Exhibit No.: *1134*
Issue: *NYMEX Natural Gas Futures Prices*
Witness: *Kwang Y. Choe*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Surrebuttal Testimony*
Case No.: *ER-2004-0034*

Date Testimony Prepared: *February 13, 2004 as modified February 27, 2004*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

SURREBUTTAL TESTIMONY

OF

KWANG Y. CHOE

AQUILA, INC.,
d/b/a AQUILA NETWORKS - MPS (Electric)

CASE NO. ER-2004-0034

Jefferson City, Missouri
February 2004

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 general rate increase in electricity.	))))	Case No. ER-2004-0034

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 as modified on February 27, 2004, in question and answer form, consisting of 6 pages to be presented in the above case; that the answers in the following surrebuttal testimony as modified on February 27, 2004, 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

Kwang Y. Choe

Subscribed and sworn to before me this 27th day of February 2004.

D SUZIE MANKIN
Notary Public - Notary Seal
STATE OF MISSOURI
COLE COUNTY
MY COMMISSION EXP. JUNE 21,2004

D Suzie Mankin

SURREBUTTAL TESTIMONY

OF

KWANG Y. CHOE

AQUILA, INC., d/b/a AQUILA NETWORKS-MPS (Electric)

CASE NO. ER-2004-0034

Q. Please state your name and business address.

A. Kwang Y. Choe, P.O. Box 360, Jefferson City, Mo. 65102.

Q. By whom are you employed and in what capacity?

A. I am the Regulatory Economist of the Procurement Analysis Department with the Missouri Public Service Commission (Commission).

Q. How long have you been employed with the Commission?

A. I commenced employment with the Commission Staff (Staff) in January of 2000.

Q. Please describe your educational background and experience.

A. I received a Bachelor of Arts, Master of Arts, and Doctor of Philosophy degrees in economics. My undergraduate degree is from the University of California, San Diego. My graduate degrees are from the University of Missouri, Columbia. I worked in the department of economics at the University of Missouri, Columbia as a graduate teaching instructor from 1997 to 1999, and as a graduate teaching assistant from 1991 to 1993 and from 1996 to 1999. Also, I am currently visiting assistant professor in the department of economics at the University of Missouri, Columbia. I am a member of the International Association for Energy Economics.

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

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

Q. Have you previously testified before the Commission?

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

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

A. My purpose is to respond to the rebuttal testimony of The Aquila Networks – MPS witness Joseph M. O'Donnell, who recommends the use of the natural gas futures market in setting the price of natural gas in this case.[1] In doing so, I will provide the Commission with a general outline of the natural gas futures market. I will explain why the natural gas futures market is not the best forecasting tool for predicting actual future natural gas prices, and therefore, should not be used for forecasting in the ratemaking process.

Q. What are natural gas futures?

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

> …a tradable document which entitles the buyer of the contract to claim physical delivery of the commodity, that is, natural gas from the seller at the contract delivery point at a specified date in the future, and entitles the seller to deliver the physical commodity to the buyer under the same conditions.[2]

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[1] Rebuttal Testimony of Joseph M. O'Donnell, Page 14, ll. 16-18

[2] Fletcher J. Strum, *Trading Natural Gas: A Non Technical Guide*, 1997, page 35.

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

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

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

Q. What is an index price?

[3] Ibid.

A. An index price is typically an average of fixed prices at which buyers and sellers agree, during the last week of a month, to purchase and sell gas for the following month.[4]

Q. Do you believe there is any significant correlation between prices in the futures market one year before closing of a contract and spot prices at the time of closing a year later?[5]

A There is no systematic correlation between the two prices (see Schedule 2).[6]

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

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

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

A. No.

Q. Please explain.

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

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[4] 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.
[5] Spot prices refer to the prices for immediate delivery of natural gas.
[6] 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.

futures market is efficient. The efficient market theory suggests that the natural gas futures price today contains all available relevant information regarding the actual natural gas price in the future, and, as such, permits a correct forecast of the future actual price.[7] Unfortunately, that is seldom the case. If you look at the price comparisons between the futures prices and the subsequent spot prices at the 12-month horizon during July 1995 through January 2004, there are significant discrepancies between these two prices during the winters of 1996 - 97, 2000 - 01, 2001 - 02, and 2002 - 03 (see Schedules 3 and 4).[8] This demonstrates another characteristic of the futures market; namely, its inherent volatility. Therefore, it is very difficult to predict the future movement of the market.[9]

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

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

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

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

[8] 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.

[9] Victor Chwee, "Chaos in Natural Gas Futures?", The Energy Journal, Vol. 19, No. 2, 1998, pages 149-164.

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

Q. What is your conclusion?

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

Q. Does this conclude your testimony?

A. Yes, it does.

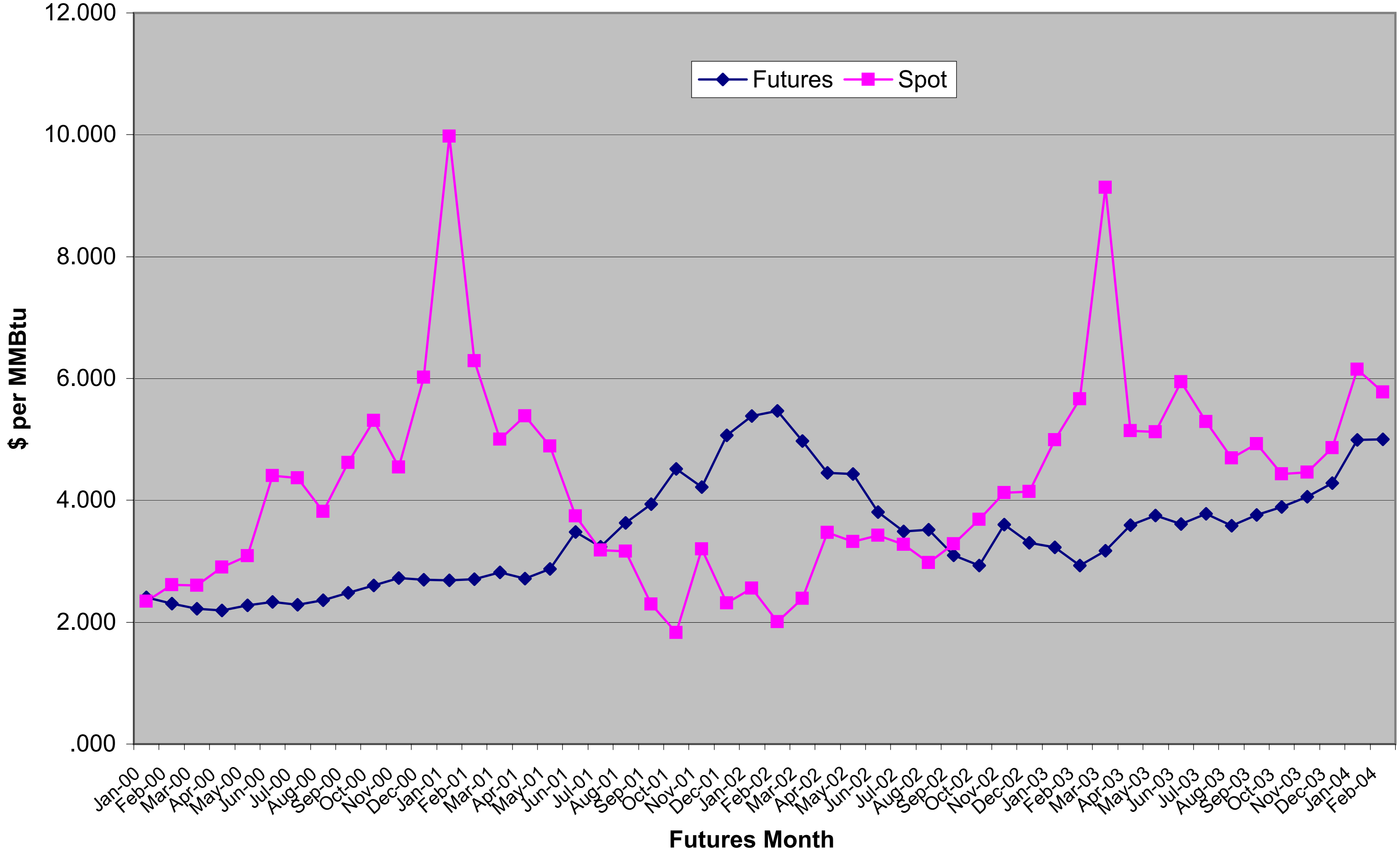
[10] Also, Sen. Joseph Lieberman (D., Conn.) asked the Commodity Futures Trading Commission and the Federal Energy Regulatory Commission in late December 2003 to investigate whether there had been market manipulation. Other Congressional members, like Sen. Orrin Hatch (R., Utah), also expressed the same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

The New York Mercantile Exchange Natural Gas Futures Contract Specifications

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

Source: http://www.nymex.com

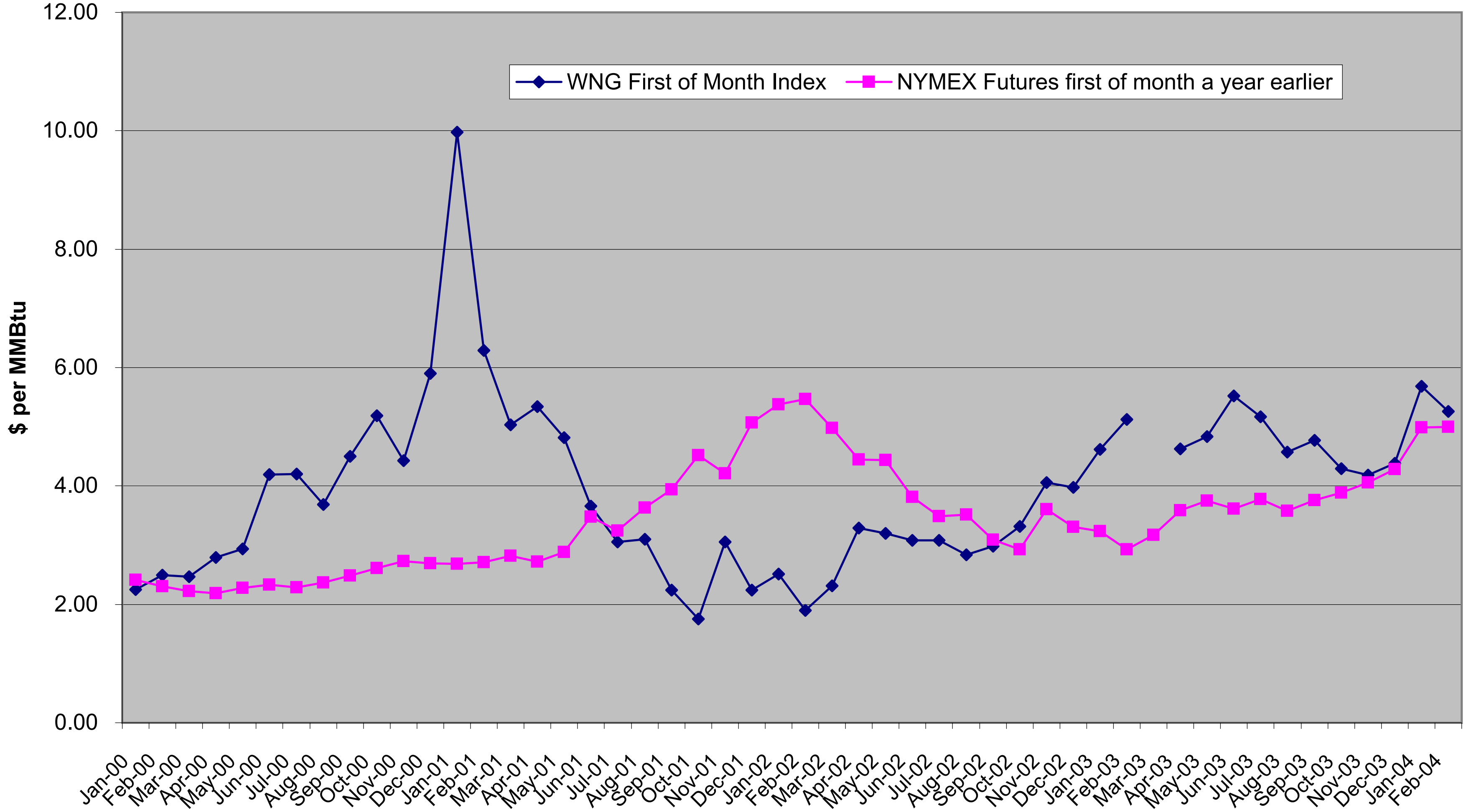
Futures vs. Spot
(Schedule2)



Source: Wall Steet Journal

Schedule 2

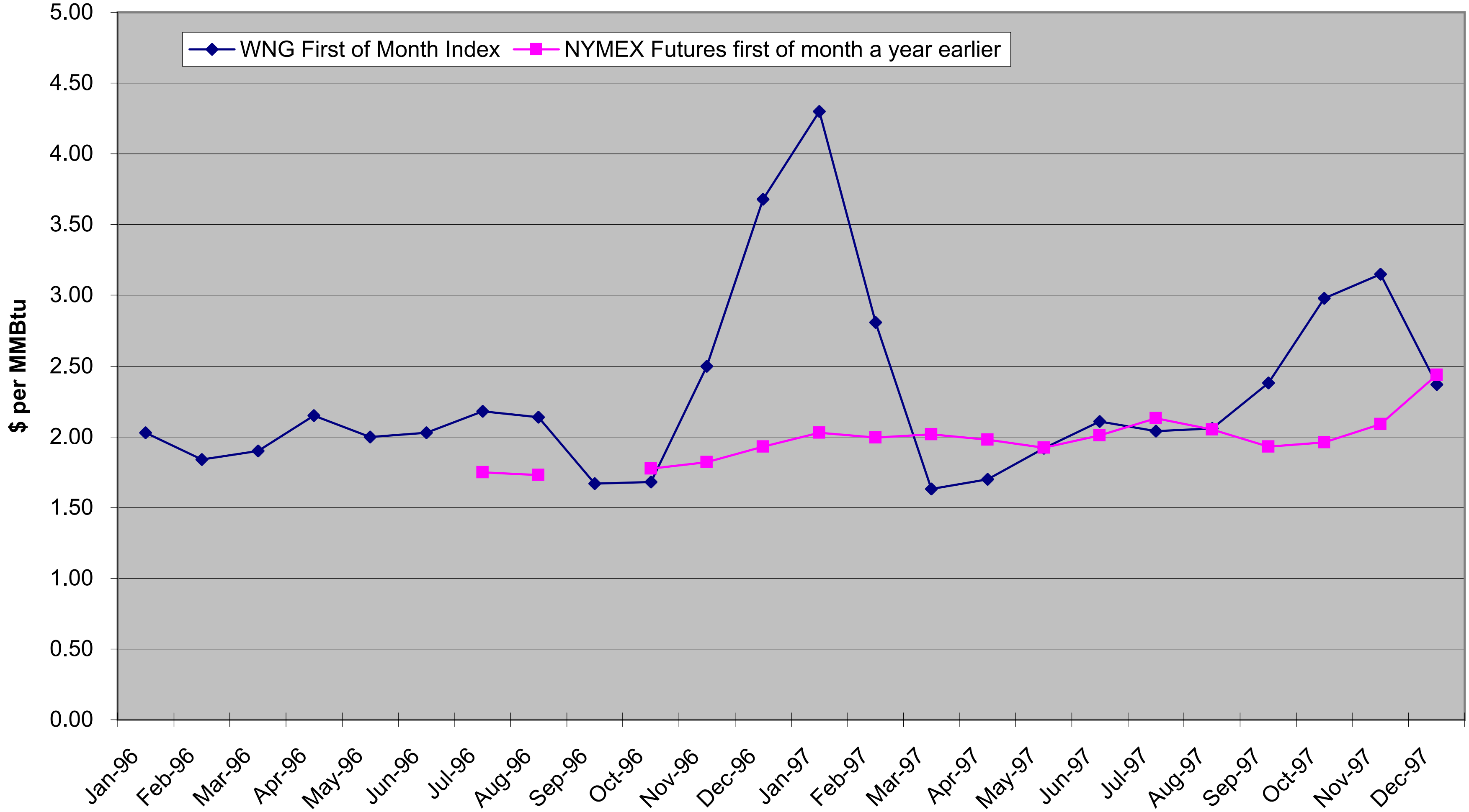
Williams Pipeline(WNG) First of Month Index vs NYMEX Futures Prediction A Year Earlier
(Schedule 3)



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

Schedule 3

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

Schedule 4