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October 24, 2002

FILED[3]

NOV 20 2002

Missouri Public Service Commission

Secretary
Public Service Commission
P. O. Box 360
Jefferson City, MO 65102

RE: Case No. GR-2002-520 and GR-2001-461(Consolidated)

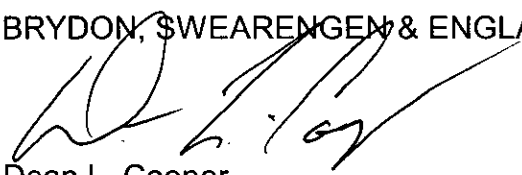
Dear Mr. Roberts:

Enclosed please find an original and eight copies of the Rebuttal Testimony of Karen S. Russell, Shawn Gillespie and Bruce B. Henning, filed on behalf of Aquila, Inc. Please file stamp the enclosed extra receipt copy and return to me for my records.

If you have any questions concerning this matter, then please do not hesitate to contact me. Thank you very much for your attention to this matter.

Sincerely,

BRYDON, SWEARENGEN & ENGLAND P.C.

By: 

Dean L. Cooper

DLC/tli
Enclosures
cc: Office of the Public Counsel
General Counsel

Exhibit No.:
Issues: Purchasing Practices
Witness: Bruce B. Henning
Exhibit Type: Rebuttal
Sponsoring Party: Aquila, Inc.
d/b/a Aquila Networks - MPS
Case No.: GR-2000-520
GR-2001-461 (Consolidated)
Date: November 20, 2002

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. GR-2000-520

CASE NO. GR-2001-461 (Consolidated)

REBUTTAL TESTIMONY

OF

BRUCE B. HENNING

ENERGY AND ENVIRONMENTAL ANALYSIS, INC.

ON BEHALF OF

AQUILA, INC

D/B/A AQUILA NETWORKS - MPS

JEFFERSON CITY, MISSOURI

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE MISSOURI

In the matter of Aquila Network-MPS' Purchase Gas Adjustment Factors to be Reviewed in its 1999-2000 Actual Cost Adjustment	))))	Case No. GR-2000-520
In the matter of Aquila Network-MPS' Purchase Gas Adjustment Factors to be Reviewed in its 2000-2001 Actual Cost Adjustment	))))	Case No. GR-2001-461

County of Arlington)
) ss
Commonwealth of Virginia)

AFFIDAVIT OF BRUCE B. HENNING

Bruce B. Henning, being of lawful age, on his oath states that the accompanying testimony titled "Rebuttal Testimony of Bruce B. Henning," that said testimony was prepared by him and under his direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, he would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of his knowledge, information and belief.

Bruce B. Henning

Subscribed and sworn to before me this 19th day of November, 2002.

Notary Public

My Commission expires:

January 31, 2004

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Rebuttal Testimony

Of

Bruce B. Henning

Energy and Environmental Analysis, Inc.

Aquila, Inc. d/b/a Aquila Networks - MPS

Case Nos. GR-2000-520 and GR-2001-461

Q. Please state your name and business address.

A. My name is Bruce B. Henning. My firm is located at 1655 North Fort Myer, Drive, Suite 600, Arlington, Virginia, 22209.

Q. Please state your educational background and professional experience regarding natural gas markets.

A. I have a Bachelor of Science in Economics from the Massachusetts Institute of Technology. Prior to my current position, I served as the Chief Economist for the American Gas Association. I was a member of the FERC Pipeline Competition Task Force and the NARUC Technical Advisors Group for Gas Integrated Resource Planning. I served as an instructor for Gas Rates Fundamentals at the University of Wisconsin and Advanced Ratemaking for Gas Utilities at the University of Maryland. For the past 24 years, I have been an analyst of natural gas and energy markets.

Q. What is your current position and by whom are you employed?

A. I am Director, Regulatory and Market Analysis with Energy and Environmental Analysis, Inc. EEA is a privately owned consulting firm that provides analysis to institutional, governmental, and private sector clients in the area of natural gas, electricity, transportation and related environmental issues and policy.

Q. Have you previously provided testimony before the Missouri Public Service Commission or other regulatory or legislative bodies?

A. Yes, I have provided written and oral testimony before the Missouri Public Service Commission ("Commission") in the matter of the Gas Supply Incentive Plan of Laclede Gas Company Case No. GT-2001-329. I also have provided affidavit testimony before the Federal Energy Regulatory Commission, testified before the United States Senate Committee on Energy and Natural Resources on the relationship between gas and electric markets in California and the Senate Committee on Governmental Affairs on the impact of the Enron bankruptcy on gas and electricity markets.

PURPOSE

Q. What is the purpose of your testimony?

A. I have been asked to review the Official Case File Memorandum dated July 9, 2001, prepared by Dave Sommerer, Phil Lock, and Lesa Jenkins submitted in this proceeding and the subsequent testimony of Mr. Lock, Ms. Jenkins, and Mr. Shawn Gillespie and provide my professional opinion regarding certain aspects. Specifically, I have been asked to focus on two issues: 1) Staff's selection of 30 percent of normal requirements as a minimum achievable level of hedging for the

2000-2001 ACA audit period; and, 2) Staff's analysis of the utilization of storage during the period from November 2000 through March 2001.

Q. Can you summarize your conclusions?

A. In both of these instances, I conclude that the Staff recommendation represents an unreasonable application of "twenty-twenty" hindsight and does not reflect the reasonableness of the Company's decisions and actions under the circumstances that existed at the time that each decision or action was taken.

Application of a 30 Percent Minimum Hedging Requirement

Q. What is your understanding of the Staff recommendation?

A. Staff recommends that the Commission order a reduction in the Company's gas costs because the Company had not hedged 30 percent of the normal requirements on the Eastern System. The recommendation is made despite the lack of any evidence that the Commission had given any indication that a minimum level of hedging was expected.

Q. Does it surprise you that hedging is a topic of discussion?

A. No. In the wake of the unprecedented increases in gas prices that occurred during the winter of 2000-2001, the subject of hedging gas supplies became a topic of discussion in many states and gatherings of state regulators such as NARUC meetings. I participated in seminars in North Carolina and Tennessee and at a Plenary session of the NARUC Summer Meeting in 2001 to explain the intricacies of hedging programs and the need for Gas Utilities and regulators to enter into discussions in advance of adopting hedging programs. I have included

(Schedule BBH-1) a presentation that I made at the NARUC Summer Meeting in Seattle.

Q. Is this discussion useful?

A. Yes. This continuing policy discussion is important and appropriate. Gas distribution companies and their regulators need to focus on measures that can be taken to manage gas price volatility.

Q. Have you reached any conclusions?

A. My conclusions are that a carefully defined hedging program developed by a Utility, with the regulatory approval of the scope and objectives of the program, can provide protection and value to Utility customers in the face of volatility. However, the appropriate level of hedging should be discussed by the Utility and regulators in advance of the winter heating season.

Q Was there a commonly accepted standard for a minimum hedging requirement prior to the winter of 2000-2001?

A. No. In the fall of 2000, I do not believe that there was any commonly accepted minimum level of hedging for winter gas supplies that Aquila should have followed without guidance from the Commission or Staff. To the contrary, few states had explicitly considered the issue in any detail. None of the material that I have reviewed in this proceeding leads me to believe that a minimum level representing prudent behavior had been established in Missouri.

Q. Does Staff provide any compelling support for the 30 percent minimum hedging requirement?

A. No. I do not believe that Staff provides compelling support. When asked "why Staff believes that 30 percent of normal requirements, as a minimum level of hedging for each month of November 2000 through 2001, is reasonable," Mr. Lock and Ms. Jenkins could not point to any contemporaneous evidence of a minimum level. Rather, they present arguments that, at their core, identify the arbitrary nature of the proposed 30 percent.

Q. What are the Staff arguments?

A. Mr. Lock cites the fact that "[g]as prices are generally lower from June to October than from November to March, but in any event, fixed prices would reduce volatility of gas prices... and therefore add price protection." The statement clearly identifies the quandary for a Utility and its regulators. Hedging should not be evaluated in terms of minimizing gas costs. Rather, hedging is a method of providing price stability and ensuring against unanticipated price increases. In four of the last six years, the cost of gas in the summer months plus the cost of storage has been higher than the cost of gas during the winter heating season. Ms. Jenkins states " that it could be argued that to mitigate price risks to customers, 100 percent of the warm month requirements should be hedged..." I agree. One could argue that level. However, one could also argue that a Utility should hedge nothing. The only way that customers can avail themselves of lower than expected prices is to be un-hedged.

In fact, Ms. Jenkins indicates that she adopts this theory in part when she indicates that the Staff wants "to allow the company some level in managing the price risk in warm weather (potential for falling prices)." This is Staff's stated rationale for

dismissing of the 100 percent level. In reality, one could argue for any other level between zero and 100 percent and that is precisely the problem. The 30 percent level is an arbitrary adjustment to the argument that the company should not subject consumers to volatile prices. Staff provides no substantive justification for why the choice of 30 percent is appropriate and why the minimum should be applied retroactively in the absence of guidance from the Commission or Staff. I believe that the reason that Staff cannot provide such a justification is simple. There is no single number that is inherently correct.

Q. Why is there no standard percentage for hedging that represents a "correct" minimum level?

A. Neither the Utility nor the state's regulators can know precisely how much of a gas supply portfolio should be hedged. This is because the appropriate amount of hedging is determined by the risk profile of the Utility's customers. As a result, the "correct" amount of hedging reflects the amount of additional costs that customers are willing to pay for stability in gas prices and insurance against unanticipated increases in gas prices. In a regulated market, the Commission should act on behalf of the Utility's customers to provide guidance in determining how much of the Utility gas supply portfolio should be hedged. The only way that a reasonable program can be designed is for the Utility and its regulators to define in advance the objectives and parameters of a hedging program.

Q. In your opinion, how should state regulators review hedging programs for prudence?

A. The standard for prudence in a hedging program should be the prudent implementation of an agreed upon strategy that is developed through "before the fact" interaction between the Utility and regulators. It is not reasonable for a Commission to hold a Utility to a standard that the Utility could not have anticipated.

Q. Is it reasonable for Staff to suggest that the Company was imprudent because the 30 percent minimum level was not achieved?

A. No. It is my understanding that Staff's proposed 30 percent threshold was not communicated to the Company before the planning process for the winter was completed. Indeed, it appears that the 30 percent level was only communicated well after end of the winter heating season. I have seen no indication that the Company received any guidance regarding the desire of Staff or the Commission to ensure than a particular amount of gas was purchased at a fixed price. It is clearly unreasonable to apply such a test after the fact.

Q. Should the Commission evaluate the amount of gas supply that is hedged based upon whether or not the hedging activity could lower gas costs?

A. No, that is not an appropriate basis for review.

Q. Why not?

A. A hedging program cannot ensure that gas costs are minimized. In fact, over the long-run, hedging will increase gas costs above the average market price because there are likely to be transaction costs, staffing costs, and additional accounting costs that result from a hedging program. In any given month or heating season, a fully hedged supply portfolio may have an average cost that is above or below the

prevailing market price. However, the expected value in the long-term is above the market price. In short, hedging isn't free. As a result, a Utility that chooses to hedge a large percentage of a supply portfolio, without the guidance of the state regulators, risks incurring additional costs for a product – price stability – that has not been approved by the Commission.

Q. Does the Staff recommendation in this case satisfy your idea of an appropriate hedging program?

A. No. The e*x post facto* Staff recommendation of 30 percent does not provide a basis for disallowance, nor does it provide the basis for a well designed hedging program. Implicit in the Staff argument is an ability to second-guess. In the Staff Memorandum, Staff states that "[T]he 30 percent of normal requirements minimum should not be viewed as an optimal level nor as precedent for future hedging levels, but only as a minimum level that was reasonable and attainable for the winter of 2000/2001." I agree that the 30 percent should not be viewed as optimal, but question how Aquila could have anticipated the minimal requirement in the absence of guidance from the Commission and/or Staff.

Q. What are the long-term implications of the Staff recommendations regarding 30 percent minimum hedging requirement?

A. Imposing an e*x post facto* minimum threshold could be detrimental to establishing a rational policy towards hedging in the state of Missouri. Regulatory risk should be clearly articulated. If there is some unstated minimum threshold, is there also an unstated maximum threshold? Would the Staff be permitted to argue that too much gas was hedged in a low price winter? A hedging policy should reflect the

value of stability in prices and the value of insurance that prices do not rise unexpectedly. The Staff recommendation does not focus on either of these legitimate objectives for hedging. Rather, the Staff recommendation focuses on whether the cost of gas would have been reduced in a particular winter season had alternative decisions been made. It is precisely this type of application of 20-20 hindsight that presents the greatest risk to the development of hedging effective programs that legitimately help to manage price volatility. Ultimately, consumers will be hurt by the application of this type of review because the imposition of unnecessary and unfair regulatory risk will increase the Utility's cost of capital, and as a result, increase consumer rates.

Use of Storage in the Southern System

Q. What is the role of storage in a Utility's gas supply portfolio?

A. Working gas placed into storage serves two purposes in a local distribution company's ("LDC") gas supply portfolio. The primary purpose is to provide a reliable source of gas during periods of cold weather. LDCs operate under a legal obligation to serve the gas requirements of their franchise customers, meeting the fluctuations in those requirements driven by variations in weather. A secondary purpose of storage is to provide a physical hedge against increases in natural gas prices. By buying gas supplies throughout the injection season, which is generally defined as the months from April through the end of October, storage gas purchases contribute to a degree of portfolio diversification for gas supply acquisition.

Q. Is the Staff recommendation for the review of the use of storage appropriate?

A. No. In my opinion, it is not appropriate or reasonable for a regulatory Commission to review the utilization of storage solely from the context of cost minimization. Nor is it appropriate to review the use of storage outside of the context of the information that was available at the time that each of the company's decisions were made. As discussed later, the application of a retrospective review of this sort would have the potential to create an incentive for future behavior that could threaten the reliability of gas service in future years. The application of this type of retrospective analysis of methods for gas cost minimization is particularly inappropriate for behavior during the winter of 2000-2001.

Q. Please provide a short description of the gas market conditions that existed during the winter of 2000-2001.

A. The winter of 2000-2001 represented an unprecedented confluence of market conditions for a "commoditized" gas market.[1] Schedule BBH-2 presents a time series of gas price data at Henry Hub. Gas market prices at Henry Hub are a commonly accepted reference point as an indicator of market conditions. Henry Hub is located on the Sabine pipeline system in Louisiana and is the trading point reference in the NYMEX natural gas futures contract. The graphic clearly shows the unusual nature of the gas market conditions during the period. During the storage injection season of 2000, natural gas prices were already quite high by historical standards. Summer gas requirements to meet the needs of a growing

[1] The restructuring of the U.S. gas market as implemented by the Federal Energy Regulatory Commission through FERC Order Nos. 436, 636, and 637 has resulted in the creation of a "commodity market" for natural gas where the price is determined by the balance of supply and demand in regional market locations.

gas-fire electricity generation sector were competing for the limited amount of gas productive capacity with gas supplies that were being injected into storage, resulting in substantial price increases. By the middle of June, spot prices at Henry Hub had risen above $4.00 per MMBtu. Nevertheless, LDCs purchased sufficient supplies of gas to inject into storage to reach the levels required by their winter gas supply portfolio plan to serve franchise customers. However, marketers' inventory of working gas in storage was limited, resulting in a total U.S. working gas inventory that was lower than the five-year average. On November 3, 2000, the A.G.A. Storage statistics indicated that there was 2,748 Billion Cubic Feet (Bcf) of working gas in storage in the United States. With the arrival of much colder than normal weather in November and December, 2000, LDCs began to withdraw storage gas to meet the load requirements.

Q. What are the principal drivers for gas withdrawals from storage?

A. LDC storage withdrawal behavior is driven by the difference between "normal" weather and "actual" weather during the winter heating season. When actual weather is colder than normal, storage withdrawals are greater than the level projected by a winter supply plan and when weather is warmer than normal, withdrawals are less than the plan. The testimony of Mr. Gillespie provided a good description of the process that leads to this result.

Q. How was this behavior reflected in the market in November 2000?

A. The pattern of the amount of storage withdrawal is reasonably predicable. There is a basic monthly pattern to storage withdrawal. However, the actual level of storage withdrawal is affected by actual market conditions. My company has

developed mathematical relationships that describe storage withdrawals. By far and away, the most statistically significant independent variable is the actual number of heating degree-days.

Storage withdrawals in November in the Eastern Market region, which includes Missouri, were substantially above the level that one would have expected under normal weather. At the beginning of November 2000, my company projected that storage withdrawals would average 1.7 Billion Cubic Feet per Day (Bcfd). (See Schedule BBH-3) This projected value was based upon normal weather. The projected level was slightly below the historic average for November because the total amount of working gas in storage was below the five-year average. Because of the cold weather, the actual level of withdrawal was 5.9 Bcfd, or 247 percent above the level that was expected assuming normal weather.

Q. How was this behavior reflected in the market in December?

A. In our projection made in November 2000, we estimated that December withdrawals in the Eastern Market region would be about 11.2 Bcfd in December assuming normal weather. In December 2000, withdrawals in the Eastern Market region averaged 14.2 Bcfd.

Q. What was the cumulative impact of the November and December withdrawals on the total amount of storage gas needed for the entire heating season?

A. In total, actual storage withdrawals in November and December accounted for 44.7 percent of the total amount of working gas that was withdrawn in the Eastern Market regions during the entire period from November through March. The

combined withdrawals in the entire Eastern Market region were nearly 45 percent above the level that was expected assuming normal weather.

Q. How does this pattern compare with your understanding of the storage withdrawals for the Southern System?

A. The pattern of storage activity described in Mr. Gillespie's testimony was generally consistent with behavior observed in the broader market. It is my understanding that, in November and December, the Company used approximately 51 percent of the total amount of working gas that was available at the end of October.

Q. In your opinion, would it be reasonable to assert that Aquila should have used less of their working gas storage in November and December?

A. No. Because the pattern of use was generally consistent with the behavior of the entire Eastern Market area, it is not reasonable to make such an assertion. Moreover, the use of storage by the Company fulfilled the primary objective of storage. Storage gas was used to provide a reliable source of gas supply during weather that was much colder than normal and colder than forecasted.

Q. What is your understanding of the Staff analysis regarding potential gas cost savings from a different storage usage pattern?

A. The Staff recommendation suggests that additional flowing supplies would have been economic in November and December. However, Staff appears to assume that one could have acquired daily gas supplies at the bidweek or first of the month prices. Daily gas was not available at bidweek prices.

Q. What leads you to this conclusion?

A. The Staff analysis does not appears to consider the cost of gas in the daily market. After the first of the month purchases were determined, the only options available to the Company were to utilize storage gas or purchase gas in the daily market at much higher prices.

Q. What are bidweek transactions?

A. "Bidweek" (or first of the month) transactions refer to firm commitments to buy or sell a uniform quantity of gas for each day in the following month. The term "bidweek" refers to the final days in the month when contracts for the next month's deliveries are signed. Trade publications collect data from the market participants and compile the prices for monthly firm contracts entered into in the last 5 days and publish the midpoint and range of the transaction prices. Daily price data is collected in a similar manner for firm transactions for a quantity of gas to be delivered (flow) in the next day.[2]

Q. How do bidweek prices relate to daily prices?

A. Bidweek prices and the average of the daily prices are generally close to one another. However, in any given month, the daily price can exceed the bidweek price or the bidweek price can exceed the daily price. Moreover, in some periods the difference can be quite significant. Schedule BBH-4 shows the relationships between bidweek and daily prices that existed during November and December 2000.[3] As is shown, the daily prices in November and December were well above the bidweek prices in both months.

Q. What is the principal cause of these differences?

[2] Daily price data can include prices for transactions for a few days of delivery of a uniform quantity of gas. However, the published data only includes transactions entered into on the previous day.

A. These gyrations in price relationships can be explained by changes in weather patterns and general market conditions. The bidweek price reflects a "consensus view" of the market conditions for more than 30 days in advance of the end of the period. Given the inaccuracies in weather and market forecasting, the actual market conditions and anticipated conditions can be substantially different. This occurred during the period from December 2000 through January 2001. December 2000 was the third coldest December on record, a fact that was not foreseen in November. In December 2000, the daily price was $2.75 above the bidweek price. And after a very cold first week, January weather turned relatively mild.

Q. What is the significance of these differences between bidweek and daily prices?

A. The significance is that Aquila would not have been able to purchase additional supplies during the month at the bidweek price to meet the additional incremental demand resulting from the colder than normal weather. Aquila would have had to purchase in the daily market, which was much more expensive. Aquila could not have achieved the gas cost savings alleged in the Staff report. Although I have not independently verified Mr. Gillespie's calculation, his conclusion that purchases in the daily market would have resulted in an increase in gas costs of $743,202 on the Southern System is consistent with the market behavior observed in the broader gas market.

[3] The Henry Hub pricing location is chosen as a commonly used reference point to illustrate the differences.

Q. Should Aquila have purchased additional supplies for November during bidweek given the possibility of colder than normal weather?

A. No, I don't think that would have been a prudent decision based on what Aquila knew at the time they set up their plan November. Consider the following hypothetical. If Aquila had purchased additional bidweek volumes and the weather had turned warm, the Utility would have purchased more gas than was necessary. Moreover, the warmer weather could likely have resulted in daily prices dropping below the bidweek prices. Aquila would have been in the position of needing to sell back gas supplies at a loss.

Q. Is it reasonable to think that daily prices could fall below bidweek prices?

A. Yes. This is precisely the behavior that occurred in January when the weather turned warmer than normal.

Q. Are there other reasons why you disagree with the Staff analysis of Aquila's operation of storage?

A. Yes. The Staff recommendation ignores the operational considerations that could have threatened the reliability of spot market purchases. As has been noted in this proceeding, pipelines throughout the nation were issuing operational notices and in some cases operational flow orders. Daily spot market purchases, which are committed on a "best efforts" basis, would not have provided the same reliability for supply as the gas that had been injected into storage with that objective in mind.

By the end of December, there was a growing and significant concern that working gas levels could drop to levels that could have threatened the operational

integrity of a number of storage facilities. If working gas levels fall below the levels within recent experience (as measured by the average of the previous five years) the ability of the storage facility to provide the contracted rate of withdrawal is called into question. As a result, LDCs adjusted planned withdrawal levels.

Q. Was Aquila's response to the market conditions consistent with the behavior of other LDCs?

A. My review of the testimony of Mr. Gillespie leads me to the conclusion that Aquila's behavior was very similar.

Q. Please describe the general gas market conditions and storage behavior in January.

A. The colder than normal weather pattern broke, and in total January was 3.5 percent warmer than normal. As a result, actual January 2001 withdrawals in the Eastern Market region averaged only 9.7 Bcfd rather than the normal level of more than 15 Bcfd. The weather pattern drove the actual performance of the market and the cost of gas for Aquila's customers.

Q. What was the impact of the decision to rely on increased quantities of first of the month gas for January supply?

A. Aquila's decision to preserve storage in January by contracting for increased quantities of first of the month gas was important to protect the reliability of gas supply for their customers.

Q. What do you think would have happened if the timing of the pattern of extremely cold weather followed by warmer than normal weather had been different?

A. If the cold weather pattern had lasted for three more weeks, then the market would have tightened even further and eventually the reliability of the system might have been tested. In the event that the colder than normal weather had continued through February, a decision to rely on storage in January for supplies to meet the normal weather demand could have resulted in an inability to meet firm service requirements.

Alternatively, if the break in the colder than normal weather pattern had occurred before bidweek, then the market price for first of the month supplies would have dropped precipitously. The use of storage gas in November and December would have saved Aquila's customers hundreds of thousands of dollars in gas costs.

Q. What is your opinion regarding the Staff recommendation to reduce the cost of gas because of the pattern of the utilization of storage?

A. The application of the type of 20-20 hindsight that is embodied in the Staff recommendation is, in my opinion, extremely ill-advised. It would force the LDCs in the state of Missouri to adjust their thinking regarding the use of storage, placing actions that have the potential to minimize gas costs above consideration for the necessary reliability that storage provides. Such a review would provide an incentive for LDCs to engage in speculative behavior based upon assumptions regarding weather and the timing of weather patterns.

Q. Do you have an opinion regarding the storage utilization decisions made by Aquila?

A. Yes. In my opinion, the decisions made by Aquila were completely consistent with historical behavior and the behavior exhibited by LDCs in the broader U.S. natural gas market. Based upon my analysis, I would conclude that Aquila's storage decisions meet a standard for prudent decision-making based upon the circumstances and market conditions that existed at the time.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Hedging in the Natural Gas Market: Risky Business or Prudent Behavior?

Bruce B. Henning
Director, Regulatory and Market Analysis
Energy and Environmental Analysis, Inc.

Background

- Natural gas has become a very liquid commodity.
  - Trading volume is at least three times as large as total consumption.
  - Gas is traded at over 50 "liquid" market centers throughout North America.
- Virtually all commodities exhibit price volatility and gas has been among the most volatile.

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Volatility and Risk Tolerance

- Volatility presents profit or loss opportunity for speculators willing to take risks.
- Forward markets can transfer risk from those needing to avoid it to those willing to take it.

Energy and Environmental Analysis, Inc. 3

What is Hedging?

- Establishing a price for a commodity TODAY that will not be delivered until the FUTURE.
- Hedging can be accomplished using a forward cash contract, or a financial contract (e.g., futures), or by balancing future purchase and sale obligations (i.e., a balanced business book).
- Hedging reduces the impact and uncertainty of price volatility by looking in prices for a period of time.

Energy and Environmental Analysis, Inc. 4

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Hedging is Not

- A hedge is not commodity trading for profit and not a source of "net" revenue.
- A hedge is not the assumption of additional price risk, that is speculation.

Pros/Cons of Gas Hedging

- Can manage the impact of wholesale price volatility
- Can assist an end-user's budgeting and planning for energy costs
- No hedge is perfect
  - imperfect convergence between forward and cash markets
  - basis "blow-out"
- Hedging isn't free
  - "insurance premium"
  - transaction and administrative costs

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Traders in Forward Markets

- Hedgers: enter the forward market to decrease a pre-existing risk.
  - Producers hedge with the goal of minimizing downside price risk at the cost of limiting upside potential.
  - Purchasers hedge with the goal of minimizing upside price risk at the cost of limiting potential savings.
- Speculators: enter futures market to accept risks from hedgers in the hope of profit.
  (Beating the Market)

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How do you Hedge?

- Physical hedges
  - term contracts with fixed price
  - index contracts with daily swing volumes
  - storage gas
- Financial hedges
  - contracts whose value is linked or derived from price movements of a commodity.
- Balanced business book
  - an approved PGA is a form of hedge for an LDC.

Energy and Environmental Analysis, Inc. 8

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Price Insurance

- A financial hedge is basically "price insurance" bought from a speculator or another hedger.
- Another hedger? Yes.
  - A gas producer sells a futures contract to establish a future price and minimize down side price risk.
  - A purchaser may buy a contract to hedge against rising prices.

Energy and Environmental Analysis, Inc. 9

Financial Tools for Hedging Gas Price Risk

- NYMEX Gas Futures Contract
- Over-the-Counter (OTC contracts)
  - Commodity swaps
  - Collars
  - Basis swaps
- Options (OTC or Exchange traded)

Energy and Environmental Analysis, Inc. 10

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Speculators

- Speculators take on unwanted risk from hedgers.
- A speculator is not guaranteed any sure return from his practices.
  - He very well may lose money.
- Larger "speculators" create a portfolio of risk so that the total risk is less than the sum of the parts.

Energy and Environmental Analysis, Inc. 11

Purchaser Hedge Fundamentals

- When the purchaser is ready to buy the product in the cash market, he SELLS a futures contract to offset his previous position. The purchase CANCELS OUT the earlier BUY.
- A purchaser rarely takes delivery under the terms of the contract.
  - The purchase and sale of the futures contract are financial transactions.

Energy and Environmental Analysis, Inc. 12

Presentation to NARUC Summer Meeting
Presented July 16, 2001

Purchaser Hedge Example (Futures Contract)

- In March, a purchaser buys a contract for January gas at $5.60 to lock in the price.
- If the January cash price is $6.15, the purchaser buys gas for $6.15 and makes a $.55 gain on the futures contract for a ***net gas cost of $5.60***.
- If the January cash price is $5.25, the purchaser will buy their gas for $5.25 and take a $.35 loss on the futures contract for a ***net gas cost of $5.60***.

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What does a Hedge Cost You?

- Hedges are not free.
  - Transaction costs.
  - Bid/ask spread.
  - Human resource and administrative costs.
    - FAS 133 report burdens
  - "Time value" of money on the margin required.

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Presentation to NARUC Summer Meeting
Presented July 16, 2001

Conclusions

- LDC's and their regulators should carefully define program objectives
- Managing price volatility and minimizing gas costs (beating the market) are ***two different objectives***
  - Managing price volatility = **Hedging**
  - Minimizing gas costs = **Gas Supply Incentive Program**

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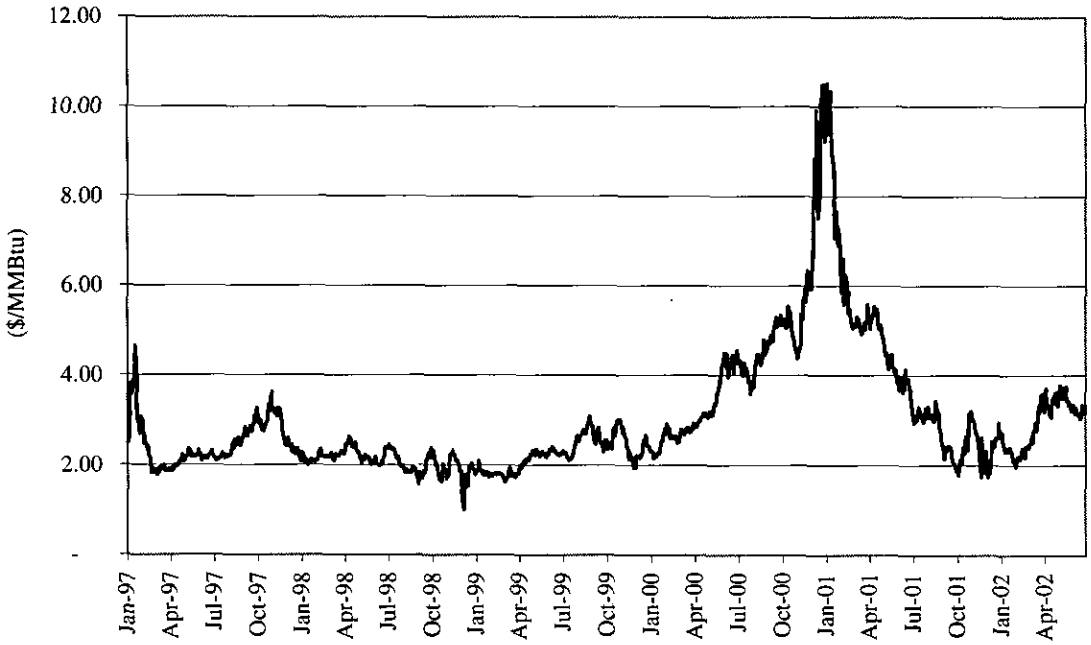
Questions and Discussion

Bruce B. Henning
Director, Regulatory and Market Analysis
Energy and Environmental Analysis, Inc.

Schedule BBH-2

U.S. Natural Gas Market Prices at Henry Hub



Schedule BBH-3

Eastern Market Region
Storage Withdrawals
(Bcfd)

	Expected Under Normal Weather	Actuals	Percent Difference
2000			
November	1.7	5.9	247.1%
December	12.1	14.2	17.4%
Average	**8.4**	**12.1**	**44.8%**

Source: EEA Natural Gas Monthly
November 2000
December 2001

Schedule BBH-4