326	379,035	1,284	367,128	1,326.11	379,035	1,215.55	347,434	1383.50	395,437	######	361,595	9.79	12.52	-2.73	-8.00
1999	1336.03	814	397,255	1,315	391,006	1,336	397,255	1,315.01	391,006	1,215.55	361,432	1372.39	408,088	######	372,863	13.89	12.52	1.38	-7.00
2000	1276.98	841	392,437	1,287	395,633	1,294	397,517	1,303.91	400,712	1,215.55	373,558	1361.29	418,347	######	381,960	11.83	12.52	-0.68	-6.00
2001	1335.09	865	422,043	1,326	419,125	1,302	411,594	1,292.81	408,676	1,215.55	384,254	1350.19	426,816	######	389,367	13.12	12.52	0.60	-5.00
2002	1262.03	887	408,880	1,249	404,545	1,295	419,590	1,281.70	415,255	1,215.55	393,822	1339.09	433,847	######	395,486	13.39	12.52	0.88	-4.00
2003	1219.16	907	403,672	1,238	409,760	1,252	414,616	1,270.60	420,705	1,215.55	402,477	1327.99	439,706	######	400,502	11.31	12.52	-1.20	-3.00
2004	1285.03	924	433,834	1,284	433,586	1,260	425,465	1,259.50	425,216	1,215.55	410,378	1316.89	444,590	######	404,616	12.56	12.52	0.05	-2.00
2005	1257.77	941	432,154	1,224	420,416	1,283	440,672	1,248.40	428,933	1,215.55	417,647	1305.78	448,650	######	407,969	14.75	12.52	2.24	-1.00
2006	1300.14	956	453,907	1,262	440,624	1,275	445,252	**1,237.30**	**431,969**	1,215.55	424,377	1294.68	452,004	######	410,667	15.01	12.52	2.49	0.00
2007	1228.20	970	434,413	1,228	434,413	1,228	434,413	1,228.20	434,413	1,215.55	430,032	1283.58	454,744	######	412,756	8.19	12.52	0.00	1.00
2008	1215.09	983	436,339	1,215	436,339	1,215	436,339	1,215.09	436,339	1,215.55	436,503	1272.48	456,948	######	414,427	8.19	12.52	0.00	2.00

Schedule 7-4

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST JOSEPH RESIDENTIAL CUSTOMERS

YYYY	GCD Regression Line	Backcast GCD	Observed Customers	Customers Regression Line	Projected Customers	Backcast Customers	Forecast Customers	Mgallons From Cust & GCD Regression Lines	Projected GCD	Projected Mgallons	Backcast Mgallons	Normal Weather GCD
1971		188.50			21,185	21,185			188.50	1,458,525	1,458,525	
1972		182.50			21,345	21,345			182.50	1,422,838	1,422,838	
1973		181.56			21,506	21,506			181.56	1,426,137	1,426,137	
1974		189.56			21,666	21,666			189.56	1,500,085	1,500,085	
1975		187.36			21,827	21,827			187.36	1,493,700	1,493,700	
1976		192.84			21,988	21,988			192.84	1,548,669	1,548,669	
1977		185.16			22,148	22,148			185.16	1,497,870	1,497,870	
1978		184.21			22,309	22,309			184.21	1,501,013	1,501,013	
1979		181.59			22,470	22,470			181.59	1,490,304	1,490,304	
1980		192.55			22,630	22,630			192.55	1,591,559	1,591,559	
1981		182.65			22,791	22,791			182.65	1,520,439	1,520,439	
1982		178.46			22,951	22,951			178.46	1,496,001	1,496,001	
1983		188.02			23,112	23,112			188.02	1,587,227	1,587,227	
1984	186.5		23,362	23,273	23,273			1,591,887	186.56	1,585,790		185.37
1985	178.9		23,551	23,433	23,433			1,521,696	181.13	1,550,241		185.47
1986	177.7		23,871	23,594	23,594			1,537,103	182.01	1,568,494		185.56
1987	184.3		23,733	23,754	23,754			1,598,085	184.36	1,598,521		185.65
1988	204.8		23,878	23,915	23,915			1,788,361	194.26	1,698,663		185.74
1989	194.6		24,066	24,076	24,076			1,710,985	188.31	1,655,934		185.84
1990	185.3		24,193	24,236	24,236			1,637,785	185.34	1,640,716		185.93
1991	194.6		24,227	24,397	24,397			1,722,835	190.47	1,697,257		186.02
1992	181.0		25,362	25,370	25,370			1,678,935	181.02	1,677,442		186.11
1993	176.7		26,281	26,343	26,343			1,696,151	176.70	1,700,165		186.21
1994	187.5		26,436	26,504	26,504			1,810,981	187.55	1,815,609		186.30
1995	181.9		26,653	26,664	26,664			1,771,198	181.94	1,771,934		186.39
1996	183.0		26,813	26,825	26,825			1,793,037	183.06	1,793,811		186.48
1997	186.21		26,958	26,986	26,986			1,834,201	186.28	1,838,091		186.58
1998	179.1		27,105	27,146	27,146			1,773,439	179.13	1,776,119		183.58
1999	180.9		27,250	27,307	27,307			1,800,705	180.92	1,804,487		180.58
2000	195.5		27,592	27,467	27,467			1,970,246	182.83	1,834,191		177.59
2001	159.7		27,743	27,628	27,628			1,618,345	172.38	1,739,549		174.59
2002	175.5		27,822	27,789	27,789			1,783,759	181.87	1,845,942		171.60
2003	166.1		27,957	27,949	27,949			1,716,986	172.37	1,759,637		168.60
2004	163.3		28,111	28,110	28,110			1,678,683	161.19	1,654,905		165.61
2005	167.3		28,212	28,270	28,270			1,724,008	163.08	1,683,938		162.61
2006	182.5		28,489	28,431	28,431		28,489	1,899,489	161.42	1,678,235		159.62
2007	[illegible]				[illegible]		[illegible]		[illegible]	[illegible]		[illegible]
2008	[illegible]				[illegible]		[illegible]		[illegible]	[illegible]		[illegible]

YYYY	Normal Weather Mgallons (Observed Customers)	Weather Adjusted GCD	Weather Adjusted Mgallons	Dummy Adjusted GCD	Dummy Adjusted Mgallons	Spitznagel Normal GCD	Spitznagel Normal Mgallons	SHORT	NSHORT	DNSHORT	Dummies	TREND02	TREND07
1971								4.66	3.38	1.28	0.00	-31.00	-26
1972								2.86	3.38	-0.52	0.00	-30.00	-25
1973								2.56	3.38	-0.83	0.00	-29.00	-24
1974								4.89	3.38	1.51	0.00	-28.00	-23
1975								4.22	3.38	0.83	0.00	-27.00	-22
1976								5.81	3.38	2.42	0.00	-26.00	-21
1977								3.51	3.38	0.13	0.00	-25.00	-20
1978								3.20	3.38	-0.18	0.00	-24.00	-19
1979								2.40	3.38	-0.98	0.00	-23.00	-18
1980								5.61	3.38	2.23	0.00	-22.00	-17
1981								2.66	3.38	-0.72	0.00	-21.00	-16
1982								1.40	3.38	-1.99	0.00	-20.00	-15
1983								4.19	3.38	0.81	0.00	-19.00	-14
1984	1,581,789							3.73	3.38	0.35	0.00	-18.00	-13
1985	1,595,381							2.10	3.38	-1.28	(0.20)	-17.00	-12
1986	1,604,309							2.34	3.38	-1.05	(0.20)	-16.00	-11
1987	1,609,313							3.00	3.38	-0.38	0.00	-15.00	-10
1988	1,619,951							5.90	3.38	2.52	0.50	-14.00	-9
1989	1,633,518							4.12	3.38	0.73	0.30	-13.00	-8
1990	1,642,944							3.21	3.38	-0.17	0.00	-12.00	-7
1991	1,648,082							4.70	3.38	1.31	0.20	-11.00	-6
1992	1,724,072							1.88	3.38	-1.50	0.00	-10.00	-5
1993	1,767,408							0.58	3.38	-2.81	0.00	-9.00	-4
1994	1,798,859							3.76	3.38	0.37	0.00	-8.00	-3
1995	1,814,631							2.07	3.38	-1.32	0.00	-7.00	-2
1996	1,826,334							2.38	3.38	-1.00	0.00	-6.00	-1
1997	1,837,081	186.58	1,837,081	186.28	1,834,201	158.31	1,558,741	3.30	3.38	-0.09	0.00	-5.00	0
1998	1,817,472	183.58	1,817,472	179.13	1,773,439	158.31	1,567,265	2.07	3.38	-1.31	0.00	-4.00	0
1999	1,797,338	180.58	1,797,338	180.92	1,800,705	158.31	1,575,611	3.48	3.38	0.10	0.00	-3.00	0
2000	1,768,737	190.26	1,917,472	182.83	1,842,511	158.31	1,585,410	4.93	3.38	1.55	0.60	-2.00	0
2001	1,769,188	161.92	1,640,735	172.38	1,746,779	158.31	1,604,131	2.73	3.38	-0.65	(0.60)	-1.00	0
2002	1,743,778	185.26	1,879,378	181.87	1,846,159	158.31	1,606,709	6.42	3.38	3.04	(0.30)	0.00	0
2003	1,721,653	184.38	1,876,512	172.37	1,760,127	158.31	1,618,515	4.50	3.38	1.11	(0.20)	1.00	0
2004	1,700,403	167.72	1,722,093	161.19	1,654,994	158.31	1,625,438	2.08	3.38	-1.31	0.10	2.00	0
2005	1,675,641	186.84	1,719,177	163.08	1,680,472	158.31	1,631,274	3.52	3.38	0.14	0.20	3.00	0
2006	1,660,930	180.74	1,680,746	161.42	1,679,673	158.31	1,647,295	3.92	3.38	0.53	1.00	4.00	0
2007	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.00	0
2008	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.00	0

Schedule 7-5

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216
PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST JOSEPH COMMERCIAL CUSTOMERS

YYYY	GCD Regression Line (Adj Cust)	Backcast GCD	Projected GCD	Projected Commercial Customers	Customers Regression Line	Backcast Customers	Forecast Customers	Projected Customers	Mgallons From Cust & GCD Regression Lines	Backcast Mgallons	Projected Mgallons (Projected Customers)	Normal Weather GCD (Projected Customers)	Normal Weather Mgallons (Projected Customers)	Weather Adjusted GCD	Weather Adjusted Mgallons	Spitznagel Normal GCD	Spitznagel Normal Mgallons	SHORT	NSHORT	DNSHORT	TREND2001	TREND2006	Dummies
1971		671.72	671.72			3.142		3.142		770,882	770.882							4.66	3.38	1.28	(30.0)	(35.0)	0.00
1972		662.86	662.86			3,142		3,142		760,705	760,705							2.86	3.38	-0.52	(29.0)	(34.0)	0.00
1973		666.66	666.66			3.142		3,142		765,091	765.091							2.56	3.38	-0.83	(28.0)	(33.0)	0.00
1974		692.96	692.96			3,142		3.142		796,250	796.250							4.89	3.38	1.51	(27.0)	(32.0)	0.00
1975		693.63	693.63			3.142		3.142		796,026	796.026							4.22	3.38	0.83	(26.0)	(31.0)	0.00
1976		713.56	713.56			3.142		3,142		818,914	818.914							5.81	3.38	2.42	(25.0)	(30.0)	0.00
1977		700.49	700.49			3.142		3.142		803,889	803.889							3.51	3.38	0.13	(24.0)	(29.0)	0.00
1978		704.30	704.30			3,142		3.142		808,263	808.263							3.20	3.38	-0.18	(23.0)	(28.0)	0.00
1979		703.90	703.90			3.142		3,142		807,811	807.811							2.40	3.38	-0.98	(22.0)	(27.0)	0.00
1980		737.63	737.63			3.142		3.142		846,510	846.510							5.61	3.38	2.23	(21.0)	(26.0)	0.00
1981		718.95	718.95			3.142		3.142		825,078	825.078							2.66	3.38	-0.72	(20.0)	(25.0)	0.00
1982		714.61	714.61			3.142		3.142		820,095	820.095							1.40	3.38	-1.99	(19.0)	(24.0)	0.00
1983		744.63	744.83			3.142		3.142		854,774	854.774							4.19	3.38	0.81	(18.0)	(23.0)	0.00
1984	776.23		747.33	3,158				3.158	885.347		862.018	744.36	856,590	773.26	891.919			3.73	3.38	0.35	(17.0)	(22.0)	0.40
1985	739.86		739.86	3,142				3.142	849.098		849.098	750.78	861,611	750.78	861.611			2.10	3.38	-1.28	(16.0)	(21.0)	0.00
1986	746.29		748.29	3,120				3.120	852.741		852.741	757.21	862,897	757.21	862.897			2.34	3.38	-1.05	(15.0)	(20.0)	0.00
1987	760.38		760.38	3,139				3,139	871,786		871.786	763.63	875,516	763.63	875.516			3.00	3.38	-0.38	(14.0)	(19.0)	0.00
1988	834.79		791.45	3,137				3,137	958.491		906.830	770.05	882,317	813.39	931.978			5.90	3.38	2.52	(13.0)	(18.0)	0.80
1989	782.69		782.69	3,138				3,138	897,086		897.086	776.47	889,960	776.47	889.960			4.12	3.38	0.73	(12.0)	(17.0)	0.00
1990	781.43		781.43	3,138				3.138	895.545		895,545	782.90	897,226	782.90	897.226			3.21	3.38	-0.17	(11.0)	(16.0)	0.00
1991	771.60		800.48	3,121				3,121	879,439		912.372	789.32	899,637	760.43	866.704			4.70	3.38	1.31	(10.0)	(15.0)	(0.40)
1992	855.20		782.96	3,144				3.144	982.142		899.183	795.74	913,860	867.96	996.819			1.88	3.38	-1.50	(9.0)	(14.0)	1.00
1993	778.29		776.29	3,174				3.174	902,272		902.272	802.17	929,953	802.17	929.953			0.58	3.38	-2.81	(8.0)	(13.0)	0.00
1994	775.62		811.74	3,185				3,185	902,261		944,266	808.59	940,596	772.47	898.563			3.76	3.38	0.37	(7.0)	(12.0)	(0.50)
1995	821.89		803.83	3,175				3,175	953.020		932.080	815.01	945,043	833.07	965.963			2.07	3.38	-1.32	(6.0)	(11.0)	0.25
1996	812.89		812.89	3,190				3.190	947,265		947.265	821.43	957,216	821.43	957.216			2.38	3.38	-1.00	(5.0)	(10.0)	0.00
1997	809.06		827.12	3,172				3,172	937,308		958.230	827.86	959,081	809.80	938.159	833.22	965,299	3.30	3.38	-0.09	(4.0)	(9.0)	(0.25)
1998	841.17		823.11	3,149				3.149	987.371		946.603	834.28	959,450	852.34	980.218	833.22	958,236	2.07	3.38	-1.31	(3.0)	(8.0)	0.25
1999	823.49		841.55	3,156				3.156	949.183		969.978	840.70	968,998	822.64	948.183	833.22	960,379	3.48	3.38	0.10	(2.0)	(7.0)	(0.25)
2000	860.28		860.28	3,168				3.168	995,305		995.305	847.12	980,086	847.12	980.086	833.22	964,006	4.93	3.38	1.55	(1.0)	(6.0)	0.00
2001	884.12		848.00	3,175				3.175	1,025,335		983.447	853.55	989,863	889.66	1,031,771	833.22	966,313	2.73	3.38	-0.66	0.0	(5.0)	0.50
2002	866.04		866.04	3,156	3,165			3,165	998,226		998.226	840.24	968,490	840.24	968.490	833.22	960,404	6.42	3.38	3.04	0.0	(4.0)	0.00
2003	836.39		836.39	3,121	3,107			3.107	953.570		953.570	826.93	942,781	826.93	942,781	833.22	949,855	4.50	3.38	1.11	0.0	(3.0)	0.00
2004	802.51		802.51	3.066	3,050			3.050	898.456		898.456	813.62	910,892	813.62	910,892	833.22	932,837	2.08	3.38	-1.31	0.0	(2.0)	0.00
2005	787.04		801.49	3,007	2,992			2,992	864,511		880.380	800.31	879,087	765.67	863.218	833.22	915,236	3.52	3.38	0.14	0.0	(1.0)	(0.20)
2006	805.98		791.53	2,950	2,934		2,934	2,934	868.282		852.718	787.00	847,844	801.45	863.408	833.22	897,635	3.92	3.38	0.53	0.0	0.0	0.20
2007	775.50		771.10	2,877			2,877	2,877			[illegible]	[illegible]	[illegible]			833.22	[illegible]	3.38	3.38	0.00	0.0	1.0	0.00
2008	760.39		760.89	2,819			2,819	2,819			762,870	760.38	762,870			833.22	[illegible]	3.38	3.38	0.00	0.0	[illegible]	0.00

Schedule 7-6

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216

PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST LOUIS QUARTERLY RESIDENTIAL CUSTOMERS

YYYY	Staff Forecast GCD (Normal Wx, Old+New Cus Behavior)	Staff Forecast GCD (Hist Wx, Old+New Cus Behavior)	Historical Old Customer Count + Est New Cust Count (Smoothed 1993 Fwd)	Staff Forecast Mgal (Normal Wx, Old+New Cus, Old+New Cus Behaviors)	Staff Forecast Mgal (Hist Wx, Old+New Cus, Old+New Cus Behaviors)	SHORT	NSHORT	DNSHORT	MAWC Wx Normalized GCD	MAWC Cust Count, No Smoothing	Forecast MWAC MGAL (Spitz N Wx, Spitz Cus Count)	Backcast MWAC MGAL (Spitz N Wx, Smoothed Old + New Cus Count)
1970						5.68	6.43	-0.75				
1971	285.18	292.89	272,751	28,410,139	29,178,453	7.51	6.43	1.08				
1972	285.18	290.96	272,751	28,410,139	28,985,833	7.24	6.43	0.81				
1973	285.18	282.02	272,751	28,410,139	28,095,944	5.98	6.43	-0.44				
1974	285.18	281.57	272,751	28,410,139	28,050,279	5.92	6.43	-0.51				
1975	285.18	273.84	272,751	28,410,139	27,280,356	4.83	6.43	-1.59				
1976	285.18	298.21	272,751	28,410,139	29,708,080	8.26	6.43	1.83				
1977	285.18	289.91	272,751	28,410,139	28,881,710	7.09	6.43	0.67				
1978	285.18	283.78	272,751	28,410,139	28,271,276	6.23	6.43	-0.20				
1979	285.18	290.37	272,751	28,410,139	28,927,643	7.16	6.43	0.73				
1980	285.18	300.12	272,751	28,410,139	29,898,937	8.53	6.43	2.10				
1981	285.18	272.28	272,751	28,410,139	27,125,556	4.62	6.43	-1.81				
1982	285.18	271.57	272,751	28,410,139	27,054,546	4.52	6.43	-1.91				
1983	285.18	289.92	272,751	28,410,139	28,882,074	7.09	6.43	0.67				
1984	285.18	288.03	272,751	28,410,139	28,693,925	6.83	6.43	0.40				
1985	285.18	276.28	272,751	28,410,139	27,524,074	5.18	6.43	-1.25				
1986	285.18	291.28	272,751	28,410,139	29,018,418	7.28	6.43	0.86				
1987	285.18	298.02	272,751	28,410,139	29,689,113	8.23	6.43	1.80				
1988	285.18	309.53	272,751	28,410,139	30,835,633	9.85	6.43	3.42				
1989	285.18	285.25	272,751	28,410,139	28,417,268	6.44	6.43	0.01				
1990	284.74	279.01	272,751	28,366,945	27,795,195	5.62	6.43	-0.81				
1991	284.31	296.98	275,713	28,631,260	29,907,274	8.21	6.43	1.78				
1992	283.88	284.18	278,976	28,925,925	28,956,708	6.47	6.43	0.04				
1993	283.44	259.46	281,574	29,150,745	26,684,341	3.06	6.43	-3.37				
1994	283.01	283.38	284,617	29,420,731	29,459,326	6.48	6.43	0.05				
1995	282.58	275.16	286,978	29,619,288	28,841,628	5.38	6.43	-1.04	260.68	285,443	27,178,070	27,324,207
1996	282.14	273.82	288,906	29,772,597	28,894,597	5.26	6.43	-1.17	260.68	288,512	27,470,258	27,507,844
1997	281.71	283.44	290,537	29,894,632	30,078,121	6.67	6.43	0.24	260.68	290,306	27,641,119	27,663,107
1998	281.28	264.04	291,949	29,993,741	28,155,693	4.01	6.43	-2.42	260.68	289,530	27,567,257	27,797,601
1999	280.84	285.90	293,195	30,075,314	30,616,605	7.14	6.43	0.71	260.68	293,280	27,924,308	27,916,234
2000	280.41	275.53	294,310	30,143,034	29,619,045	5.74	6.43	-0.68	260.68	294,286	28,020,045	28,022,355
2001	279.98	281.43	295,318	30,199,528	30,356,156	6.63	6.43	0.20	260.68	295,906	28,174,316	28,118,352
2002	274.88	274.80	317,590	31,885,554	31,876,201	6.42	6.43	-0.01	260.68	317,639	30,243,619	30,238,927
2003	274.32	263.78	319,124	31,975,124	30,746,410	4.92	6.43	-1.51				
2004	273.78	272.64	320,545	32,053,970	31,920,974	6.26	6.43	-0.16	260.68	320,881	30,552,279	30,520,302
2005	273.25	284.88	321,868	32,123,559	33,490,840	8.09	6.43	1.66	260.68	321,347	30,596,601	30,646,237
2006	272.72	286.53	323,105	32,185,076	33,814,060	8.40	6.43	1.98	260.68	318,372	30,313,343	30,764,041
2007	272.20	272.20	324,267	32,239,485	32,239,485	6.43	6.43	0.00	260.68	318,372	30,313,343	30,874,701
2008	271.69	271.69	325,363	32,287,600	32,287,600	6.43	6.43	0.00	260.68	318,372	30,313,343	30,979,034

Schedule 7-7

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216

PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST LOUIS QUARTERLY COMMERCIAL CUSTOMERS

YYYY	Staff Forecast GCD (Normal Wx, Old+New Cus Behavior)	Staff Forecast GCD (Hist Wx, Old+New Cus Behavior)	Proj. Old Customer Count + Proj New Cust Count (Smoothed	Staff Forecast Mgal (Normal Wx, Old+New Cus, Old+New Cus Behaviors)	Staff Forecast Mgal (Hist Wx, Old+New Cus,	SHORT	NSHORT	DNSHORT	MAWC Wx Normalized GCD	MAWC Cust Count, No Smoothing	Forecast MWAC MGAL (Spitz N Wx, Spitz Cus Count)	Backcast MWAC MGAL (Spitz N Wx, Smoothed Old + New Cus Count)
1970						0.00	0.00	0.00				
1971	1130.05	1150.63	14,366	5,929,683	6,037,685	7.51	6.43	1.08				
1972	1130.05	1145.47	14,366	5,929,683	6,010,608	7.24	6.43	0.81				
1973	1130.05	1121.63	14,366	5,929,683	5,885,517	5.98	6.43	-0.44				
1974	1130.05	1120.41	14,366	5,929,683	5,879,097	5.92	6.43	-0.51				
1975	1130.05	1099.78	14,366	5,929,683	5,770,869	4.83	6.43	-1.59				
1976	1130.05	1164.82	14,366	5,929,683	6,112,135	8.26	6.43	1.83				
1977	1130.05	1142.68	14,366	5,929,683	5,995,972	7.09	6.43	0.67				
1978	1130.05	1126.33	14,366	5,929,683	5,910,163	6.23	6.43	-0.20				
1979	1130.05	1143.91	14,366	5,929,683	6,002,428	7.16	6.43	0.73				
1980	1130.05	1169.93	14,366	5,929,683	6,138,963	8.53	6.43	2.10				
1981	1130.05	1095.64	14,366	5,929,683	5,749,109	4.62	6.43	-1.81				
1982	1130.05	1093.74	14,366	5,929,683	5,739,127	4.52	6.43	-1.91				
1983	1130.05	1142.69	14,366	5,929,683	5,996,023	7.09	6.43	0.67				
1984	1130.05	1137.65	14,366	5,929,683	5,969,575	6.83	6.43	0.40				
1985	1130.05	1106.31	14,366	5,929,683	5,805,129	5.18	6.43	-1.25				
1986	1130.05	1146.35	14,366	5,929,683	6,015,189	7.28	6.43	0.86				
1987	1130.05	1164.31	14,366	5,929,683	6,109,468	8.23	6.43	1.80				
1988	1130.05	1195.03	14,366	5,929,683	6,270,635	9.85	6.43	3.42				
1989	1130.05	1130.24	14,366	5,929,683	5,930,685	6.44	6.43	0.01				
1990	1130.05	1114.73	14,366	5,929,683	5,849,312	5.62	6.43	-0.81				
1991	1164.34	1198.16	14,784	6,287,382	6,469,988	8.21	6.43	1.78				
1992	1055.01	1055.82	14,968	5,767,831	5,772,239	6.47	6.43	0.04				
1993	1048.56	984.56	14,887	5,701,350	5,353,348	3.06	6.43	-3.37				
1994	964.02	965.01	15,065	5,304,458	5,309,910	6.48	6.43	0.05				
1995	954.54	934.74	15,203	5,300,502	5,190,553	5.38	6.43	-1.04	1,214.18	15,248	6,761,950	6,742,276
1996	963.83	941.62	15,316	5,391,856	5,267,632	5.26	6.43	-1.17	1,214.18	15,349	6,806,852	6,792,389
1997	973.11	977.73	15,412	5,477,770	5,503,746	6.67	6.43	0.24	1,214.18	15,420	6,838,339	6,834,758
1998	1044.97	998.97	15,494	5,913,827	5,653,487	4.01	6.43	-2.42	1,214.18	15,381	6,820,933	6,871,460
1999	1054.25	1067.74	15,567	5,994,498	6,071,200	7.14	6.43	0.71	1,214.18	15,587	6,912,289	6,903,834
2000	1063.54	1050.53	15,633	6,072,674	5,998,395	5.74	6.43	-0.68	1,214.18	15,619	6,926,591	6,932,793
2001	1072.83	1076.71	15,692	6,148,853	6,171,064	6.63	6.43	0.20	1,214.18	15,726	6,973,933	6,958,990
2002	1073.09	1072.68	17,541	6,875,017	6,872,423	6.42	6.43	-0.01	1,214.18	17,375	7,705,341	7,778,960
2003	1096.20	1038.39	17,648	7,066,089	6,693,453	4.92	6.43	-1.51				
2004	1119.98	1118.46	17,748	7,260,061	7,250,242	6.26	6.43	-0.16	1,214.18	17,651	7,827,630	7,870,713
2005	1144.35	1182.67	17,840	7,456,738	7,706,433	8.09	6.43	1.66	1,214.18	17,632	7,819,204	7,911,779
2006	1169.24	1264.07	17,927	7,655,947	8,276,884	8.40	6.43	1.98	1,214.18	18,372	8,147,601	7,950,193
2007	1194.61	1194.61	18,008	7,857,839	7,857,839	6.43	6.43	0.00	1,214.18	18,372	8,147,601	7,968,277
2008	1220.40	1220.40	18,085	8,061,378	8,061,378	6.43	6.43	0.00	1,214.18	18,372	8,147,601	8,020,299

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