

ORIGINAL R-00061296
Docket R-~~067000~~

Volume 2

Philadelphia Gas Works

Before The

DOCUMENT
FOLDER

Pennsylvania Public Utility Commission

Computation of Annual Purchased Gas Costs
For Twelve Months Ending August 31, 2007

66 Pa.C.S. § 1307(f)

DOCKETED
FEB 06 2006

Information Submitted Pursuant To:

66 Pa.C.S. §§ 1307(f), 1317, 1318 and
52 Pa. Code § 53.61, et seq.

February 1, 2006

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Philadelphia Gas Works 1307f - 2006 Prefiling

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Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

- (5) A listing and updating, if necessary, of projections of gas supply and demand provided to the Commission for any purpose—see § 59.67 (relating to formats). In addition, provide an accounting of the difference between reported gas supply available and gas supply deliverable—including storage—from the utility to its customers under various circumstances and time periods.

Response:

Please see the attached document. PGW's next Annual Resource Planning Report (Forms 1 and 2) is due for submission to the Commission on March 1, 2006 and no updated Annual Resource Planning Report is available or required at this time.

ANNUAL RESOURCE PLANNING REPORT

Philadelphia Gas Works
Philadelphia, Pennsylvania

March 2005

Forms 1 & 2

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

**Philadelphia Gas Works
800 West Montgomery Avenue
Philadelphia, Pennsylvania 19122**

ANNUAL RESOURCE PLANNING REPORT
MARCH 2005

Forms 1 & 2

**Information Submitted in Compliance with and Pursuant to Title 52
Pennsylvania Code Section 59.81**

PHILADELPHIA GAS WORKS

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<u>EXHIBIT NO.</u>	<u>REGULATION</u>	<u>DESCRIPTION</u>
1	59.81	General
2	59.81	Forms IRP-Gas 1A, and 1B Annual and Peak Day Energy Demand
3	59.81	Forms IRP-Gas 2A, 2B, and 2C Annual and Peak Day Energy Resources, And transmission and storage contracts

Section 59.81: **General**

Pursuant to Section 59.81 (a), each major jurisdictional gas utility must file an annual resource planning report (ARPR) on or before June 1, 1996 and June 1 of each succeeding year, except Form 1A/2A which filing date is March 1. One (1) original and seven (7) copies of the report must be submitted to:

Secretary
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

One copy should be submitted unbound for ease of duplication.

One courtesy copy should also be submitted to:

Pennsylvania Public Utility Commission
Conservation, Economics and Energy Planning
P.O. Box 3265
Harrisburg, PA 17105-3265
Attn. Calvin Birge

Also submit one (1) copy to the following:

Office of Consumer Advocate
555 Walnut Street
Forum Place, 5th Floor
Harrisburg, PA 17101-1921

Office of Small Business Advocate
Suite 1102, Commerce Building
300 N. Second Street
Harrisburg, PA 17101

Be sure to indicate the name and telephone number of at least one individual at the company who is familiar with the filing and will be available to answer any questions the Commission staff may have. You may also wish to list those individuals who are directly involved in the preparation of the various document components.

Information contained in annual resource planning reports must be utility-specific. The report should follow an outline similar to that which is contained herein, with narrative accompanying the required data. Forms may be modified to accommodate wide columns of numbers and enhance readability, but the general format should be used to maintain consistency.

This information is not generally considered confidential. Utilities are obligated to provide complete information. However, we will treat as confidential those portions of the report designated by the utility as proprietary. If a utility's proprietary claim is challenged, the Commission will direct the utility to file a petition for protective order pursuant to 52 PA Code 5.423.

All questions concerning the reporting requirements for Forms IRP Gas 1A through 9 should be addressed to Pennsylvania Public Utility Commission Bureau of Conservation, Economics and Energy Planning.

Response:

An original, seven (7) copies, and one unbound copy of Forms 1A, 1B, 2A, 2b, and 2C along with a general discussion of the methodologies, data sources, and assumptions are being submitted to meet the requirements of the March 1 filing.

All questions concerning the ARPR should be directed to Mr. Kenneth Dybalski, Manager - Gas Planning at (215) 684-6317. The following individual is available to answer questions concerning Forms 1 and 2:
Ms. Maria Hogan, Administrator - Gas Planning at (215) 684-6618.

Section 59.81 **Forms IRP-Gas 1A, and 1B – Annual and Peak Day Demand**

The load growth projections shall reflect the effects of price elasticity, market induced conservation, building and appliance efficiency standards, and the effects of the utility's existing and planned conservation and load management activities.

Response: Please see the attached documentation and forms.

Section 59.81

Forms IRP-Gas 2A, 2B and 2C - Annual and Peak Day Energy Resources, Transmission and Storage Contracts

The forecast of energy sources shall indicate sources of all presently available and new supplies which the utility estimates will become available, displayed by component parts.

Response:

Please see the attached documentation and forms.

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

**PHILADELPHIA GAS WORKS
800 WEST MONTGOMERY AVENUE
PHILADELPHIA, PENNSYLVANIA**

Annual Resource Planning Summary Report

Filed: March 2005

**Information Submitted in Compliance with and Pursuant to Title 52
Pennsylvania Code Sections 59.81-59.84**

PHILADELPHIA GAS WORKS

2005 Annual Resource Planning Summary Report

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SECTION V -- PGW Corporate Modeling System

Introduction

By Order entered January 11, 1996, the Pennsylvania Public Utility Commission (PUC) adopted final regulations (52 PA Code §§ 59.81 - 59.84) which set forth revised requirements for filing an Annual Resource Planning Report (the Plan). The Plan submitted represents Philadelphia Gas Works' (PGW or the Company) belief that integrated resource planning (IRP) is a workable approach to utility planning.

This plan summary contains historical data and projections for annual, winter and peak day supply to meet projected customer requirements in a least cost manner, while ensuring adequate and reliable service. It is organized into the following 5 sections:

- I. PGW's Overall Approach to Integrated Resource Planning
- II. Supply Forecasting Methodology and Assumptions
- III. Demand Forecasting Methodology and Assumptions
- IV. Design Day Forecasting Methodology and Assumptions
- V. PGW Corporate Modeling System

I. PGW's Overall Approach to Integrated Resource Planning

PGW Optimization Standard for Purchasing and Utilizing Gas Supplies

As reasonably anticipated PGW intends on meeting its contractual obligations to supply all of its current firm customers in its service territory on the coldest day and throughout the season.

Projected customer requirements for design day and design winter conditions form the basis for capacity commitments for pipeline supply, storage, and transportation contracting.

Natural gas supplies are purchased under a portfolio approach with PGW intending to secure the lowest overall price consistent with the primary corporate goals of reliability and security of supply. In addition, consideration is given to maintaining a diversity of sources and types of supply, coupled with contractual and operational flexibility on both a daily and seasonal basis. Short term purchases from spot market sources are utilized to the maximum degree that they are more economical, available, and transportable.

Natural gas supplies are utilized so as to maximize net contributions subject to reliability constraints. Supply contract obligations are honored and prudent Gas Control operational requirements are assumed. Storage gas is drawn down so as to always maintain an inventory level sufficient for the remaining winter in the event that design temperature conditions should occur in the remaining segment of the winter season. Within the above parameters, priority is given to utilizing the most economical sources of supply first within the context of preserving the capability of meeting seasonal and annual demands rather than the momentary daily requirements. All facilities and sources of supply, flowing, storage and LNG are available to achieve the intended end, namely, maximizing net contributions subject to reliability constraints.

II. Supply Forecasting Methodology and Assumptions **Basic Assumptions**

The PGW Gas Supply Policy Committee comprised of senior corporate management as well as Gas Planning, Gas Control, Gas Supply, and Regulatory departmental management, approved the aforementioned Optimization Standard for Purchasing and Utilizing Gas Supplies (Section I). All natural gas purchases continue to be made in accordance with this standard. Projected sales, revenues and natural gas expenses in this report result from this agreement, particularly in the areas of inventory valuation, priorities of gas selection and interruptible supply availability.

Incorporated into our projections are additional implementation steps involved with developing a cohesive gas supply/demand strategy for the near term and the longer range. These include developing a cost relationship comparison for current resources and a review of current contract terms and alternatives for continuing, extending, modifying or eliminating contracts.

In order to achieve this while maintaining a balance between economics and security of supply, the company uses a portfolio strategy approach. This approach incorporates a menu driven selection of services which allows the company to choose only those specific services necessary to meet its requirements. This is achieved by first securing transportation capacity rights and then sources of supply are contracted to cover the firm transport rights taking into consideration differing seasonal obligations.

Operating flexibility is sustained by variations in contract stipulations to permit the system to swing on the most economical gas supplies available while maintaining the ability to supply rapidly fluctuating temperature requirements. Storage facilities are substituted wherever opportunity affords to reduce annual expense for flowing 365 day pipeline service without reducing design day and design winter season delivery capability. Direct control of all storage is paramount to permit PGW to minimize winter costs by injecting lower priced summer purchases and to cycle storage to balance daily take fluctuations to avoid overrun/balancing charges.

II. Supply Forecasting Methodology and Assumptions **Basic Assumptions (Continued)**

PGW's supply strategy incorporates maintaining full current winter day deliverability with regard to transportation capacity but to convert, where possible, to storage rather than winter flowing contracts to enhance financial and operational flexibility. A variety of longer term supply contracts are necessary to support pipeline transportation capacity because reliance upon best effort spot suppliers to fill wintertime supply requirements to meet firm customers' demands has proven to be an unreliable alternative. As a result longer-term contracts are utilized to support firm transportation capacity. To accomplish this end, the Company purchases winter supply contracts with daily deliverability equal to approximately 64% of the contractual daily transportation entitlements on its two interstate pipelines with direct connections to PGW's service territory. Additionally, these supply contracts match the contractual entitlements of the two pipelines by sourcing supply in a manner consistent with the pipeline's upstream contractual requirements. In this way, PGW not only helps ensure the security of supply by sourcing the gas from geographically diverse supply regions but this diversity also allows PGW to take advantage of the pricing basis differential inherent in these supply locations.

These contracts all contain the ability to fix the price for upcoming months as well as to allow the pricing to default to an agreed upon market index when there is no market advantage in fixing a price before the month begins. PGW uses this fixed price option in conjunction with its Gas Cost Rate (GCR) filing (GCR filing includes pricing based upon the NYMEX and Global Insight) by always attempting to buy under the GCR forecasted prices. Through the matching of the duration supply contracts to a seasonal demand, such as the winter operating season, the firm ratepayers benefit from not paying demand charges year-round.

A second component of PGW's supply portfolio or a volume equal to 32% of pipeline capacity, is purchased gas based on a first-of-the-month index pricing methodology with contracts that allow for daily change in volumetric take. This allows the Company to effectively shut-off higher priced supply replacing such supply with daily cheaper spot priced gases. Under assumed normal winter conditions, PGW utilizes certain storage fields (Eminence and Washington) in a manner similar to third party supply. Specifically, these storage contracts do not contain

II. Supply Forecasting Methodology and Assumptions **Basic Assumptions (Continued)**

transportation to the PGW city gate. Therefore, these storages must flow within PGW's contractual upstream capacity rights on TETCO and TGPL. Typical daily delivery from these fields utilizes approximately 4% of the daily TETCO and TGPL capacity rights to the Philadelphia city gates. These storage fields also act as a physical fixed price to counter winter price conditions since the WACOG usually reflects a winter/summer pricing differential. PGW's summer purchasing strategy also incorporates a portfolio approach to the purchase of system supply and storage refill. The GCR filing is again used as a yardstick in purchasing supply for both system supply and storage refill. PGW attempts to always purchase a portion of its supply needs below the projected GCR cost estimate with a portion of the portfolio purchased at default, first-of-the-month pricing. These first of the month pricing option contracts, in most instances, allow PGW to evaluate daily spot prices and provide for a turn-off of first-of-the-month index priced supply in favor of the purchase of more advantageous daily spot purchases.

Operating conditions permitting, the Company enters into the FERC approved capacity release market to offset demand charges it pays for its firm transportation and/or the incremental off-systems sales market when it is economically advantageous for the firm ratepayer. In both instances, these opportunities are sought only when firm customer needs are satisfied. Additionally, PGW's bundled storages and LNG can be utilized as a substitute for higher price gas supply based on market pricing conditions and the results of PGW's status report. Effectively, the Gas Supply Group is at all times studying the market for any economic advantage it can bring to the firm ratepayer.

III. Demand Forecasting Methodology and Assumptions **Basic Assumptions**

PGW uses a combination of four basic methods to develop demand projections. They are:

- 1) Historical Data -- data showing long-term demand trends, conservation and utilization patterns by the various classes of customers -- Residential, Commercial, Industrial and Interruptible.
- 2) Customer Survey -- Information as gathered by PGW's Marketing Department and used for annual projections by month and year.
- 3) Relative End Use -- Projections via Marketing methods of customer load sizing by appliance type, maximum input, maximum summer and winter full load hour (FLH) calculations which are used to develop yearly and monthly demand requirements.
- 4) Judgment -- Experienced opinion as applied to the evaluation of the combination of all data to develop the basic demand requirements.

Customer Demand

The total system-wide demand is a function of the projected gas demand per customer and the anticipated number of customers in each class. In determining customer demand, consideration is given to projecting current customer usage, augmented by significant gains or losses in each of 43 homogeneous groups for the period being projected. The Gas Planning Department attempts to determine for each customer class, the level of demand relating to experienced temperatures and the component of demand that is apparently not affected by changes in temperature. Within each class the most recent summer and winter usage patterns are established from historical records. Summer data provides an insight into each class of customer's non-temperature sensitive load requirements or baseload which can be expressed in terms of thousands of cubic feet (Mcf) per day, per customer. Similarly, winter data after removal of the daily baseload level provides the temperature sensitive load requirements for each class of customer.

This usage primarily reflects space heating but also includes such other temperature sensitive needs as water heating attributable to colder ground water inlet temperatures and similar process variations. This overall heating requirement can be expressed in terms of the cubic feet of gas

III. Demand Forecasting Methodology and Assumptions Basic Assumptions (Continued)

utilized per degree of temperature change on a per customer basis for each separate customer classification.

In addition, consideration must be given to the variation of customer utilization patterns for space heating over the year, recognizing the transitional fall start-up of heaters, the deep winter period needs and the tapering off and shut-down which occurs in the spring. These usage patterns taken in conjunction with anticipated customer counts and appropriate temperature patterns form the basis of determining class and total system demands. Due to the inconsistencies of weather and weather forecasting techniques, no attempt is made to predict the specific daily temperatures of the projection period. Instead PGW has developed a normal monthly temperature pattern by analyzing statistical records of actual temperature patterns over a 30-year period. This pattern reflects 4555 degree-days annually distributed in a stylized pattern preserving the monthly range of colder to warmer daily temperatures experienced in the January to May period and warmer to colder daily temperatures in the September to December period.

The term "degree days" quantifies the number of degrees of temperature below a base level of 65 degrees Fahrenheit and is used as a tool to measure space heating requirements, i.e. on a day experiencing an average temperature of 40 degrees F. there would be 25 degree days. The annual 4555 degree days which is composed of the PGW normal monthly temperature patterns, form the basis of the calculation of the temperature sensitive component of demand. The application of the above described baseload, space heating factors and customer counts, when applied to a calendar based daily temperature pattern, produce a daily calculation of total customer requirements identified as sendout. It should be noted that there is a difference between sendout volume and sales volume. Sendout represents those volumes metered at the city gate to supply customers' requirements while sales are those volumes registered on customer meters. The variation between sendout and sales, after adjustments, is that portion which is lost and unaccounted for in the PGW distribution system.

III. Demand Forecasting Methodology and Assumptions **Basic Assumptions (Continued)**

Sales and sendout differ on a monthly basis in the degree day distribution pattern. For efficiency, meter reading and billing efforts are distributed uniformly over the available number of working days in a month and the majority of PGW customers are divided into 20 individual groups or cycles containing residential, commercial and industrial accounts within a specific geographic area. When these cycle customers are billed each month they reflect meter reading usage not for the calendar month being billed, but for the number of days and temperature pattern of degree-days experienced during their specific interval between readings. For example, assume the month of January contained 900 calendar degree-days. The customers in cycle 10 being billed for the month of January might have had meter readings taken on December 15 and again on January 17. Sales billed and reported in the company records for these customers would reflect the number of days and degree days between these reading dates rather than the 900 degree days of the month. Similarly, cycle 1 customers that might have had meter readings taken on December 1 and January 2 would reflect principally the month of December temperature experience, whereas, cycle 20 customers with meter readings taken possibly December 28 and January 29 would reflect principally the month of January temperature experience.

An average of the 20 cycles (Average Cycle Degree-Days) is used as the temperature pattern upon which to project the potential volume of sales in the estimation period. Both projections of sales and sendouts represent the full potential demand for that period from both firm and interruptible customers.

Methodology Used to Develop Monthly Estimates

A trial domestic factor is developed by classes of customers from sales reported for the previous year's summer months. This average factor is then utilized in the sendout formula with the customer counts for the months of July, August and September. A comparison between what the formula calculates and the actual experienced for those three months is ascertained and the trial

III. Demand Forecasting Methodology and Assumptions **Basic Assumptions (Continued)**

domestic (baseload) factors are finalized to replicate the total sendout experienced. The finalized domestic factors (DOMs) are then utilized in conjunction with the actual sales and customer counts for the months of December, January and February to determine the average Mcf per degree day for each of the individual months for the remaining temperature sensitive load. The results are weighted by degree-days to give an average value which is utilized as a trial value for the heating factor.

The finalized domestic factor and the trial heating factor developed, as such, are then applied in the sendout calculations together with customer counts for the months of December, January and February (the peak winter heating period) to project an estimated sendout for each of these months. The projected sendout is then compared with the actual sendout experienced. Any variation between the projected and actual is adjusted to force the replication of the actual sendout experience thus resulting in the determination of a finalized heating factor.

To project the number of customers for each individual rate class, each rate class of customers are reviewed and accumulated individually. Current customers are ascertained from the number of billings data available from sales and revenue actually experienced immediately prior to the commencement of a model run. Declines are projected for anticipated losses to electric and other fuels, demolitions and transfers to other rates. Direct transfers from a non-heating to a heating account, as a result of a current customer's conversion to gas heat, moves the domestic load to the new category. Projected additional customers are developed by the Marketing Department where staff dealing with individual classes of customers and having the most direct knowledge of conditions within their sphere, project annual load additions which are translated into customer counts based upon typical customer usage for that individual customer class. The approximate month of turn-on is also developed to permit reflection of the effective portion of the load addition within the fiscal period under study. Interruptible class customers as well as other large special accounts are detailed individually incorporating expected gains and losses as direct contact and experience has indicated.

III. Demand Forecasting Methodology and Assumptions
Basic Assumptions (Continued)

The base revenue projections for both firm and interruptible customer groups are derived as the product of the projected sales volumes and the present tariff rate for each individual customer class within each group. The GCR revenue projections are derived as the product of the GCR factor and the projected sales volumes to the firm customers.

IV. Design Day and Design Hour Forecasting Methodology and Assumptions

Each year a six year estimate of Design Day and Design Hour requirements anticipated under design day and design hour operating conditions is prepared to ensure that adequate resources are under contract and to further ensure that PGW can fulfill its supply obligation to its firm customer requirements on a design day and design hour.

The projected demands for design day are developed utilizing previous winter periods data for all weekdays where the temperature average for the day is 32 degrees Fahrenheit or below. The total sendout for these days as recorded under actual conditions and is reduced to firm sendout by removal of the interruptible load. A computer generated linear regression procedure is utilized to develop a sendout model from actual daily sendouts and degree days, and the process is repeated in a quadratic regression and a cubic regression procedure. The model's predicted sendouts are, within a reasonable percent of error to the actual sendout, the actual sendouts. The factors derived from this are used to determine the current load requirements for a 0 degrees F day and from this data, the load for a -5 degrees F hour is calculated. PGW's Marketing Department's load projections for present and future years are then applied to these requirements to develop design day and design hour present and future load requirements. This is achieved by the addition of the projected marketing load growth on an annual basis (by day) to the derived base-year design day requirements.

V. PGW Corporate Modeling System

General Description

The corporate modeling system is a tool used by PGW management to project sales, revenues and expenses, as well as to examine key planning strategies and evaluate their effects on company operations. The system provides the ability to determine the results of alternate plans and scenarios, while at the same time allowing for responses to "what if" type situations quantifying revenue and expenses. The system is totally interactive in that it combines the power of the computer with the experience of management to develop both short and long range projections based upon experienced historical data for sales and sendout volumes, raw material expenses and sale revenues. The corporate model system is composed of five separate models. Each model operates independently but requires substantial external data inputs as well as data output results from one or more of the other models in the system.

Gas Demand Model

The gas demand model is used to forecast total requirements for gas based upon current customer usage experience with adjustments for projected gains and losses. Input data includes domestic and space heating usage factors, customer counts by rate classifications, temperature patterns and results in projections of sales and sendout volumes. Detail and summary reports include average usage per customer and demands by rate classification. This data is transferred to the supply model.

Gas Supply Model

The supply model is used to dispatch the various supply sources in accordance with contract availability limitations. It develops the necessary balance between supply and demand which reflects plant fuel and storage injection requirements as well as customer demands by identifying the availability of interruptible load balancing sales. Detail and summary reports include daily and monthly load requirements, the volumes taken from each source by pipeline contract, storage balances, supplemental fuel requirements, etc. Data is transferred to both the cost model and the revenue model downstream.

V. PGW Corporate Modeling System (Continued)

Gas Cost Model

The gas cost model is used to determine natural gas and other raw material costs dispatched. The model tracks the various cost components of each contract - the demand, capacity, commodity, injection and withdrawal charges - providing monthly and annual details and summary information including inventory valuations and expenses for supplemental LNG supplies. It transfers these expenses to the Gas Cost Rate Model.

Gas Cost Rate Model

The gas cost rate model is used to develop the net natural gas expenses, net applicable GCR expenses and the GCR. It ascribes responsibility for the raw material costs to firm and interruptible classes in accordance with PGW's tariff requirements, assigning cost on an as-used basis to customer classes applicable to such charges, and compensates for natural gas refunds and previous over or under billing of fuel expenses. Detail summary reports include specifics of raw material adjustment, statements of reconciliation, and determination of applicable sales and expenses. It transfers the results to the revenue model.

Revenue Model

The revenue model is used to project billed revenue by rate classification in accordance with PGW's rate tariffs. It prepares the net billed revenue, GCR revenues, senior citizen discounts, and cycle billing information all detailed by rate classification. The detail and summary reports provided by this model are directed to the accounting and financial departments for inclusion in various financial reviews.

Summary

The corporate modeling system allows PGW management to effectively address supply/demand balancing, supply facilities planning, projected sales, cost, revenues, and sendout volumes in a timely manner. Results assist in the development of PGW's annual Operating Budget, setting of the GCR and planning of supply resources.

V. PGW Corporate Modeling System (Continued)

The model also provides a Status Report for the evaluation of remaining winter period requirements on both normal and design temperature patterns and the extrapolation of the current year based upon the experience to date and an assumption of temperatures anticipated for the remaining period of the year, this latter acting as a guide for both financial cash flow planning and winter operations.

**FORM-IRP-GAS-1A: ANNUAL GAS REQUIREMENTS
REPORTING UTILITY: PHILADELPHIA GAS WORKS**

(VOLUMES IN MMcf)

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2002-2003	-1 2003-2004	0 2004-2005	1 2005-2006	2 2006-2007	3 2007-2008
Firm Requirements:						
Retail Residential	47,656	42,433	43,514	45,035	44,973	44,908
Retail Commercial	13,317	12,166	12,253	13,147	13,353	13,564
Retail Industrial	1,337	1,119	1,115	1,282	1,311	1,341
Electric Power Generation Exchanges with Other Utilities	-	-	-	-	-	-
Unaccounted For Gas	2,669	2,540	2,096	2,483	2,489	2,498
Company Use	113	99	112	121	121	121
Other	-	-	-	-	-	-
Subtotal Firm	65,091	58,356	59,089	62,067	62,247	62,432
Interruptible Requirements:						
Retail	5,984	4,006	3,781	4,521	4,297	4,136
Electric Power Generation	110	98	41	135	147	160
Company's Own Plant ⁽¹⁾	64	61	66	74	74	74
Unaccounted For Gas ⁽¹⁾	420	183	150	178	171	166
Subtotal Interruptible	6,578	4,347	4,038	4,908	4,689	4,536
SUBTOTAL FIRM AND INTERRUPTIBLE	71,669	62,703	63,128	66,975	66,936	66,968
Transportation:						
Firm Residential	-	-	-	-	-	-
Firm Commercial	-	-	-	-	-	-
Firm Industrial	-	-	-	-	-	-
Interruptible Residential	-	-	-	-	-	-
Interruptible Commercial	59	302	1,919	785	883	972
Interruptible Industrial	1,614	918	1,154	1,413	1,587	1,760
Other - Non-Utility Power Producers	9,315	7,762	8,024	7,925	7,925	7,925
Subtotal Transportation	10,988	8,981	11,097	10,122	10,394	10,657
TOTAL GAS REQUIREMENTS	82,657	71,684	74,224	77,098	77,331	77,625
Increase (Decrease)	na	(10,973)	2,540	2,873	233	294
Percent Change (%)	na	-13.28%	3.54%	3.87%	0.30%	0.38%

⁽¹⁾ Fiscal Year 2002-2003 Revised

FORM-IRP-GAS-1B: PEAK DAY REQUIREMENTS ⁽²⁾
REPORTING UTILITY: PHILADELPHIA GAS WORKS
(VOLUMES IN MMcf)

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2002-2003	-1 2003-2004	0 2004-2005	1 2005-2006	2 2006-2007	3 2007-2008
Firm Requirements:						
Retail Residential	433	438	536	525	525	523
Retail Commercial	121	125	151	153	156	158
Retail Industrial	12	12	14	15	15	16
Electric Power Generation	0	0	0	0	0	0
Exchanges with Other Utilities	0	0	0	0	0	0
Unaccounted For Gas	24	26	26	29	29	29
Company Use	1	1	1	1	1	1
Other	0	0	0	0	0	0
Subtotal Firm	592	602	727	723	726	728
Interruptible Requirements:						
Retail	25.1	18.1	0.0	0.0	0.0	0.0
Electric Power Generation	0.0	0.0	0.0	0.0	0.0	0.0
Company's Own Plant ⁽¹⁾	0.5	0.4	0.3	0.3	0.3	0.3
Unaccounted For Gas ⁽¹⁾	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Interruptible	25.6	18.5	0.3	0.3	0.3	0.3
SUBTOTAL FIRM AND INTERRUPTIBLE						
	618	620	728	724	726	728
Transportation:						
Firm Residential	0	0	0	0	0	0
Firm Commercial	0	0	0	0	0	0
Firm Industrial	0	0	0	0	0	0
Interruptible Residential	0	0	0	0	0	0
Interruptible Commercial	0	0	0	0	0	0
Interruptible Industrial	1	2	0	0	0	0
Other - Non-Utility Power Producers	42	2	0	0	0	0
Subtotal Transportation	42.8	4	0	0	0	0
TOTAL GAS REQUIREMENTS						
	660	624	728	724	726	728
Increase (Decrease)	na	(36)	104	(4.1)	3	2
Percent Change (%)	na	-5.52%	16.66%	-0.56%	0.37%	0.22%

⁽¹⁾ Fiscal Year 2002-2003 Revised

⁽²⁾ Peak Day is forecasted at a 2 degree temperature.

**FORM-IRP-GAS-2A: ANNUAL/PEAK SUPPLY
REPORTING UTILITY: PHILADELPHIA GAS WORKS
(VOLUMES IN MMcf)**

Index Year Actual Year	Historical Data				Current Year		Three Year Forecast ⁽²⁾					
	-2 2002-2003		-1 2003-2004		0 2004-2005		1 2005-2006		2 2006-2007		3 2007-2008	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Gas Supply for Sales Service												
TETCO	-	-	-	-	-	-	-	-	-	-	-	-
TRANSCO	19,477	53	9,841	53	14,551	53	-	-	-	-	-	-
Spot Purchases	50,053	186	57,160	295	51,037	209	69,106	289	67,834	289	67,839	289
Storage Withdrawals	16,428	208	14,082	86	15,639	197	9,972	169	11,029	169	10,303	169
LNG Withdrawal	3,335	171	2,609	188	1,789	275	4,793	271	4,598	274	4,538	275
Company Production	-	-	-	-	-	-	-	-	-	-	-	-
LNG Purchases	127	-	-	-	-	-	-	-	-	-	-	-
Exchanges with other LDCs	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply	89,421	618	83,692	622	83,016	733.39	83,871	729	83,461	732	82,680	734
Total Transportation Services	10,988	43	8,981	4	11,097	-	10,122	-	10,394	-	10,657	-
TOTAL GAS SUPPLY AND TRANSPORTATION SERVICE	100,409	661	92,673	625	94,113	733	93,993	729	93,855	732	93,337	734
Deductions												
Underground Storage Injections & Fuels	14,534	-	18,290	-	16,714	4	12,206	4	11,422	4	10,802	4
LNG Liquefactions & Fuels ⁽¹⁾	3,049	2	2,699	1	3,175	2	4,690	2	5,103	2	4,910	2
Sales to other LDC's	169	-	-	-	-	-	-	-	-	-	-	-
Total Deductions	17,752	2	20,989	1	19,889	6	16,895	6	16,525	6	15,712	6
NET GAS SUPPLY	82,657	660	71,684	624	74,224	728	77,098	724	77,331	726	77,625	728
BTU	1,038											

⁽¹⁾ Fiscal Year 2002-2003 Revised

⁽²⁾ Peak Day is forecasted at a 2 degree temperature.

**FORM-IRP-GAS-2B: NATURAL GAS TRANSPORTATION
REPORTING UTILITY: PHILADELPHIA GAS WORKS
(VOLUMES IN MMcf)**

Index Year Actual year	Historical Data				Current Year		Three Year Forecast					
	-2 2002-2003		-1 2003-2004		0 2004-2005		1 2005-2006		2 2006-2007		3 2007-2008	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
City Gate Transportation Contracts:												
Transcontinental Transmission Corp.	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60
Texas Eastern Transmission Corp.	2,570	43	2,570	43	2,570	43	2,570	43	2,570	43	2,570	43
Texas Eastern Transmission Corp.	2,390	20	2,390	20	2,390	20	2,390	20	2,390	20	2,390	20
Transcontinental Transmission Corp.	453	5	453	5	453	5	453	5	453	5	453	5
Total	9,137	128	9,137	128	9,137	128	9,137	128	9,137	128	9,137	128
Upstream Transportation Contracts:												
Transcontinental Transmission Corp.	58,546	160	58,546	160	58,546	160	58,546	160	58,546	160	58,546	160
Texas Eastern Transmission Corp.	26,578	73	26,578	73	26,578	73	26,578	73	26,578	73	26,578	73
Texas Eastern Transmission Corp.	8,442	23	8,442	23	8,442	23	8,442	23	8,442	23	8,442	23
Texas Eastern Transmission Corp.	2,359	17	2,359	17	2,359	17	2,359	17	2,359	17	2,359	17
Texas Eastern Transmission Corp.	2,359	17	2,359	17	2,359	17	2,359	17	2,359	17	2,359	17
Transcontinental Transmission Corp.	172	2	172	2	172	2	172	2	172	2	172	2
Total	98,456	293	98,456	293	98,456	293	98,456	293	98,456	293	98,456	293
Storage-Related Transportation Contracts:												
Dominion Transmission Inc.	9,110	25	9,110	25	9,110	25	9,110	25	9,110	25	9,110	25
Dominion Transmission Inc.	2,760	8	2,760	8	2,760	8	2,760	8	2,760	8	2,760	8
Equitrans	1,911	5	1,911	5	1,911	5	1,911	5	1,911	5	1,911	5
Total	13,782	38	13,782	38	13,782	38	13,782	38	13,782	38	13,782	38

FORM-IRP-GAS-2C: NATURAL GAS STORAGE ⁽¹⁾
REPORTING UTILITY: PHILADELPHIA GAS WORKS
(VOLUMES IN MMcf)

Index Year Actual year	Historical Data				Current Year		Three Year Forecast					
	-2 2003		-1 2004		0 2005		1 2006		2 2007		3 2008	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Transcontinental Transmission Corp.	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60
Dominion Transmission Inc.	3,481	32	3,481	32	3,481	32	3,481	32	3,481	32	3,481	32
Transcontinental Transmission Corp.	3,086	36	3,086	36	3,086	36	3,086	36	3,086	36	3,086	36
Texas Eastern Transmission Corp.	2,467	43	2,467	43	2,467	43	2,467	43	2,467	43	2,467	43
Texas Eastern Transmission Corp.	2,219	20	2,219	20	2,219	20	2,219	20	2,219	20	2,219	20
ANR	1,824	12	-	-	-	-	-	-	-	-	-	-
Transcontinental Transmission Corp.	802	80	802	80	802	80	802	80	802	80	802	80
Equitrans	507	5	507	5	507	5	507	5	507	5	507	5
Transcontinental Transmission Corp.	453	5	453	5	453	5	453	5	453	5	453	5
Total	18,562	294	16,738	281	16,738	281	16,738	281	16,738	281	16,738	281

⁽¹⁾ Rank contracts in order of magnitude for the current year, noting the transportation provided and termination date for each contract reported. Reporting should proceed along rank ordering until 75% of total is accounted for, or until ten contracts have been listed, whichever occurs first.

Conversions at 1030 Btu

	Contract Expiration Date ⁽²⁾
Transcontinental Transmission Corp.	03/31/2013
Dominion Transmission Inc.	03/31/2006
Transcontinental Transmission Corp.	Evergreen
Texas Eastern Transmission Corp.	04/30/2012
Texas Eastern Transmission Corp.	04/30/2012
ANR	03/31/2003
Transcontinental Transmission Corp.	10/31/2013
Equitrans	03/31/2005
Transcontinental Transmission Corp.	04/15/2005

⁽²⁾ For purposes of this report, except ANR, all contracts due to expire are assumed renewed for the forecast years.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing, of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) as utility seeking recovery of purchased as costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

53.64(c)(6) Each Section 1307 (f) utility shall file with the Commission a statement of its current fuel procurement practices, detailed information concerning, the staffing and expertise of its fuel procurement personnel, a discussion of its methodology for obtaining a least cost and reliable source of as supply, including a discussion of any methodologies, assumptions, models or rules of thumb employed in selecting its gas supply, transportation and storage mix, its loss prevention strategy in the event of fraud, nonperformance or interruption of performance, its participation in capacity release and reallocation programs, the impact, if any, upon least cost fuel procurement by constraints imposed by local transportation end users, interruptible service, balancing, storage and dispatching, options, and its strategy for improving its fuel procurement practices in the future and timetable for implementing these changes.

Response:

I. Current Strategy

PGW's current strategy for meeting, the system's supply requirements is to use a portfolio approach in both contract structures and pricing. The Company's supply portfolio is split into three distinct categories. First, the Company enters into winter-only supply contracts. These winter-only supply arrangements provide gas supply that fills approximately sixty-four percent (64%) of PGW's daily firm transportation entitlements on both Duke Energy Gas Transmission and Williams Gas Pipeline.

Item 53.64(c)(6) continued

The Duke Energy and Williams pipelines represent the only interstate pipeline facilities with physical connections to the PGW service territory. These supply contracts also recognize pipeline receipt and delivery rights. By sourcing supply in this manner, PGW not only ensures security of supply from the pipelines, but also can take advantage of varying basis differentiated pricing in the market. These contracts all contain the ability to set the price for upcoming months, or to have the pricing, default to an agreed upon market index. Second, an additional thirty-two percent (32 %) of PGW's gas supply portfolio is purchased on "first of the month index" priced contracts that allow for daily changes in volume. The operational flexibility of these contracts allows the company to increase or decrease gas supply to meet variations in sendout requirements at a known price. Third the company utilizes three (3) pipeline storage services, as an additional source of supply. These storage services do not contain bundled transportation and therefore are moved to the city gates within PGW's firm interstate pipeline capacity. These services represent four percent (4 %) of supply at a fixed price.

Additionally, PGW utilizes bundled storage and LNG to meet operational requirements and to accomplish other cost saving initiatives. Specifically, once design winter sendout requirements are ensured of being met, the company may utilize bundled storage and LNG inventories to displace higher priced supply based on then current market conditions. PGW's also uses a portfolio approach to address system supply and storage refill in the traditional non-peak season. The Gas Supply area uses the GCR filing as a template in an attempt to purchase gas volumes for both system supply and storage refill below the projected cost, when possible. However, some proportion of the supply will always be subject to spot market pricing either daily or monthly due to the constant need to purchase gas to meet sendout variations that are inherent in a residential firm heating load. PGW seeks to recoup demand charges for its firm transportation through the FERC approved capacity release mechanisms.

The Company also enters into the incremental off systems sales market to generate additional revenue when it is economically advantageous to do so. At all times the Company is studying, the market for any, economic advantage that can be derived in support of the firm ratepayer.

Item 53.64(c)(6) continued

II. Overview of Gas Supply Section

The Gas Supply Section of Gas Management is comprised of four departments: Gas Supply, Gas Transportation, Gas Accounting and Gas Control. The Gas Supply Section is responsible for ensuring that there is an adequate supply of natural gas available at all times to meet the requirements of PGW's over 500,000 firm customers. The Gas Supply Section accomplishes this through continuous interaction with various departments within PGW.

The staff of the Gas Supply Section is expected to maintain an in-depth working knowledge of all facets of the natural gas supply markets. The staff members of the four departments are required to maintain a working knowledge of PGW's natural gas contracts and facilities for the purpose of ensuring the safe and efficient operation of the distribution system, in accordance with company procedures, and in compliance with federal, state, and local regulations.

III. Organization and Staffing

Director of Gas Transportation and Gas Control: This person has a fourteen-year history in the supply area and a four-year history in gas control. This individual has a BA as well as having a background in natural gas accounting, allocation and confirmation experience under the first stages of FERC Order 636, and its effect on supply portfolio management.

This individual and the staffs of the departments that report to him interacts continuously and provides 24/7 coverage in all situations pertaining to the gas supply portfolio and operation of the natural gas facilities. This is done in conjunction with the Gas Supply Committee as well as everyday meetings with the VP of Gas Management and the other direct reports of the VP of Gas Management. The following departments report directly to this individual Gas Supply, Gas Control, Gas Accounting, and Gas Transportation.

Item 53.64(c)(6) continued

Manager, Gas Accounting this person has over ten years experience in the gas supply area. This individual has a MBA and BS in addition to having an extensive background in the area of gas accounting. Reporting to this individual is the gas accountants and contract administrator.

Manager, Gas Control: This person has over ten years in the supply area, is responsible for the day-today management of the city distribution grid as well as daily confirmation of each day's gas volumes. He supervises the gas control department on a 24/7 basis. The manager has a BS degree and extends duty in the Distribution Department's network analysis area.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

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- (7) A list of off-system sales, including transportation, storage, or capacity releases by the utility at less than the weighted average price of gas, or at less than the original contract cost of transportation, storage, or capacity supplied to the utility for its own customers.

Response:

The attached schedules list off system sales and capacity release for the period of January 1, 2005 to December 31, 2005.

Schedule 1 – reflects all off system sales margins for the period January 1, 2005 to December 31, 2005.

Schedule 2 – would reflect any off system sales transactions, which were done at less than the weighted average cost of gas. The schedule is blank because none of the deals match the criteria.

Schedule 3 – illustrates all capacity release deals.

Schedule 4 - would reflect any individual capacity release transactions, which were done at less than the weighted average cost of capacity.

Philadelphia Gas Works
 Pennsylvania Public Utilities Commission
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Schedule 1
 Item 53.64(C)(7)

Off-System Sales			
MONTH	Total Revenue	Ratepayer Margin	Total Credit To GCR
Jan-05	\$0	\$0	\$0
Feb-05	\$0	\$0	\$0
Mar-05	\$0	\$0	\$0
Apr-05	\$0	\$0	\$0
May-05	\$0	\$0	\$0
Jun-05	\$1,754,550	\$229,601	\$1,754,550
Jul-05	\$401,670	\$23,783	\$401,670
Aug-05	\$1,859,700	\$206,855	\$1,859,700
Sep-05	\$0	\$0	\$0
Oct-05	\$0	\$0	\$0
Nov-05	\$0	\$0	\$0
Dec-05	\$0	\$0	\$0
Total	\$4,015,920	\$460,239	\$4,015,920

Off System Sale Profits Per WACOG Worksheet

No deals were enacted under the weighted average cost of gas.

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Schedule 3
 Item 53.64(C)(7)

MONTH	Capacity Release		
	Total	Total	Total
	TGPL	TETCO	GCR
	Credits	Credits	Credits
Jan-05	\$0	\$0	\$0
Feb-05	\$0	\$0	\$0
Mar-05	\$0	\$0	\$0
Apr-05	\$0	\$70,740	\$ 70,740
May-05	\$108,810	\$265,773	\$ 374,583
Jun-05	\$224,580	\$257,200	\$ 481,780
Jul-05	\$232,066	\$265,773	\$ 497,839
Aug-05	\$256,866	\$265,626	\$ 522,492
Sep-05	\$273,450	\$557,183	\$ 830,633
Oct-05	\$231,415	\$424,278	\$ 655,693
Nov-05	\$171,695	\$262,970	\$ 434,665
Dec-05			
Total	\$1,498,882	\$2,369,544	\$3,868,426

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Schedule 4
 Page 1 of 2
 Item 53.64(C)(7)

M / YR	PIPELINE	PATH	RECALL STATUS	MONTHLY VOLUME DTH	TOTAL MONTHLY CREDIT	CREDIT DTH	TOTAL GCR CREDIT	REPLACEMENT SHIPPER
January-05	None							
February-05	None							
March-05	None							
April-05	TETCO	WLA-M3	N	540,000	\$ 38,340.00	\$ 0.0710	\$ 38,340.00	Constellation
	TETCO	WLA-M3	N	540,000	\$ 32,400.00	\$ 0.0600	\$ 32,400.00	Constellation
May-05	TRANSCO	3-6	N	310,000	\$51,150.00	\$ 0.1650	\$ 51,150.00	Constellation
	TRANSCO	3-6	N	310,000	\$57,660.00	\$ 0.1860	\$ 57,660.00	Constellation
June-05	TETCO	WLA - M-3	N	558,000	\$110,732.00	\$ 0.1984	\$ 110,732.00	Grays Ferry
	TETCO	WLA - M-3	N	558,000	\$110,732.00	\$ 0.1984	\$ 110,732.00	Grays Ferry
	TETCO	WLA - M-3	N	44,309	\$738,482.00	\$ 16.6666	\$ 738,482.00	Tenaska
	TRANSCO	3-6	N	150,000	\$ 14,250.00	\$ 0.0950	\$ 14,250.00	Sequent
	TRANSCO	3-6	N	300,000	\$ 49,500.00	\$ 0.1650	\$ 49,500.00	Constellation
	TRANSCO	3-6	N	300,000	\$ 55,800.00	\$ 0.1860	\$ 55,800.00	Constellation
	TRANSCO	3-6	N	300,000	\$ 51,000.00	\$ 0.1700	\$ 51,000.00	Conoco Philips
	TRANSCO	3-6	N	300,000	\$ 54,030.00	\$ 0.1801	\$ 54,030.00	Coral Energy
	TETCO	WLA - M-3	N	540,000	\$107,160.00	\$ 0.1984	\$ 107,160.00	Grays Ferry
	TETCO	WLA - M-3	N	540,000	\$107,160.00	\$ 0.1984	\$ 107,160.00	Grays Ferry
TETCO	WLA - M-3	N	714,660	\$42,880.00	\$ 0.0600	\$ 42,880.00	Tenaska	

M / YR	PIPELINE	PATH	RECALL STATUS	MONTHLY VOLUME DTH	TOTAL MONTHLY CREDIT	CREDIT DTH	TOTAL GCR CREDIT	SHIPPER
July-05	TRANSCO	3-6	N	155,000	\$ 14,725.00	\$ 0.0950	\$ 14,725.00	Sequent
	TRANSCO	3-6	N	310,000	\$ 51,150.00	\$ 0.1650	\$ 51,150.00	Constellation
	TRANSCO	3-6	N	310,000	\$ 57,660.00	\$ 0.1860	\$ 57,660.00	Constellation
	TRANSCO	3-6	N	310,000	\$ 52,700.00	\$ 0.1700	\$ 52,700.00	Conoco Phillips
	TRANSCO	3-6	N	310,000	\$ 55,831.00	\$ 0.1801	\$ 55,831.00	Coral
	TETCO	WLA - M-3	N	558,000	\$110,732.00	\$ 0.1984	\$ 110,732.00	Grays Ferry
	TETCO	WLA - M-3	N	558,000	\$110,732.00	\$ 0.1984	\$ 110,732.00	Grays Ferry
	TETCO	WLA - M-3	N	738,482	\$ 44,309.00	\$ 0.0600	\$ 44,309.00	Tenaska
August-05	TRANSCO	3-6	N	155,000	\$ 14,725.00	\$ 0.0950	\$ 14,725.00	Sequent
	TRANSCO	3-6	N	155,000	\$ 24,800.00	\$ 0.1600	\$ 24,800.00	PSNG LNG
	TRANSCO	3-6	N	310,000	\$ 51,150.00	\$ 0.1650	\$ 51,150.00	Constellation
	TRANSCO	3-6	N	310,000	\$ 57,660.00	\$ 0.1860	\$ 57,660.00	Constellation
	TRANSCO	3-6	N	310,000	\$ 52,700.00	\$ 0.1700	\$ 52,700.00	Conoco Philips
	TRANSCO	3-6	N	310,000	\$ 55,831.00	\$ 0.1801	\$ 55,831.00	Coral
	TETCO	WLA - M-3	N	558,000	\$110,659.00	\$ 0.1983	\$ 110,659.00	Grays Ferry
	TETCO	WLA - M-3	N	558,000	\$110,659.00	\$ 0.1983	\$ 110,659.00	Grays Ferry
	TETCO	WLA - M-3	N	738,482	\$44,309.00	\$ 0.0600	\$ 44,309.00	Tenaska
September-05	TRANSCO	3-6	N	300,000	\$ 49,500.00	\$ 0.1650	\$ 49,500.00	Stat Oil
	TRANSCO	3-6	N	300,000	\$ 97,950.00	\$ 0.3265	\$ 97,950.00	Stat Oil
	TRANSCO	3-6	N	300,000	\$ 126,000.00	\$ 0.4200	\$ 126,000.00	BG LNG System
	TETCO	WLA - M-3	N	540,000	\$ 107,089.13	\$ 0.1983	\$ 107,089.13	Grays Ferry
	TETCO	WLA - M-3	N	540,000	\$ 107,089.13	\$ 0.1983	\$ 107,089.13	Grays Ferry
	TETCO	WLA - M-3	N	714,660	\$ 343,004.91	\$ 0.4800	\$ 343,004.91	BG LNG System
October-05	TRANSCO	3-6	N	310,000	\$ 101,215.00	\$ 0.3265	\$ 101,215.00	Stat Oil
	TRANSCO	3-6	N	310,000	\$ 130,200.00	\$ 0.4200	\$ 130,200.00	BG LNG
	TETCO	WLA - M-3	N	558,000	\$ 44,640.00	\$ 0.0800	\$ 44,640.00	Sprague
	TETCO	WLA - M-3	N	504,000	\$ 25,200.00	\$ 0.0500	\$ 25,200.00	Cook Infet
	TETCO	WLA - M-3	N	738,482	\$ 354,438.40	\$ 0.4800	\$ 354,438.40	BG LNG
November-05	TRANSCO	3-6	N	230,000	\$ 96,600.00	\$ 0.4200	\$ 96,600.00	BG LNG System
	TRANSCO	3-6	N	230,000	\$ 75,095.00	\$ 0.3265	\$ 75,095.00	Stat Oil
	TETCO	WLA - M-3	N	547,906	\$ 262,970.00	\$ 0.4800	\$ 262,970.00	BG LNG
December-05								

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

- (8) A list of agreements to transport gas by the utility through its system, for other utilities, pipelines or jurisdictional customers including the quantity and price of the transportation.

Response:

Please see the attached list of gas transportation agreements for PGW's jurisdictional customers. PGW has no transportation agreements with other utilities or pipeline customers.

TRANSPORTATION CONTRACTS

Maximum Company Obiligation		Maximum Company Obiligation		Maximum Company Obiligation		Maximum Company Obiligation	
ID#	Dth/D	ID#	Dth/D	ID#	Dth/D	ID#	Dth/D
1	60,000	29	100	55	64	76	173
2	250	30	100	55	55	77	782
3	10,000	31	103	55	46	78	782
4	12,000	32	900	56	2,000	79	782
5	50,000	33	50	57	43	80	782
6	50,000	33	50	57	101	81	235
7	312	34	240	58	100	82	626
8	360	34	240	53	316	83	626
8	346	35	58	54	407	84	251
9	84	35	1,250	55	46	85	170
9	1,380	36	58	56	64	86	513
10	60	36	58	57	55	87	707
11	300	37	58	58	30	88	171
12	750	38	4,360	59	43	89	490
13	400	39	250	60	101	90	237
14	141	39	250	61	100	91	262
15	120	40	100	62	2,000	92	628
15	185	41	63	63	522	93	373
16	624	41	437	64	676	94	291
17	622	42	1,362	65	339	95	222
18	1,355	43	178	65	159	96	44
19	123	44	1,225	65	469	97	120
20	432	45	267	65	469	98	354
21	42	46	3,432	66	261	99	281
22	408	47	80	67	240	100	204
23	550	48	291	68	240	101	141
24	400	49	120	69	750	102	336
25	240	50	100	70	496	103	1,080
25	463	51	200	71	907	104	114
26	420	52	27	72	241	105	576
26	8,479	53	407	73	320	106	1,833
27	500	53	316	74	1,252	107	223
28	75	54	30	75	417		

Philadelphia Gas Works

Pennsylvania Public Utility Commission
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- (9) A schedule depicting historic monthly end-user transportation through-put by customer. Each customer or account shall be identified solely by a unique alphanumeric code, the key to which may be provided subject to § 5.423 (relating to orders to limit availability of proprietary information).

Response:

Please see the attached schedule depicting the monthly end-user transportation through-put by customer.

The Philadelphia Gas Works
Jan-2005 - Dec-2005 (Dth)

ID #	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Total
1	5,193	114	1,430	2,530	55,208	94,984	198,065	46,264	43,122	43,266	12,113	6,594	508,883
2	12,516	11,661	12,946	10,740	9,218	11,168	11,367	11,645	10,056	9,092	12,695	12,012	135,116
3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-
6	929,685	714,772	909,105	506,614	697,458	703,419	690,040	631,868	521,375	389,506	405,049	541,834	7,640,725
7	4,728	4,362	4,815	3,695	3,654	3,976	3,756	3,525	3,214	3,586	4,185	1,688	45,183
8	4,114	845	857	1,057	1,482	1,872	1,395	1,646	1,209	1,252	1,262	3,244	20,235
8	8,266	7,998	7,372	6,154	6,373	6,545	6,459	6,354	5,455	6,216	7,178	7,279	81,648
9	14,070	12,742	11,953	7,741	10,688	12,738	10,685	11,372	14,773	17,139	12,736	10,604	147,239
9	11,034	721	4,286	4,255	4,111	3,874	4,125	4,135	4,350	5,061	4	338	46,292
10	178	2,391	2,456	529	350	175	146	140	208	81	-	3	6,656
11	1,502	4,693	4,156	1,218	-	-	-	-	-	254	1,952	4,992	18,767
12	1,572	-	1,933	11,326	14,851	15,425	14,133	14,386	16,100	1,254	-	-	90,979
13	9,545	8,463	8,259	4,344	2,902	2,140	2,077	1,978	2,756	4,141	5,608	8,936	61,148
14	2,567	2,756	3,425	2,734	2,333	2,220	2,688	3,218	3,432	3,182	2,882	2,453	33,889
15	4,520	3,643	3,519	1,148	48	-	2	3	15	295	2,082	4,633	19,907
15	1,430	1,503	1,620	1,368	1,778	1,354	1,573	1,551	1,442	1,612	1,537	1,258	18,026
16	5,957	5,410	4,803	1,904	259	835	1,256	-	514	2,507	4,084	5,939	33,468
17	2,220	783	1,018	467	1,367	437	13	1,166	852	-	4	1,854	10,180
18	2,875	-	-	10	16,056	10,151	7,248	9,116	8,251	16,143	13,882	9,236	92,968
19	4,744	4,403	4,610	3,645	3,044	2,363	2,352	2,344	2,475	2,912	3,736	4,828	41,454
20	6,302	5,566	6,187	4,598	4,438	4,348	3,802	3,208	3,268	4,059	4,510	5,654	55,941
21	2,210	2,021	2,292	1,979	1,772	1,451	1,496	1,619	1,380	1,801	2,051	2,321	22,392
22	-	-	6,220	4,685	4,726	3,220	2,929	2,934	3,059	3,816	4,532	5,231	41,352
23	8,107	7,053	7,908	6,875	5,387	5,143	4,974	5,329	3,827	6,271	6,468	7,122	74,463
24	-	6,132	6,341	3,801	3,383	2,024	1,823	1,776	1,931	3,725	5,003	7,228	43,168
25	38	9	3,692	3,459	3,501	2,920	3,206	3,412	3,269	3,071	2,940	3,021	32,536
25	1,282	630	4,094	3,940	4,060	3,981	4,000	3,997	3,923	3,352	3,914	4,106	41,278
26	3,361	4,481	19,660	14,213	14,775	16,513	17,715	16,827	15,645	14,596	14,263	83	152,131
26	-	-	-	-	-	-	0	0	-	-	-	-	0

The Philadelphia Gas Works
Jan-2005 - Dec-2005 (Dth)

ID #	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Total
27	340	5,003	5,324	3,548	2,038	1,236	2,124	2,007	2,214	3,174	3,913	-	30,920
28	73	1,824	1,846	811	585	188	176	177	187	554	1,124	1,932	9,475
29	2,302	2,350	2,396	2,067	1,901	1,538	1,517	1,496	1,527	1,767	2,052	2,452	23,364
30	5,881	5,457	5,325	3,098	3,138	2,078	1,950	1,990	2,693	3,287	4,295	5,803	44,994
31	9	1,080	1,067	728	816	1,339	1,545	1,581	1,489	701	729	1,114	12,198
32	2,307	10	18,081	17,249	16,512	13,544	10,861	11,965	8,620	11,491	13,242	15,392	139,274
33	345	276	310	292	288	300	157	330	307	327	379	522	3,832
33	974	775	862	810	803	853	439	930	863	910	1,055	1,472	10,745
34	9,234	7,343	7,183	5,284	5,711	5,183	4,581	4,536	4,708	5,483	6,141	8,214	73,600
34	0	3	5	15	36	1	0	-	-	0	-	-	60
35	859	701	696	329	234	59	58	55	62	229	428	789	4,496
35	775	624	596	241	145	-	-	23	46	193	389	731	3,762
36	1,989	1,584	1,391	502	373	200	181	159	177	452	876	1,788	9,671
36	910	699	700	334	263	12	-	-	50	209	444	799	4,420
37			2,112	1,225	1,063	770	709	711	727	1,032	1,416	2,272	12,036
38	30,108	22,301	30,519	20,122	17,594	11,279	10,860	11,090	10,607	17,352	22,914	29,470	234,214
39	1,656	738	2,483	3,295	3,852	4,401	4,305	4,669	4,830	1,554	2,849	4,744	39,375
39	1,925	846	2,905	3,775	4,394	4,932	4,841	5,165	5,297	1,772	3,285	5,504	44,641
40	2,264	1,692	1,508	658	578	456	417	401	418	577	1,262	2,173	12,404
41	7,390	7,167	7,862	7,040	6,755	6,269	5,859	6,102	6,229	6,566	6,889	7,308	81,434
41	990	999	1,005	899	1,117	937	785	935	898	768	829	966	11,128
42	5,656	4,950	4,325	3,019	3,164	3,059	2,699	2,911	2,069	2,260	2,434	2,718	39,264
43	2,250	2,180	2,572	1,988	2,145	2,041	1,779	2,015	1,835	2,091	2,669	2,617	26,183
44	24,796	21,278	23,318	7,124	21	-	-	-	94	74	11,731	24,581	113,015
45	6,714	5,600	6,046	6,806	9,363	14,003	16,054	15,463	11,949	8,294	5,920	3,280	109,491
46	207	42	62	238	9,572	217	352	332	659	282	63	-	12,026
47	2,289	2,377	2,612	1,310	496	-	-	2	-	-	-	-	9,084
48	6,106	4,897	5,210	4,967	4,834	4,632	4,419	4,484	4,500	4,807	5,157	6,205	60,217
49	3,090	2,591	2,646	1,276	206	4	4	6	1	541	1,361	2,792	14,519
50	2,376	1,905	2,220	869	590	-	-	-	-	363	1,063	2,130	11,516
51	4,176	3,616	3,698	1,798	841	5,375	7,118	6,893	6,096	1,142	2,573	4,130	47,454

**The Philadelphia Gas Works
Jan-2005 - Dec-2005 (Dth)**

ID #	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Total
52	2,156	1,474	1,544	179	-	-	-	-	-	173	170	1,162	6,858
53	6,896	5,074	4,670	680	20	-	-	-	-	-	1,468	5,479	24,286
54	7,287	7,773	7,319	5,788	5,814	5,645	4,841	5,557	5,436	5,574	5,638	6,613	73,283
55	1,364	950	872	198	58	1	1	1	0	185	497	1,131	5,258
56	1,668	1,181	1,163	251	85	-	-	-	-	145	448	1,397	6,338
57	1,746	1,246	1,114	124	40	-	-	-	-	-	-	-	4,271
58	681	691	742	575	550	509	457	490	453	519	603	638	6,905
59	1,330	987	624	111	-	14	-	-	28	576	1,398	84	5,152
60	2,955	2,489	2,451	294	1,275	958	721	726	724	899	-	-	13,492
61	3,536	3,130	3,347	1,101	71	-	-	-	-	1,375	2,174	3,719	18,453
62	5,682	5,913	6,956	6,010	6,104	5,095	4,632	2,834	4,439	4,484	2,684	1,391	56,222
63		4,783	5,599	1,942	1,035	1,048	827	608	644	2,161	5,739	6,052	30,439
64		3,755	3,760	1,453	870	522	441	407	428	1,116	2,010	3	14,766
65		3,814	4,454	1,378	883	460	374	486	450	1,151	1,728	4,101	19,280
65		-	-	36	200	2,015	2,722	2,506	1,630	625	-	-	9,734
65		1,127	1,272	430	314	72	17	11	30	297	730	1,622	5,922
65												226	226
66			1,534	1,672	1,686	1,533	1,465	1,583	1,550	1,617	188	-	12,828
67			2,741	1,389	1,084	79	-	-	-	914	1,689	3,083	10,980
68				2,744	2,574	1,647	1,648	1,924	1,988	2,870	3,235	-	18,630
69				5,657	6,299	6,293	6,347	8,111	469	31	334	1,213	34,754
70				1,323	772	344	319	311	324	4	-	-	3,397
71					5,110	4,436	4,612	4,589	4,562	5,200	4,031	418	32,956
72										287	519	1,234	2,040
73						298	277	280	303	1,284	2,087	4,584	9,113
74							912	920	31	13	-	-	1,875
75						78	575	546	635	627	-	-	2,460
76							561	600	579	195	134	-	2,068
77		2,599	2,977	955	506		383	388	409	1,306	2,324	3,503	15,349
78		2,412	2,418	925	470		347	368	492	1,088	2,000	3,561	14,081
79		2,406	2,358	761	403		338	352	375	1,101	1,932	2,869	12,896

The Philadelphia Gas Works
Jan-2005 - Dec-2005 (Dth)

ID #	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Total
80		3,449	3,082	1,397	775		398	388	413	1,237	2,672	4,421	18,231
81								1,548	1,365	1,482	1,210	649	6,253
82									-	447	1,097	2,448	3,992
83									176	462	968	2,614	4,221
84										736	1,177	2,878	4,791
85										247	357	831	1,435
86										1,458	976	585	3,020
87											4,189	5,526	9,716
88											2,225	2,140	4,364
89											2,535	1,597	4,132
90											357	1,235	1,592
91											1,333	2,307	3,640
92											2,877	833	3,710
93											1,414	2,512	3,925
94										7,213	1,594	2,748	11,555
95											449	1,035	1,484
96											918	1,505	2,423
97											297	586	883
98											24	-	24
99											984	1,382	2,366
100											595	1,357	1,952
101												962	962
102												425	425
103												6,080	6,080
104												642	642
105												7,076	7,076
106												7,869	7,869
107												684	684

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

- (10) A schematic system map, locating and identifying by name, the pressure and capacity of all interstate or intrastate transmission pipeline connections, compressor stations, utility transmission or distribution mains 6 inches or larger in size, storage facilities, including maximum daily injection and withdrawal rates, production fields, and each individual supply or transportation customer which represents 5% or more of total system throughput in a month. Each customer or account shall be identified solely by a unique alphanumeric code, the key to which may be provided subject to § 5.423.

Response:

Following the lead of the industry, as well as federal policy guidelines regarding the security of information relating to energy transmission sites, PGW will no longer provide this data to the general public. However, upon request PGW will provide this information to the Commission and will also provide this information, upon written request, to parties to this proceeding that have legitimate business reasons to view this information.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

- (11) If any rate structure or rate allocation changes are to be proposed, a detailed explanation of each proposal, reasons therefore, number of customers affected, net effect on each customer class, and how the change relates to or is justified by changes in gas costs proposed in the Section 1307(f) tariff filing. Explain how gas supply, transportation and storage capacity costs are allocated to customers which are primarily nonheating, interruptible or transportation customers.

Response:

PGW is not proposing any rate structure or rate allocation changes in the instant proceeding, therefore, no testimony or schedules have been provided in this pre-filing to support such changes.

PGW will provide testimony regarding gas procurement policies, strategies and the GCR calculation in its 1307f March 1 filing.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

- (12) A schedule depicting the most recent 5-year consecutive 3-day peak data by customer class (or other historic peak day data used for system planning), daily volumetric throughput by customer class (including end-user transportation throughput), gas interruptions and high, low and average temperature during each day.

Response:

Schedule 1 – Three-day peak for FY 00-01 through FY 04-05.

Schedule 2 – Identifies a listing of gas interruptions for FY 00-01 through FY 04-05, their duration and the high, low and average temperatures for each day that the interruption was in effect.

3 DAY PEAK ANALYSIS

Winter Peak Season	Date	Average Temperature	Hi Temperature	Low Temperature	Total Sendout (mcfs)	Firm Sendout (mcfs)	Cogen Sendout (mcfs)	LBS Sendout (mcfs)	BPS Sendout (mcfs)	GTS Sendout (mcfs)	IT Sendout (mcfs)
2000-2001	Dec 24	29	37.	21	444,640	421,627	0	19,800	2,550	663	0
2000-2001	Dec 25	20	26	17	520,086	515,045	0	1,376	2,831	834	0
2000-2001	Dec 26	25	30	22	486,331	478,958	0	1,673	4,682	1,018	0
2001-2002	Dec 30	27	33	22	452,320	431,470	0	7,130	13,405	315	0
2001-2002	Dec 31	27	34	21	459,593	436,440	0	7,835	15,004	314	0
2001-2002	Jan 1	30	36	25	441,971	419,432	0	7,968	14,100	471	0
2002-2003	Jan 22	19	27	13	575,641	548,462	13	832	24,118	2,216	0
2002-2003	Jan 23	16	22	11	616,928	588,420	0	549	25,204	2,755	0
2002-2003	Jan 24	25	31	19	540,817	512,675	0	672	25,430	2,040	0
2003-2004	Jan 14	20	24	12	514,424	501,989	1	71	8,418	3,945	0
2003-2004	Jan 15	14	24	6	578,880	570,609	0	135	4,331	3,805	0
2003-2004	Jan 16	23	28	17	538,111	533,127	0	30	2,472	2,482	0
2004-2005	Jan 21	14	22	8	578,200	539,136	77	4,744	23,858	438	9,947
2004-2005	Jan 22	19	23	14	562,716	527,118	0	4,047	22,682	435	8,434
2004-2005	Jan 23	15	24	9	590,559	552,862	22	4,526	23,429	452	9,268

Interruptions (September 1, 2000 through August 31, 2005)

<u>DATE</u>	<u>TEMPERATURE</u>			<u>GAS INTERRUPTIONS</u>						
	<u>HIGH</u>	<u>LOW</u>	<u>AVERAGE</u>	<u>BPS-S</u>	<u>BPS-H</u>	<u>BPS-L</u>	<u>LBS-S</u>	<u>LBS-L</u>	<u>LBS-XL</u>	<u>COGEN</u>
12/20/2000	32	23	26	X	X	X	X	X	X	X
12/21/2000	36	29	32	X	X	X	X	X	X	X
12/22/2000	34	12	21	X	X	X	X	X	X	X
12/23/2000	31	19	25	X	X	X	X	X	X	X
12/24/2000	37	21	29	X	X	X	X	X	X	X
12/25/2000	26	17	20	X	X	X	X	X	X	X
12/26/2000	30	22	25	X	X	X	X	X	X	X
12/27/2000	34	23	29	X	X	X	X	X	X	X
12/28/2000	28	17	22	X	X	X	X	X	X	X
12/29/2000	34	23	28	X	X	X	X	X	X	X
12/30/2000	31	23	26	X	X	X	X	X	X	X
12/31/2000	37	24	29	X	X	X	X	X	X	X
01/01/2001	36	25	30	X	X	X	X	X	X	X
01/02/2001	29	20	24	X	X	X	X	X	X	X
01/03/2001	37	26	30	X	X	X	X	X	X	X
01/04/2001	38	24	31	X	X	X	X	X	X	X
01/05/2001	38	29	32	X	X	X	X	X	X	X
01/06/2001	40	28	34	X	X	X	X	X	X	X
01/07/2001	47	35	39	X	X	X	X	X	X	X
01/08/2001	42	31	37	X	X	X	X	X	X	X
01/09/2001	34	26	30	X	X	X	X	X	X	X
01/10/2001	40	28	34	X	X	X	X	X	X	X
01/11/2001	51	31	41	X	X	X	X	X	X	X
01/12/2001	48	28	35	X	X	X	X	X	X	X
01/13/2001	47	29	37	X	X	X	X	X	X	X
01/14/2001	44	35	40	X	X	X	X	X	X	X
01/15/2001	44	37	39	X	X	X	X	X	X	X
01/16/2001	46	36	40	X	X	X	X	X	X	X
01/17/2001	45	32	38	X	X	X	X	X	X	X
01/18/2001	39	35	37	X	X	X	X	X	X	X
01/19/2001	42	36	39	X	X	X	X	X	X	X
01/20/2001	36	23	31	X	X	X	X	X	X	X
01/21/2001	32	22	27	X	X	X	X	X	X	X
01/22/2001	39	23	29	X	X	X	X	X	X	X
01/23/2001	41	29	34	X	X	X	X	X	X	X
01/24/2001	47	32	38	X	X	X	X	X	X	X
01/25/2001	40	24	31	X	X	X	X	X	X	X
01/26/2001	39	28	33	X	X	X	X	X	X	X
01/27/2001	42	21	37	X	X	X	X	X	X	X
01/28/2001	40	28	34	X	X	X	X	X	X	X
01/29/2001	42	34	37	X	X	X	X	X	X	X
01/30/2001	58	36	47	X	X	X	X	X	X	X
01/31/2001	53	39	44	X	X	X	X	X	X	X

TEMPERATUREGAS INTERRUPTIONS

<u>DATE</u>	<u>HIGH</u>	<u>LOW</u>	<u>AVERAGE</u>	<u>BPS-S</u>	<u>BPS-H</u>	<u>BPS-L</u>	<u>LBS-S</u>	<u>LBS-L</u>	<u>LBS-XL</u>	<u>COGEN</u>
01/17/2003	33	10	21				X	X	X	
01/18/2003	26	14	20				X	X	X	
01/19/2003	37	26	29				X	X	X	
01/20/2003	38	20	27				X	X	X	
01/21/2003	32	16	23				X	X	X	
01/22/2003	27	13	19				X	X	X	
01/23/2003	22	11	16				X	X	X	
01/24/2003	31	19	25				X	X	X	
01/25/2003	35	25	30				X	X	X	
01/26/2003	38	13	29				X	X	X	
01/27/2003	21	13	16				X	X	X	
01/28/2003	31	19	27				X	X	X	
01/29/2003	34	26	31				X	X	X	
01/30/2003	37	30	33				X	X	X	
01/31/2003	39	36	37				X	X	X	
02/01/2003	44	36	39				X	X	X	
02/02/2003	46	36	40				X	X	X	
02/03/2003	53	38	44				X	X	X	
02/04/2003	49	31	41				X	X	X	
02/05/2003	36	25	30	X	X	X	X	X	X	
02/06/2003	35	28	31	X	X	X	X	X	X	
02/07/2003	38	22	30	X	X	X	X	X	X	
02/08/2003	34	23	27	X	X	X	X	X	X	
02/09/2003	42	33	36	X	X	X	X	X	X	
02/10/2003	37	21	33	X	X	X	X	X	X	
02/11/2003	36	24	30	X	X	X	X	X	X	
02/12/2003	32	20	25	X	X	X	X	X	X	
02/13/2003	33	20	25	X	X	X	X	X	X	
02/14/2003	37	25	32	X	X	X	X	X	X	
02/15/2003	29	12	23	X	X	X	X	X	X	
02/16/2003	25	12	16	X	X	X	X	X	X	
02/17/2003	30	24	27	X	X	X	X	X	X	
02/18/2003	37	28	32	X	X	X	X	X	X	
02/19/2003	45	36	38	X	X	X	X	X	X	
02/20/2003	54	30	40	X	X	X	X	X	X	
02/21/2003	52	37	41	X	X	X	X	X	X	
02/22/2003	44	38	40	X	X	X	X	X	X	
02/23/2003	48	27	35	X	X	X	X	X	X	
02/24/2003	44	29	36	X	X	X	X	X	X	
02/25/2003	38	21	27	X	X	X	X	X	X	
02/26/2003	29	24	26	X	X	X	X	X	X	
02/27/2003	34	28	31	X	X	X	X	X	X	
02/28/2003	42	32	36	X	X	X	X	X	X	
03/01/2003	42	36	39	X	X	X	X	X	X	
03/02/2003	48	17	38	X	X	X	X	X	X	
03/03/2003	32	17	22	X	X	X	X	X	X	
03/04/2003	44	31	39	X	X	X	X	X	X	
03/05/2003	56	34	47	X	X	X	X	X	X	
03/06/2003	35	20	28	X	X	X	X	X	X	
03/07/2003	41	26	32	X	X	X	X	X	X	
03/08/2003	56	41	47	X	X	X	X	X	X	
03/09/2003	56	24	37	X	X	X	X	X	X	
03/10/2003	36	24	29	X	X	X	X	X	X	
03/11/2003	41	33	36	X	X	X	X	X	X	
03/12/2003	56	37	46	X	X	X	X	X	X	
03/13/2003	58	27	41	X	X	X	X	X	X	
03/14/2003	46	32	37	X	X	X	X	X	X	

TEMPERATUREGAS INTERRUPTIONS

<u>DATE</u>	<u>HIGH</u>	<u>LOW</u>	<u>AVERAGE</u>	<u>BPS-S</u>	<u>BPS-H</u>	<u>BPS-L</u>	<u>LBS-S</u>	<u>LBS-L</u>	<u>LBS-XL</u>	<u>COGEN</u>
12/05/2003	35	26	30				X	X	X	X
12/06/2003	30	25	28				X	X	X	X
12/07/2003	33	26	29				X	X	X	X
12/08/2003	37	30	34				X	X	X	X
12/09/2003	40	34	36				X	X	X	X
12/10/2003	60	39	52				X	X	X	X
12/11/2003	58	37	45				X	X	X	X
12/12/2003	44	30	36				X	X	X	X
12/13/2003	37	30	34				X	X	X	X
12/14/2003	45	31	37				X	X	X	X
12/15/2003	43	33	37				X	X	X	X
12/16/2003	51	40	47				X	X	X	X
12/17/2003	52	32	38				X	X	X	X
12/18/2003	39	31	34				X	X	X	X
12/19/2003	38	31	34				X	X	X	X
12/20/2003	40	29	34				X	X	X	X
12/21/2003	45	34	38				X	X	X	X
12/22/2003	54	45	48				X	X	X	X
12/23/2003	62	51	56				X	X	X	X
12/24/2003	60	35	46				X	X	X	X
12/25/2003	44	31	37				X	X	X	X
12/26/2003	43	36	39				X	X	X	X
12/27/2003	52	33	42				X	X	X	X
12/28/2003	56	33	42				X	X	X	X
12/29/2003	56	42	49				X	X	X	X
12/30/2003	55	36	43				X	X	X	X
12/31/2003	49	40	43				X	X	X	X
01/01/2004	52	38	44				X	X	X	X
01/02/2004	50	44	47				X	X	X	X
01/03/2004	56	48	52				X	X	X	X
01/04/2004	55	39	45				X	X	X	X
01/05/2004	44	35	41				X	X	X	X
01/06/2004	42	20	29				X	X	X	X
01/07/2004	31	23	25				X	X	X	X
01/08/2004	34	24	32				X	X	X	X
01/09/2004	27	5	15				X	X	X	X
01/10/2004	21	8	13				X	X	X	X
01/11/2004	36	20	29				X	X	X	X
01/12/2004	47	36	41				X	X	X	X
01/13/2004	48	17	32				X	X	X	X
01/14/2004	24	12	20				X	X	X	X
01/15/2004	24	6	14	X	X	X	X	X	X	X
01/16/2004	28	17	23	X	X	X	X	X	X	X
01/17/2004	35	25	32	X	X	X	X	X	X	X
01/18/2004	37	25	32	X	X	X	X	X	X	X
01/19/2004	31	24	27	X	X	X	X	X	X	X
01/20/2004	31	20	25	X	X	X	X	X	X	X
01/21/2004	33	23	27	X	X	X	X	X	X	X
01/22/2004	44	15	28	X	X	X	X	X	X	X
01/23/2004	20	16	17	X	X	X	X	X	X	X
01/24/2004	26	11	18	X	X	X	X	X	X	X
01/25/2004	21	14	18	X	X	X	X	X	X	X
01/26/2004	24	20	22	X	X	X	X	X	X	X
01/27/2004	29	22	25	X	X	X	X	X	X	X
01/28/2004	30	23	26	X	X	X	X	X	X	X
01/29/2004	31	19	25	X	X	X	X	X	X	X
01/30/2004	28	15	20	X	X	X	X	X	X	X

TEMPERATUREGAS INTERRUPTIONS

<u>DATE</u>	<u>HIGH</u>	<u>LOW</u>	<u>AVERAGE</u>	<u>BPS-S</u>	<u>BPS-H</u>	<u>BPS-L</u>	<u>LBS-S</u>	<u>LBS-L</u>	<u>LBS-XL</u>	<u>COGEN</u>
01/31/2004	27	19	22	X	X	X	X	X	X	X
02/01/2004	38	24	30	X	X	X	X	X	X	X
02/02/2004	43	30	34	X	X	X	X	X	X	X
02/03/2004	47	37	41				X	X	X	X
02/04/2004	44	29	37				X	X	X	X
02/05/2004	37	31	34				X	X	X	X
02/06/2004	46	37	39				X	X	X	X
02/07/2004	45	23	35				X	X	X	X
02/08/2004	36	25	30				X	X	X	X
02/09/2004	47	36	41				X	X	X	X
02/10/2004	53	35	44				X	X	X	X
02/11/2004	42	31	36				X	X	X	X
02/12/2004	42	34	37				X	X	X	X
02/13/2004	45	37	40				X	X	X	X
02/14/2004	49	28	40				X	X	X	X
02/15/2004	33	16	24				X	X	X	X
02/16/2004	36	22	29				X	X	X	X
02/17/2004	44	30	35				X	X	X	X
02/18/2004	47	35	39				X	X	X	X
02/19/2004	52	35	43				X	X	X	X
02/20/2004	52	39	43				X	X	X	X
02/21/2004	56	37	44				X	X	X	X
02/22/2004	49	33	40				X	X	X	X
02/23/2004	52	39	44				X	X	X	X
02/24/2004	42	26	34				X	X	X	X
02/25/2004	45	30	36				X	X	X	X
02/26/2004	47	32	40				X	X	X	X

Note: X-Denotes that service to this rate schedule was interrupted on the specified date.
No interruptions occurred between February 26, 2004 and August 31, 2005.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

(13) Identification and support for any peak day methodology used to project future gas demands and studies supporting the validity of the methodology.

Response:

Please see the attached Peak Day analysis and discussion. Additionally, in 1997, ICF Kaiser prepared a *Gas Supply Study* on PGW's behalf. The final study is attached as PGW's response to Item 53.64(c)(14). In addition to that study, ICF Kaiser was also asked to review PGW's peak day methodology as a supplemental study. The results of that study are attached. PGW's analysis methodology has not changed since the study was completed.

Peak Day Analysis

PGW performs a peak day analysis on an annual basis to determine its projected sendout requirements during peak conditions. Essentially this process is completed by collecting sendout and average temperature data for all days where the temperature is at or below 32 degrees Fahrenheit, excluding holidays and weekends. All transportation and interruptible volumes are removed from total sendout to arrive at firm sendout on a daily basis.

Common statistical practices warrant that no less than thirty (30) data points be utilized in the analysis to ensure its integrity. For this analysis, PGW has utilized data from the period winter of FY 02-03 through FY 04-05 which would reflect the most current consumption behaviors of its customers. This period yielded 72 data points where the average temperature was at or below 32 degrees Fahrenheit.

Degree days are calculated by subtracting the average daily temperature from sixty-five (65).

A standard linear regression was performed on the data using the calculated degree-days and the actual firm daily sendout information. Additionally, in order to confirm the accuracy of the analysis, and to smooth the charting of the data, a quadratic and a cubic regression analysis were also completed.

A resulting R^2 (Correlation Coefficient) indicates an 82.10 % correlation between firm sendout and degree-days. The multiple regression correlation coefficient, R^2 , is a measure of the proportion of variability explained by, or due to the regression (linear relationship) in a sample of paired data. It is a number between zero and one and a value close to zero suggests a poor model.

To verify the level of confidence we can ascribe to the model, we developed the attached Linear Regression Confidence Level Table. Essentially, this table compares the actual versus projected sendout to determine the level of variance expressed as a standard deviation. A standard deviation represents the positive square root of the variance where the variance simply represents the dispersion about the mean. In this analysis the sample standard deviation is 24,845 MCF.

To determine the level where the relationship between consumption and degree-days is "significant" it is necessary to incorporate Degrees of Freedom and the Student's T Statistic. Degrees of freedom refer to how many cases in the sample are free to vary.

The sample loses one degree of freedom for each estimated parameter. Thus, with a sample of 100 paired values and two estimated parameters (one for the constant and one for the coefficient of "degree days"), there are $100-2=98$ degrees of freedom. In this analysis we had 72 data points and there were 70 Degrees of Freedom.

The critical value is the value the Student's T statistic must equal or exceed to conclude that there is a 97.5% chance that the relationship between consumption and degree days is not 0. A Student's T statistic of 2.04 is required for a sample with 70 Degrees of Freedom.

The Student's T statistic is the distribution of the (mean/standard deviation) of a sample of normal distributed values with unknown variance. In this case, it is a measure of the likelihood that the estimated coefficient for "degree days" is actually zero. The farther the statistic is from 0, the greater the likelihood that the sample pairs are related. The Student-T distribution varies with the number of independent values (Degrees of Freedom) from which the variance is calculated. For this example, the T-statistic is calculated as $\text{SQRT}(R^2 * (\text{degrees of freedom}) / (1 - R^2)) = 17.920630$. The calculated Student's T statistic of 17.92063 exceeds the critical value of 2.04. Thus, we can conclude that the relationship between consumption and degree-days is "significant" at the 97.5% level.

Finally, based upon the models developed, it can be determined that the company's projected peak day sendout should be set at 729,903 MCF per day at 0 degrees Fahrenheit. This calculation is performed using the X Coefficient (i.e. slope) multiplied by the number of degree days and adding the Constant (Y Intercept). In this case the calculation was performed at a temperature of 0 degrees Fahrenheit and at 15 degrees Fahrenheit.

Winter 03-05 Data for Daily Temperatures <= 32 Degrees Fahrenheit

W/O Holidays, Weekends

Day	Date	Daily Temp	Degree			Actual	Firm Sendout	Linear	Quadratic	Cubic
			Days	X ²	X ³	Firm Sendout	Per DD	Projected	Projected	Projected
			X			(Mcf)	(Mcf)	(Mcf)	(Mcf)	(Mcf)
Wednesday	03/09/05	28	37	1,369	50,653	422,369	11,415	437,298	440,633	437,025
Tuesday	03/08/05	25	40	1,600	64,000	424,014	10,600	468,649	475,359	474,619
Thursday	03/03/05	30	35	1,225	42,875	403,084	11,517	416,398	415,191	413,055
Wednesday	03/02/05	30	35	1,225	42,875	402,148	11,490	416,398	415,191	413,055
Monday	02/28/05	31	34	1,156	39,304	371,763	10,934	405,948	401,783	401,910
Friday	02/25/05	31	34	1,156	39,304	375,106	11,033	405,948	401,783	401,910
Thursday	02/24/05	26	39	1,521	59,319	412,696	10,582	458,199	464,242	462,097
Monday	01/31/05	31	34	1,156	39,304	386,287	11,361	405,948	401,783	401,910
Friday	01/28/05	22	43	1,849	79,507	507,618	11,805	500,000	505,962	510,083
Thursday	01/27/05	15	50	2,500	125,000	541,487	10,830	573,151	561,332	558,647
Wednesday	01/26/05	29	36	1,296	46,656	417,993	11,611	426,848	428,141	424,817
Monday	01/24/05	22	43	1,849	79,507	506,677	11,783	500,000	505,962	510,083
Friday	01/21/05	14	51	2,601	132,651	539,136	10,571	583,601	567,409	559,173
Thursday	01/20/05	25	40	1,600	64,000	457,855	11,446	468,649	475,359	474,619
Wednesday	01/19/05	25	40	1,600	64,000	486,786	12,170	468,649	475,359	474,619
Tuesday	01/18/05	15	50	2,500	125,000	551,528	11,031	573,151	561,332	558,647
Tuesday	12/28/04	32	33	1,089	35,937	405,227	12,280	395,498	387,917	391,553
Monday	12/27/04	23	42	1,764	74,088	470,830	11,210	489,549	496,219	498,783
Monday	12/20/04	17	48	2,304	110,592	521,017	10,855	552,250	547,803	551,932
Wednesday	12/15/04	32	33	1,089	35,937	372,106	11,276	395,498	387,917	391,553
Tuesday	12/14/04	32	33	1,089	35,937	359,005	10,879	395,498	387,917	391,553
Friday	01/30/04	20	45	2,025	91,125	514,527	11,434	520,900	524,072	530,265
Thursday	01/29/04	25	40	1,600	64,000	471,297	11,782	468,649	475,359	474,619
Wednesday	01/28/04	26	39	1,521	59,319	473,254	12,135	458,199	464,242	462,097
Tuesday	01/27/04	25	40	1,600	64,000	478,530	11,963	468,649	475,359	474,619
Monday	01/26/04	22	43	1,849	79,507	522,827	12,159	500,000	505,962	510,083
Friday	01/23/04	17	48	2,304	110,592	531,550	11,074	552,250	547,803	551,932
Thursday	01/22/04	28	37	1,369	50,653	454,790	12,292	437,298	440,633	437,025
Wednesday	01/21/04	27	38	1,444	54,872	449,611	11,832	447,749	452,666	449,508
Tuesday	01/20/04	25	40	1,600	64,000	476,106	11,903	468,649	475,359	474,619
Friday	01/16/04	23	42	1,764	74,088	531,367	12,652	489,549	496,219	498,783
Thursday	01/15/04	14	51	2,601	132,651	570,415	11,185	583,601	567,409	559,173
Wednesday	01/14/04	20	45	2,025	91,125	501,684	11,149	520,900	524,072	530,265
Tuesday	01/13/04	32	33	1,089	35,937	398,948	12,089	395,498	387,917	391,553
Thursday	01/08/04	32	33	1,089	35,937	415,332	12,586	395,498	387,917	391,553

Day	Date	Daily Temp	Degree Days X	Degree Days		Actual Firm Sendout (Mcf)	Firm Sendout Per DD (Mcf)	Linear Projected Firm Sendout (Mcf)	Quadratic Projected Firm Sendout (Mcf)	Cubic Projected Firm Sendout (Mcf)
				X^2	X^3					
Wednesday	01/07/04	25	40	1,600	64,000	492,500	12,313	468,649	475,359	474,619
Tuesday	01/06/04	29	36	1,296	46,656	401,879	11,163	426,848	428,141	424,817
Friday	12/05/03	30	35	1,225	42,875	379,292	10,837	416,398	415,191	413,055
Monday	03/10/03	29	36	1,296	46,656	431,722	11,992	426,848	428,141	424,817
Friday	03/07/03	32	33	1,089	35,937	387,204	11,733	395,498	387,917	391,553
Thursday	03/06/03	28	37	1,369	50,653	431,870	11,672	437,298	440,633	437,025
Monday	03/03/03	22	43	1,849	79,507	485,096	11,281	500,000	505,962	510,083
Thursday	02/27/03	31	34	1,156	39,304	419,397	12,335	405,948	401,783	401,910
Wednesday	02/26/03	26	39	1,521	59,319	461,271	11,827	458,199	464,242	462,097
Tuesday	02/25/03	27	38	1,444	54,872	432,012	11,369	447,749	452,666	449,508
Tuesday	02/18/03	32	33	1,089	35,937	414,921	12,573	395,498	387,917	391,553
Friday	02/14/03	32	33	1,089	35,937	404,972	12,272	395,498	387,917	391,553
Thursday	02/13/03	25	40	1,600	64,000	471,898	11,797	468,649	475,359	474,619
Wednesday	02/12/03	25	40	1,600	64,000	462,953	11,574	468,649	475,359	474,619
Tuesday	02/11/03	30	35	1,225	42,875	418,200	11,949	416,398	415,191	413,055
Friday	02/07/03	30	35	1,225	42,875	403,375	11,525	416,398	415,191	413,055
Thursday	02/06/03	31	34	1,156	39,304	406,365	11,952	405,948	401,783	401,910
Wednesday	02/05/03	30	35	1,225	42,875	410,042	11,715	416,398	415,191	413,055
Wednesday	01/29/03	31	34	1,156	39,304	450,555	13,252	405,948	401,783	401,910
Tuesday	01/28/03	27	38	1,444	54,872	522,441	13,748	447,749	452,666	449,508
Monday	01/27/03	16	49	2,401	117,649	592,249	12,087	562,701	554,796	556,176
Friday	01/24/03	25	40	1,600	64,000	530,565	13,264	468,649	475,359	474,619
Thursday	01/23/03	16	49	2,401	117,649	607,422	12,396	562,701	554,796	556,176
Wednesday	01/22/03	19	46	2,116	97,336	570,900	12,411	531,350	532,441	538,805
Tuesday	01/21/03	23	42	1,764	74,088	511,988	12,190	489,549	496,219	498,783
Friday	01/17/03	21	44	1,936	85,184	513,451	11,669	510,450	515,246	520,634
Thursday	01/16/03	27	38	1,444	54,872	480,494	12,645	447,749	452,666	449,508
Wednesday	01/15/03	25	40	1,600	64,000	501,491	12,537	468,649	475,359	474,619
Tuesday	01/14/03	28	37	1,369	50,653	463,772	12,534	437,298	440,633	437,025
Tuesday	01/07/03	32	33	1,089	35,937	424,609	12,867	395,498	387,917	391,553
Tuesday	12/17/02	31	34	1,156	39,304	395,015	11,618	405,948	401,783	401,910
Monday	12/16/02	32	33	1,089	35,937	374,544	11,350	395,498	387,917	391,553
Monday	12/09/02	27	38	1,444	54,872	456,519	12,014	447,749	452,666	449,508
Friday	12/06/02	30	35	1,225	42,875	397,320	11,352	416,398	415,191	413,055
Thursday	12/05/02	30	35	1,225	42,875	414,418	11,841	416,398	415,191	413,055
Wednesday	12/04/02	30	35	1,225	42,875	408,177	11,662	416,398	415,191	413,055
Tuesday	12/03/02	25	40	1,600	64,000	450,841	11,271	468,649	475,359	474,619

Count

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Firm Sendout Projection Based Data From 03-05
Data for Daily Temperatures <= 32 Degrees Fahrenheit

<u>R Squared</u>	<u>Change</u>	<u>Student's T</u>	<u>Degrees of Freedom</u>	<u>Critical Value</u>	<u>@ 97.5% Significant</u>
0.821040	0.821040	17.920630	70	2.04	Yes
0.832386	0.011346	2.161149	69	2.04	Yes
0.835409	0.003023	1.117560	68	2.04	No

Degrees of Freedom	<u>70</u>	<u>69</u>	<u>68</u>
97.5% Significance Level	<u>2.04</u>	<u>2.04</u>	<u>2.04</u>
95.0% Significance Level	<u>1.65</u>	<u>1.65</u>	<u>1.65</u>

<u>Linear Projection at Zero Degrees Fahrenheit</u>	729,903	Mcf
<u>Linear Projection at 15 Degrees Fahrenheit</u>	573,151	Mcf

*Student's T = Square Root[(Increase * Degrees of Freedom)/(1 - R Squared)]*

*Linear SO = Constant + (X * X Coefficient)*

*Quadratic SO = Constant + (X * X Coeff) + (X 1u2 * X 1u2 Coeff)*

*Cubic SO = Constant + (X * X Coeff) + (X 1u2 * X 1u2 Coeff) + (X 1u3 * X 1u3 Coeff)*

Linear Regression Confidence Level Table

Count	Degree Days X	Firm Sendout (McF) Y	Projected Firm Sendout (McF) Y dc	Difference Actual Versus Projected Y - Yc	Actual Versus Projected Squared (Y - Yc) ²	(Degree Days - Xm) X - Xm	(Degree Days - Xm) ² (X - Xm) ²	s dyc	t's dyc	Lower Acc		Upper Acc		"- 1 SD"		"+ 1 SD"		"- 2 SD"		"+ 2 SD"	
										Lower	Y dc + t's dyc	Y dc + t's dyc	Upper	Lower	Y dc + s dyc	Y dc + s dyc	Upper	Lower	Y dc + 2s dyc	Y dc + 2s dyc	Upper
1	33	405,227	395,498	9,729	94,658,577	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
2	33	372,106	395,498	(23,392)	547,166,308	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
3	33	359,005	395,498	(36,492)	1,331,686,903	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
4	33	398,948	395,498	3,451	11,907,415	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
5	33	415,332	395,498	19,834	393,404,356	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
6	33	387,204	395,498	(8,294)	68,787,540	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
7	33	414,921	395,498	19,423	377,255,749	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
8	33	404,972	395,498	9,474	89,757,260	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
9	33	424,609	395,498	29,111	847,478,769	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
10	33	374,544	395,498	(20,953)	439,041,218	(6)	35	4,540	9,247	386,250	404,745	370,653	420,343	345,808	445,188						
11	34	371,763	405,948	(34,185)	1,168,611,405	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
12	34	375,106	405,948	(30,842)	951,226,419	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
13	34	386,287	405,948	(19,661)	386,559,578	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
14	34	419,397	405,948	13,449	180,875,602	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
15	34	406,365	405,948	417	174,225	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
16	34	450,555	405,948	44,607	1,989,789,396	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
17	34	395,015	405,948	(10,933)	119,539,556	(5)	24	4,117	8,385	397,563	414,333	381,103	430,793	356,258	455,638						
18	35	403,084	416,398	(13,314)	177,266,135	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
19	35	402,148	416,398	(14,250)	203,066,288	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
20	35	379,292	416,398	(37,106)	1,376,866,589	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
21	35	418,200	416,398	1,802	3,246,388	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
22	35	403,375	416,398	(13,023)	169,596,229	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
23	35	410,042	416,398	(6,356)	40,395,852	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
24	35	397,320	416,398	(19,078)	363,987,462	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
25	35	414,418	416,398	(1,980)	3,919,131	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
26	35	408,177	416,398	(8,221)	67,588,418	(4)	15	3,736	7,611	408,787	424,009	391,553	441,243	366,708	466,088						
27	36	417,993	426,848	(8,855)	78,409,659	(3)	8	3,414	6,954	419,894	433,803	402,003	451,693	377,158	476,538						
28	36	401,879	426,848	(24,969)	623,465,151	(3)	8	3,414	6,954	419,894	433,803	402,003	451,693	377,158	476,538						
29	36	431,722	426,848	4,873	23,748,822	(3)	8	3,414	6,954	419,894	433,803	402,003	451,693	377,158	476,538						
30	37	422,369	437,298	(14,929)	222,889,409	(2)	4	3,167	6,451	430,847	443,750	412,454	462,143	387,609	486,988						
31	37	454,790	437,298	17,492	305,962,331	(2)	4	3,167	6,451	430,847	443,750	412,454	462,143	387,609	486,988						
32	37	431,870	437,298	(5,428)	29,463,924	(2)	4	3,167	6,451	430,847	443,750	412,454	462,143	387,609	486,988						
33	37	463,772	437,298	26,473	700,843,926	(2)	4	3,167	6,451	430,847	443,750	412,454	462,143	387,609	486,988						
34	38	449,611	447,749	1,862	3,466,541	(1)	1	3,014	6,140	441,608	453,889	422,904	472,594	398,059	497,439						
35	38	432,012	447,749	(15,737)	247,643,788	(1)	1	3,014	6,140	441,608	453,889	422,904	472,594	398,059	497,439						
36	38	522,441	447,749	74,692	5,578,899,144	(1)	1	3,014	6,140	441,608	453,889	422,904	472,594	398,059	497,439						
37	38	480,494	447,749	32,746	1,072,276,471	(1)	1	3,014	6,140	441,608	453,889	422,904	472,594	398,059	497,439						
38	38	456,519	447,749	8,771	76,924,952	(1)	1	3,014	6,140	441,608	453,889	422,904	472,594	398,059	497,439						
39	39	412,696	458,199	(45,503)	2,070,507,492	0	0	2,970	6,050	452,149	464,249	433,354	483,044	408,509	507,889						
40	39	473,254	458,199	15,055	226,658,315	0	0	2,970	6,050	452,149	464,249	433,354	483,044	408,509	507,889						
41	39	461,271	458,199	3,072	9,438,920	0	0	2,970	6,050	452,149	464,249	433,354	483,044	408,509	507,889						

Count	Degree Days	Firm Sendout (McF)	Projected	Difference	Actual	(Degree Days - Xm)	(Degree Days - Xm)								
			Linear Firm Sendout (McF)	Actual Versus Projected	Squared		Squared	Lower Acc	Upper Acc	"- 1 SD"	"+ 1 SD"	"- 2 SD"	"+ 2 SD"		
	X	Y	Y dc	Y - Yc	(Y - Yc) ²	X - Xm	(X - Xm) ²	s dyc	t*s dyc	Lower	Y dc + t*s dyc	Lower	Y dc + s dyc	Lower	Y dc + 2s dyc
42	40	424,014	468,649	(44,635)	1,992,283,551	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
43	40	457,855	468,649	(10,794)	116,509,548	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
44	40	486,786	468,649	18,137	328,958,247	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
45	40	471,297	468,649	2,648	7,013,692	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
46	40	478,530	468,649	9,881	97,634,745	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
47	40	476,106	468,649	7,457	55,607,120	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
48	40	492,500	468,649	23,851	568,881,593	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
49	40	471,898	468,649	3,249	10,558,241	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
50	40	462,953	468,649	(5,696)	32,447,889	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
51	40	530,565	468,649	61,916	3,833,637,388	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
52	40	501,491	468,649	32,842	1,078,621,684	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
53	40	450,841	468,649	(17,808)	317,122,245	1	1	3,039	6,191	462,458	474,840	443,804	493,494	418,959	518,339
54	42	470,830	489,549	(18,720)	350,427,787	3	10	3,480	7,088	482,461	496,638	464,704	514,394	439,859	539,239
55	42	531,367	489,549	41,818	1,748,715,166	3	10	3,480	7,088	482,461	496,638	464,704	514,394	439,859	539,239
56	42	511,988	489,549	22,439	503,498,303	3	10	3,480	7,088	482,461	496,638	464,704	514,394	439,859	539,239
57	43	507,618	500,000	7,619	58,041,681	4	17	3,816	7,774	492,226	507,773	475,155	524,844	450,310	549,689
58	43	506,677	500,000	6,677	44,582,203	4	17	3,816	7,774	492,226	507,773	475,155	524,844	450,310	549,689
59	43	522,827	500,000	22,827	521,090,382	4	17	3,816	7,774	492,226	507,773	475,155	524,844	450,310	549,689
60	43	485,096	500,000	(14,904)	222,122,232	4	17	3,816	7,774	492,226	507,773	475,155	524,844	450,310	549,689
61	44	513,451	510,450	3,001	9,006,221	5	26	4,207	8,570	501,880	519,020	485,605	535,295	460,760	560,140
62	45	514,527	520,900	(6,372)	40,607,296	6	37	4,639	9,449	511,451	530,349	498,055	545,745	471,210	570,590
63	45	501,684	520,900	(19,215)	369,232,716	6	37	4,639	9,449	511,451	530,349	498,055	545,745	471,210	570,590
64	46	570,900	531,350	39,550	1,564,203,674	7	51	5,100	10,389	520,961	541,739	506,505	556,195	481,660	581,040
65	48	521,017	552,250	(31,234)	975,531,762	9	83	6,087	12,398	539,852	564,648	527,405	577,095	502,561	601,940
66	48	531,550	552,250	(20,701)	428,519,268	9	83	6,087	12,398	539,852	564,648	527,405	577,095	502,561	601,940
67	49	592,249	562,701	29,548	873,090,982	10	102	6,602	13,447	549,253	576,148	537,856	587,546	513,011	612,390
68	49	607,422	562,701	44,722	2,000,040,003	10	102	6,602	13,447	549,253	576,148	537,856	587,546	513,011	612,390
69	50	541,487	573,151	(31,664)	1,002,578,819	11	123	7,127	14,518	558,633	587,669	548,306	597,996	523,461	622,841
70	50	551,528	573,151	(21,622)	467,523,499	11	123	7,127	14,518	558,633	587,669	548,306	597,996	523,461	622,841
71	51	539,136	583,601	(44,465)	1,977,138,479	12	147	7,661	15,606	567,995	599,207	558,756	608,446	533,911	633,291
72	51	570,415	583,601	(13,186)	173,867,233	12	147	7,661	15,606	567,995	599,207	558,756	608,446	533,911	633,291
Tot/Avg	39	457,038	457,038		44,443,545,261			1,867							

t = 2.04

Xm = 39

Population Standard Deviation of Regression Squared = 617,271,460

Population Standard Deviation of Regression	=	24,845	1s	<u>Upper Range</u> 481,883	<u>Lower Range</u> 432,193
			2s	506,728	407,348

Standard error of sendout projection 25,197

T-factor 2.04

(T factor) * (Std error of projection) 51,325

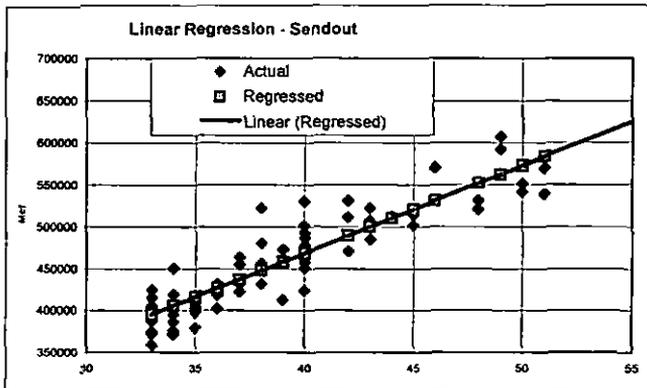
Regression Results

Winter 03-05

Based On Data for Daily Temperatures <= 32 Degrees Fahrenheit

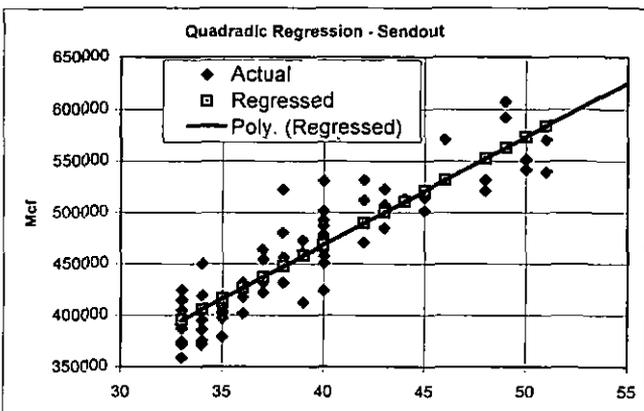
Regression Output:		Quadratic		Cubic	
Regression Output:		Regression Output:		Regression Output:	
Constant	50,642.04	Constant	(326,698.40)	Constant	1,609,356.96
Std Err of Y Est	25,197.38	Std Err of Y Est	24,561.64	Std Err of Y Est	24,517.45
R Squared	0.82104	R Squared	0.83239	R Squared	0.83541
No. of Observations	72	No. of Observations	72	No. of Observations	72
Degrees of Freedom	70	Degrees of Freedom	69	Degrees of Freedom	68
X Coefficient(s)	10,450.17	X Coefficient(s)	29,214.76 (229.08)	X Coefficient(s)	(114,705.11) 3,298.81 (28.46)
Std Err of Coef.	583.14	Std Err of Coef.	8,701.28 106.00	Std Err of Coef.	128,072.98 3,156.77 25.47

Regression Chart Analysis
 Based Upon Data For Temperatures Of <=32 Degrees F.
 Winters 2002-03 To 2004-05



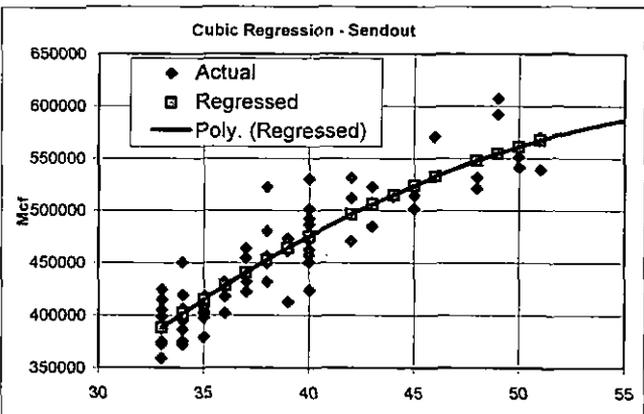
Linear Regression Output

Constant		50,642
Std. Error of Y Estimate		25,197
R Squared		0.821040
Number of Observations		72
Degrees of Freedom		70
	X	
X Coefficient	10,450	
Std. Err. Of Coefficeint	583	



Quadratic Regression Output

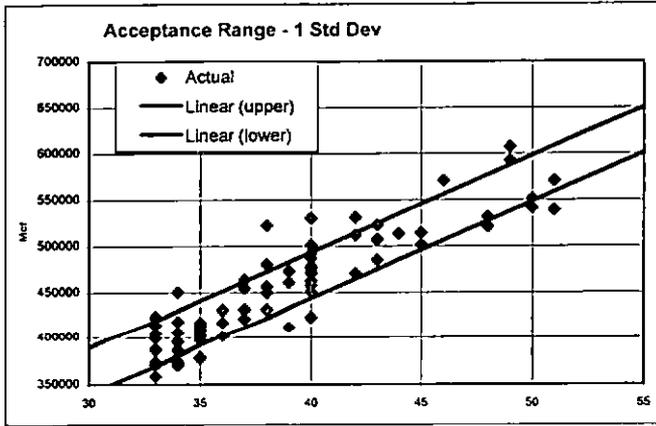
Constant		(326,698)
Std. Error of Y Estimate		24,562
R Squared		1
Number of Observations		72
Degrees of Freedom		69
	X	X ^ 2
X Coefficient	29,215	-229
Std. Err. Of Coefficeint	8,701	106



Cubic Regression Output

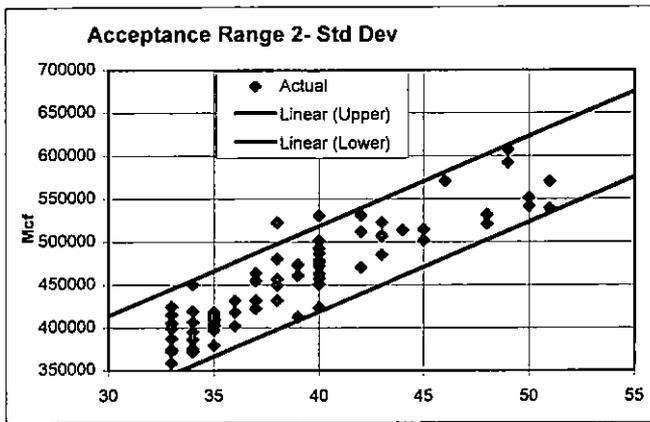
Constant		1,609,357	
Std. Error of Y Estimate		24,517	
R Squared		0.8354088	
Number of Observations		72	
Degrees of Freedom		68	
	X	X ^ 2	X ^ 3
X Coefficient	(114,705)	3,297	-28
Std. Err. Of Coefficeint	129,073	3,157	25

Regression Chart Analysis Based Upon Data For Temperatures Of <=32 Degrees F. Winters 2002-03 To 2004-05



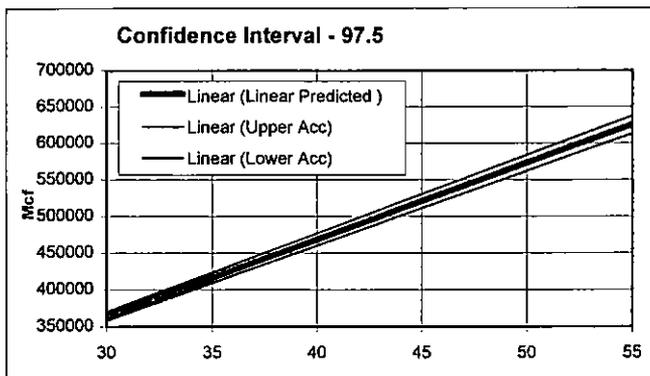
Acceptance Range @ 1 Standard Deviation

Regression Squared	617,271,460
Regression	24,845
Upper Range 1sd	481,883
Lower Range 1sd	432,193



Acceptance Range @ 2 Standard Deviation

Regression Squared	617,271,460
Regression	24,845
Upper Range 2sd	506,728
Lower Range 2sd	407,348



Confidence Interval: 97.5%

Regression Squared	617,271,460
Standard error of sendout projection	25,197
X Mean	39
T Distribution	2.04

MEMORANDUM

May 2, 1997

To: B.Z. Karachiwala, PGW
Craig White, PGW

From: ICF Kaiser

Subject: Design Weather Conditions for Supply Planning at PGW

As part of ICF Kaiser's assignment to assist PGW in assessing its optimal supply planning configuration, we were asked to assess PGW's design day and design winter planning methodologies. To the extent that the approach to defining the design day or design winter leads to an overly conservative estimation of design conditions (that is, the estimated design conditions are higher than requirements), PGW could be over-investing in capacity or not using its existing capacity optimally.

ICF evaluated the design winter gas demand estimation methodology currently used by PGW. As a first step, we reviewed the design winter and design day demand estimation methodologies and evaluated the critical assumptions underlying the methodologies using historical data and statistical tools.

PGW estimates its design day demand using a valid statistical procedure. PGW's degree day estimates for a design winter and a design day are *consistent* with the historical weather data and the degree day estimates used by other utilities in the region. The following table compares PGW's design winter with the historical weather data.

Data Set (1948-1996)	Nov	Dec	Jan	Feb	Mar	Winter Season
Historical Mean Winter Degree Days	554	884	1018	869	703	4025 ^a
Historical Peak Winter Degree Days	743	1219	1390	1170	997	4640 ^a
Lower limit of 95% confidence level (Mean - 2 std.dev.)	395	615	717	644	504	3353 ^a
Upper limit of 95% confidence level (Mean + 2 std.dev.)	705	1157	1318	1093	901	4698 ^a
PGW's Design Winter Degree Days	617	994	1160	987	808	4566
Probability of PGW's Design Winter	1:5	1:4	1:6	1:7	1:7	1:16

Notes:

^a Individual month estimates do not add up to this total, because it has been calculated independently using the historical winter season data or standard deviation for the season total.

These statistical estimates indicate the following:

- PGW's design winter is 74 degree days short of 48-year historical peak winter.
- PGW's monthly design winter conditions are 126 to 230 degree days less than 48-year historical monthly peak winter conditions.
- PGW's design winter conditions lie well within the 95 percent confidence level. This indicates that the likelihood of a winter being colder than PGW's design winter is greater

than 5 percent. This suggests that PGW's design winter conditions are not overly conservative.

- A winter that is *as cold as or colder than* PGW's design winter is likely to occur once in 16 years.

This memorandum summarizes the results of this study in two sections: (1) a summary of the methodology used by PGW to estimate design conditions; and (2) a statistical analysis of PGW's design winter. We have supplied more detail on our assessment in two attachments (Appendices A & B) to this memorandum.

Overview of PGW's Design Winter/Day Gas Demand Estimation Methodology

The design day and design winter are the periods which define the largest amount of gas that PGW must deliver to meet system requirements and to maintain system integrity. The design day is the coldest day resulting in the highest expected coincident demand on the system; the design winter is defined as the coldest experienced winter, combined with the coldest experienced January (historically, the coldest month in Philadelphia). As such, the design conditions are used to for determining annual total storage and pipeline capacity, storage injection and withdrawal patterns, and supply plans for the PGW system. Design sendout is a function of three factors: (1) weather expressed in degree days, (2) number of customers, and (3) the demand response of those customers to cold weather.

As noted above, this memorandum addresses PGW's approach to describing design weather conditions. We have not evaluated PGW's approach to estimating the demand response or the number of customers. Rather, we have focused on addressing the issue of whether the design day or winter conditions are in excess of what may be considered statistically reasonable. The technical description of each is defined as follows:

- The design day at PGW is a day when the mean temperature is zero degree F, or 65 degree days. Under these conditions, PGW plans to send 714 Mmcf of natural gas to firm (i.e., after the interruptible customers have been dropped from the system) on-system customers. Because PGW owns about 291 Mmcf of pipeline capacity from supply areas and can vaporize between 450 and 540 Mmcf of LNG on any day, design day conditions appear not to be constraining even without employing PGW's approximately 160 Mmcf per day of peak storage withdrawal capacity.
- Design winter describes a colder than normal winter combined with a colder than normal January. The design winter has 4,566 degree days; the design year has 5,280 degree days.

The design winter demand is estimated by summing the demands of each customer rate class over the winter period (November through March). More specifically, the following equation is used to estimate the total monthly demand for each rate class of customers.

For each customer rate class:

$$\begin{aligned} \text{Monthly Demand} = & \text{No. of customers} * \text{UAF} * \{ [\text{Domestic Load Adjustment Factor} \\ & * (\text{DOM} * 12/365 * \text{No. of days in the month}) \} + \{ (\text{CFDD} * \text{Heating Degree Days}) \\ & * \text{Heating Adjustment Factor} \} \end{aligned}$$

where

DOM, domestic load factor per customer per month, is the minimum or base load requirement:

CFDD is the heating demand factor per customer per degree day; and

UAF is the unaccounted for gas adjustment factor per customer.

The Domestic Load Adjustment Factor is used to adjust the seasonal variation in the non-heating gas demand (i.e., domestic load). Heating Adjustment Factor, on the other hand, is used to adjust the seasonal variation in the gas demand for space heating (i.e., sendouts for heating). due to differences in the responsiveness of customers to changes in heating degree days between seasons.¹

DOM factor is calculated for each customer rate class (excluding interruptible customers) by adjusting the estimated (or trial) sendouts--during the previous year's summer months, July through September--by the Domestic Load Adjustment Factor. As such the DOM factor accounts for baseload, non-weather demand by PGW's customers. CFDD is calculated for each customer rate class (excluding interruptibles) by adjusting the estimated total heating gas demand by *actual* heating degree days--during the previous year's peak winter months, December through February--and the Heating Adjustment Factor.

The design winter gas demand for each customer rate class is calculated by using PGW's design winter degree days. PGW's design winter consists of 4,566 heating degree days over the 151-day period of November through March.

Design day gas demand projections are made using a statistically estimated equation. More specifically, using linear regression analysis, a peak winter day gas demand equation is estimated by regressing the actual sendouts on those weekdays (excluding holidays) during the previous year's winter season when temperature was 32°F or below. The gas demand equation is:

$$\text{Weekday actual sendout} = a + b * \text{Degree Days} + \epsilon$$

where

a is the intercept;

b is the slope; and

ε is the residual, not captured by the estimated demand equation.

The design day consists of 65 degree days or a day with a mean temperature of zero degree F with a design hour of -5°F. Using the regression estimates of a and b and 65 degree days, design day gas demand is calculated. An additional 5% contingency is normally added to the estimated total gas demand.

To attach a degree of confidence (e.g., 95%) to the demand estimate thus calculated, an interval of gas demand estimates are developed using (plus or minus two times) standard deviation of the weekday actual sendouts. This implies that 95% of the time actual gas demand will be within the interval of estimates thus computed. This establishes the response of the firm customers under cold weather conditions. Although this demand equation can be used to estimate the total gas

¹ For example, the gas demand for space heating in response to an increase in the number of heating degree days during September is likely to be less than the gas demand for space heating in response to a corresponding increase in the number of degree days during January.

- Historically, winter temperature (excluding wind-chill effect) of 5°F or below always occurred in January. In addition, on average, coldest day of the year is more likely to be a day in January than in any other month. These imply that PGW's planning for the design day to occur in January is *consistent* with the historical data.
- Historically, winter temperature (excluding wind-chill effect) in March has always been above 10°F. In addition, on average, the likelihood of the coldest day of the year occurring in March, rather than in any other month, is 4%. Therefore, it is *consistent* with the historical data to say that Design Day conditions are *not likely* to occur in March.

To evaluate if PGW's design winter estimate, we (1) estimated a set of alternative design winters based on historical weather data and simple statistical criteria, and computed associated risks of not being able to meet the gas demand due to colder than alternative design winters; (2) surveyed other utilities in the region and compiled their design winter criteria and estimates; and (3) compared these estimates to those of PGW's. Similar analysis was performed on PGW's design day estimate. The results of our analyses suggest that PGW's design winter and design day are reasonable estimates. Appendix B contains the statistical results of these analyses.

Conclusion

As mentioned earlier, design sendout is a function of three factors: (1) weather expressed in degree days, (2) number of customers, and (3) the demand response of those customers to cold weather. We analyzed PGW's degree day estimates for design winter/day, using historical data, statistical tools, and degree day estimates of other utilities in the region. The results of our analysis indicate that the PGW's degree day estimates are consistent with the historical weather data and the degree day estimates of other utilities in the region. We examined the PGW's winter gas demand estimation methodologies and found them to be satisfactory.

If you have any questions or comments, please call Leonard Crook at (202)-862-2952.

demand on other severe winter days (ranging from 33 to 65 degree days), it will not be statistically valid to use this equation to estimate gas demand on days when the weather conditions are milder.

ICF's Assessment of Design Winter Estimation Methodology

A critical factor in estimating design winter gas demand is the number of heating degree days. ICF evaluated PGW's estimate of the design winter total (i.e., 4,566 degree days) and individual design winter monthly degree days to determine whether better estimates could be generated using purely statistical approaches. Historical winter degree days during the past 48 years (1948-95) were statistically analyzed and compared to the PGW's design winter to determine the extent to which PGW's design winter is representative of historically colder than average winters. Following are the key findings.

- PGW's design winter, as expected, *exceeds* the historical mean by about 540 degree days; however, it is about 75 degree days *lower* than the historical maximum.
- On average, once in every 16 years, a winter is likely to be *as cold as or colder than* PGW's design winter.
- PGW's ranking of design winter months are, on average, *consistent* with the ranking of historical winter months. January is the coldest month; December is the second coldest month, followed by February; March is the fourth coldest month; and November as the fewest heating degree days.
- The PGW's design winter is *consistent with* the design winters adopted by other utilities in the region.
- On average, PGW's design winter is *less likely to occur than* (1) any of its design winter month, (2) a combined design December and January, or (3) a combined design December through February. The design winter, however, is *more likely* to occur than a combined design December through March. Essentially, this indicates that design months occur randomly, independent of design winter conditions. It may be more likely that a string of colder than normal winter months will occur than a design winter; but it is less likely that these months will include March.
- There is *no correlation* between January, February, and March heating degree days. Although statistically significant relationships do exist between monthly heating degree days, these relationships are *highly sensitive* to the sample data set used. Thus, one cannot say if March will be colder or warmer than normal based on February or other winter months.
- PGW's Design Day temperature, as expected, *exceeds* the historical mean by over 10 degree days; however, it *almost equals* the historical peak.
- On average, once in every 16 years, temperature (excluding wind-chill effect) is likely to be 2°F or below on the coldest day of the year. This implies that PGW's design day is *almost as likely* to occur as its design winter.

APPENDIX A

PHILADELPHIA GAS WORKS' (PGW) DESIGN WINTER/DAY NATURAL GAS DEMAND ESTIMATION¹

The design day and design winter are the periods which define the largest amount of gas that PGW must deliver to meet system requirements and to maintain system integrity. The design day is the coldest day resulting in the highest expected coincident demand on the system; the design winter is defined as the coldest experienced winter, combined with the coldest experienced January (historically, the coldest month in Philadelphia). As such, the design conditions are used to for planning annual total capacity and supply necessary for the PGW system. Following are PGW's design winter conditions.

- Design winter describes a colder than normal winter combined with a colder than normal January. The design winter consists of 4,566 degree days over the 151-day period of November through March; the design year has 5,280 degree days.
- The design day at PGW is a day when the mean temperature is 0°F, or 65 degree days, with a design hour of -5°F.

Design sendout (i.e., gas demand) is a function of three factors: (1) weather expressed in degree days, (2) number of customers, and (3) the demand response of those customers to cold weather. PGW's design sendout estimation methodologies are described below in two parts: (1) Design Winter demand and (2) Design Day demand.

I. DESIGN WINTER DEMAND ESTIMATION

Design winter demand comprises of domestic load and heating demand. Domestic load is determined by number of customers and domestic load requirement per customer. Heating demand, on the other hand, is determined by number of customers, heating degree days, and heating demand requirement per customer per degree day.

The design winter demand is estimated by summing the demands of each customer rate class over the 151-day winter period (November through March). More specifically, the following equation is used to estimate the total monthly demand for each rate class of customers.

For each customer rate class:

$$\text{Monthly Demand} = \text{No. of customers} * \text{UAF} * \{ \{ \text{Domestic Load Adjustment Factor} * (\text{DOM} * 12/365 * \text{No. of days in the month}) \} + \{ (\text{CFDD} * \text{Heating Degree Days}) * \text{Heating Adjustment Factor} \} \}$$

¹ Our understanding of PGW's design winter/day demand estimation methodology is primarily based on our review of PGW's document "Gas Cost Rate (GCR) Fiscal Year 1995-96 for the Philadelphia Gas Works, Volume I--Gas Supply/Demand Strategy, Section A: Statistical Reference Data Schedules," submitted before the Philadelphia Gas Commission, August 1995. This document contains the methodology used by PGW to estimate (in March 1995) its annual gas demand for 1995-96 and for every planning year thereafter until 2000-01. In this appendix, we have generalized the methodology without making reference to any particular year.

where

DOM, domestic load factor per customer per month, is the minimum or base load requirement;

CFDD is the heating demand factor per customer per degree day; and

UAF is the unaccounted for gas adjustment factor per customer.

The methodologies used to estimate each of these components are described below in detail.

DOMESTIC DEMAND

Domestic gas demand or baseload is estimated for each customer rate class by multiplying minimum load requirement per customer (i.e., DOM) by PGW's projections of number of customers in that rate class. The methodologies for estimating DOM and the domestic load adjustment factor are explained below.

DOMESTIC LOAD FACTOR (DOM)

DOM is the per customer minimum or base load requirement, which varies across customer rate class. It is calculated (1) by adjusting the estimated (or trial) sendouts--during the previous year's summer months of July through September--calculated for each customer rate class (excluding interruptible customers) by the domestic load adjustment factor described below, and (2) by dividing the estimates by the number of customers in each rate class.²

DOMESTIC LOAD ADJUSTMENT FACTOR

The Domestic Load Adjustment Factor is used to adjust the seasonal variation in the non-heating gas demand (i.e., domestic load). This factor is calculated by adjusting (previously) estimated sendout to actual sendout, during the previous year's summer months of July through September.

Domestic Load Adjustment Factor

$$\approx 3 \text{ month-total of actual firm sendout} / 3\text{-month total estimated firm sendout}$$

HEATING DEMAND

Heating demand is determined by the following three factors: (1) demand response of customers to cold weather; (2) number of degree days; and (3) number of customers. For each customer rate class, heating demand for a design winter is calculated by multiplying the following factors: (1) heating requirement per degree day per customer; (2) PGW's design winter degree days; and (3) PGW's projections of number of customers.³ To this estimate a heating demand adjustment factor is applied to correct for the seasonal variation in the gas demand for space heating.

² We understand that trial sales were calculated based on the previous year's load calculation.

³ Number of customers is based on projections developed by the Marketing department and historical assessments of customer attrition.

HEATING FACTOR (CFDD)

It is the heating gas demand requirement per degree day per customer. It varies by customer rate class. It is calculated as follows: first, Trial Heating Factor (Trial CFDD) is calculated; second, heating adjustment factor is calculated using DOM, Trial CFDD, and baseload estimates during peak winter months for each customer rate class; and last, Final CFDD is calculated by adjusting trial CFDD by the heating adjustment factor. The heating factor estimation methodology is described below in detail.

TRIAL HEATING FACTOR (TRIAL CFDD): It is calculated by dividing the total amount of gas demanded for heating (only) by the total degree days during the previous year's peak winter months, December through February.

$$\text{Trial CFDD} = \frac{\text{Total Gas Demand for heating over previous year's peak winter months (Dec.-Feb.)}}{\text{total degree days during this period}}$$

This calculation involves two steps:

(1) Calculate total heating gas demand for each of the 3 months (MCF) by subtracting the DOM factor from the actual sendout. For example, *for December*:

$$\text{MCF}_{\text{dec}} = \left[\left(\frac{\text{Actual Sales}_{\text{dec}}}{\text{Number of Customers}_{\text{dec}}} - \text{DOM} \right) / \text{Degree Days}_{\text{dec}} \right] \\ * \text{Degree Days}_{\text{dec}}$$

(2) Add MCF_{dec} , MCF_{jan} , and MCF_{feb} , and divide by total degree days during this three month-period.

$$\text{Trial CFDD} = \left(\text{MCF}_{\text{dec}} + \text{MCF}_{\text{jan}} + \text{MCF}_{\text{feb}} \right) / \text{Degree Days}_{\text{dec+jan+feb}}$$

Note: Degree days vary by customer rate class. Calendar degree days are used for customer rate class 1-18; cycle degree days are used for customer rate class 37-57; and previous month's cycle degree days are used for customer rate class 36.

FINAL CFDD: Final CFDD is calculated by adjusting trial CFDD by the heating adjustment factor (which is described below) as follows:

$$\text{Final CFDD} = \text{Trial CFDD} * \text{Heating Adjustment Factor.}$$

HEATING ADJUSTMENT FACTOR

Heating Adjustment Factor is used to adjust the seasonal variation in the gas demand for space heating that arises from differences in the responsiveness of customers to changes in heating degree days between seasons. It is calculated by adjusting the (previously) estimated sendout to the actual sendout during the previous year's peak winter months.

To avoid over-or under projections of heating gas demand, PGW (1) calculates the difference between actual and estimated total gas sendouts during the previous year's peak winter months, December through February and (2) inflates (deflates) the planned sendout by adding (subtracting) the difference if the actual sendout exceeded (fell below) estimated sendout. Heating Adjustment Factor is calculated as follows:

$$\text{Heating Adjustment Factor} = \frac{(\text{Actual Sendout} - \text{Estimated Sendout})}{(\text{Estimated Sendout} - \text{Baseload})} + 1$$

where Estimated Sendout is calculated using trial CFDD and Baseload is calculated for the peak winter months, setting trial CFDD to zero.

Heating adjustment factor of, for example, 1.0735 implies the following: (1) actual total sendout (during the previous year's peak winter months) exceeded the estimated total sendout (as indicated by the greater than unity value of the heating adjustment factor is); (2) this difference between estimated and actual sendouts accounts for about 7.35% of the estimated heating demand; and (3) in the future, heating sendouts will be increased by 7.35% of the estimated sendout.

The heating adjustment factor remains constant across all customers and customer rate classes.

UNACCOUNTED FOR GAS FACTOR (UAF)

UAF is used to adjust the difference between actual sendout and gas consumption by customers. This difference can arise from factors, such as pipeline leaks, pressure differentials, and unmetered deliveries. For example, UAF of 1.031 indicates 103.1 Mcf of natural gas must be sent out to meet 100 Mcf of gas demand. Therefore, UAF is usually calculated by dividing actual total gas sendout by total gas consumed by customers in that month. This factor remains constant across all customers and customer classes.

PGW'S DESIGN WINTER DEGREE DAYS

PGW's design winter has 4,566 degree days during the 151 days of a winter season. Following is the monthly spread:

617	- November
994	- December
1,160	- January
987	- February
808	- March

II. DESIGN DAY DEMAND ESTIMATION

Design day gas demand projections are made using a statistically estimated equation. More specifically, using linear regression analysis, a peak winter day gas demand equation is estimated by regressing the actual sendouts on those weekdays (excluding holidays) during the previous year's winter season when temperature is 32°F or below.

For example, design day projections for 1995-96 were developed by PGW through a demand equation, estimated by regressing the actual sendout when daily temperature was 32°F or below (during 1994-95 winter weekdays, i.e., excluding weekends and holidays) on a constant and degree days during the same period. The 5% contingency normally applied to the baseload was not used, because, the near design conditions of continuous severe weather was experienced during 1994-95. The following is the design day gas demand model, estimated by PGW.

$$\text{Gas Demand} = a + b_1 * \text{Degree Days} + b_2 * \text{Degree Days}^2 + b_3 * \text{Degree Days}^3 + \epsilon$$

where

a is the intercept;

b_1 is the slope;

b_2 & b_3 indicate the shape; and

ϵ is the residual, not captured by the estimated demand equation.

Using 22 observations, three models were estimated by PGW with linear, quadratic, and cubic terms for degree days (i.e., Degree Days, Degree Days², and Degree Days³ respectively). The model with linear term for degree days (hereafter, referred to as linear model, for simplicity) fitted the data better than the others, with an adjusted R² of 0.905.⁴ The adjusted R² value, however, informs us that about 90% of the variation in the actual sendout data are explained by the estimated demand equation.

PGW's linear model estimates are: $a = -16.883$ and $b_1 = 12.275$. We observe that the negative estimate of a is not consistent with the conventional wisdom, because it implies that domestic load per customer is negative. Nevertheless, the objective is to estimate a demand equation that fits actual peak winter day sendout data the best, so that in the future, best possible design day sendout estimates can be developed using the estimated demand equation. Therefore, it is *reasonable* to use the model estimates to calculate design day sendouts.

Design day gas demand is calculated using the linear model estimates of a and b and 65 degree days. To attach a degree of confidence (e.g., 95%) to the demand estimate thus calculated, an interval of gas demand estimates are developed using (plus or minus two times) standard deviation of the weekday actual sendouts. This implies that 95% of the time actual gas demand will be within the interval of estimates thus computed. This establishes the gas demand response of PGW's firm customers under cold weather conditions.

Although this demand equation estimated by PGW can be used to estimate gas demand on other severe winter days (ranging from 33 to 64 degree days), it will not be statistically valid to use this equation to estimate gas demand on days when the weather conditions are milder, because it is estimated based on a restricted (i.e., only when temperature was 32°F or below) sendout sample and because the gas demand response of customers may be different at milder weather conditions.

⁴ ICF calculated *Adjusted R²* from PGW's unadjusted R² estimate (of the linear gas demand model), by adjusting it for the degrees of freedom.

APPENDIX B

ARE PGW'S DESIGN CONDITIONS REPRESENTATIVE OF THE HISTORICAL WINTER?

A critical factor in estimating design winter gas demand is the number of heating degree days. ICF evaluated PGW's estimate of the design winter total (i.e., 4,566 degree days) and individual design winter monthly degree days to determine whether better estimates could be generated using purely statistical approaches. Historical winter degree days during the past 48 years (1948-95) were statistically analyzed and compared to the PGW's design winter to determine the extent to which PGW's design winter is representative of historically colder than average winters.¹ The results and the findings of these analyses are presented below in terms of questions and answers (Qs & As). These Qs & As are presented in two parts: (1) Design Winter and (2) Design Day conditions.

I. DESIGN WINTER CONDITIONS

1. What are the sample statistics of the Historical Winter Degree Days?

Data set (1948-95)	Nov	Dec	Jan	Feb	Mar	Winter Season
Historical Mean Degree Days	554	884	1,018	869	703	4,025 ^b
Historical Peak Degree Days	743	1,219	1,390	1,170	997	4,640 ^b
No. of Sample Observations	49	49	48	48	48	48
Sample Standard Deviation	80	135	150	112	99	336
Variability of Historical Data Relative to Mean ^a (%)	14	15	15	13	14	8 ^b
PGW's Design Degree Days	617	994	1,160	987	808	4,566

Notes:

^a It is coefficient of variation, calculated as (sample standard deviation/sample mean)* 100.

^b Individual months do not add up to this total, because it has been calculated independently using the historical winter season data or the standard deviation for the season total.

Findings:

- PGW's design winter, as expected, *exceeds* the historical mean by about 540 degree days; however, it is about 75 degree days *lower* than the historical maximum.
- PGW's ranking of design winter months are, on average, *consistent* with the ranking of historical winter months. January is the coldest month; December is the second coldest month, followed by February; March is the fourth coldest month; and November as the fewest heating degree days.
- The number of total degree days during winters is less variable (by about 5%-7%) than the number of degree days during individual winter months. This implies that if historical data is used to develop a design winter, more reliance can be placed on a design winter,

¹ Bowen, K. Earl and Starr, Martin K. 1982. *Basic Statistics for Business and Economics*. McGraw-Hill Book Company, New York.

developed using historical mean (such as mean \pm 1.5 standard deviation) than on any similarly developed individual design winter month.

2. What is the probability that PGW's design winter conditions will occur?

Design Winter Months	Number of PGW's Design Degree Days	No. of times a design or a colder winter occurred during 1948-96.	Historical Probability that a design or a colder winter will occur (number of years)	Historical Probability that a design or a colder winter will occur (%)
November	617	9	1/5	18
December	994	12	1/4	24
January	1160	8	1/6	17
February	987	7	1/7	15
March	808	7	1/7	15
Dec. & Jan.	2154	7	1/7	15
Dec. through Feb.	3141	4	1/12	8
Dec. through March	3949	2	1/24	4
Nov. through Feb.	3758	4	1/12	8
Design Winter	4566	3	1/16	6

Findings:

- On average, once in every 16 years, a winter is likely to be *as cold as or colder than* PGW's design winter.
- On average, PGW's design winter is *less likely* to occur than (1) any of its design winter month, (2) a combined design December and January, or (3) a combined design December through February. The design winter, however, is *more likely* to occur than a combined design December through March. Essentially, this indicates that design months occur randomly, independent of design winter conditions. It may be more likely that a string of colder than normal winter months will occur than a design winter; but it is less likely that these months will include March.

3. What do winter conditions during early winter months inform us about the winter conditions during rest of the winter season? (Anecdotally, observers think that there may be a positive correlation between early winter and severity of winter, but apparently there does not seem to exist any scientific meteorological relationship.)

To examine if cold weather in early winter is any indicator of cold weather in late winter months or rest of the winter, correlation coefficients (*r*) were calculated and analyzed for several sub-sample data sets. The data set was divided on the basis of severity of winter and November winter conditions as follows:

- (i) complete data set 1948-95;
- (ii) only those years, when winter conditions were average or milder, i.e., 4,025 degree days or below;

- (iii) only those years, when winter conditions were colder than average, i.e., above 4,025 degree days;
- (iv) only those years, when winter was much colder than average, i.e., at least 4,100 degree days;
- (v) only those years, when winter conditions during November were average or milder, i.e., 554 degree days or below;
- (vi) only those years, when November was colder than average, i.e., above 554 degree days; and
- (vii) only those years, when November was much colder than average, i.e., above 600 degree days.

Findings:

- There is *no correlation* between January, February, and March heating degree days. Although statistically significant relationships do exist between monthly heating degree days, these relationships are *highly sensitive* to the sample data set used. Thus, one cannot say if March will be colder or warmer than normal based on February or other winter months.

4. Compare PGW's Design Winter with those of other utilities in the region.

Utilities	Design Winter Criterion	Time period used	No. of Design Degree Days
PGW, Philadelphia, PA			4,566
UGI, Reading, PA	Mean of 40 winters +1.645*std.dev.	1957-95	4,616
PECO, Philadelphia, PA	Mean of 28 winters * 112%	1968-95	4,483
South Jersey Gas, Folsom, NJ	30 year-peak winter	1966-95	4,613
Elizabethtown, Bedminster, NJ	30 year-peak winter	1966-95	4,613
Historical Maximum		1948-95	4,640

Source: ICF Kaiser's Survey and Historical Temperature Data Analysis.

Findings:

- The PGW's design winter is *consistent with* the design winters adopted by other utilities in the region.

5. Is there a statistical criterion that can be used to estimate design winter conditions, based on historical data?

The objective is to evaluate PGW's design winter conditions against statistically developed winter conditions; if PGW's design winter conditions are much colder than the winter conditions statistically developed, for example, with 95% confidence level, PGW's design winter conditions could be considered overly conservative. Under such conditions PGW could be over-investing in capacity or under-utilizing existing capacity.

A principal advantage of using statistical methodology to estimate design winter conditions is that it would us to construct intervals of estimates, within which winter conditions can be

expected to lie 95% or 99% of the time. Therefore, a statistical criterion could be to develop estimates of winter conditions such that 95% of the time winter conditions will be within this range of estimates. Validity of such estimates, however, is dependent upon the validity of the assumption that we make about the underlying distribution of the weather conditions (that extend beyond our sample data pertaining to 1948-95). Therefore, we have developed below confidence intervals for winter conditions with and without assumption about the underlying distribution of winter weather conditions.

Assuming that the winter degree days are normally distributed about the mean, (i) 68% of winter degree days will lie between the following interval of sample mean ± 1 standard deviation, (ii) 95% of winter degree days will lie between the interval of sample mean ± 2 standard deviation, and (iii) 99.7% of winter degree days will lie between the interval of sample mean ± 3 standard deviation.

However, if winter degree days are not normally distributed, the above conclusions will not hold and the confidence level could be lower. Nevertheless, we can conclude that (i) *at least 75%* of winter degree days will lie between the interval of sample mean ± 2 standard deviation and (ii) *at least 88%* of winter degree days will lie between the interval of sample mean ± 3 standard deviation (*Chebyshev Inequality Theorem*).

Month	PGW's Design Winter	Sample mean - 1 Std. Dev	Sample mean + 1 Std. Dev	Sample mean - 2 Std. Dev	Sample mean + 2 Std. Dev
Nov	617	473	628	395	705
Dec	994	751	1022	615	1157
Jan	1160	867	1168	717	1318
Feb	987	756	981	644	1093
Mar	808	603	802	504	901
Season Total	4566	3689 ^a	4362 ^a	3353 ^a	4698 ^a

Note: ^a Individual months do not add up to this total, because it has been calculated independently using the standard deviation for the season total.

Findings:

- PGW's design winter falls within the 95% confidence interval estimates; developed assuming winter conditions are normally distributed. This indicates that there is *no statistically based criterion* that can be used to optimally estimate PGW's design winter better. Nevertheless, there may be other *policy criteria--such as cost-benefit (i.e., and an acceptable trade off between risks and potential cost savings) criterion and maximum acceptable risk criterion--that can be used to optimally estimate design winter conditions.*

6. To facilitate setting up an optimal policy criterion, evaluate the risks associated with alternative design winters and compare them to PGW's design winter.

To estimate an optimal design winter for PGW, we need to establish a probability or a cost-benefit "*criterion*"--such as (a) a probability (i.e., relative frequency) limit *above* which a winter may not be colder than a design winter; or (b) a criterion for an acceptable trade-off between the risks and the potential cost-savings from reduced supply capacity due to reduced design winter conditions. We observe that currently, PGW does not appear to have any such criterion.

Setting up an optimal criterion, however, will require evaluating a wide range of alternative criteria. To facilitate such a comparison, we established simple *alternative* design winter criteria. [Note: there is no significance attached to these design winter criteria; the design winters calculated must be simply considered as alternative thresholds without any importance attached to them.] Based on these criteria, alternative design winters and probabilities of winter being *as cold as or colder than* these design winters were calculated. These results, presented below, are then compared to the PGW's design winter.²

Alternative Design Winter Criterion	Alternative Design Winter (Deg.days)	No. of times the winter was as cold as or colder than the alternative design winter during the past 48 years	Probability that a winter is as cold as or colder than the alternative design winter (years and %)
Sample Mean (upper limit of the 99% confidence interval) (1948-95)	4,157	19	2/5 (=40%)
Sample Mean + 1 standard deviation	4,362	10	1/5 (=21%)
(Sample Mean + 1 std. dev.) + 1% of this total, added as contingency	4,406	7	1/7 (=15%)
(Sample Mean + 1 std. dev.) + 2% of this total, added as contingency	4,450	6	1/8 (=13%)
(Sample Mean + 1 std. dev.) + 3% of this total, added as contingency	4,493	5	1/9 (=10%)
(Sample Mean + 1 std. dev.) + 4% of this total, added as contingency	4,537	4	1/12 (=8%)
(Sample Mean + 1 std. dev.) + 5% of this total, added as contingency	4,580	3	1/16 (=6%)
PGW's Design Winter	4,566	3	1/16 (=6%)

Findings:

- If PGW's design winter is reduced by about 115 degree days (to 4,450), the risk of *not being able to meet the total winter gas demand* will increase by about 100%.
- If PGW's design winter is reduced by about 75 degree days (to 4,493), the risk of *not being able to meet the total winter gas demand* will increase by about 65% (i.e., two-third).
- If PGW's design winter is reduced by about 30 degree days (to 4,537), the risk of *not being able to meet the total winter gas demand* will increase by about 35% (i.e., one-third).

² Because, winter conditions that are below planned design winter conditions are always preferred, we assume that if a winter is as cold as or colder than the design winter, there will be a risk of not being able to meet total winter gas demand.

II. DESIGN DAY CONDITIONS

7. What are the sample statistics of historical monthly peaks?

Data Set (1948-95)	Nov	Dec	Jan	Feb	Mar	Winter Season
Average Daily Temperature (°F)	47	36	32	34	42	38 ^a
Lowest Temperature Ever (°F)	21	6	1	6	15	1 ^a
Sample Mean of monthly peak day temperatures (°F)	32	21	16	18	27	13 ^a
Standard Deviation of peak day temperatures	4.5	5.4	7.2	5.4	5.4	5.3 ^a
PGW's monthly Peak Day/Design Day Winter Temperature (°F)	22	11	0	5	18	0
Lower Limit of the 95% Confidence Interval for monthly peak day temperature (Peak Mean - 2 std.dev) (°F)	23	21	18	21	21	21 ^a
Upperlimit of the 95% Confidence Interval for monthly peak day temperature (Peak Mean + 2 std.dev) (°F)	41	32	30	29	38	24 ^a
By how many degrees PGW's monthly peak day/Design Day temp. is colder than the 95% confidence interval? (°F)	1	10	18	16	3	21 ^a
Lower Limit of the 99% Confidence Interval for monthly peak day temperature (Peak Mean - 3 std.dev) (°F)	19	5	-6	2	11	-3 ^a
Upperlimit of the 99% Confidence Interval for monthly peak day temperature (Peak Mean + 3 std.dev) (°F)	46	37	38	34	43	29 ^a
No.of observations in the sample	49	49	49	48	48	48

^a Individual months do not add up to this total, because it has been calculated independently using the historical winter season data or the standard deviation for the season total.

Findings:

- PGW's Design Day temperature is *almost equal* to the historical peak.
- PGW's Design Day temperature, as expected, *exceeds* the mean of historical peaks by over 10 degree days.
- On average, once in every 16 years, temperature (excluding wind-chill effect) is likely to be 2°F or below on the coldest day of the year. This implies that PGW's design day is *almost as likely* to occur as its design winter.

8. What is the historical frequency distribution of cold days (i.e., ≤0°F, 5-10°F, 10-15°F, 15-20°F, 20-25°F, and 25-30°F) during the winter months?

Winter Temperature	Nov	Dec	Jan	Feb	Mar	Winter	Historical	PGW's
--------------------	-----	-----	-----	-----	-----	--------	------------	-------

(during 1948-95)	(days)	(days)	(days)	(days)	(days)	Season (days)	Yearly Average (days)	Design Winter (days)
0°F or below	0	0	0	0	0	0	0	1
1°F - 5°F	0	0	7	0	0	7	0.1	4
6°F - 10°F	0	2	16	10	0	28	0.6	0
11°F - 15°F	0	12	45	16	1	74	2	5
16°F - 20°F	0	57	105	73	8	243	5	11
21°F - 25°F	3	111	190	132	32	468	10	10
25°F - 30°F	22	196	254	220	68	761	16	20
Total number of days winter temperature was 30°F or below	25	378	617	451	109	1,581	33	51
Average no. of days in a year winter temperature was 30°F or below	0.5	8	12	9	2	33	-	-

Findings:

- Historically, winter temperature of 5°F or below always occurred in January. This implies that PGW's planning for the design day to occur in January is *consistent* with the historical data.
- Historically, winter temperature in March has always been above 10°F; over the past 48 years, fewer than 5 times, the temperature has been 15°F or below during March. Therefore, it is *consistent* with the historical data to say that Design Day conditions are *not likely* to occur in March.

9. What is the probability that the coldest winter day in a year will occur in January?

Sample Data Set: 1948-95	Nov	Dec	Jan	Feb	Mar
Mean of monthly peak day temperatures (°F)	32	21	16	18	27
Lowest Temperature ever (°F)	21	6	1	6	15
No. of times the coldest day in a year occurred this month during the past 48 yrs.	0	10	23	16	2
Probability that the coldest day in a year will fall in this month (number of years)	0	1/5	1/2	1/3	1/24
Probability that the coldest day in a year will fall in this month (%)	0	20	47	33	4
PGW's Monthly Peak day/Design Day Winter Temperature (°F)	22	11	0	5	18

Findings:

- On average, coldest day of the year is *more likely* to be a day in January than in any other month. This implies that PGW's planning for the design day to occur in January is *consistent* with the historical data.
- On average, the likelihood of the coldest day of the year occurring in March is 4%. In other words, 96% of the time, the coldest day of the year is likely to occur in December, January,

or February. Therefore, it is *consistent* with the historical data to say that coldest day of the year is *less likely* to occur in March.

10. How does PGW's design day compare with those of other utilities in and around the region?

To evaluate PGW's design day with that of other utilities in the region, we compiled design day criteria adopted by other utilities in the region. To facilitate comparison across the design day planning criteria adopted by utilities and to compare other utilities' design day sendout planning with that of PGW's, we estimated relative potential design day sendout. It was calculated as follows: Relative potential Design Day Sendout = Sendout when the temperature is 0°F, which is assumed to equal 100% * [(65 degree days - Design Day Mean Temp.)/65] * (1 + PGW's sendout adjustment factor for wind speed + reserve margin). This formula assumes that sendout increases linearly to increases in wind speed and heating degree days. The following table compares the design day adopted by other utilities in the region with PGW's design day.

Utilities	Design Day Mean Temperature (°F)	Probability of Design Day occurrence ^a (years)	Design Day Wind Speed (mph)	Design Day Reserve Margin (%)	Increase in heating demand resulting from Design Day Wind Speed ^b (%)	Relative Potential Design Day Sendout ^c (%)
PGW, Philadelphia, PA	0	-	-	-	-	100
Baltimore Gas & Electric, Baltimore, MD	2.7	1:25	15	10.7	5	111
Peoples Natural Gas, Pittsburg, PA	-9	1:15	15.8	10 ^d	5.6	132
UGI, Reading, PA	-1.1	1:20	-	-	-	102
Washington Gas Light, Washington, DC	5	-	17	0.6	6.2	99
48-year Historical Peak (1948-96)	1	1:48	n/a	-	-	98

Sources: (1) PGW's documents on Design Day Planning and Sendout Estimation; (2) "Analysis of LDC Peak Day Planning," prepared by Fosters Associates for American Gas Association. *Gas Energy Review*, March 1996, pp:7-10; (3) ICF Kaiser's Historical Temperature Data Analysis.

Notes:

^a It is a design day planning criterion adopted by some utilities.

^b It is the sendout adjustment factor used by PGW. For example, for a wind speed of 15 mph, other things equal, PGW will increase the sendout by 5%. There is no adjustment factor for wind speed of below 10 mph.

^c It is the design day-sendouts of utilities, relative to the peak winter day of 65 heating degree days.

^d Applies only to interstate supplies.

n/a = Data not available.

Findings:

- PGW's design day is *consistent with* other utilities' design day planning and 48-year historical peak winter.

Docket No. R-06XXX

Item 53.64 (c)(14)

Philadelphia Gas Works

Pennsylvania Public Utility Commission

52 Pa. Code §53.61, et seq.

Item 53.64(c) Thirty days prior to the filing of a tariff reflecting an increase or decrease in natural gas costs, each Section 1307(f) gas utility seeking recovery of purchased gas costs under that section shall provide notice to the public, under § 53.68 (relating to notice requirements), and shall file the following supporting information with the Commission, with a copy to the Consumer Advocate, Small Business Advocate and to intervenors upon request:

(14) Analysis and data demonstrating, on an historic and projected future basis, the minimum gas entitlements needed to provide reliable and uninterrupted service to priority one customers during peak periods.

Response:

In 1997, PGW contracted with ICF Kaiser Group to review its capacity entitlements. A copy of the final report is attached.

PGW Gas Supply Study Final Report

Prepared for:
Philadelphia Gas Works

Prepared by:
ICF Kaiser International, Inc.

 **ICF KAISER**

July 2, 1997

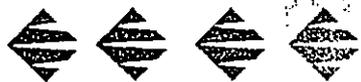


PGW Gas Supply Study Final Report

Prepared for:
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July 2, 1997



ICF KAISER

Outline of Report



- ❖ **Purpose of Study**
- ❖ **Overview of Assignment**
 - ◆ Management Review
 - ◆ Peak Day Study
 - ◆ Risk Management Study
 - ◆ LNG Liquefaction Options Study
 - ◆ Supply Optimization
- ❖ **Supply Study--Analytic Approach**
- ❖ **Findings**
- ❖ **Conclusions**

Purpose of Study



- ❖ Conduct a broad assessment of PGW's gas supply operations to answer the following questions.
 - ◆ Does the PGW gas purchasing function operate in a way to minimize gas costs?
 - ◆ Does PGW over-estimate its peak requirements, leading to over commitments in delivery capacity?
 - ◆ Would implementing a risk management program reduce PGWs' gas supply costs?

Purpose of Study (contd.)



- ❖ Develop an analytic framework for assessing whether and how PGW can manage its gas pipeline, storage, and peak shaving capacity to minimize gas supply costs.
 - ◆ Has PGW over committed to pipeline or storage capacity?
 - ◆ Where can capacity reductions be made to reduce cost while maintaining delivery reliability?
 - ◆ Pipeline capacity
 - ◆ Storage
 - ◆ Peak shaving
 - ◆ How much interruption of BPS and LBS should PGW accept?
 - ◆ Would dropping the South Jersey sale allow PGW to turn back pipeline capacity and reduce costs?
 - ◆ Is the current commitment to LNG capacity excessive?

Outline of Report



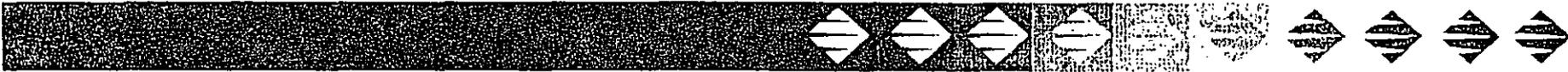
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- ❖ **Conclusions**

Overview of Assignment



- ❖ ICF has conducted four related studies at PGW
 - ◆ A management review of the gas supply function
 - ◆ A review of PGW's approach to estimating peak day and peak season gas demand
 - ◆ An evaluation of a risk management strategy for PGW
 - ◆ A gas supply optimization study
- ❖ This report presents the final results of the gas supply optimization study
- ❖ In a related assignment, ICF Kaiser evaluated alternative approaches to upgrading the LNG liquefaction facilities at the Richmond plant

Management Review (Dec. 1996)

- 
- ❖ Management recommendations were made for four areas
 - ◆ Gas Acquisition
 - ◆ Gas Control
 - ◆ Gas Planning
 - ◆ Regulatory Affairs
 - ❖ Specific recommendations were made for aligning PGW's gas supply function with PGW's corporate strategy

Peak Day Study (Feb. 1997)



- ❖ Focused on estimations of design day, winter and year
- ❖ Concluded that PGW's approach yields reasonable results consistent with empirical data
- ❖ PGW's design weather estimates are not overly conservative
 - ◆ The design winter is less than the 48-year historical peak winter
 - ◆ The monthly design winter conditions are well below the 48-year peak
 - ◆ Design winter conditions lie within the 95 percent confidence interval
 - ◆ A winter as cold or colder than the design winter is likely to occur once in 16 years

Risk Management (Jan. 1997)

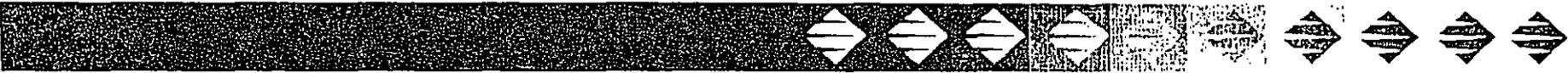


- ❖ The study made three findings
 - ◆ PGW and its customers have substantial exposure to market risks through the reliance on market pricing for gas supply
 - ◆ This exposure is mitigated partially by the investment in storage and LNG
 - ◆ Active risk management can further mitigate risk and provide opportunities to develop innovative products for PGW's customers
- ❖ The study recommended PGW proceed deliberately to develop a risk management function
 - ◆ PGW should use a phased approach to maximize learning about risk management
 - ◆ PGW should begin with a pilot project

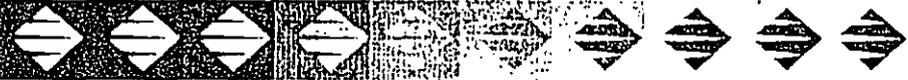
LNG Liquefaction Options (June 1997)

- 
- ❖ In a related report, ICF Kaiser in conjunction with CH-IV Corporation and MPR Engineers analyzed options for improving the 30 year old liquefaction facilities at Richmond
 - ◆ Upgrade the existing system and replace 30+ year old compressors with modern centrifugal compressors
 - ◆ Install an open expander system
 - ◆ Install a mixed refrigerant system
 - ❖ New technologies can enhance reliability, provide operational flexibility, additional liquefaction capability, and reduced liquefaction costs

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Purpose of the Supply Optimization Study



- ❖ Develop an analytic framework for assessing whether and how PGW can manage its gas pipeline, storage, and peak shaving capacity to minimize gas supply costs.
 - ◆ Has PGW over committed to pipeline or storage capacity?
 - ◆ Where can capacity reductions be made to reduce cost while maintaining delivery reliability?
 - ◆ Pipeline capacity
 - ◆ Storage
 - ◆ Peak shaving
 - ◆ How much interruption of BPS and LBS should PGW accept?
 - ◆ Would dropping the South Jersey sale allow PGW to turn back pipeline capacity and reduce costs?
 - ◆ Is the current commitment to LNG capacity excessive?

Analytic Approach - Optimization



- ❖ ICF Kaiser used the Gas Acquisition Strategy Model²
- ❖ GASM² optimizes across all supply and demand options
 - ◆ Pipeline capacity
 - ◆ Storage
 - ◆ Peak shaving -- LNG/Propane
 - ◆ Interruption
- ❖ The optimal solution identifies the least cost supply strategy under given assumptions
 - ◆ Multiple model runs test “What ifs”
 - ◆ Minimizes costs to PGW and customers

Analytic Approach - Optimization Inputs

- 
- ❖ Define the period to be studied (multi-year or single year) and the detail within the period
 - ❖ Provide gas requirements as load duration curve: total sendout or by customer class
 - ❖ Identify and characterize gas supply options
 - ❖ Identify and characterize the pipeline transportation options
 - ❖ Identify and characterize storage and peak shaving options
 - ❖ Integrate storage, transportation and peak capacities

Analytic Approach - Period and Term

- 
- ❖ The Study used a single year representation for PGW
 - ◆ PGW has no long-term contracts with distinctive pricing terms
 - ◆ Allows greater load detail for modeling critical winter months
 - ❖ GASM² used 36 load periods per simulation
 - ◆ November through March (20 periods total)
 - ◆ 4 periods per month: Peak, Next 3 days, Next 10 days, Remainder of the month
 - ◆ April, May, September, October (12 periods total)
 - ◆ 3 periods per month: Peak, Next 13 days, Remainder of the month
 - ◆ June (2 periods)
 - ◆ 14 highest days, Remainder of the month
 - ◆ July, August (2 periods total)

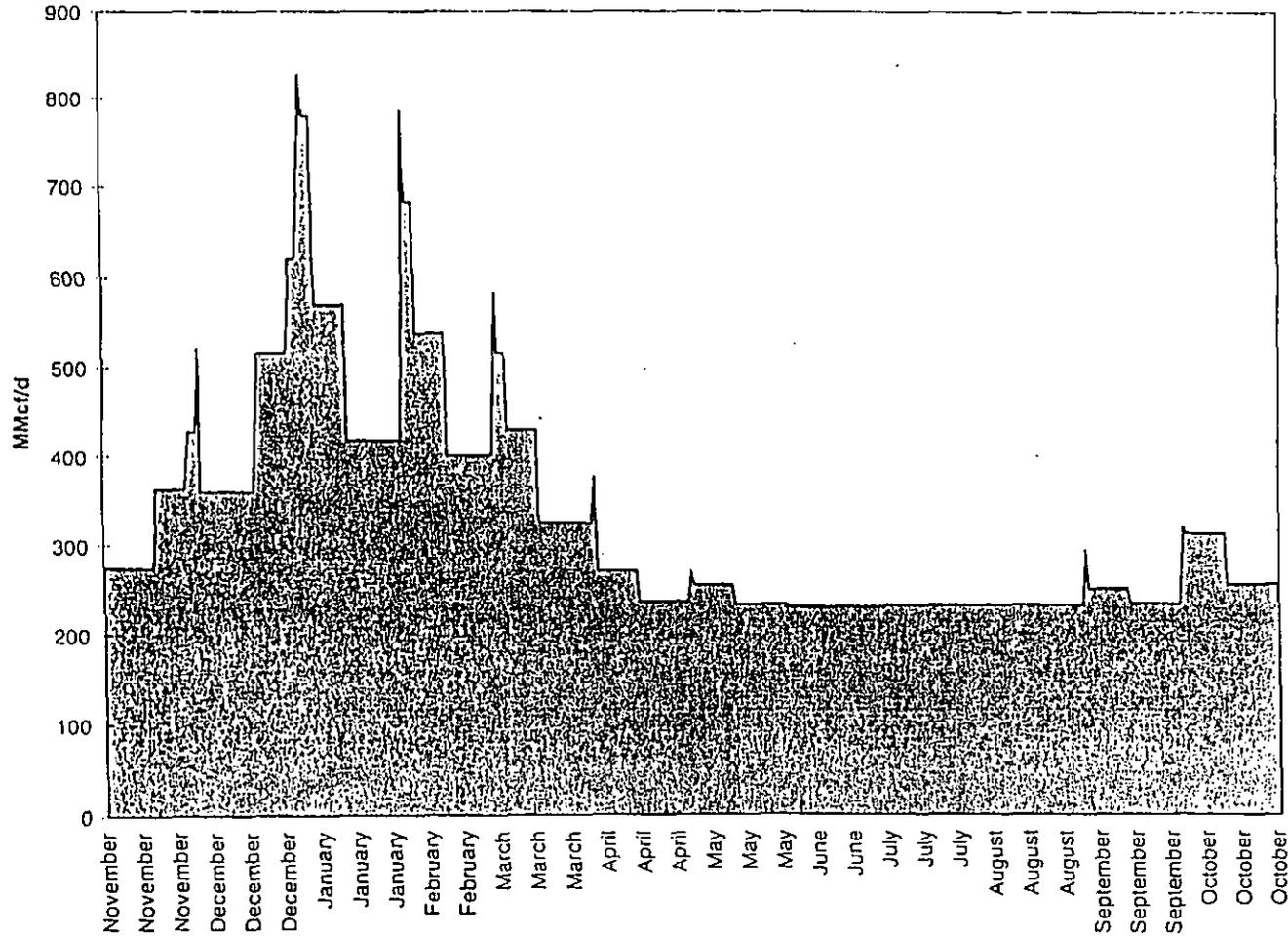
Analytic Approach - Load Characterization



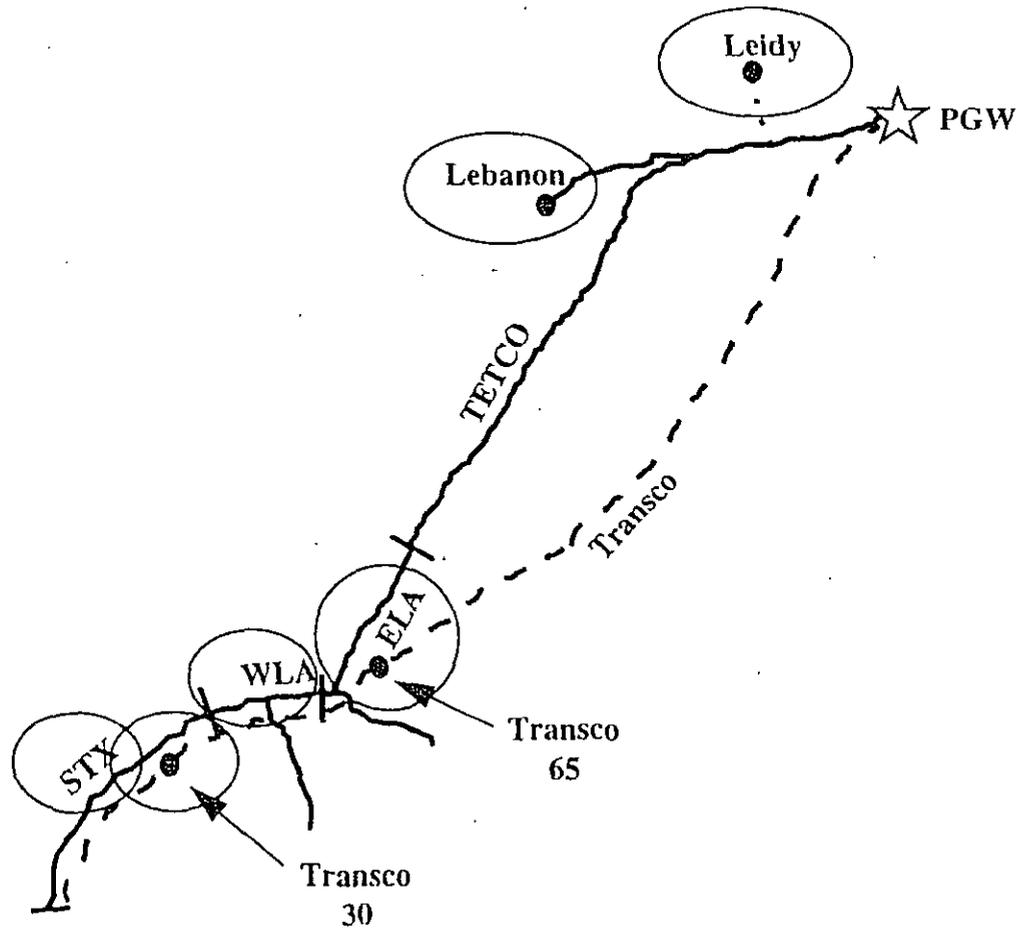
- ❖ Used PGW's load forecasting DOM/HDD method by customer class
- ❖ Used design year definitions for HDD inputs
 - ◆ Increased firm demand in January to equal all-time peak month
- ❖ Customer classes grouped into six categories
 - ◆ Residential, Commercial, Industrial (firm), Interruptible (No. 6 fuel oil), Interruptible (No. 2 fuel oil), Municipal
 - ◆ Interruption occurs when cost of serving interruptible customer exceeds alternative fuel cost
- ❖ South Jersey sales incorporated separately
 - ◆ 10 days of 25 Mmcf/day on winter peaks.

(See Appendix A for key load inputs)

Analytic Approach - Chronological Load Duration Curve (includes storage injection)



Analytic Approach - Gas Supply Markets



Analytic Approach - Characterize Gas Supply Options



- ❖ Contract prices are assumed to be indexed to monthly spot prices (\$/Mcf)
 - ◆ Average Price
 - ◆ Winter
 - ◆ Spring Fall
 - ◆ Summer
 - ◆ Prices used are from DRI Summer 1996 forecast
- ❖ Contract parameters include minimum take requirements and demand charges
- ❖ Spot supplies can provide no more than 30% of gas in base case

(See Appendix A for key supply inputs)

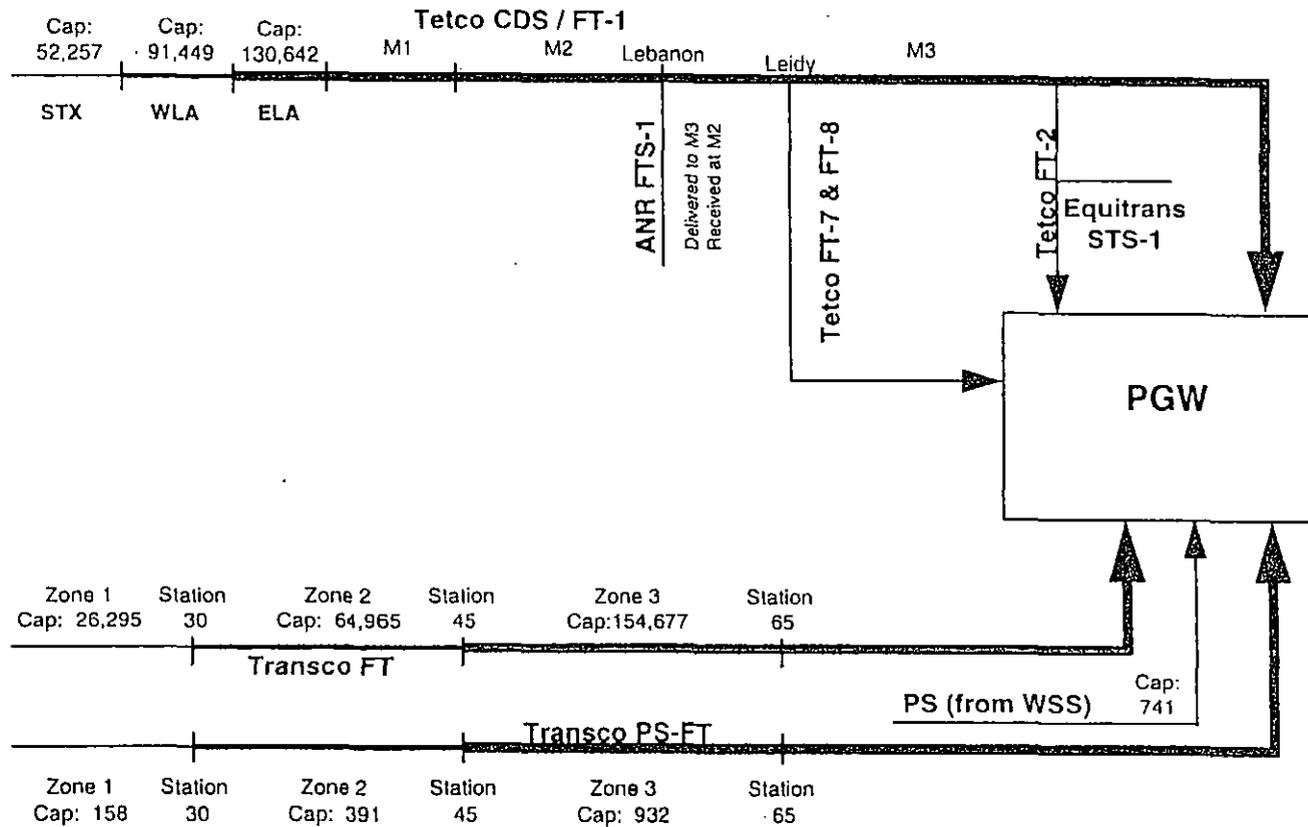
Analytic Approach - Characterize Pipeline Options



- ❖ Pipeline Name
 - ◆ Transco
 - ◆ Tetco
 - ◆ ANR
 - ◆ Equitrans
- ❖ Contract Type
- ❖ Capacity by Zone
- ❖ Expiration Date of Contract
- ❖ Distinguishing Operational Rules (i.e., winter only; tied to a given storage)

(See Appendix A for key pipeline inputs)

Analytic Approach - Characterize Pipeline Options (contd)



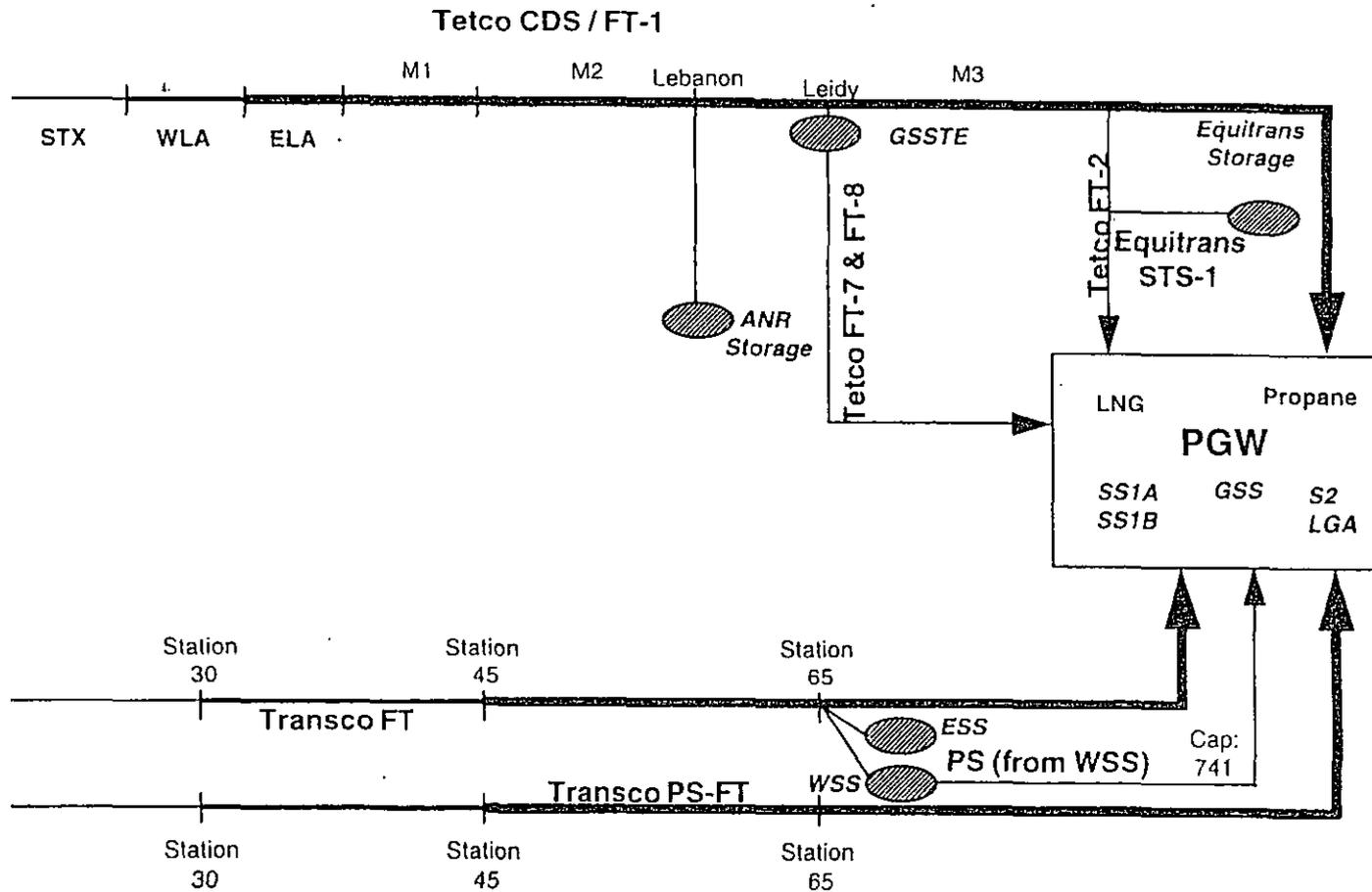
Analytic Approach - Storage and Peak Shaving Options



- ❖ Storage is matched with associated pipeline capacity
 - ◆ GSS (Transco), SS1A, SS1B, S2 and LGA storage assumed to be available at citygate
 - ◆ Equitrans and GSS (TETCO) storage associated with unbundled capacity to the city gate
 - ◆ WSS, ESS, and ANR storage treated as production area storage
- ❖ “Untouchable” gas under storage contracts is subtracted from available capacity
- ❖ LNG is assumed to have year-round minimum inventory of 750 MMcf
 - ◆ Maximum available for use equals 3,550 MMcf
- ❖ Propane is treated as a locally available, high-priced supply

(See Appendix A for key inputs)

Analytic Approach - Integration



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Findings - Three Sets of Cases Studied



- ❖ Three cases address the basic questions raised by PGW about the levels of capacity commitments
 - ◆ Base--current contract levels are fixed, approximates current operations
 - ◆ Open--all contracts can be modified; model is allowed to choose least cost mix of contract levels
 - ◆ Modified Open--only expiring contracts can be modified
- ❖ Two cases examine the implications of terminating the South Jersey contract
 - ◆ Base without South Jersey--base case with the South Jersey contract terminated
 - ◆ Modified Base without South Jersey--modified case after the South Jersey contract expires

Findings - Three Sets of Cases Studied (contd)

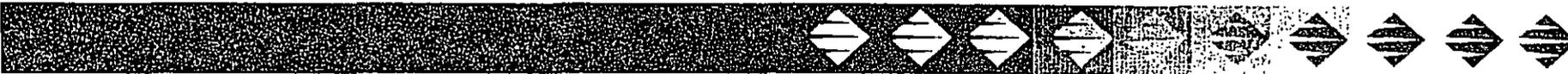
- 
- ❖ Two cases examine the impact of turning back pipeline capacity if the South Jersey contract expires
 - ◆ 10,000 Mcf/d turn back
 - ◆ 20,000 Mcf/d turn back

Findings - Summary of Case Results



	Capacity Commitment			South Jersey			Turn Back		
	Base	Open	Modified Open	Base	Base No SJ	Modified Open No SJ	Base No SJ	Reduce Cap 10,000 Mct/d No SJ	Reduce Cap 20,000 Mct/d No SJ
Savings (\$ Change from Base)	-	6,202,600	682,200	-	(156,200)	573,000	(156,200)	(62,000)	(1,784,800)
Pipeline Load Factor (%)									
Winter	99%	98%	99%	99%	99%	99%	99%	99%	100%
Annual	81%	81%	81%	81%	81%	81%	81%	83%	85%
Storage (% of Max Contract Cap)									
Production	96%	63%	100%	96%	94%	100%	94%	99%	99%
Market	100%	98%	97%	100%	100%	97%	100%	100%	100%
LNG (% of Max Contract Cap)	100%	100%	100%	100%	100%	100%	100%	100%	100%
Interruption (Days)									
BPS	38	47	46	38	33	42	33	67	100
LBS	118	136	118	118	118	118	118	126	136
Propane (Total MMcf Equivalent)	0	0	0	0	0	0	0	0	16

Findings - Capacity Commitment

- 
- ❖ The Base Case results are consistent with PGW's current operations
 - ◆ PGW actual use of storage, pipeline capacity, LNG, and interruption is similar to the model results for current levels of contractual commitments
 - ❖ Optimizing gas supply where all of the current contracts can be redetermined will lead to the elimination of some commitments
 - ◆ ANR, Eminence and Transco LGA storage would not be needed
 - ◆ Production area storage (ANR and Eminence) is more economic when the difference between summer and winter prices widens
 - ◆ Transco LGA storage suffers from high variable costs

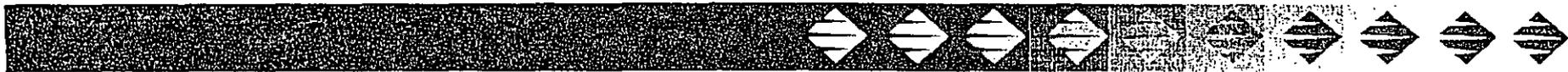
Findings - Capacity Commitment (contd)

- 
- ❖ Under the optimal Open case additional interruption would occur, however
 - ◆ 9 more days for BPS customers
 - ◆ 18 more days for LBS customers
 - ❖ Under the optimal strategy, PGW's current commitments to LNG and pipeline capacity would be unchanged
 - ❖ If only the expiring storage contracts can be modified, PGW should
 - ◆ Reduce the Transco S2 contract by 1/3rd
 - ◆ Eliminate the LGA contract
 - ❖ These reductions would be offset by 9 additional days of BPS interruption

Findings - Eliminating the South Jersey Contract

- 
- ❖ The expiration of the South Jersey contract would cost PGW approximately \$150,000 relative to the base case
 - ◆ Contract elimination would allow PGW to reduce S-2 storage levels and BPS interruption
 - ◆ Resulting cost decreases would not offset the \$1.25 million in lost revenue from South Jersey
 - ❖ The expiration of the South Jersey contract would reduce the savings gained under the modified open case
 - ◆ Like above, there would be less interruption of BPS customers
 - ❖ PGW's service to South Jersey contributes more than it costs

Findings - Capacity Turn Back



- ❖ Turning back 10,000 Mcf/d of TETCO CDS capacity would cost PGW and its customers over \$60,000 per year
 - ◆ Interruption of BPS would double and LBS increase by 8 days
 - ◆ More expensive storage would have to be used
- ❖ Turning back 20,000 Mcf/d of pipeline capacity would be extremely costly
 - ◆ Costs would increase by almost \$1.8 million
 - ◆ BPS customers would be interrupted 100 days and LBS customers for 136 days
 - ◆ This is the only case where PGW would have to use propane

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Conclusions



- ❖ PGW has the right mix of pipeline capacity
 - ◆ Under all of the cases studied, the current levels of pipeline capacity were fully utilized in winter
 - ◆ Turn back of pipeline capacity would lead to higher costs by forcing the use of more expensive supply options and greater levels of interruption
- ❖ PGW's LNG capacity is fully utilized under all cases
 - ◆ LNG is an important element of PGW's capacity mix, providing peak day reliability and winter capacity at reasonable cost
 - ◆ LNG capacity in conjunction with pipeline capacity may provide greater opportunities for on-and off-system services

Conclusions (contd)



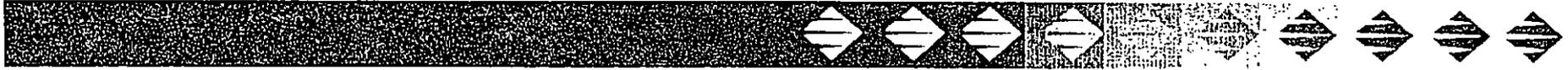
- ❖ PGW can reduce costs by eliminating several storage contracts-- ANR, Eminence and Transco LGA and reduce its capacity under Transco S-2
 - ❖ Under the Open case, the optimal mix of supply could meet demand without using these services
- ❖ PGW can reduce costs, where the opportunity to reduce capacity commitments is limited to expiring contracts, by eliminating the LGA storage and cutting back S-2 storage
- ❖ PGW should not terminate the South Jersey contract
 - ❖ South Jersey contributes more than it costs to serve
 - ❖ Termination would not allow PGW to reduce pipeline capacity commitments and save money

Conclusions (contd)



- ❖ PGW's interruptible customers are on the margin in most cases
 - ◆ Reductions in capacity commitments increase the interruption of BPS and LBS customers
 - ◆ PGW should consider innovative Btu-services for these customers
- ❖ PGW should consider ways to maximize the value of existing assets by developing new services for on- and off-system customers
 - ◆ PGW should examine regional market opportunities for leveraging LNG and other assets
 - ◆ PGW should develop a capability to enhance offerings using risk management tools

Appendix A



Key Gas Supply Inputs



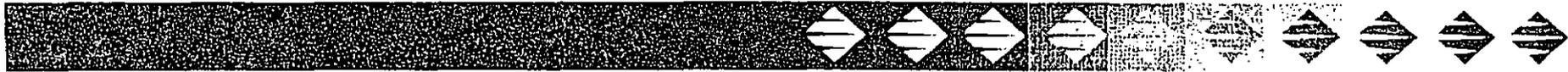
Market Location	Year	Average Price \$/Mcf	Price		
			Winter \$/Mcf	Spring/Fall \$/Mcf	Summer \$/Mcf
Transco 30	1996-97	2.18	2.44	2.25	1.78
Transco 65	1996-97	2.23	2.49	2.30	1.83
Tetco South Texas (STX)	1996-97	2.05	2.24	2.11	1.74
Tetco Louisiana (ELA)	1996-97	2.21	2.48	2.27	1.81
Tetco Louisiana (WLA)	1996-97	2.21	2.48	2.27	1.81
CNG Leidy	1996-97	2.31	2.51	2.37	1.98
ANR Lebanon	1996-97	2.31	2.51	2.37	1.98

Key Load Inputs



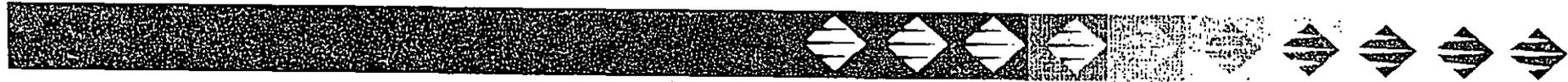
Customer Class	Number of Customers	Peak Day Demand (MMcf)	Peak Month Demand (MMcf)	Annual Demand (MMcf)
Residential	500,655	589.7	11,255.4	56,304.9
Commercial	23,661	90.0	1,757.0	9,532.5
Industrial Firm	1,034	20.8	474.1	3,756.5
Municipal	742	20.2	377.1	1,722.3
<i>Total Firm</i>	526,092	720.7	13,863.6	71,316.2
Interruptible #2	410	48.5	1101.3	7,585.4
Interruptible #6	50	15.6	383.1	3,023.4
<i>Total Interruptible</i>	460	64.1	1,484.1	10,608.8
South Jersey	1	25.0	100.0	250.0
Grey's Ferry	1	0.0	0.0	8,388.0
<i>Total Other</i>	2	25.0	100.0	8,638.0
Total	526,554	809.8	15,448.1	90,563.0

Key Pipeline Inputs



Company	Contract	Capacity	Expiration Date	Notes
Transco	FT	27,100 (Zone 1) 67,000 (Zone 2) 159,600 (Zone 3)	31-Mar-2005	
Transco	PS-FT	158 (Zone 1) 233 (Zone 2) 541 (Zone 3) 741 (Zone 4)	31-Jul-2011	Winter Only
TETCO	CDS	72,674	31-Oct-2003	
TETCO	FT-1	57,967	31-Oct-2003	
TETCO	FT-2	5,227	31-Mar-2002	Formerly bundled with Equitrans storage.
TETCO	FT-7	7,238	15-Apr-2006	Formerly bundled with CNG storage
TETCO	FT-8	24,905	31-Mar-2006	Formerly bundled with CNG storage.
ANR	FTS-1	13,168 (Summer) 9,329 (Winter)	31-Mar-2013	Delivers gas to TETCO at Lebanon.
Equitrans	STS-1	4,843	1-Apr-2002	Delivers gas to TETCO FT-2.

Key Storage and Peak Shaving Inputs



Company	Contract	Expiration Date	Injection Period	Withdrawal Period	Storage Capacity	Max. Withdrawal Capacity	Ratchet	Injection Capacity	Notes:
Transco	WSS	31-Mar-1998	Year Round	Year Round	3,232,470	38,029	Y	15,105	
Transco	ESS	31-Oct-2013	Year Round	Year Round	79,700	10,230	N	682	Capacity will increase with expiration of Transco FS sales volumes.
Transco	S-2	11/15/1974*	4/16 - 11/15	11/16 - 4/15	452,087	5,032	N	2,324	Service may be canceled with 12 months prior notice.
Transco	GSS	Pending	Year Round	Year Round	3,893,346	59,658	Y	19,563	Storage capacity reduced 7% to account for base volumes. Monthly extraction 87.5% of daily total.
Transco	LGA	31-Oct-1991	4/1 - 10/31	11/1 - 3/31	50,848	10,171	N	254	
TETCO	SS-1A	30-Apr-2012	Year Round	Year Round	2,570,000	42,750	Y	13,184	Storage capacity reduced 4% to account for base volumes.
TETCO	SS-1B	30-Apr-2012	Year Round	Year Round	2,390,344	20,201	Y	12,264	Storage capacity reduced 4% to account for base volumes.
CNG	GSS	31-Mar-2006	Year Round	Year Round	3,531,631	32,991	Y	21,097	Storage capacity reduced 7% to account for base volumes. Monthly extraction 87.5% of daily total.
Equitrans	SS-3	1-Apr-2002	Year Round	Year Round	506,298	4,843	Y	2,529	Typical injection period is 4/1 - 10/31; withdrawal period is 11/1 - 3/31
ANR	FSS	1-Jan-2003	4/1 - 10/31	11/1 - 3/31	1,843,400	13,429	N	9,200	
LNG			4/1 - 10/31	11/1 - 3/31	3,985,000	450,000		23,500	All costs other than fuel assumed to be fixed

Appendix B



Summary of Cases (Base/Scenarios)

- 
- ❖ Case 1: Base - All contracts are considered fixed
 - ❖ Case 2: Open - No contracts are considered fixed
 - ❖ Case 3: Modified Open - Capacities on expiring contracts are variable
 - ❖ Case 4: Base, No South Jersey
 - ❖ Case 5: Modified Open, No South Jersey
 - ❖ Case 6: Pipeline Capacity Turn Back 10,000 Mcf/d (No South Jersey)
 - ❖ Case 7: Pipeline Capacity Turn Back 20,000 Mcf/d (No South Jersey)

Case summary outline (Case 1 Base)

- 
- ❖ All contracts are considered fixed
 - ◆ Capacities and capacity charges cannot change
 - ◆ Fixed costs are sunk for decisionmaking purposes

Case 1 Base: Sources of Supply

- 
- ❖ Purchases - Range (incl. pipeline fuel): 230-355 MMcf
 - ❖ Production area storage (including ANR)
 - ◆ Transco storage (ESS and WSS) used at over 98% of capacity
 - ◆ ANR storage used at 90% capacity
 - ◆ Peak day withdrawal: 39 MMcf
 - ❖ Market area storage
 - ◆ Maximum storage capacity except LGA (high variable cost)
 - ◆ Peak day withdrawal: 165 MMcf

Case 1 Base: Sources of Supply (cont.)



❖ LNG

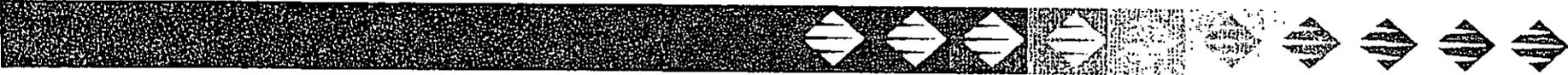
- ◆ All capacity is used
- ◆ Maximum withdrawal: 290 MMcf

❖ No propane is used

❖ Interruption

- ◆ 2.96 Bcf of demand total
- ◆ On PGW peak day: 64.1 MMcf (all BPS and LBS customers)
- ◆ BPS customers are interrupted for 38 days
- ◆ LBS customers are interrupted for 118 days

Case 1 Base: Capacity Use

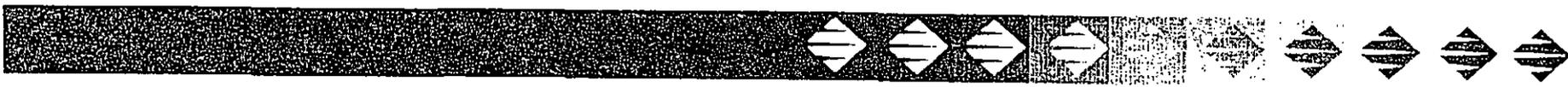


❖ Pipeline load factors

Pipeline	Winter	Total
Transco FT	100%	88%
TETCO FT-1	99%	80%
TETCO CDS	96%	67%

*Winter = Nov 1 - Mar 31

Case 1 Base: Capacity Use (cont.)



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	4,942
<i>Transco WSS</i>	3,233	3,187
<i>Transco ESS</i>	80	80
<i>ANR FSS</i>	1,843	1,675
Market Area	13,395	13,384
<i>Transco S2</i>	452	452
<i>Transco GSS</i>	3,893	3,893
<i>Transco LGA</i>	51	41
<i>TETCO SS1A</i>	2,570	2,570
<i>TETCO SS1B</i>	2,390	2,390
<i>CNG GSST</i>	3,532	3,532
<i>Equitrans SS3</i>	506	506

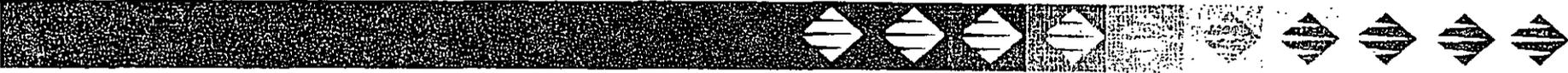
Case summary outline (Case 2 Open)

- 
- ❖ No contracts are considered fixed
 - ◆ All fixed costs are avoidable
 - ◆ Capacities represented in portfolio are available
 - ◆ In the “capacity store”

Case 2 Open: Sources of Supply

- 
- ❖ Purchases - Range (incl. pipeline fuel): 210-354 MMcf
 - ❖ Production area storage (including ANR)
 - ◆ All available WSS capacity is purchased; no ANR or ESS
 - ◆ Peak day withdrawal: 24 MMcf
 - ❖ Market area storage
 - ◆ Some reductions from base case
 - ◆ TETCO SS-1 and CNG are used at 95% capacity; S2 at 85%
 - ◆ LGA eliminated
 - ◆ Peak day withdrawal: 152 MMcf

Case 2 Open: Sources of Supply (cont.)



❖ LNG

- ◆ Maximum available capacity is used
- ◆ Maximum withdrawal: 301 MMcf

❖ No propane is used

❖ Interruption

- ◆ 3.47 Bcf of demand total
- ◆ On PGW peak day: 64.1 MMcf (all BPS and LBS customers)
- ◆ BPS customers are interrupted for 47 days
- ◆ LBS customers are interrupted for 136 days

Case 2 Open: Capacity Use



❖ Pipeline load factors

Pipeline	Winter	Total
Transco FT	100%	78%
TETCO FT-1	90%	55%
TETCO CDS	97%	99%

*Winter = Nov 1 - Mar 31

Case 2 Open: Capacity Use (cont.)



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	3,236
<i>Transco WSS</i>	<i>3,233</i>	<i>3,233</i>
<i>Transco ESS</i>	<i>80</i>	<i>0</i>
<i>ANR FSS</i>	<i>1843</i>	<i>3</i>
Market Area	13,395	13,078
<i>Transco S2</i>	<i>452</i>	<i>381</i>
<i>Transco GSS</i>	<i>3,893</i>	<i>3,893</i>
<i>Transco LGA</i>	<i>51</i>	<i>0</i>
<i>TETCO SS1A</i>	<i>2,570</i>	<i>2,507</i>
<i>TETCO SS1B</i>	<i>2,390</i>	<i>2,277</i>
<i>CNG GSST</i>	<i>3,532</i>	<i>3,532</i>
<i>Equitrans SS3</i>	<i>506</i>	<i>506</i>

Case summary outline (Case 3 Modified Open)



- ❖ Capacities on contracts that have or are about to expire are considered variable for decisionmaking purposes
 - ◆ Transco WSS storage
 - ◆ Transco S-2 storage
 - ◆ Transco GSS storage
 - ◆ Transco LGA storage

Case 3 Modified Open: Sources of Supply

- 
- ❖ Purchases - Range (incl. pipeline fuel): 223-356 MMcf
 - ❖ Production area storage (including ANR)
 - ◆ All production area storage is used to capacity
 - ◆ Peak day withdrawal: 38 MMcf
 - ❖ Market area storage
 - ◆ Most storage used to full capacity
 - ◆ LGA is eliminated; S2 is used at 33% of contract maximum
 - ◆ Peak day withdrawal: 155 MMcf

Case 3 Modified Open: Sources of Supply (cont.)



❖ LNG

- ❖ All capacity is used
- ❖ Maximum withdrawal: 300 MMcf

❖ No propane is used

❖ Interruption

- ❖ 3.26 Bcf of demand total
- ❖ On PGW peak day: 64.1 MMcf (all BPS and LBS customers)
- ❖ BPS customers are interrupted for 46 days
- ❖ LBS customers are interrupted for 118 days

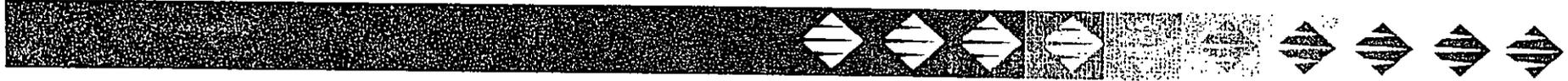
Case 3 Modified Open: Capacity Use

❖ Pipeline load factors

Pipeline	Winter	Total
Transco FT	100%	88%
TETCO FT-1	98%	77%
TETCO CDS	96%	67%

*Winter = Nov 1 - Mar 31

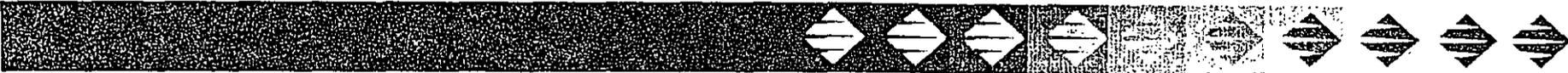
Case 3 Modified Open: Capacity Use (cont.)



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	5,156
<i>Transco WSS</i>	3,233	3,233
<i>Transco ESS</i>	80	80
<i>ANR FSS</i>	1,843	1,483
Market Area	13,395	13,041
<i>Transco S2</i>	452	150
<i>Transco GSS</i>	3,893	3,893
<i>Transco LGA</i>	51	0
<i>TETCO SS1A</i>	2,570	2,570
<i>TETCO SS1B</i>	2,390	2,390
<i>CNG GSST</i>	3,532	3,532
<i>Equitrans SS3</i>	506	506

Case summary outline (Case 4 Base, No South Jersey)

- 
- ❖ All contracts are considered fixed
 - ◆ Capacities and capacity charges cannot change
 - ◆ Fixed costs are sunk for decisionmaking purposes
 - ❖ PGW does not supply gas to South Jersey
 - ◆ 2,500 Mcf/d for 10 days
 - ◆ Contract expires winter 97-98

Case 4 Base, No South Jersey: Sources of Supply

- 
- ❖ Purchases - Range (incl. pipeline fuel): 231-356 MMcf
 - ❖ Production area storage (including ANR)
 - ◆ Similar to the base case, with a slight reduction in use of ANR
 - ◆ Peak day withdrawal: 38 MMcf
 - ❖ Market area storage
 - ◆ Maximum storage capacity is used for all except LGA and Equitrans
 - ◆ Peak day withdrawal: 165 MMcf

Case 4 Base, No South Jersey: Sources of Supply (cont.)

❖ LNG

- ◆ All capacity is used
- ◆ Maximum withdrawal: 313 MMcf

❖ No propane is used

❖ Interruption

- ◆ 2.74 Bcf of demand total
- ◆ On PGW peak day: 15.6 MMcf (LBS customers)
- ◆ BPS customers are interrupted for 33 days
- ◆ LBS customers are interrupted for 118 days

Case 4 Base, No South Jersey: Capacity Use

❖ Pipeline load factors

Pipeline	Winter	Total
Transco FT	100%	87%
TETCO FT-1	99%	81%
TETCO CDS	96%	66%

*Winter = Nov 1 - Mar 31



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	4,863
<i>Transco WSS</i>	3,233	3,187
<i>Transco ESS</i>	80	80
<i>ANR FSS</i>	1843	1,596
Market Area	13,395	13,368
<i>Transco S2</i>	452	452
<i>Transco GSS</i>	3,893	3,893
<i>Transco LGA</i>	51	41
<i>TETCO SS1A</i>	2,570	2,570
<i>TETCO SS1B</i>	2,390	2,390
<i>CNG GSST</i>	3,532	3,532
<i>Equitrans SS3</i>	506	506

Case 5 Modified Open, No South Jersey: Sources of Supply



- ❖ Purchases - Range (incl. pipeline fuel): 223-356 MMcf
- ❖ Production area storage (including ANR) is virtually identical to Case 3
 - ◆ All production area storage is used to capacity
 - ◆ Peak day withdrawal: 38 MMcf
- ❖ Market area storage
 - ◆ Most storage used to full capacity
 - ◆ LGA is eliminated
 - ◆ S2 now used at 19% of contract maximum
 - ◆ Peak day withdrawal: 153 MMcf

Case 5 Modified Open, No South Jersey: Sources of Supply (cont.)

❖ LNG

- ◆ All capacity is used
- ◆ Maximum withdrawal: 300 MMcf

❖ No propane is used

❖ Interruption

- ◆ 3.10 Bcf of demand total
- ◆ On PGW peak day: 64.1 MMcf (all BPS and LBS customers)
- ◆ BPS customers are interrupted for 42 days
- ◆ LBS customers are interrupted for 118 days

Case 5 Modified Open, No South Jersey: Capacity Use

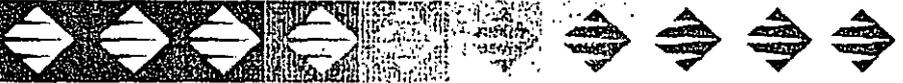


❖ Pipeline load factors are the same as Case 3

Pipeline	Winter	Total
Transco FT	100%	88%
TETCO FT-1	98%	77%
TETCO CDS	96%	67%

*Winter = Nov 1 - Mar 31

Case 5 Modified Open, No South Jersey: Capacity Use (cont.)



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	5,156
<i>Transco WSS</i>	<i>3,233</i>	<i>3,233</i>
<i>Transco ESS</i>	<i>80</i>	<i>80</i>
<i>ANR FSS</i>	<i>1,843</i>	<i>1,483</i>
Market Area	13,395	12,975
<i>Transco S2</i>	<i>452</i>	<i>84</i>
<i>Transco GSS</i>	<i>3,893</i>	<i>3,893</i>
<i>Transco LGA</i>	<i>51</i>	<i>0</i>
<i>TETCO SS1A</i>	<i>2,570</i>	<i>2,570</i>
<i>TETCO SS1B</i>	<i>2,390</i>	<i>2,390</i>
<i>CNG GSST</i>	<i>3,532</i>	<i>3,532</i>
<i>Equitrans SS3</i>	<i>506</i>	<i>506</i>

Case summary outline (Case 6 Pipeline Capacity Turn Back 10,000 Mcf/d (No South Jersey))



- ❖ Delivery capacity to PGW is reduced by 10,000 Mcf/d on TETCO CDS
- ❖ PGW does not supply gas to South Jersey
 - ◆ 25,000 Mcf/d for 10 days
 - ◆ Contract expires winter 97-98

Case 6 Pipeline Capacity Turn Back 10,000 Mcf/d (No South Jersey): Sources of Supply



- ❖ Purchases - Range (incl. pipeline fuel): 231-345 MMcf
- ❖ Production area storage (including ANR)
 - ◆ ANR and ESS are used to full capacity
 - ◆ WSS is used at 99% capacity
 - ◆ Peak day withdrawal: 40 MMcf
- ❖ Market area storage
 - ◆ Maximum storage capacity is used for all except LGA
 - ◆ Peak day withdrawal: 165 MMcf

Case 6 Pipeline Capacity Turn Back 10,000 Mcf/d (No South Jersey): Sources of Supply (cont.)



❖ LNG

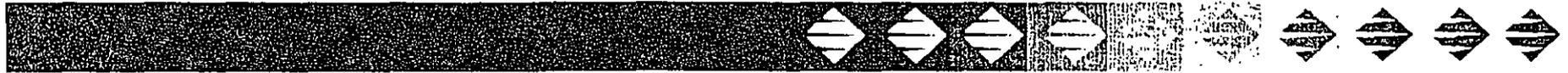
- ◆ All capacity is used
- ◆ Maximum withdrawal: 275 MMcf

❖ Propane is not used

❖ Interruption

- ◆ 4.00 Bcf of demand total
- ◆ On PGW peak day: 64.1 MMcf (all BPS and LBS customers)
- ◆ BPS customers are interrupted for 67 days
- ◆ LBS customers are interrupted for 126 days

Case 6 Pipeline Capacity Turn Back 10,000 Mcf/d (No South Jersey): Capacity Use



❖ Pipeline load factors

Pipeline	Winter	Total
Transco FT	100%	88%
TETCO FT-1	99%	79%
TETCO CDS	97%	71%

*Winter = Nov 1 - Mar 31

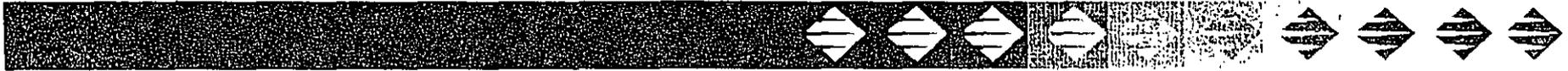
Case 6 Pipeline Capacity Turn Back 10,000 Mcf/d (No South Jersey): Capacity Use (cont.)



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	5,110
<i>Transco WSS</i>	<i>3,233</i>	<i>3,187</i>
<i>Transco ESS</i>	<i>80</i>	<i>80</i>
<i>ANR FSS</i>	<i>1,843</i>	<i>1,843</i>
Market Area	13,395	13,384
<i>Transco S2</i>	<i>452</i>	<i>452</i>
<i>Transco GSS</i>	<i>3,893</i>	<i>3,893</i>
<i>Transco LGA</i>	<i>51</i>	<i>41</i>
<i>TETCO SS1A</i>	<i>2,570</i>	<i>2,570</i>
<i>TETCO SS1B</i>	<i>2,390</i>	<i>2,390</i>
<i>CNG GSST</i>	<i>3,532</i>	<i>3,532</i>
<i>Equitrans SS3</i>	<i>506</i>	<i>506</i>

Case summary outline (Case 7 Pipeline Capacity Turn Back 20,000 Mcf/d (No South Jersey))



- ❖ Delivery capacity to PGW is reduced by 20,000 Mcf/d on TETCO CDS
- ❖ PGW does not supply gas to South Jersey
 - ◆ 25,000 Mcf/d for 10 days
 - ◆ Contract expires winter 97-98

Case 7 Pipeline Capacity Turn Back 20,000 Mcf/d (No South Jersey): Sources of Supply



- ❖ Purchases - Range (incl. pipeline fuel): 226-334 MMcf
- ❖ Production area storage (including ANR)
 - ◆ ANR and ESS are used to full capacity
 - ◆ WSS is used at 99% capacity
 - ◆ Peak day withdrawal: 39 MMcf
- ❖ Market area storage
 - ◆ Maximum storage capacity is used for all except LGA
 - ◆ Peak day withdrawal: 165 MMcf

Case 7 Pipeline Capacity Turn Back 20,000 Mcf/d (No South Jersey): Sources of Supply (cont.)

❖ LNG

- ◆ All capacity is used
- ◆ Maximum withdrawal: 283 MMcf

❖ Propane is used at maximum capacity (16 MMcf equivalent)

❖ Interruption

- ◆ 5.08 Bcf of demand total
- ◆ On PGW peak day: 64.1 MMcf (all BPS and LBS customers)
- ◆ BPS customers are interrupted for 100 days
- ◆ LBS customers are interrupted for 136 days

Case 7 Pipeline Capacity Turn Back 20,000 Mcf/d (No South Jersey): Capacity Use



❖ Pipeline load factors

Pipeline	Winter	Total
Transco FT	100%	88%
TETCO FT-1	100%	80%
TETCO CDS	98%	77%

*Winter = Nov 1 - Mar 31

Case 7 Pipeline Capacity Turn Back 20,000 Mcf/d (No South Jersey): Capacity Use (cont.)



❖ Storage Capacity Use

Storage	Contract Max.	Capacity Use
Production Area	5,156	5,110
<i>Transco WSS</i>	<i>3,233</i>	<i>3,187</i>
<i>Transco ESS</i>	<i>80</i>	<i>80</i>
<i>ANR FSS</i>	<i>1,843</i>	<i>1,843</i>
Market Area	13,395	13,384
<i>Transco S2</i>	<i>452</i>	<i>452</i>
<i>Transco GSS</i>	<i>3,893</i>	<i>3,893</i>
<i>Transco LGA</i>	<i>51</i>	<i>41</i>
<i>TETCO SS1A</i>	<i>2,570</i>	<i>2,570</i>
<i>TETCO SS1B</i>	<i>2,390</i>	<i>2,390</i>
<i>CNG GSST</i>	<i>3,532</i>	<i>3,532</i>
<i>Equitrans SS3</i>	<i>506</i>	<i>506</i>

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 PA Code 53.61, et seq.

Item 53.64(i) Utilities shall comply with the following:

- (1) Thirty days prior to the filing of a tariff reflecting increases or decreases in purchased gas expenses, gas utilities under 66 Pa.C.S. § 1307 (f) recovering expenses under that section shall file a statement for the 12-month period ending 2 months prior to the filing date under 66 Pa.C.S. § 1307(f) as published in accordance with subsection (b) which shall specify:
 - (i) The total revenues received under 66 Pa.C.S. § 1307(a), (b) or (f), including fuel revenues received, whether shown on the bill as 66 Pa.C.S. § 1307(f) as published in accordance with subsection (b) which shall specify:
 - (ii) The total gas expenses incurred.
 - (iii) The difference between the amounts in sub paragraphs (i) and (ii).
 - (iv) Evidence explaining how actual costs incurred differ from the costs allowed under subparagraph (ii).
 - (v) How these costs are consistent with a least cost fuel procurement policy, as required by 66 Pa.C.S. § 1318 (relating to determination of just and reasonable natural gas rates).

Response: Please see attached schedule. Additionally, please refer to Item 53.64(c)(6) for a detailed discussion regarding the company's least cost fuel procurement policy.

GCR
STATEMENT OF RECONCILIATION
January through December 2005

		NET COST OF FUEL 1 \$	FIRM SALES 2 (Mcf)	IRC FACTOR APPLIED 3 \$	INTERRUPT REVENUE CREDIT 4= (2 *3) \$	APPLICABLE EXPENSES 5 = (1 - 4) \$	GCR FACTOR APPLIED 6 \$	GCR REVENUE BILLED 7 \$	OVER/ (UNDER) RECOVERY 8=7-5 \$	NATURAL GAS REFUNDS 9 \$	CUMULATIVE OVER/(UNDER) RECOVERY 10 \$
PRIOR YEAR'S CARRYOVER:											(39,490,081)
JANUARY 05	Actual	87,811,049	9,207,202	0.1713	1,577,194	86,233,855	9.8857	91,187,727	4,953,872		(34,536,210)
FEBRUARY	Actual	72,019,552	9,967,593	0.1713	1,707,449	70,312,103	9.8857	98,255,350	27,943,247		(6,592,963)
MARCH	Actual	65,479,201	8,687,786	0.1690	1,468,236	64,010,965	8.9990	78,743,648	14,732,683	330,356	8,470,076
APRIL	Actual	35,037,339	5,559,491	0.1667	926,767	34,110,572	8.1122	45,170,518	11,059,946		19,530,022
MAY	Actual	15,660,373	2,715,678	0.1667	452,704	15,207,669	8.1122	22,345,257	7,137,588		26,667,610
JUNE	Actual	13,345,655	1,928,570	0.1695	326,796	13,018,859	8.5560	15,944,763	2,925,904		29,593,514
JULY	Actual	16,703,822	1,325,566	0.1722	228,262	16,475,560	8.9998	11,922,535	(4,553,025)	151,922	25,192,412
AUGUST 05	Actual	<u>15,271,548</u>	<u>1,253,067</u>	0.1722	<u>215,778</u>	<u>15,055,770</u>	8.9998	<u>11,223,405</u>	<u>(3,832,365)</u>	<u>8,658</u>	<u>21,368,705</u>
SUBTOTAL JAN. TO AUG. 05		321,328,539	40,644,953		6,903,186	314,425,353		374,793,203	60,367,850	490,936	21,368,705
2004-2005 FINALIZED OVERCOLLECTION											21,368,705
2004-2005 INTEREST CREDIT ON COMMODITY											(121,542)
TOTAL "E" FACTOR											21,490,247
SEPTEMBER 05	Actual	19,154,304	1,324,674	0.1839	243,608	18,910,696	9.3527	12,315,821	(6,594,875)	51,344	14,946,715
OCTOBER	Actual	38,947,392	1,464,380	0.1957	286,579	38,660,813	10.6274	15,702,656	(22,958,157)		(8,011,442)
NOVEMBER	Actual	62,043,581	3,381,901	0.1960	662,853	61,380,728	12.5632	42,217,575	(19,163,153)	16	(27,174,579)
DECEMBER 05	Actual	<u>118,432,317</u>	<u>7,388,559</u>	0.1960	<u>1,448,158</u>	<u>116,984,159</u>	12.5632	<u>92,795,057</u>	<u>(24,189,102)</u>		<u>(51,363,681)</u>
SUBTOTAL SEPT. TO DEC. 05		238,577,594	13,559,514		2,641,197	235,936,397		163,031,109	(72,905,288)	51,360	(51,363,681)
TOTAL 2005		559,906,133	54,204,467		9,544,383	550,361,750		537,824,312	(12,537,438)	542,296	(51,363,681)

Docket No. R-06XXX

Item 53.65 (1)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.65 (1)

The costs of the affiliated gas, transportation or storage as compared to the average market price of other gas, transportation or storage and the price of other sources of gas, transportation and storage.

Response:

PGW has no affiliates, see response to 53.64(c)(1) for price of gas, transportation and storage.

Docket No. R-06XXX

Item 53.65 (2)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.65 (2)

Estimates of the quantity of gas, transportation or storage available to the utility from all sources.

Response:

PGW has no affiliates and provided is a summary of all transport, storage and LNG capacity.

Philadelphia Gas Works
Gas Supply Group – Supply and Transportation
Abstract of Natural Gas Contracts

This document contains confidential information for the use of the Gas Operations personnel only. It is important to note that this is a brief summary of the terms and conditions of our contracts. The pipeline tariffs and contract files should be referenced for complete information.

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PHILA.GAS WORKS

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PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract # 10
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract # 1003691
Contract Term:	2 Years
Initial Contract Date:	04/02005
Contract Expiration Date:	03/31/2007
Quality of Service:	Firm
Daily Maximum:	20,000 DT per Day
Availability:	Year Round
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	None
Nomination & Scheduling:	24 hour notice business day. Next day nomination change. Nominations subject to Transco rules. No limit to amount of changes within the month.
Other Terms & Conditions:	Pricing for each month defaults to an index.
Most Recent Negotiation:	Contract expires March 31, 2007.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract # 2
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract # 1003691
Contract Term:	1 Year
Initial Contract Date:	04/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	15,000 DT per Day
Availability:	Year Round
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	None
Nomination & Scheduling:	24 hour notice business day. Next day nomination change. Nominations subject to Transco rules. No limit to amount of changes within the month.
Other Terms & Conditions:	Pricing for each month defaults to an index.
Most Recent Negotiation:	Contract expires March 31, 2006.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract # 7
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract # 1003691
Contract Term:	2 Years
Initial Contract Date:	04/01/2005
Contract Expiration Date:	03/31/2007
Quality of Service:	Firm
Daily Maximum:	25,000 DT per Day
Availability:	Year Round
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	None
Nomination & Scheduling:	24 hour notice business day. Next day nomination change. Nominations subject to Transco rules. No limit to amount of changes within the month.
Other Terms & Conditions:	Pricing for each month defaults to an index.
Most Recent Negotiation:	Contract expires March 31, 2007.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #17
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract # 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/05
Contract Expiration Date:	3/31/06
Quality of Service:	Firm
Daily Maximum:	10,000 DT Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	10,000 DT Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #8
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract # 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	10,000 DT per Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #8
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	10,000 DT per Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #14
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	10,000 DT per Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #10
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	5,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	5,000 DT per Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #10
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	5,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	5,000 DT per Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #12
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	10,000 DT per Day.
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #15
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	20,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	20,000 DT per Day
Nomination & Scheduling:	Firm must take contract. Nominations subject to Transco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Transco Gas Supply Contract #8
Delivery Pipeline & Contract #:	Transco
Associated Transportation Contract:	Transco FT Contract 1003691
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	20,000 DT per Day Nov.-Mar.
Availability:	Take or Release prior to each month
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	None.
Nomination & Scheduling:	Take or Release option must exercised by the fifth business day prior to first of month of the gas flow.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract expires March 31, 2006.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #1
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	10 Years
Initial Contract Date:	10/31/1993
Contract Expiration Date:	10/31/2006
Quality of Service:	Firm
Daily Maximum:	40,000 DT plus fuel per Day Nov.- Mar. 15,000 DT plus fuel per Day Apr.- Oct.
Availability:	Year Round
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	None
Nomination & Scheduling:	Next day nomination change. Nominations subject to Tetco rules. No limit to amount of changes within the month.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Under original terms of contract supplier opened negotiations and contract was extended.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #14
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum: .	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	10,000 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #15
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	8,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	8,000 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #7
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	20,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	20,000 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #7
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	8,500 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	8,500 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #13
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	25,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	25,000 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #2
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	10,000 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #2
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	10,000 DT per Day
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract is active.

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #1
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	Take or release notification must be given 24 hours before the Nymex settlement date.
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract ends 03/31/2006.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
GAS SUPPLY CONTRACT

Name & Type of Service:	Tetco Gas Supply Contract #13
Delivery Pipeline & Contract #:	Tetco
Associated Transportation Contract:	Tetco FT and CDS
Contract Term:	Winter Supply
Initial Contract Date:	11/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	10,000 DT per Day Nov.-Mar.
Availability:	Winter Supply Contract
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	Take or Release option must exercised by the fifth business day prior to first of month of the gas flow.
Nomination & Scheduling:	Nominations subject to Tetco rules.
Other Terms & Conditions:	Pricing for each month can be negotiated or default to an index.
Most Recent Negotiation:	Contract ends 03/31/2006.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Transportation Contract

Name & Type of Service:	Transco FT
Delivery Pipeline & Contract #:	Transco FT 1003691
Associated Transportation Contract:	Transco Supply Contracts, WSS, ES, and Spot Supply contracts.
Contract Term:	13 Years
Initial Contract Date:	02/01/1992
Contract Expiration Date:	03/31/2005
Quality of Service:	Firm
Daily Maximum:	165,212 DT
Availability:	Year Round
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	N/A
Most Recent Negotiation:	Contract is now in the evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Transportation Contract

Name & Type of Service:	Transco Peaking Service FT
Delivery Pipeline & Contract #:	Transco FT 1005001
Associated Transportation Contract:	Transco Supply Contracts, WSS, ES, and Spot Supply contracts.
Contract Term:	13 Years
Initial Contract Date:	02/01/1992
Contract Expiration Date:	03/31/2011
Quality of Service:	Firm
Daily Maximum:	1,967 DT
Availability:	Winter Peaking Dec-Feb
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	N/A
Most Recent Negotiation:	Contract is now in the evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Interruptible Transportation Contract

Name & Type of Service:	Transco Interruptible Transportation
Delivery Pipeline & Contract #:	Transco IT 1002427
Associated Transportation Contract:	Transco Supply Contracts, WSS, ES, and Spot Supply contracts.
Contract Term:	13 Years
Initial Contract Date:	02/01/1992
Contract Expiration Date:	03/31/2005
Quality of Service:	Firm
Daily Maximum:	See Transco Tariff
Availability:	See Transco Tariff
Fuel (%):	Subject to Transco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	N/A
Most Recent Negotiation:	Contract is now in the evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Comprehensive Delivery Service

Name & Type of Service:	Tetco CDS FT
Delivery Pipeline & Contract #:	Tetco #800232
Associated Transportation Contract:	Tetco Supply Contracts, Spot Supply contracts.
Contract Term:	2.8 Years
Initial Contract Date:	12/15/1998
Contract Expiration Date:	10/31/2001
Quality of Service:	Firm
Daily Maximum:	75,000 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	Contract is now in the evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Firm Transportation

Name & Type of Service:	Tetco FT 1
Delivery Pipeline & Contract #:	Tetco #800233
Associated Transportation Contract:	Tetco Supply Contracts, Spot Supply contracts.
Contract Term:	2.8 Years
Initial Contract Date:	12/15/1998
Contract Expiration Date:	10/31/2001
Quality of Service:	Firm
Daily Maximum:	23,822 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	Contract is now in the evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Firm Transportation

Name & Type of Service:	Tetco FT 1
Delivery Pipeline & Contract #:	Tetco #800514
Associated Transportation Contract:	Tetco Supply Contracts & Spot Supply contracts.
Contract Term:	7.8 Years
Initial Contract Date:	12/15/1998
Contract Expiration Date:	10/31/2006
Quality of Service:	Firm
Daily Maximum:	18,000 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	N/A

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Firm Transportation

Name & Type of Service:	Tetco FT 1
Delivery Pipeline & Contract #:	Tetco #800515
Associated Transportation Contract:	Tetco Supply Contracts & Spot Supply contracts.
Contract Term:	4.8 Years
Initial Contract Date:	12/15/1998
Contract Expiration Date:	10/31/2005
Quality of Service:	Firm
Daily Maximum:	18,000 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	Contract in Evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Firm Transportation

Name & Type of Service:	Tetco FTS 2
Delivery Pipeline & Contract #:	Tetco #300791
Associated Contract:	Equitrans SS3.
Contract Term:	8.75 Years
Initial Contract Date:	06/01/1993
Contract Expiration Date:	03/31/2002
Quality of Service:	Firm
Daily Maximum:	5,394 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	Contract in Evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION

Firm Transportation

Name & Type of Service:	Tetco FTS 7
Delivery Pipeline & Contract #:	Tetco #331725
Associated Contract:	Dominion GSS
Contract Term:	10 Years
Initial Contract Date:	08/07/1996
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	7,788 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	N/A

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Firm Transportation

Name & Type of Service:	Tetco FTS 8
Delivery Pipeline & Contract #:	Tetco #331822
Associated Contract:	Dominion GSS
Contract Term:	10 Years
Initial Contract Date:	08/07/1996
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm
Daily Maximum:	25,709 DT per Day
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	N/A

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Interruptible Transportation

Name & Type of Service:	Tetco IT
Delivery Pipeline & Contract #:	Tetco #710468
Associated Contract:	Supply Contracts, Spot Supply
Contract Term:	1 Year
Initial Contract Date:	04/01/1993
Contract Expiration Date:	03/31/1994
Quality of Service:	Interruptible
Daily Maximum:	See Tetco Tariff
Availability:	See Tetco Tariff
Fuel (%):	Subject to Tetco fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Tetco Tariff
Most Recent Negotiation:	Contract in Evergreen status.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Storage Transportation Service

Name & Type of Service:	Equitrans STS 1
Delivery Pipeline & Contract #:	Equitrans SS 62
Associated Contract:	Equitrans SS 3
Contract Term:	8.6 Years
Initial Contract Date:	09/01/1993
Contract Expiration Date:	03/31/2002
Quality of Service:	Firm
Daily Maximum:	2,612 DT per Day Summer 4,998 DT per Day Winter
Availability:	See Equitrans Tariff
Fuel (%):	Subject to Equitrans fuel rates
Minimum Take Level:	N/A
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	See Equitrans Tariff
Most Recent Negotiation:	Contract is in Evergreen status

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service:	Dominion GSS Storage Service
Delivery Pipeline & Contract #:	Tetco
Associated Contract:	Tetco FTS 7 Contract#331725 Tetco FTS 8 Contract#331822
Contract Term:	13 Years
Initial Contract Date:	09/30/1993
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm (Unbundled)
Daily Maximum Withdrawal:	34,047 DT <u>Inventory % W/D Rate</u>
	>35% 34,047
	<35% 31,322
	<16% 23,833
	<10% 21,450
Availability (Withdrawal/Injection):	Year round
Daily Maximum Injection:	21,772 DT
Maximum Storage Quantity:	3,918,971 DT
Fuel (%):	2.56 % injection
Nomination & Scheduling:	GISB Standards. Within day nomination changes maybe accomplished as long as both Tetco and Dominion parties are notified and can confirm.
Other Terms & Conditions:	None

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service:	Equitrans SS3
Delivery Pipeline & Contract #:	Equitrans STS 1 & Tetco
Associated Contract:	Tetco FTS 2 #300791
Contract Term:	9 Years
Initial Contract Date:	09/01/1993
Contract Expiration Date:	04/01/2002
Quality of Service:	Firm (Unbundled)
Daily Maximum Withdrawal:	4,998 DT 100%>=17% 4,544 DT 17%>=0%
Availability (Withdrawal/Injection):	Injection period Apr1 through Oct 31. Withdrawal period Nov 1 through Mar.31
Daily Maximum Injection:	2,610 DT
Maximum Storage Quantity:	522,500 DT
Fuel (%):	Injection fuel only subject to Equitrans Tariff.
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	Contract is now in the evergreen state.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service:	SS1
Delivery Pipeline & Contract #:	Tetco Contract #400121
Associated Contract:	None
Contract Term:	19 Years
Initial Contract Date:	06/01/1993
Contract Expiration Date:	04/30/2012
Quality of Service:	Firm (Bundled)
Daily Maximum Withdrawal:	44,118 DT <u>Inventory % W/D Rate</u>
	100%>20% 44,118
	<20%>=10% 36,764
	<10%>= 0% 29,413
Availability (Withdrawal/Injection):	Year round
Daily Maximum Injection:	13,606 DT
Maximum Storage Quantity:	2,647,080 DT
Fuel (%) Injection & Withdrawal:	Subject to Tetco Tariff Revisions
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	Storage is a No Notice Service

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service: SS1

Delivery Pipeline & Contract #: Tetco Contract #400209

Associated Contract: None

Contract Term: 19 Years

Initial Contract Date: 06/01/1993

Contract Expiration Date: 04/30/2012

Quality of Service: Firm (Bundled)

Daily Maximum Withdrawal: 20,847 DT Inventory % W/D Rate
100%>20% 20,847
<20%>=10% 17,372
<10%>= 0% 13,899

Availability (Withdrawal/Injection): Year round

Daily Maximum Injection: 13,606 DT

Maximum Storage Quantity: 2,647,080 DT

Fuel (%) Injection & Withdrawal: Subject to Tetco Tariff Revisions

Nomination & Scheduling: GISB Standards.

Other Terms & Conditions: Storage is a No Notice Service

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service: GSS

Delivery Pipeline & Contract #: Transco Contract #1000791

Associated Contract: None

Contract Term: 20 Years

Initial Contract Date: 10/01/1993

Contract Expiration Date: 03/31/2013

Quality of Service: Firm (Bundled)

Daily Maximum Withdrawal: 61,567 DT

<u>Inventory % W/D Rate</u>	
100%>35%	61,567
35%>=20%	60,951
20%>= 7%	45,560
7%>=0%	33,862

Availability (Withdrawal/Injection): Year round

Daily Maximum Injection: 22,910 DT

Maximum Storage Quantity: 4,123,733 DT

Fuel (%) Injection : Subject to Transco Tariff Revisions

Nomination & Scheduling: GISB Standards.

Other Terms & Conditions: Storage is a No Notice Service

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service: S 2

Delivery Pipeline & Contract #: Transco Contract #1000943

Associated Contract: None

Contract Term: 5 Years

Initial Contract Date: 04/16/1996

Contract Expiration Date: 04/15/2001

Quality of Service: Firm (Bundled)

Daily Maximum Withdrawal: 5,193 DT Inventory % W/D Rate
100%>20% 5,193
20%>=10% 4,238
10%>= 0% 3,482

Availability (Withdrawal/Injection): Injection from April 16 to Nov 15
Withdrawal from Nov 16 to April 15

Daily Maximum Injection: 3,900 DT

Maximum Storage Quantity: 466,554 DT

Fuel (%) Injection & Withdrawal: Subject to Transco Tariff Revisions

Nomination & Scheduling: GISB Standards.

Other Terms & Conditions: Contract is now in the evergreen state. Storage is a No Notice Service.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service:	WSS
Delivery Pipeline & Contract #:	Transco Contract #1038582
Associated Contract:	Transco 1003691 & 1005001
Contract Term:	1 Years
Initial Contract Date:	04/01/2005
Contract Expiration Date:	03/31/2006
Quality of Service:	Firm (Unbundled)
Daily Maximum Withdrawal:	39,246 DT <u>Inventory % W/D Rate</u>
	100%>80% 39,246
	80%>=60% 35,115
	60%>= 40% 31,771
	40%>=20% 26,687
	20%>=0 % 21,522
Availability (Withdrawal/Injection):	Year Round
Daily Maximum Injection:	18,533 DT
Maximum Storage Quantity:	3,335,909 DT
Fuel (%) Injection :	Subject to Transco Tariff Revisions
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	Storage converted to Part 284G this year.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service:	ES
Delivery Pipeline & Contract #:	Transco Contract #1010416
Associated Contract:	Transco 1003691 & 1005001
Contract Term:	Contract Pending
Initial Contract Date:	N/A
Contract Expiration Date:	N/A
Quality of Service:	Firm (Unbundled)
Daily Maximum Withdrawal:	47,986 DT non-ratcheted
Availability (Withdrawal/Injection):	Year Round
Daily Maximum Injection:	3,198 DT
Maximum Storage Quantity:	482,792 DT
Fuel (%) Injection :	Subject to Transco Tariff Revisions
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	Storage given to PGW as Transco contract 1003409 terminated.

PHILA.GAS WORKS

PGW NATURAL GAS CONTRACT INFORMATION
Underground Storage Contract

Name & Type of Service:	ES
Delivery Pipeline & Contract #:	Transco Contract #1039085
Associated Contract:	Transco 1003691 & 1005001
Contract Term:	June 1, 2001 through March 31, 2005
Initial Contract Date:	06/01/2001
Contract Expiration Date:	03/31/2005
Quality of Service:	Firm (Unbundled)
Daily Maximum Withdrawal:	65,201 DT non-ratcheted
Availability (Withdrawal/Injection):	Year Round
Daily Maximum Injection:	4,346 DT
Maximum Storage Quantity:	656,013 DT
Fuel (%) Injection :	Subject to Transco Tariff Revisions
Nomination & Scheduling:	GISB Standards.
Other Terms & Conditions:	Storage purchased by PGW to aid in security of supply. Contract is now in the evergreen state.

Docket No. R-06XXX

Item 53.65 (3)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.65 (3)

Efforts made by the utility to obtain gas, transportation or storage from nonaffiliated interests.

Response:

PGW has no affiliates, therefore, all gas purchases were made from non-affiliated interests. Also see the response to 53.64(c)(6) outlining PGW's current least cost fuel procurement practices.

Docket No. R-06XXX

Item 53.65 (4)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.65 (4)

The specific reasons why the utility has purchased gas, transportation or storage from an affiliated interest and demonstration that the purchases are consistent with a least cost fuel procurement policy.

Response:

PGW has no affiliates, therefore, all gas purchases were made from non-affiliated interests. Also see the response to 53.64(c)(6) outlining PGW's current least cost fuel procurement practices.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 53.65 (5) The sources and amounts of gas, transportation or storage, which have been withheld from the market by the utility or, affiliated interest and the reasons why the gas, transportation or storage has been withheld?

Response: PGW has no affiliates.

PGW operates two LNG Peak shaving facilities with a total usable storage capacity of 3.9 Bcf, 18.17 percent of PGW's total storage capacity. When pipeline and underground storage deliveries are insufficient to meet sendout requirements, LNG storage withdrawals will be considered. These LNG storage withdrawals are based upon incremental costs, weather forecasts, inventory balances, distribution system requirements, and other variables such as plant maintenance and operating requirements all of which can influence the vaporization and liquefaction rates of PGW's LNG facilities.

PGW used a total of 2,108,277 Mcf (53.73% of usable LNG Inventory) to meet city sendout requirements during fiscal year 2005.

Docket No. R-06XXX

Item 1317 (a)(1)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (a)(1)

General rule.--In every rate proceeding instituted by a natural gas distribution utility, pursuant to section 1307(f) (relating to sliding scale of rates; adjustments), each such utility shall be required to supply to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, information, data and statements regarding:

(1) The utility's participation in rate proceedings before the Federal Energy Regulatory Commission which affect the utility's gas costs.

Response:

Please refer to Item 53.64(c)(4) contained in this filing.

Docket No. R-06XXX

Item 1317 (a)(2)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (a)(2)

General rule.--In every rate proceeding instituted by a natural gas distribution utility, pursuant to section 1307(f) (relating to sliding scale of rates; adjustments), each such utility shall be required to supply to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, information, data and statements regarding:

(2) The utility's efforts to negotiate favorable contracts with gas suppliers and to renegotiate existing contracts with gas suppliers or take legal actions necessary to relieve the utility from existing contract terms which are or may be adverse to the interests of the utility's ratepayers.

Response:

Please refer to Item 53.64(c)(1) contained in this filing.

Docket No. R-06XXX

Item 1317 (a)(3)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (a)(3)

General rule.--In every rate proceeding instituted by a natural gas distribution utility, pursuant to section 1307(f) (relating to sliding scale of rates; adjustments), each such utility shall be required to supply to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, information, data and statements regarding:

(3) The utility's efforts to secure lower cost gas supplies both within and outside of the Commonwealth, including the use of transportation arrangements with pipelines and other gas distribution companies.

Response:

Please refer to Item 53.64(c)(1) contained in this filing.

Docket No. R-06XXX

Item 1317 (a)(4)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (a)(4)

General rule.--In every rate proceeding instituted by a natural gas distribution utility, pursuant to section 1307(f) (relating to sliding scale of rates; adjustments), each such utility shall be required to supply to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, information, data and statements regarding:

(4) The sources and amounts of all gas supplies which have been withheld or have been caused to be withheld from the market by the utility and the reasons why such gas is not to be utilized.

Response:

Please refer to Item 53.65 (5) contained in this filing.

Docket No. R-06XXX

Item 1317 (b)(1)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (b)(1)

Integrated gas companies.--In the case of a natural gas distribution utility which purchases all or part of its gas supplies from an affiliated interest, as that term is defined in section 2101 (relating to definition of affiliated interest), such utility shall, in addition to the materials required in subsection (a), be required to provide to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether any purchases of gas from an affiliated interest are consistent with a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, statements regarding:

(1) Efforts made by the utility to obtain gas supplies from nonaffiliated interests.

Response:

Please refer to Item 53.65 (3) contained in this filing.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (b)(2)

Integrated gas companies.--In the case of a natural gas distribution utility which purchases all or part of its gas supplies from an affiliated interest, as that term is defined in section 2101 (relating to definition of affiliated interest), such utility shall, in addition to the materials required in subsection (a), be required to provide to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether any purchases of gas from an affiliated interest are consistent with a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, statements regarding:

(2) The specific reasons why the utility has purchased gas supplies from an affiliated interest and demonstration that such purchases are consistent with a least cost fuel procurement policy.

Response:

Please refer to Item 53.65 (4) contained in this filing.

Docket No. R-06XXX

Item 1317 (b)(3)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (b)(3)

Integrated gas companies.--In the case of a natural gas distribution utility which purchases all or part of its gas supplies from an affiliated interest, as that term is defined in section 2101 (relating to definition of affiliated interest), such utility shall, in addition to the materials required in subsection (a), be required to provide to the commission such information, to be established by commission regulation within 120 days of the passage of this section, that will permit the commission to make specific findings as to whether any purchases of gas from an affiliated interest are consistent with a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. Such information shall include, but need not be limited to, statements regarding:

(3) The sources and amounts of all gas supplies which have been withheld from the market by the utility or any affiliated interest and the reasons why such gas is not being utilized.

Response:

Please refer to Item 53.65 (5) contained in this filing.

Docket No. R-06XXX

Item 1317 (c)(1)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (c)(1)

Reliability plans.--As part of its filing under section 1307(f) or if it is not required to make such a filing on an annual basis, a natural gas distribution company, as defined in section 2202 (relating to definitions), shall file a proposed reliability plan with the commission which shall, at a minimum, identify the following:

(1) The projected peak day and seasonal requirements of the firm customers utilizing the distribution system of the natural gas distribution company during the 12-month projected period specified in section 1307(f)(1). Where operationally required, the design peak day requirements shall be specified for discrete segments of each natural gas distribution system.

Response:

Please refer to Item 53.64(c)(13) contained in this filing.

Docket No. R-06XXX

Item 1317 (c)(2)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (c)(2)

Reliability plans.--As part of its filing under section 1307(f) or if it is not required to make such a filing on an annual basis, a natural gas distribution company, as defined in section 2202 (relating to definitions), shall file a proposed reliability plan with the commission which shall, at a minimum, identify the following:

(2) The transportation capacity, storage, peaking or on-system production that ensures deliverability of the natural gas supplies necessary to meet such projected period peak day and seasonal requirements.

Response:

PGW does not maintain a specific document entitled a Reliability Plan, however, all of the components that would be contained in such a document are prepared by PGW and are contained in this filing in Items 53.64 (c)(1), 53.64 (c)(3), 53.64 (c)(5), 53.64 (c)(6), 53.64 (c)(10), 53.64 (c)(12), 53.64 (c)(13), 53.64 (c)(14), 53.65 (2) and 53.65 (5).

Docket No. R-06XXX

Item 1317 (d)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1317 (d)

Supply plans.--As part of its filing under section 1307(f), a natural gas distribution company shall file a proposed plan with the commission for acquisition or receipt of natural gas supplies.

Response:

Please refer to Item 53.64(c)(1) and 53.65 (2) contained in this filing.

Docket No. R-06XXX

Item 1318 (a)(1)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (a)(1)

General rule.--In establishing just and reasonable rates for those natural gas distribution companies, as defined in section 2202 (relating to definitions), with gross intrastate operating revenues in excess of \$40,000,000 under section 1307(f) (relating to sliding scale of rates; adjustments) or 1308(d) (relating to voluntary changes in rates) or any other rate proceeding, the commission shall consider the materials provided by the utilities pursuant to section 1317 (relating to regulation of natural gas costs). No rates for a natural gas distribution utility shall be deemed just and reasonable unless the commission finds that the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. In making such a determination, the commission shall be required to make specific findings which shall include, but need not be limited to, findings that:

(1) The utility has fully and vigorously represented the interests of its ratepayers in proceedings before the Federal Energy Regulatory Commission.

Response:

Please refer to Item 53.64(c)(4) contained in this filing.

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (a)(2)

General rule.--In establishing just and reasonable rates for those natural gas distribution companies, as defined in section 2202 (relating to definitions), with gross intrastate operating revenues in excess of \$40,000,000 under section 1307(f) (relating to sliding scale of rates; adjustments) or 1308(d) (relating to voluntary changes in rates) or any other rate proceeding, the commission shall consider the materials provided by the utilities pursuant to section 1317 (relating to regulation of natural gas costs). No rates for a natural gas distribution utility shall be deemed just and reasonable unless the commission finds that the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. In making such a determination, the commission shall be required to make specific findings which shall include, but need not be limited to, findings that:

(2) The utility has taken all prudent steps necessary to negotiate favorable gas supply contracts and to relieve the utility from terms in existing contracts with its gas suppliers which are or may be adverse to the interests of the utility's ratepayers.

Response:

Please refer to Item 53.64(c)(1) contained in this filing.

Docket No. R-06XXX

Item 1318 (a)(3)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (a)(3)

General rule.--In establishing just and reasonable rates for those natural gas distribution companies, as defined in section 2202 (relating to definitions), with gross intrastate operating revenues in excess of \$40,000,000 under section 1307(f) (relating to sliding scale of rates; adjustments) or 1308(d) (relating to voluntary changes in rates) or any other rate proceeding, the commission shall consider the materials provided by the utilities pursuant to section 1317 (relating to regulation of natural gas costs). No rates for a natural gas distribution utility shall be deemed just and reasonable unless the commission finds that the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. In making such a determination, the commission shall be required to make specific findings which shall include, but need not be limited to, findings that:

(3) The utility has taken all prudent steps necessary to obtain lower cost gas supplies on both short-term and long-term bases both within and outside the Commonwealth, including the use of gas transportation arrangements with pipelines and other distribution companies.

Response:

Please refer to Item 53.64(c)(1) contained in this filing.

Docket No. R-06XXX

Item 1318 (a)(4)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (a)(4)

General rule.--In establishing just and reasonable rates for those natural gas distribution companies, as defined in section 2202 (relating to definitions), with gross intrastate operating revenues in excess of \$40,000,000 under section 1307(f) (relating to sliding scale of rates; adjustments) or 1308(d) (relating to voluntary changes in rates) or any other rate proceeding, the commission shall consider the materials provided by the utilities pursuant to section 1317 (relating to regulation of natural gas costs). No rates for a natural gas distribution utility shall be deemed just and reasonable unless the commission finds that the utility is pursuing a least cost fuel procurement policy, consistent with the utility's obligation to provide safe, adequate and reliable service to its customers. In making such a determination, the commission shall be required to make specific findings which shall include, but need not be limited to, findings that:

(4) The utility has not withheld from the market or caused to be withheld from the market any gas supplies which should have been utilized as part of a least cost fuel procurement policy.

Response:

Please refer to Item 53.65 (5) contained in this filing.

Docket No. R-06XXX

Item 1318 (b)(1)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (b)(1)

Limitation on gas purchased from affiliates.--In any instance in which a natural gas distribution company purchases all or part of its gas supplies from an affiliated interest, as that term is defined in section 2101 (relating to definition of affiliated interest), the commission, in addition to the determinations and findings set forth in subsection (a), shall be required to make specific findings with regard to the justness and reasonableness of all such purchases. Such findings shall include, but not be limited to findings:

(1) That the utility has fully and vigorously attempted to obtain less costly gas supplies on both short-term and long-term bases from nonaffiliated interests.

Response:

Please refer to Item 53.65 (3) contained in this filing.

Docket No. R-06XXX

Item 1318 (b)(2)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (b)(2)

Limitation on gas purchased from affiliates.--In any instance in which a natural gas distribution company purchases all or part of its gas supplies from an affiliated interest, as that term is defined in section 2101 (relating to definition of affiliated interest), the commission, in addition to the determinations and findings set forth in subsection (a), shall be required to make specific findings with regard to the justness and reasonableness of all such purchases. Such findings shall include, but not be limited to findings:

(2) That each contract for the purchase of gas from its affiliated interest is consistent with a least cost fuel procurement policy.

Response:

Please refer to Item 53.65 (4) contained in this filing.

Docket No. R-06XXX

Item 1318 (b)(3)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (b)(3)

Limitation on gas purchased from affiliates.--In any instance in which a natural gas distribution company purchases all or part of its gas supplies from an affiliated interest, as that term is defined in section 2101 (relating to definition of affiliated interest), the commission, in addition to the determinations and findings set forth in subsection (a), shall be required to make specific findings with regard to the justness and reasonableness of all such purchases. Such findings shall include, but not be limited to findings:

(3) That neither the utility nor its affiliated interest has withheld from the market any gas supplies which should have been utilized as part of a least cost fuel procurement policy.

Response:

Please refer to Item 53.65 (5) contained in this filing.

Docket No. R-06XXX

Item 1318 (c)

Philadelphia Gas Works

Pennsylvania Public Utility Commission
52 Pa. Code §53.61, et seq.

Item 1318 (c)

Shut-in gas; special rule.--In determining whether a gas utility has purchased the least costly natural gas available, the commission shall consider as available to the utility any gas supplies that reasonably could have been brought to market during the relevant period but which were voluntarily withheld from the market by the utility or an affiliated interest of the utility.

Response:

Please refer to Item 53.65 (5) contained in this filing.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the participants listed below in accordance with the requirements of § 1.54 (relating to service by a participant).

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Date: January 31, 2006

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