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APR 29 2004

Missouri Public  
Service Commission

*Exhibit No.:*

*Issue: NYMEX Natural Gas  
Futures Prices*

*Witness: Kwang Y. Choe*

*Sponsoring Party: MoPSC Staff*

*Type of Exhibit: Surrebuttal Testimony*

*Case Nos.: ER-2004-0034 and  
HR-2004-0024 (Consolidated)*

*Date Testimony Prepared: February 13, 2004*

**MISSOURI PUBLIC SERVICE COMMISSION**

**UTILITY SERVICES DIVISION**

**SURREBUTTAL TESTIMONY**

**OF**

**KWANG Y. CHOE**

**AQUILA, INC.,**

**d/b/a AQUILA NETWORKS - MPS (Electric) and  
AQUILA NETWORKS - L&P - (Electric and Steam)**

**CASE NOS. ER-2004-0034 and HR-2004-0024  
(Consolidated)**

*Jefferson City, Missouri  
February 2004*

Exhibit No. 34  
Case No(s) ER-2004-0034  
Date 2/23/04 Rptr xs

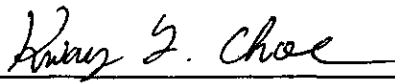
**BEFORE THE PUBLIC SERVICE COMMISSION**  
**OF THE STATE OF MISSOURI**

In the matter of Aquila, Inc. d/b/a Aquila Networks )  
L&P and Aquila Networks MPS to implement a ) Case No. ER-2004-0034  
general rate increase in electricity. )  
)  
)  
In the matter of Aquila, Inc. d/b/a Aquila Networks )  
L&P to implement a general rate increase in Steam ) Case No. HR-2004-0024  
Rates. )  
)

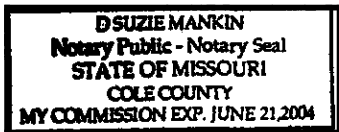
AFFIDAVIT OF KWANG Y. CHOE

STATE OF MISSOURI     )  
                                  )  
                                  )     ss.  
COUNTY OF COLE     )

Kwang Y. Choe, of lawful age, on his oath states: that he has participated in the preparation of the following surrebuttal testimony in question and answer form, consisting of 6 pages to be presented in the above case; that the answers in the following surrebuttal testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

  
\_\_\_\_\_  
Kwang Y. Choe

Subscribed and sworn to before me this 11<sup>th</sup> day of February 2004.



  
\_\_\_\_\_



Surrebuttal Testimony of  
Kwang Y. Choe

1 Q. What has been the nature of your duties at the Commission?

2 A. Since early 2000, I have assisted the Commission with monitoring and  
3 evaluating the various economic aspects of the natural gas market, both nationally and in  
4 Missouri.

5 Q. Have you previously testified before the Commission?

6 A. Yes. I previously filed testimonies in two general rate cases, Case No.  
7 ER-2001-299 (The Empire District Electric Company) and Case No. ER-2001-672  
8 (Utilicorp United Inc. d/b/a Missouri Public Service).

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

10 A. My purpose is to respond to the rebuttal testimony of The Aquila  
11 Networks – L&P witness Joseph M. O'Donnell, who recommends the use of the natural  
12 gas futures market in setting the price of natural gas in this case.<sup>1</sup> In doing so, I will  
13 provide the Commission with a general outline of the natural gas futures market. I will  
14 explain why the natural gas futures market is not the best forecasting tool for predicting  
15 actual future natural gas prices, and therefore, should not be used for forecasting in the  
16 ratemaking process.

17 Q. What are natural gas futures?

18 A. They are financial derivatives for natural gas, and traded on the New York  
19 Mercantile Exchange (NYMEX). A natural gas futures contract is:

20 ...a tradable document which entitles the buyer of the contract to  
21 claim physical delivery of the commodity, that is, natural gas from  
22 the seller at the contract delivery point at a specified date in the  
23 future, and entitles the seller to deliver the physical commodity to  
24 the buyer under the same conditions.<sup>2</sup>  
25  
26

<sup>1</sup> Rebuttal Testimony of Joseph M. O'Donnell, Page 14, ll. 16-18

<sup>2</sup> Fletcher J. Strum, *Trading Natural Gas: A Non Technical Guide*, 1997, page 35.

1           A unique characteristic of natural gas futures contracts is that they are  
2 standardized contracts, meaning that each natural gas futures contract has the same  
3 quality and quantity of natural gas, and is to be delivered and received at the same  
4 delivery location (see Schedule 1 for the standard contract specifications for the NYMEX  
5 natural gas futures contract).<sup>3</sup> Natural gas futures prices are based on demand for and  
6 supply of the commodity in the future. Furthermore, when the natural gas demand and  
7 supply are fairly predictable and we can buy or sell the commodity at any time in the  
8 future for the prices that we want, there may not be a need for a natural gas futures  
9 market. But we cannot predict, with any certainty, what the future of the natural gas  
10 market will bring, and therefore, it is difficult to plan ahead for this market. This is  
11 where the natural gas futures market comes in; i.e., to help minimize uncertainty or risk  
12 associated with price movements. But the natural gas futures market is in no way able to  
13 accurately predict that there will be a certain price prevailing in the future.

14           Q.     What are some of the factors that affect natural gas prices?

15           A.     There are several factors that affect natural gas prices, including weather,  
16 oil prices, drilling rig counts, electric generation from natural gas-fired combustion  
17 turbines, national storage levels for natural gas, the level of economic activity, war, and  
18 psychological factors. All of these factors influence market speculation as to where the  
19 natural gas market will be heading.

20           Q.     What is an index price?

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<sup>3</sup> Ibid.

Surrebuttal Testimony of  
Kwang Y. Choe

1           A.     An index price is typically an average of fixed prices at which buyers and  
2 sellers agree, during the last week of a month, to purchase and sell gas for the following  
3 month.<sup>4</sup>

4           Q.     Do you believe there is any significant correlation between prices in the  
5 futures market one year before closing of a contract and spot prices at the time of closing  
6 a year later?<sup>5</sup>

7           A.     There is no systematic correlation between the two prices (see  
8 Schedule 2).<sup>6</sup>

9           Q.     Why does Staff believe there is no systematic correlation between futures  
10 market prices and spot prices?

11          A.     While the futures market predicts a relatively stable price trend going  
12 forward at the 12-month horizon, actual spot prices have fluctuated considerably since  
13 May 2000 (see Schedule 2). This indicates that there is no systematic correlation  
14 between futures market prices and spot prices.

15          Q.     Is the natural gas futures market a good source from which to accurately  
16 predict the actual future natural gas prices?

17          A.     No.

18          Q.     Please explain.

19          A.     The idea that the natural gas futures market can accurately predict the  
20 actual future natural gas prices is predicated upon the assumption that the natural gas

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<sup>4</sup> Typically this index price is denoted as a first of month index price and tied to a specific natural gas pipeline. See schedules 3 and 4.

<sup>5</sup> Spot prices refer to the prices for immediate delivery of natural gas.

<sup>6</sup> Based on the New York Mercantile Exchange (NYMEX) Natural Gas Futures Prices (Monthly) with one-year maturity and the prices at the time of closing a year later, *Wall Street Journal*, Jan 1999 – February 2004.

Surrebuttal Testimony of  
Kwang Y. Choe

1 futures market is efficient. The efficient market theory suggests that the natural gas  
2 futures price today contains all available relevant information regarding the actual natural  
3 gas price in the future, and, as such, permits a correct forecast of the future actual price.<sup>7</sup>

4 Unfortunately, that is seldom the case. If you look at the price comparisons between the  
5 futures prices and the subsequent spot prices at the 12-month horizon during July 1995  
6 through January 2004, there are significant discrepancies between these two prices during  
7 the winters of 1996 - 97, 2000 - 01, 2001 - 02, and 2002 - 03 (see Schedules 3 and 4).<sup>8</sup>  
8 This demonstrates another characteristic of the futures market; namely, its inherent  
9 volatility. Therefore, it is very difficult to predict the future movement of the market.<sup>9</sup>

10 Q. Can the natural gas futures market be successfully used in the  
11 determination of the rates that customers pay for electricity use?

12 A. No. Because of the inherent risk in the market and the historical volatility  
13 of natural gas prices, it is extremely difficult to develop a method that will provide  
14 enough assurance to be able to use the futures market prices in the ratemaking process.  
15 There is no "safety net" for consumers if the futures market prices overstate natural gas  
16 prices, and ultimately, fuel expense. Using futures market prices to determine natural gas  
17 prices for fuel expense places substantial risk on the customers in that any overstatement  
18 will be a windfall to the Company in higher fuel costs.

19 Q. Are you responsible for developing the natural gas prices in this case?

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<sup>7</sup> W. David Walls, "An Econometric Analysis of the Market for Natural Gas Futures," *The Energy Journal*, Vol. 16, No. 1, 1995, pages 71-83.

<sup>8</sup> Based on the New York Mercantile Exchange (NYMEX) Natural Gas Futures Prices, *Wall Street Journal and Inside FERC's Gas Market Report*, July 1995 - January 2004 and Williams Pipeline (WNG) First of Month Index Prices. WNG's March 2003 First of Month Index Price is not available.

<sup>9</sup> Victor Chwee, "Chaos in Natural Gas Futures?", *The Energy Journal*, Vol. 19, No. 2, 1998, pages 149-164.

Surrebuttal Testimony of  
Kwang Y. Choe

1           A.     No. Staff witness Graham A. Vesely identified in his direct testimony the  
2 approach that Staff is using with regard to natural gas prices.

3           Q.     What is your conclusion?

4           A.     The efficient market theory does not apply to the natural gas futures  
5 market because the market faces a great deal of uncertainty. Furthermore, due to the  
6 inherent volatility of the natural gas futures market, it is highly risky to rely solely on  
7 what the natural gas futures market predicts to determine the actual future natural gas  
8 prices. Also, it is quite noteworthy that recent price spikes in the natural gas futures  
9 market have led the Commodity Futures Trading Commission to launch a market  
10 manipulation investigation.<sup>10</sup>

11          Q.     Does this conclude your testimony?

12          A.     Yes, it does.

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<sup>10</sup> Also, Sen. Joseph Lieberman (D., Conn.) asked the Commodity Futures Trading Commission and the Federal Energy Regulatory Commission in late December 2003 to investigate whether there had been market manipulation. Other Congressional members, like Sen. Orrin Hatch (R., Utah), also expressed the same concern, *Wall Street Journal*, Jan 12, 2004

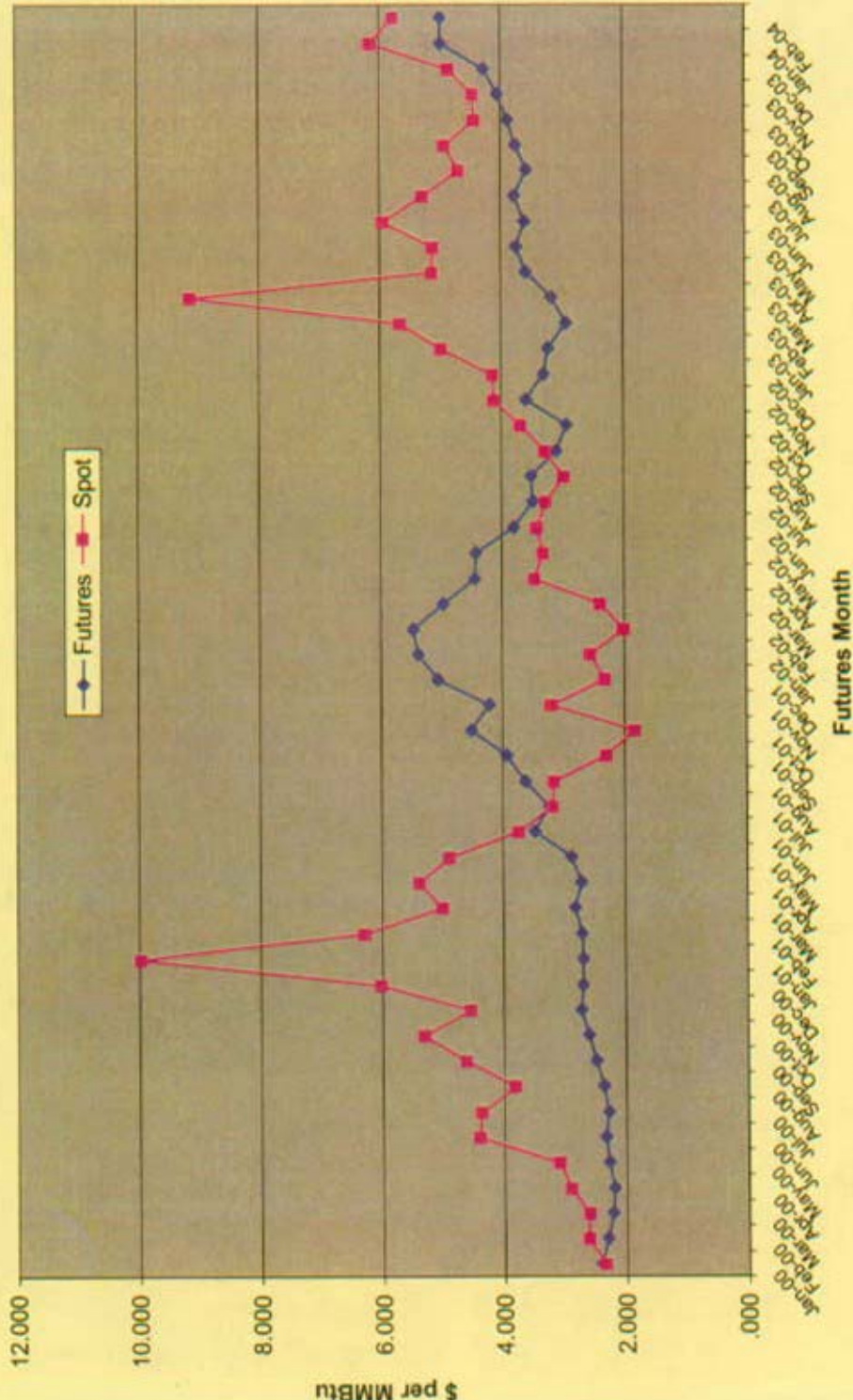


## **The New York Mercantile Exchange Natural Gas Futures Contract Specifications**

<b>Delivery Location:</b>	<b>Sabine Pipeline Hub at Henry, Louisiana</b>
<b>Contract Size:</b>	<b>One (1) contract equals 10,000 MMBtu</b>
<b>Minimum Price Fluctuation:</b>	<b>\$0.001 per MMBtu (\$10.00 per contract)</b>
<b>Maximum Daily Price Fluctuation:</b>	<b>\$3.00 per MMBtu for all months (\$30,000 per contract)</b>
<b>Trading Months:</b>	<b>Seventy-two (72) consecutive months commencing with the next calendar month</b>
<b>Last Trading Day:</b>	<b>Three (3) business days prior to the first calendar day of the delivery month</b>

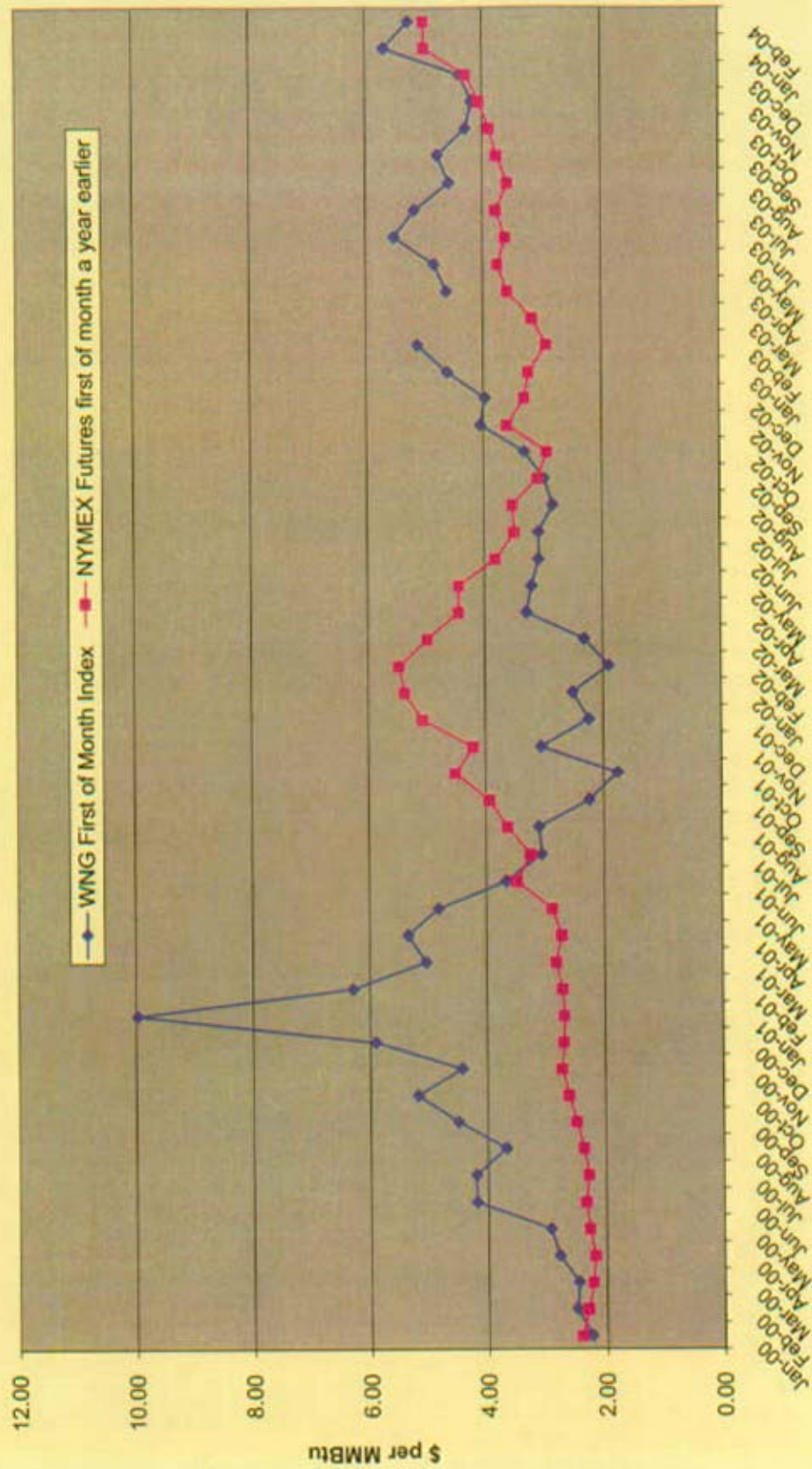
Source: <http://www.nymex.com>

### Futures vs. Spot (Schedule2)



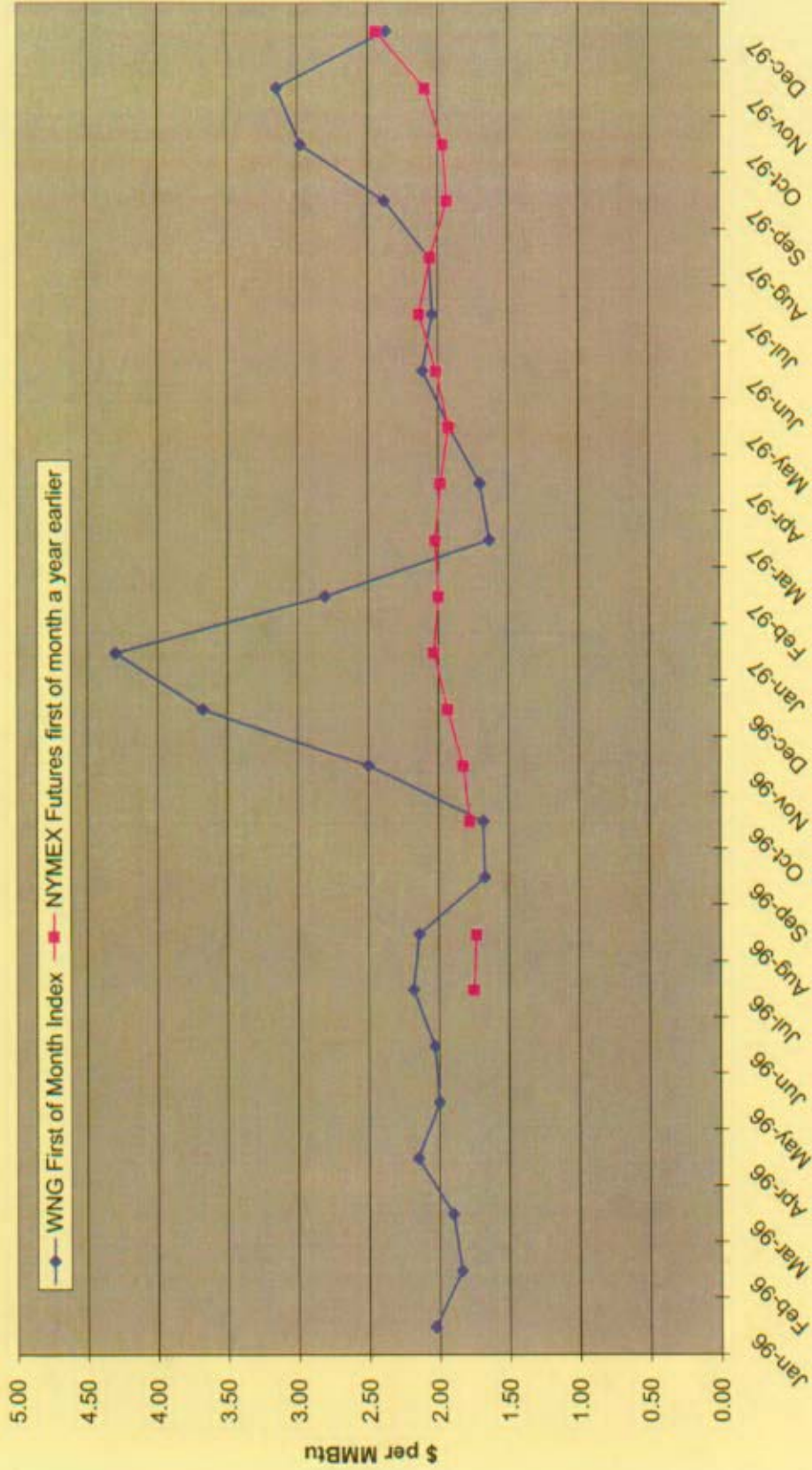
Source: Wall Street Journal

Williams Pipeline(WNG) First of Month Index vs NYMEX Futures Prediction A Year Earlier  
(Schedule 3)



Source: Wall Street Journal and Inside FERC's Gas Market Report

Williams Pipeline(WNG) First of Month Index vs NYMEX Futures Prediction A Year Earlier  
(Schedule 4)



Source: Wall Street Journal and Inside FERC's Gas Market Report