BEFORE THE
TENNESSEE REGULATORY AUTHORITY

PREPARED DIRECT TESTIMONY
OF
PHILIP G. BUCHANAN

IN RE:
CHATTANOOGA GAS COMPANY
DOCKET NO. 06-00175

Q. Please state your name, position and business address.

A. Philip G. Buchanan, Consultant, Rates and Regulatory, AGL Services Company. My business address is Ten Peachtree Place, Suite 1000, Atlanta, Georgia 30309.

Q. Have you provided an outline of your educational background and professional experiences?

A. Yes. Attachment A to this testimony contains a summary of my educational background and professional experiences.

Q. Have you previously submitted testimony before the Tennessee Regulatory Authority or any other regulatory commission?

A. Yes. I provided testimony before the Tennessee Regulatory Authority ("TRA") in Docket No. 04-00034 on behalf of Chattanooga Gas Company ("CGC" or the "Company") and before the Georgia Public Service Commission in Docket No. 18638-U on behalf of Atlanta Gas Light Company.

Q. What is the purpose of your testimony?

A. I will support and describe the specific methods employed in developing the normalization of billing determinates and base revenue for the Test Year period ending December 31, 2005, and for the forecast of billing determinates and

base revenue for the Attrition Year period ending December 31, 2007 for Chattanooga Gas Company ("CGC" or "the Company"). The Attrition Year period forecast is the base from which the requested base revenue increase of $5.8M has been determined.

Q. Are you sponsoring any exhibits in connection with your testimony?

A. Yes, I am sponsoring the following exhibits:

- Exhibit PGB-1 – Test Year Actual and Normalized billing determinates and forecasted Attrition Year period billing determinates and base revenue
- Exhibit PGB-2 – Graph of Chattanooga Gas Company Retail Gas Prices
- Exhibit PGB-3 – Graph of Chattanooga Gas Company Residential Use Per Customer over time
- Exhibit PGB-4 – Residential and Commercial consumption equations and Forecast Pro graph of fit of the forecast model
- Exhibit PGB-5 – Customer Growth by class
- Exhibit PGB-6 – 1975 to 2005 Normal Heating Degree Days
- Exhibit PGB-7 – Breakout of the proposed Commercial C-2 customer class

Q. Were these exhibits and related schedules prepared by you or under your direct supervision?

A. Yes.

Q. How is your testimony organized?

A. Section 1 is a summary of the results of the Attrition Year period forecast of base revenues. Section 2 discusses CGC's approach to forecasting customers, consumption, and base revenue for the Attrition Year period. Section 3 discusses

the forecast of billing determinates and base revenue for the proposed Commercial C-2 customer class. Section 4 discusses the forecast of Other Revenues, and gas cost revenues. Finally, Section 5 reviews the difference between the proposed cost of service and the forecast of base revenue for the Attrition Year period.

Section 1

Q. Please summarize the results of CGC's Attrition Year period forecast.

A. CGC's base revenue for the Test Year period was $30.7M. When normalized for the most recent 30-year normal weather pattern and for natural gas prices expected in the 2007 Attrition Year period, normalized Test Year period base revenue is $29.0M. The normalization of Test Year period base revenue can be attributed to the following:

Test Year period base revenue	$30.7M
Update 30-year normal weather pattern	$(1.0M)
Update price variable	$(0.6M)
Adjust for Unbilled Revenue and Prior Period Adjustments	$(0.1M)
Normalized Test Year period Base Revenue	$29.0M

CGC's forecast of normalized customers, usage, and base revenue for the Attrition Year period is displayed in Exhibit PGB-1. The forecast of Attrition Year period base revenue is $28.5M. Forecasted Attrition Year period

Residential and Commercial new customer growth is expected to be 1,200 customers and 240 customers, respectively. Annual residential and commercial customer attrition rates are forecast at 1.93% and 2.4%, respectively. Attrition Year period Industrial customers and usage are expected to be similar to Test Year period levels. The forecasted decline in total base revenue in the Attrition Year period from pre-normalized 2005 levels can be attributed mainly to the updated normal weather pattern, higher than normal attrition rates in the Residential and Commercial customer classes, and increased declining use per customer due to (i) continued efficiency gains in gas equipment and building weatherization and (ii) conservation due to gas prices.

Q. The Company has not achieved the level of base revenues authorized in its 2004 rate case. How do you account for this?

A. Several factors may account for the Company not being able to achieve the level of base revenue that were projected in its last rate case. A major factor causing base revenue erosion is declining use per customer.

Q. Please explain.

A. Declining use per customer is a national phenomenon in the natural gas industry. Increases in appliance efficiency, reduced appliance saturation, and more efficient housing characteristics all contribute to natural gas customers using less gas annually. Bruce McDowell of the American Gas Association ("AGA") stated in a presentation at the AGA Public Affairs and Marketing Forum on April 23, 2003, that weather normalized use per residential customer has declined 21% in 21 years. CGC has experienced similar trends. Weather normalized annual use per

residential customer averaged 899 Ccfs in 1998. The weather normalized annual use per residential customer for the 2004 rate case Test Year period ending September 2003 was approximately 800 Ccfs. This indicates an annual average decline of 2% per year from 1998 to 2003.

Changes in normal weather patterns also have contributed to the decline in usage. 30-year normal weather has become warmer over time. Normal heating degree days were updated in this case to include average weather for the 30 years ending July 2005. For this period, the annual number of normal heating degree days is 3,287. This represents a decline in normal heating degree days of 138 (or 4%). Put another way, the most recent 30-year normal weather is 4% warmer than the weather pattern used to forecast usage and base revenue in the most recent CGC rate case. Warmer 30-year normal weather translates directly into lower usage, which decreases base revenue.

Recently, the price of natural gas also has affected customer usage. Conservation by residential and commercial customers has hastened the usage decline. In 2005, natural gas prices rose to a peak level of $1.43 per therm. Please see Exhibit PGB-2, which displays natural gas retail prices. Weather normalized use per residential customer in 2005 was 697 Dths. This indicates an annual average decline of 6% per year from 2003 to 2005, or 3 times the historical annual rate. Exhibit PGB-3 displays this decline in use per customer.

Q. What steps has the Company taken to address its base revenue erosion due to declining use per customer?

A. Clearly, conservation of natural gas resources is good policy. For the customer, conservation results in a lower total gas bill as the commodity portion makes up approximately 75% of the total gas bill. Conservation results in better management of our environment as we use less of our natural energy resources; however, conservation has a negative impact on the ability of the Company to recover the fixed costs of its distribution system. Under current rate design, the respective interests of the customer, the environment, and the Company are at odds. The Company is proposing a comprehensive rate design that will align better the interests of the customer and the Company. This proposal will be addressed in the testimony of Witness Daniel Nikolich.

Section 2

Q. Please discuss CGC's approach to forecasting demand and base revenues for the attrition year period.

A. Customers, usage, and base revenue are forecast using a multi-step process for each of the customer classes we serve. Each customer is classified as one of the following characters of service: Residential, Multi-Family R-4, General Service Commercial C-1, proposed General Service Commercial C-2, and Industrial. The next stage of the process includes four steps. First, consumption equations are developed that model consumption per customer for each of the customer classes.

The consumption for the Multi-Family R-4 and large industrial classes are forecast in a different manner, as will be described below. Second, the number of customers billed for each class is determined. Third, a consumption forecast for each class is calculated by applying the results of the consumption equations to the number of customers billed in the class. Fourth, a base-revenue forecast is generated by applying the class consumptions, along with other billing determinants, including customer service charges, to the existing rate structure.

Q. Is this the traditional manner in which CGC has developed its forecast?

A. The basic forecasting methods described in my testimony were employed by CGC in its 1998 base rate proceeding, and employed again for the 2004 base rate proceeding. On an on-going basis our methods are reviewed through activities such as variance analyses, and adjusted when required. This is an evolutionary process with the goal of continually improving forecast performance. New techniques are evaluated continually and are incorporated into the forecast models when they demonstrate improvement in forecast accuracy.

Q. How were the consumption equations developed for the Company's various customer classes?

A. Consumption equations were developed for the Residential and Commercial classes. Consumption for the Multi-Family and Industrial classes were forecasted on an individual customer basis.

For the Residential and Commercial classes, the Company employed statistical regression techniques, which correlated historical consumption with actual heating degree days, natural gas retail price, a time trend, and a cubic spline term

to develop models of gas usage per customer. The relationships between usage and actual heating degree days and between usage and price were the factors with the largest impact on usage.

Q. Please describe the relationship between each of the factors and use per customer.

A. A customer's usage depends on several factors. By quantifying the historical relationship between usage and these factors, an accurate forecast of usage can be made. The most obvious factor affecting usage is weather. Heating degree days are a measure of how cold the weather was when usage occurred. Usage has a direct relationship with the number of heating degree days.

Another factor affecting usage is the retail price of natural gas. Recently, natural gas prices have climbed to all time highs. As discussed above, customers have taken measures to conserve usage to lower their bill. Some customers simply lower their thermostat during cold weather to lower their consumption, while some supplement their energy needs with alternative sources such as kerosene or wood. Each of these actions results in lower gas usage when prices climb. Thus, it was important in the modeling process to establish the historical relationship between usage and price.

The relationship between usage and a time-trend factor takes into account the long-term declines in use per customer due to efficiency gains. Over time, homeowners of older homes replace inefficient natural gas equipment with new, more efficient models, lowering their natural gas usage. Homeowners also add insulation and weather stripping to make their home more efficient. New homes

are added to the system that have efficient natural gas equipment installed, lowering the average use per customer on CGC's system. This results in a decline in average use per customer per year over time.

The cubic spline term provides an adjustment for the non-linear relationship between usage and weather during transitional-weather months. The term provides adjustment only when the average daily temperature of the month is above 55°F. This adjustment is necessary to forecast more accurately usage in "shoulder months" when the relationship between usage and cold weather is not exactly the same as usage during warmer weather.

The models for forecasting use per customer for the Residential and Commercial customer classes in this proceeding take into account the effects of all of the above-discussed factors.

Q. Were these models then used to develop consumption equations?

A. Yes. The models employed 72 months of historical consumption, temperature, and price data, over the period January 2000 through December 2005. From these models, the consumption equations that are used to develop monthly average usage per customer for the Residential and Commercial classes were derived. The consumption equations can, in their most basic form, be broken down into a base-use component (non-temperature sensitive) and a heat-use component (temperature sensitive). Review of the output statistics, use of holdout periods (i.e., segmenting the dataset into two periods and using one subset to develop a model and the other to evaluate equation performance), and validation through "backcasting" (i.e., comparing actual historical results to the fitted values

generated by the statistical model) demonstrated the accuracy of the regression models selected. Please see Exhibit PGB-4 for the consumption equations that were developed and graphs of the validations of the models through backcasting.

Q. For the attrition year period, how was the number of customers billed in each class developed?

A. The number of customers billed by class for the Attrition Year period was developed as follows:

- The actual number of customers by class that were billed as of May 2006 was determined and used as the base starting point upon which new customer growth was added.

- A monthly forecast of new customers by class was developed in coordination with the Marketing and Engineering Departments, as well as reliance on historical trends.

- A seasonal pattern of changes in the number of active and inactive customers was developed from historical customer count data.

- A percentage of attrition (i.e., loss of customers due to building demolition, switch to use of alternative source of energy, business failures, etc.) was developed from historical customer count data.

- The aggregate number of customers by class by month was developed by adding the monthly growth projections, seasonal changes in customer patterns, and monthly attrition projections to the May 2006 starting point. Exhibit PGB-5 presents the monthly number of customers by class used to develop the normalized consumption and base revenues.

Q. How was consumption developed for the customer classes?

A. Consumption by class for those classes for which we employed consumption equations was developed by multiplying the projected number of customers billed in the class for each month by the usage per customer for the month. The usage per customer was developed by applying the consumption equation for the month with an input of expected natural gas prices and updated 30-year normal heating degree days for that month and multiplying by the number of average meter read days in the month.

Q. How were expected natural gas prices developed?

A. The wholesale futures price of natural gas during the Attrition Year period, as reported by NYMEX on June 15, 2006, were used as the basis to project retail price. Monthly wholesale futures prices from January 2007 through December 2007 were increased by the historical average difference between wholesale and retail prices to project retail price.

Q. How was consumption developed for the remaining classes?

A. For classes that were forecast by individual customer (Multi-Family R-4, I1/T1, I1/T2 + T1, L1, T1, and Special Contract), the monthly consumption for the class represents the aggregate of the individual customer forecasts. The forecast by individual customer was prepared by reviewing historical monthly consumption data and customer surveys with the Marketing Department, and correcting for future changes in demand resulting from customer expansions and contractions and customer loss.

Q. What heating degree-day pattern was applied to the consumption equations?

A. To develop a normalized consumption forecast for those classes where consumption equations were employed, it was necessary to develop a normal heating degree-day pattern for each day of the year. Heating degree-days are the difference between a base 65°F temperature and the average temperature for a day when that daily average is below the base temperature. The base-65°F heating degree-day pattern that was employed is presented in Exhibit PGB-6. It is based on 30 years of daily weather data (July 1, 1974 through June 30, 2005) as measured by the National Oceanic and Atmospheric Administration ("NOAA") for Chattanooga's Lovell Field ("KCHA"). This weather distribution then is adjusted for the Company's meter read schedule.

Although the base temperature that was found to have highest correlation with actual usage was 65°F, the base temperature of 55°F also had a high correlation with actual usage. Therefore, both base 65°F and base 55°F were incorporated into the multiple regression models.

Q. How were base revenues for the attrition year period developed?

A. The base revenues shown on Exhibit PGB-1 were developed by applying the forecasted, normalized consumption and number of customers billed by class for the Attrition Year period to a model of the existing rate structure of the Company's tariff.

Q. Were changes made to the forecast models that were used in the 2004 rate case?

A. As stated above, new techniques are evaluated continually in an attempt to improve forecast accuracy. In order to improve the performance of the models,

retail price, historic trend, and a cubic spline were introduced as a variable in the residential and commercial equations. These variables were not included in the 2004 forecast models. Next, an updated 30 Year Normal heating degree-day distribution was used to derive Attrition Year period base revenues. By updating the weather data to the most recent 30-year period available (1975 - 2005), usage and base revenue projections will be more likely to reflect the most recent 30 year trend in weather. Next, Weather Normalization Adjustment ("WNA") factors were updated using the new weather pattern and usage forecast. By updating WNA factors, customers' bills will be more likely to reflect levels of charges experienced at normal weather. Lastly, the customer count forecast is based on actual number of customers as of May 2006 and includes growth in residential and commercial accounts. These growth forecasts have been tempered by including the higher level of losses currently being experienced due to attrition. This combination of growth and attrition results in a net change of customers that is more reflective of system growth.

Q. Is the forecast model being filed as part of this proceeding?

A. Yes. The entire forecast model is being filed as part of the Minimum Filing Guidelines #s 29 and 34.

Section 3

Q. The Company has proposed to disaggregate the current commercial class into two classes, C-1 and C-2. Could you please discuss the process the

company employed to reclassify customers into the new service classification being proposed by the Company?

A. The proposed C-2 customer class consists of customers whose annual usage exceeds 4,000 therms per year. Usage data during the period of January 2000 through March 2006 was examined for all commercial customers. Approximately 1,729 commercial customers qualify for the proposed class. These customers then were used as the basis for the forecast of Commercial C-2 usage, Demand Units, and base revenue for the attrition year. Exhibit PGB-7 displays the details of the proposed Commercial C-2 customer class. All other commercial customers whose annual usage is less than 4,000 therms will remain on the current Commercial C-1 class.

Q. For the projected test year period, how was the number of customers billed in the proposed C-2 rate class developed?

A. The number of customers billed by proposed class for the Attrition Year period was developed as follows:

- As described above, qualifying customers as of December 2005 were assigned to the new C-2 rate class. From this data, the number of customers in the proposed class was determined and used as the base starting point upon which new customer growth was added.

- A monthly forecast of new customers was developed in coordination with the Marketing and Engineering Departments.

- A seasonal pattern of changes in the number of active and inactive customers was developed from historical customer count data.

- The aggregate number of customers by class by month was developed by adding the monthly growth projections and seasonal changes in customer patterns to the April 2006 starting point.

Q. How was consumption developed for the proposed customer class?

A. The 51 months of individual monthly customer billing records for customers who qualify for the proposed C-2 class were aggregated. This data then was used to generate use per customer for the new class in the same manner as for the existing rate classes. Then, as before, new customer load and new incremental load from existing customers were added.

Q. Is there any impact on the forecast resulting from the reclassification?

A. No. Exhibit PGB-1 presents the new forecast of customers, usage, and base revenue under current rates resulting from the reclassification. Exhibit PGB-7 presents the forecast of customers, usage, and base revenue of the total Commercial customer class, as well as the proposed C-1 and C-2 classes at current rates. As shown when the two exhibits are compared, there is no change in either the aggregate number of Commercial customers or volumes as a result of the reclassification.

Q. Under the proposed rate structure, the "demand unit" billing determinant has been introduced for customers who qualify for the proposed C-2 customer class. Please define this billing determinant.

A. Demand Units are a measure of the firm capacity on CGC's distribution system that is needed by the customer for use on a design day. In other words, the Demand Unit represents the customer's peak demand, measured in decatherms.

This demand factor is similar to the demand units that are used in the Company's Industrial classes' current rate structures. Exhibit PGB-7 presents the proposed Demand Unit quantities.

Q. How was the number of demand units determined for the class?

A. The Demand Units for each customer were determined by reviewing individual customer billing data for the past year and calculated in the manner described in the Company's proposed tariff. The individual customers' Demand Units then were aggregated to the C-2 class level. The calculation process is similar to that utilized by Atlanta Gas Light Company to calculate Dedicated Design Day Capacity ("DDDC") factors for its firm residential and commercial customers. The DDDC factor is a factor used to recover a portion of the costs of Atlanta Gas Light Company's distribution system from each customer, dependant on their respective design day requirements.

Q. Were demand units calculated for other classes of customers as well?

A. Yes. Demand Units were calculated for all firm residential and commercial customers, along with the firm requirements of the industrial customers. When aggregated by class, the Demand Units can be used to allocate design day capacity of the system. This allocation of design day capacity was used by Witness David Heintz in his Class Cost of Service Study.

Section 4

Q. Please list the sources of "other revenue."

A. Other Revenue items include revenue from turn-ons, meter sets, returned checks, reconnects, seasonal reconnects, late payment fees, damage billing, and jobbing.

Q. Please explain procedures used to calculate revenue associated with these charges.

A. Revenues associated with charges for turn-ons, meter sets, reconnects, seasonal reconnects, returned checks, damage billing, and jobbing were forecast in the same manner. The 12-month average number of occurrences (or revenue) for each charge was calculated for each month from March 2005 through February 2006. The 12-month average of these 12 months is the forecast for the Attrition Year period. For late payment revenue, the historical percentage of late payment revenue, as compared to base revenue, was calculated. The same percentage was applied to forecasted Attrition Year period base revenue to forecast late payment revenue.

Q. How were Purchase Gas Adjustment ("PGA") revenues projected?

A. The NYMEX wholesale futures price as of June 15, 2006 was adjusted to estimate PGA rates for the Attrition Year period. The projected PGA rates for each class then were applied to forecasted sales volumes to produce PGA revenue.

Q. What were the results of the attrition period base revenue and revenue forecast under current rates?

A. Total base revenue for the Attrition Year period under current rates is projected to be $28.5M, with total revenue (including gas costs) of $122.1M. Please see column 7 of Exhibit PGB-1 for a summary of attrition period base revenue under current rates.

Section 5

Q. What is the Company's base revenue requirement for the attrition period?

A. As discussed in the testimony of Witness Michael Morley, the Company proposes an attrition period base-revenue requirement of $34.4M.

Q. Are existing rates sufficient to recover the base revenue requirement?

A. No. The comparison of projected attrition period base revenue under current rates to the projected attrition period revenue requirement yields a base revenue deficiency of $5.8M. The proposed rates to recover Attrition Year period base-revenue requirement are discussed in the testimony of Witness Daniel Nikolich.

Q. Does this complete your testimony?

A. Yes, it does.

PHILIP G. BUCHANAN

Educational Background and Professional Experience

Mr. Philip G. Buchanan is a Rates and Regulatory Consultant for Atlanta Gas Light Company (AGLC) and is an employee of AGL Resources' wholly-owned subsidiary, AGL Services Company. He is responsible for providing rates and regulatory support for AGLC and Chattanooga Gas Company (CGC), with duties including administering the tariff rates, rules, and regulations for AGLC and CGC, managing AGLC's Dedicated Design Day Capacity annual calculation, managing CGC's Weather Normalization Adjustment Program, and providing expert testimony in rate proceedings.

Mr. Buchanan received a B.S. in Physics from the West Georgia College, Carrollton, GA, in 1988.

The following is a summary and timeline of Mr. Buchanan's professional experience:

- **AGL Services Company, Atlanta, Georgia**
  - Rates and Regulatory Consultant, December 2000 to present

- **Atlanta Gas Light Company, Atlanta, Georgia**
  - Rates and Regulatory Consultant, November 2000 to December 2000
    Provided budget and operation variance analysis for AGLC and CGC.

- **Atlanta Gas Light Company, Atlanta, Georgia**
  - Rates Analyst, September 1999 to November 2000
    Provided support for DDDC recalculation, revenue forecasting, and variance analysis. Provided support for customer service.

- **AGL Resources, Atlanta, Georgia**
  - Rates Analyst, May 1999 to September 1999
    Provided support for DDDC recalculation, revenue forecasting, and variance analysis.

- **Atlanta Gas Light Company, Atlanta, Georgia**
  - Field Service Representative, October 1988 to May 1999
    Provided AGLC field operation support.