THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

D.T.E. 05-27

DIRECT TESTIMONY
OF
JAMES L. HARRISON

MARGINAL COST STUDY

IN SUPPORT OF
BAY STATE GAS COMPANY'S
REQUEST FOR AN INCREASE IN BASE REVENUES
AND OTHER RATE MODIFICATIONS

EXH. BSG/JLH-3

APRIL 27, 2005

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I. INTRODUCTION

Q. Please state your name, address and position.

A. My name is James L. Harrison. I am a management consultant and Vice President with the firm of Management Applications Consulting, Inc., 1103 Rocky Drive, Suite 201, Reading, PA 19609.

Q. Please state your qualifications.

A. My qualifications are provided in Schedule JLH-1-1.

II. SCOPE OF TESTIMONY

Q. What is your responsibility in connection with this proceeding?

A. I am responsible for developing the accounting cost of service and marginal cost studies and the proposed revisions for the Cost of Gas Adjustment Clause used by Bay State Gas Company ("Bay State" or the "Company") in rate design in this filing.

Q. Please outline the organization of your testimony and schedules.

A. My testimony is organized into three Exhibits, this being the third exhibit. In this exhibit, I present the results of my Marginal Cost Study and summarize the cost data I generated for Mr. Ferro's use in rate design.

Schedules JLH-3-1 though 3-13 show the results of the marginal cost analysis. Schedule JLH-3-14 summarizes the information employed in the rate design process by Mr. Ferro.

In addition to this exhibit, Exhibit BSG/JLH-1 describes the allocation of gas costs using the Simplified Market Based Allocation Method ("SMBA") and the proposed revisions to the Cost of Gas Adjustment Clause ("CGAC"). In Exhibit BSG/JLH-2, I present the results of my Accounting Class Cost of Service Study ("COSS").

Since the marginal cost study is closely related to my other studies, I have identified the schedules included with each piece of testimony in the List of Schedules to serve as a ready reference.

III. MARGINAL COST OF SERVICE STUDY

Overview of Marginal Cost Study

Q. Please summarize the objectives of a marginal cost study.

A. A marginal cost study provides estimates of the cost of providing an additional unit of service. These estimates are utilized as a threshold in establishing pricing levels to the extent allowed by considerations such as rate continuity and intra-class equity. As the Department has previously determined, the use of marginal costs in rate making will result in a level and pattern of prices that promote

appropriate consumption decisions and an efficient allocation of society's resources. Efficiency is promoted by sending consumers accurate price signals regarding the costs resulting from their consumption decisions. Customers, in turn, will be able to make more informed decisions on their use of utility services.

Q. Please summarize the different elements of a marginal cost study.

A. A typical marginal cost estimate contains several components. The marginal commodity cost component is intended to reflect the short-run variable cost of varying the Company's level of gas sendout by one unit, assuming the Company's production capacity is held constant. The marginal production capacity cost component is intended to reflect the long-run cost, on a unitized basis, of expanding the Company's production facilities to meet an increase in customers' requirements for gas service. The marginal distribution component is intended to reflect the unitized cost, based on historical data and recent trends, of expanding the local distribution network to accommodate growth in customers' requirements.

Q. Would you please summarize the methodology you employed?

A. I have computed the marginal costs to serve each of Bay State's rate classes based on rate year costs. My methodology is relatively straightforward. For commodity cost estimation, I used the futures cost of gas (NYMEX) and adjusted these for the cost basis at Bay State's city gates to determine the daily costs of serving a small increment of customer load. I employed the peaker method to estimate production capacity costs. I have used regression and engineering techniques to

estimate the hypothetical distribution costs of serving an increment of customer load, including the unit costs of adding distribution plant facilities as well as the additional costs for operations and maintenance. I have used engineering estimates to identify the investment in services and meters and added O&M expenses necessary to serve a new customer. Finally, I have developed from these factors the annual revenue requirements to serve each of Bay State's rate classes. These revenue requirements are stated in terms of customer, commodity and demand charges.

Q. What time periods did you select for the evaluation of marginal costs?

A. I used three different time periods in my marginal cost study:

(1) The design day,
(2) The six winter months of November to April, and
(3) The six summer months of May to October.

The design day was the period used to measure capacity costs and represents the load on the coldest day for which the Company plans to provide reliable service. My discussions with Company planners indicate that the design day is the primary planning criterion for decisions concerning sizing of production and distribution capacity costs. The design day is not to be confused with the peak day, the day each year in which observed customer load requirements are greatest. The design day is an extremely rare occurrence representing the coldest day that can be expected in 25 years. Consequently, the design day does not occur regularly and is instead more of a theoretical concept. Based on the weather sensitive nature of

customer loads, Bay State estimates and plans for the magnitude of sendout which would be required under the extreme conditions hypothesized for the design day.

The summer season was chosen to represent the period of the year when temperatures and gas sales and sendouts are more moderate. The winter season represents the most critical months when weather conditions are more severe and utility loads increase. The seasons chosen also coincide with the seasons employed in the Company's current sales and transportation tariffs as well as the Cost of Gas Adjustment Clause. The winter season is defined as the months of November through April.

Q. How have you organized your marginal cost schedules?

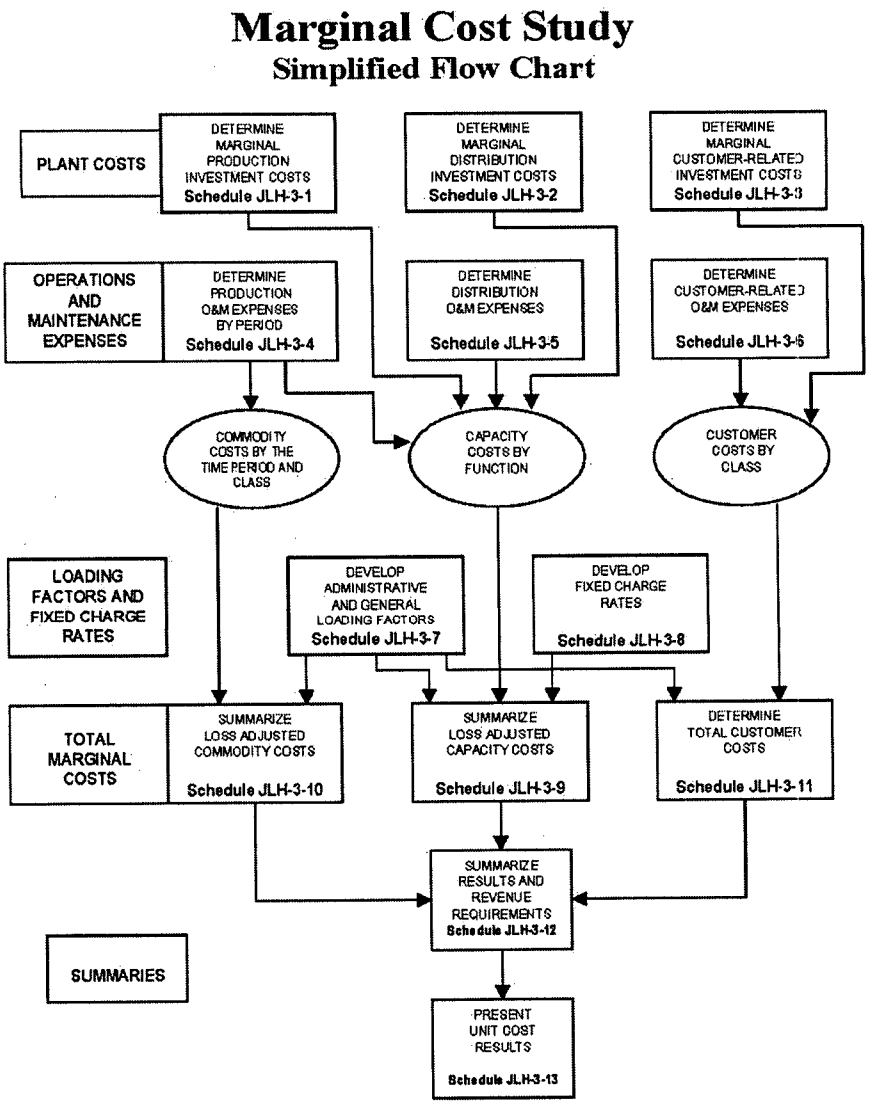
A. The marginal cost study consists of thirteen different schedules and supporting calculations. The organization of my schedules can be understood by referring to the attached flow chart (Figure 1). This flow chart shows the logical progression of calculations through my marginal cost study beginning with plant investment data and proceeding through to the development of marginal unit costs to serve. The summary output from the marginal cost study is shown on Schedule JLH-3-13.

Q. Referring to the flow chart on the following page, could you provide a brief overview of the marginal cost study?

A. The first three schedules develop the plant investment necessary to serve growth. Schedule JLH-3-1 develops the investment in production plant and the commitment of contracted production capacity necessary to serve an increment of customer load. Schedule JLH-3-2 addresses the capacity-related distribution plant investments, while Schedule JLH-3-3 addresses customer-related investments to the distribution system. Schedule JLH-3-4 details the development of estimated marginal production O&M expenses, both commodity and capacity. Schedule JLH-3-5 computes marginal distribution capacity-related O&M expenses. Schedule JLH-3-6 estimates customer-related O&M expenses. Schedule JLH-3-7 develops loading factors used to account for marginal costs not individually estimated, such as administrative and general expenses. Schedule JLH-3-8 develops levelized fixed charge rates used to translate one-time capital investments into annual revenue requirements. Schedules JLH-3-9, -10, and -11 summarize the results of all calculations, depicting the quantification of marginal capacity, commodity, and customer-related costs, respectively. Schedule JLH-3-12 summarizes these component costs. Finally, Schedule JLH-3-13 converts the Schedule JLH-3-12 costs into marginal cost-based rates.

I have reviewed the Department's directions concerning the preparation of a marginal cost study in the recent Fitchburg Gas and Electric Light Company D.T.E. 02-24/25 and Boston Gas Company D.T.E. 03-40 orders and believe my study complies with these directives.

FIGURE 1


Marginal Cost Study
Simplified Flow Chart
PLANT COSTS
DETERMINE MARGINAL PRODUCTION INVESTMENT COSTS Schedule JLH-3-1
DETERMINE MARGINAL DISTRIBUTION INVESTMENT COSTS Schedule JLH-3-2
DETERMINE MARGINAL CUSTOMER-RELATED INVESTMENT COSTS Schedule JLH-3-3
OPERATIONS AND MAINTENANCE EXPENSES
DETERMINE PRODUCTION O&M EXPENSES BY PERIOD Schedule JLH-3-4
DETERMINE DISTRIBUTION O&M EXPENSES Schedule JLH-3-5
DETERMINE CUSTOMER-RELATED O&M EXPENSES Schedule JLH-3-6
COMMODITY COSTS BY THE TIME PERIOD AND CLASS
CAPACITY COSTS BY FUNCTION
CUSTOMER COSTS BY CLASS
LOADING FACTORS AND FIXED CHARGE RATES
DEVELOP ADMINISTRATIVE AND GENERAL LOADING FACTORS Schedule JLH-3-7
DEVELOP FIXED CHARGE RATES Schedule JLH-3-8
TOTAL MARGINAL COSTS
SUMMARIZE LOSS ADJUSTED COMMODITY COSTS Schedule JLH-3-10
SUMMARIZE LOSS ADJUSTED CAPACITY COSTS Schedule JLH-3-9
DETERMINE TOTAL CUSTOMER COSTS Schedule JLH-3-11
SUMMARIZE RESULTS AND REVENUE REQUIREMENTS Schedule JLH-3-12
SUMMARIES
PRESENT UNIT COST RESULTS Schedule JLH-3-13

Capacity Costs

Q. Please describe your calculation of marginal capacity costs.

A. Demand or capacity costs for gas distribution companies consist of production and distribution functions. Production capacity costs are the unitized costs of expanding the Company's production capability to meet a long-run increase in customers' requirements for gas service. Under most conditions, a small increase in customer demand will cause the Company to incur little or no additional cost. With few exceptions, the Company will meet any additional load with its existing supply sources. However, at some point the load increment will demand that the Company acquire additional sources of supply. In practice, a gas utility may expand its production capacity by increasing the amount of gas it may take under a firm contract from a supplier, by expanding its storage capacity, or by increasing its ability to supply itself from production facilities, such as an LP-air or an LNG vaporizer.

My analysis utilizes the peaker method with which the Department is familiar. In simple terms, the peaker method identifies the least capital intensive capacity source which would be added to the Company's resources to meet peaks of short duration. For Bay State, constructing a new LNG vaporization facility was the most likely and least costly available alternative to serve peak load growth due to the limited pipeline capacity available west of the Connecticut River in the

Springfield division and the geographic constraints limiting expansion of the existing LP-air facility.

Q. Please explain the development of the production plant capacity number shown on Schedule JLH-3-1, page 1.

A. The development of production plant capacity begins on Schedule JLH-3-1, page 2. The Company identified the costs to construct a new LNG peaking facility as its least capital intensive alternative to add peaking capacity. The conceptual cost estimate for construction was furnished by the Company's engineering department with substantial assistance from its consultant, Northstar Industries.

Consistent with prior studies, I have employed the modified peaker method to compute the long-run marginal capacity costs. This method discounts the costs of pure capacity when current capability exceeds current requirements. The Company's 2002 Integrated Resource Plan shows the first need for additional capacity in 2007. Page 1 of Schedule JLH-3-1 presents the modified peaker cost calculation, showing its slight reduction to the peaker cost estimate.

Q. Please describe your analysis of marginal distribution capacity costs.

A. Distribution capacity costs were computed in two pieces—the long-run marginal costs of expanding the existing gas distribution system and the long-run marginal costs of adding main extensions.

Schedule JLH-3-2, consisting of five pages, develops the estimate of the costs of expanding the distribution system and two alternative calculations to corroborate my results. The first approach is entitled "Historical Investments," as shown on page 1, and represents the average investment over the last 29 years, in current dollars, to raise design day sendout capability.

Q. Why did you select 29 years as the historical period for analysis?

A. The first marginal cost study prepared for Bay State in D.P.U. 89-81 (1989) used a thirteen-year period commencing in 1976. Subsequent studies added additional years of accounting data to my database. However, data prior to 1976 would be burdensome if not impossible to accumulate. Thus, the 29-year period, 1976 to 2004, formed the basis for all historical cost analyses included in the marginal cost study.

Q. Please describe your analysis of marginal distribution plant capacity investment?

A. In order to accurately estimate current marginal costs from historical distribution investments, three sequential calculations were performed. First, historical capacity-related additions were identified and restated in 2004 dollars on Schedule JLH-3-2, page 2, using the Handy-Whitman Index for Public Utility Costs. Since net additions represent replacement of retirements as well as additions for load growth, the second calculation, shown on Schedule JLH-3-2,

page 3, was developed from engineering department input to identify the percentage of net additions for growth alone.

The second approach, identified as the "Prospective Additions," is detailed on pages 3 and 4. Page 4 develops an estimate of the anticipated unit cost of additional main extensions based on an analysis of historical main extension footage, load, and cost. For this analysis data prior to 1984 was discounted since it most likely includes costs for replacement mains and, therefore is inconsistent with the post-1984 data. The average incremental cost over the period 1984 to 2004 was $256.33 per Dt.

Load growth could place additional load on the Company's existing distribution system making reinforcement necessary. Page 3 shows a 10-year, forward-looking analysis prepared by the Company's engineering staff to forecast reinforcement costs and the incremental cost per Dt. For this analysis, the three division engineers ran their distribution flow models annually for a ten year period to identify when and where increased load generated pressure problems. The engineers were then asked to design a system improvement to resolve the problem and estimate the cost. The divisional results are summarized on this page, resulting in an estimate of $199.33 per Dt for each additional dekatherm of design day load. Total unit cost for the prospective additions method is simply the sum of these two unit costs, main extension and main reinforcement.

The third approach, entitled "Trended Cost," is based on statistical regression techniques shown on Schedule JLH-3-2, page 5. Using historical plant investment data, shown on page 2, the unit cost per design day Dt was obtained by regressing the cumulative investment in new capacity-related distribution plant against the annual design day capability requirement over this same period.

I have concluded that long-run marginal costs are best estimated by the Prospective Additions approach, since this method is based on the engineering principals that control the Company's planning decisions and provides valuable additional information not available from the other statistical methods. The similarity of the results from the other methods adds credence to the estimates selected.

Q. How did you compute the capacity-related component of Distribution O&M expenses?

A. This calculation is shown on Schedule JLH-3-5 consisting of two pages. On the second page, I reviewed distribution O&M expenses account by account for the historical period. I assumed that Account 874, Mains and Services Expense, and Account 852, Communications Expense, had both a capacity- and customer-related component. I segregated these costs on the basis of the relative plant investments in Mains and Services. I directly assigned Meter and House Regulator expenses, Account 878, Account 879-Customer Installation Expenses, Account 892-Maintenance of Services and Account 893-Maintenance of Meter

and House Regulator Equipment to the customer component. In addition, I pro-rated Supervision and Engineering expenses in Accounts 850 and 885 as well as Accounts 880 and 881, Other Expenses and Rents, to the customer and capacity components in proportion to all other distribution O&M expenses.

On page 1 of Schedule JLH-3-5, I restated the annual capacity-related expenses in terms of current cost, indexing by the year-end GNP Implicit Price Deflator, to determine capacity-related O&M expenses in current dollars. Engineering personnel previously indicated that maintenance costs are generally declining on a real basis due to the reduced maintenance costs associated with plastic pipe, as more and more cast iron and bare steel pipe is replaced. Regressing these data against the system's design day sendout resulted in a poor correlation. Performing a time-series regression for these O&M expenses and correcting for auto-serial correlation revealed a better correlation and clearly demonstrated the declining trend in unit costs. Since the recent average costs in this analysis corroborated the statistical analysis, the time-series was used to estimate marginal costs.

Q. Please describe the development of marginal capacity costs on Schedule JLH-3-9.

A. Schedule JLH-3-9 develops marginal capacity costs by production and distribution function. Plant investments identified in Schedules 1 and 2 are grossed up to include general plant. These investments are then annualized by applying the fixed charge rate developed on Schedule JLH-3-8. To this amount,

annual operating expenses are added, including an allowance for administrative and general expenses. An adjustment reflecting annual revenue requirements to finance working capital is added. Next, the indicated unit costs were increased to reflect unaccounted for losses experienced. Finally, these costs were escalated from test year to rate year levels.

Commodity Costs

Q. Please elaborate on your calculation of marginal commodity costs.

A. Marginal commodity cost estimates are short-run costs that are driven by widely fluctuating market prices. Therefore, it is the current market prices, rather than these estimates of marginal commodity cost, which should be used for pricing purposes. Nonetheless, marginal commodity costs have been provided for completeness. For this study, marginal commodity costs are defined as the short-run cost of serving a small increment in customer load in the winter or summer seasons. The estimates of marginal commodity cost were based on the New York Mercantile Exchange (NYMEX) futures prices for the rate year, November, 2005 to October, 2006 adjusted to reflect prices delivered to Bay State's city gate.

Q. Please explain the development of marginal costs associated with production operations and maintenance expenses.

A. The development of production O&M expenses are also shown on Schedule JLH-3-4. In order to produce load weighted marginal commodity costs, the monthly

system incremental unit costs shown on Schedule JLH-3-4, page 6, were load weighted by sales for each of the marginal cost study's classes in order to develop class by class, winter and summer marginal commodity costs. This computation is summarized on Schedule JLH-3-4, pages 2 and 3.

Other indirect gas costs are not included in Schedule JLH-3-4 but are developed as part of a commodity loading factor on Schedule JLH-3-7, page 2.

Schedule JLH-3-10 summarizes marginal commodity costs. The calculation of marginal commodity costs begins on page 2 with the gas costs developed on a short run basis from Schedule JLH-3-4, page 1. Additions for other variable production plant operations and maintenance expense shown on Schedule JLH-3-7, page 2, from data on Schedule JLH-3-4, page 5, and working capital were included. The resulting system seasonal commodity-related costs were adjusted for lost and unaccounted for gas and Company use to reflect marginal commodity costs for pricing purposes. At the bottom of page 2, seasonal ratios are computed to relate total marginal commodity costs to the gas costs contained in the dispatch analysis. These seasonal ratios are then applied on page 1 to the class-by-class gas costs shown on JLH-6, Schedule JLH-3-4, page 2, to derive marginal commodity costs by class.

Customer Costs

Q. Please describe your calculation of marginal customer costs.

A. The long-run marginal costs of serving an additional customer were determined to be a function of the size of the customer and the class of service. Three different customer costs were computed, representing the costs of connecting and serving a customer for each of the Company's new rate categories. These customer costs consisted of:

(1) Plant investment in services and meters,
(2) Related operations and maintenance expenses, and
(3) Billing costs such as customer accounting and customer information expenses.

Q. How did you compute customer-related plant investment?

A. I began with services, as shown on Schedule JLH-3-3, page 1. I computed average replacement costs new for each customer class and then factored them by the services-per-customer ratio to recognize that services among smaller customers are often shared. Meter investment was also developed from the Company's engineering estimates including the current cost of replacement meters, both active and inactive, used for each customer class and the Company's engineering estimates of the current installation costs and regulator costs, when required. Finally, the costs of installed meters were factored by meters per customer ratios to recognize the need for spares.

Q. Please describe your computation of customer-related operations and maintenance expenses.

A. These calculations are summarized on Schedule JLH-3-6, consisting of five pages. On the first page, customer-related distribution operations and maintenance expenses previously identified on Schedule JLH-3-5, page 2, were restated in current dollars, using the GDP Implicit Price Deflator as a cost index. Annual expenses were regressed against the number of customers, but initially promising results were found to be invalid after eliminating first order serial correlation. The average cost was then regressed against the time series. This regression also showed little correlation suggesting that the recent two-year average cost be used as a reasonable estimate of marginal costs to serve a new customer. Page 2 of Schedule JLH-3-6 shows the allocation of costs to customer classes, based on the services and meters investments required.

Page 3 of this Schedule, shows the development of customer accounting and marketing services expenses. In general, the number of customers has been increasing, while these customer-related expenses have been roughly constant and, post-merger, declining. While the data demonstrated a reasonable statistical correlation, the trends could not explain the recent experience. Since the merger, some of the customer accounting and marketing efforts formerly performed by Bay State personnel have been undertaken by NiSource personnel and billed back to Bay State as an Outside Service Expense in Account 923. Thus the data displayed on Schedule JLH-3-6, page 3, are not internally consistent. The post-

merger figures are biased downward. Therefore, the results were discounted. Using the last two years of data provides a reasonable expectation of the future, so the average cost per customer for the past two years was chosen as a proxy for the average marginal customer-related accounting costs. The cost per year was not assumed to be equal for all customer classes. Using the causal relationships identified in my COSS, Schedule JLH-2-2, I computed marginal customer costs for each customer class on Schedule JLH-3-6, page 4.

The customer charges shown on Schedule JLH-3-6, page 4, specifically exclude uncollectible accounts expense. A separate analysis of the uncollectible costs is shown on Schedule JLH-3-6, page 5. On this schedule, a ratio of uncollectible accounts expenses to each class's total annual revenue requirements is presented.

Q. Please summarize Schedule JLH-3-11.

A. Schedule JLH-3-11 shows the development of marginal customer-related costs by class. Plant investments for customer-related costs, shown on Schedule JLH-3-3, were converted to an annual expense, using the appropriate fixed charged rate from Schedule JLH-3-8. Annual expenses from Schedule JLH-3-6, loaders from Schedule JLH-3-7 and working capital requirements were added in a manner analogous to capacity costs, as explained previously. Finally, costs were restated in rate year dollars, using anticipated price escalation.

Q. What is the purpose of Schedule JLH-3-7?

A. Schedule JLH-3-7, consisting of two pages, develops loading factors used in the marginal cost study. Loading factors are used to compute estimates of marginal costs where direct quantification is either too complex or the costs are insignificant. In the former category, administrative and general ("A&G") expenses are only indirectly related to customer load characteristics. To simplify quantification of marginal costs, A&G costs are related to other operations and maintenance expenses or plant-related items. All loading factors are calculated as the most recent two-year average. This approach was necessitated by the fundamental change in the Company's operations following its merger with NiSource. The historical data prior to the merger reflects the self-contained operations of Bay State. However, post-merger, the Company increasingly utilizes NiSource's resources to perform many functions, demonstrating a shift toward increased Outside Services and a decline in most other administrative and general expenses. Any trends developed from the 29-year historical database would not be indicative of the future.

The top of page 2 shows the development of a commodity loading factor used to adjust commodity costs for other non-fuel variable O&M costs. These non-fuel variable costs were averaged over the most recent two years. Similarly, material and supplies fuel inventory and general plant loaders were also developed using the most recent two years of data.

The cost of lost and unaccounted for gas and Company use cannot be directly attributable to classes and are computed as a loss factor for use on Schedules JLH-3-9 and -10. The figure of 1% is the current level experienced by the Company, but more importantly, it is also the figure used by the Company's planning personnel for long-range studies.

Q. Would you explain the development of the carrying charge rates shown in Schedule JLH-3-8?

A. Schedule JLH-3-8 details the development of the levelized fixed charged rates for peaking production facilities, capacity-related distribution plant and customer-related distribution plant. These rates are used to convert one-time investments into annualized revenue requirements, necessary for pricing. For ratemaking purposes, investments in fixed plant are normally treated as rate base items. Utility rates are established periodically to allow the recovery of costs incurred in ownership, including such items as return, taxes, depreciation, etc. Rather than deal with an irregular set of annual costs stemming from ownership of assets, levelized fixed charge rates compute the present worth of all revenue requirements stemming from utility ownership of an asset, and then provide an equivalent annual payment stream of identical present worth.

The development of a levelized fixed charge rate applicable to Production plant investment is shown on pages 2, 3 and 7. The calculations for capacity-related distribution plant (pages 2, 4 and 8), services (pages 2, 5 and 9), and metering

investment (pages 2, 6 and 10) are similar. For simplicity, I will only discuss the calculation of the production plant carrying charge rate.

Page 2 shows the input assumptions used to develop levelized fixed charge rates. A hypothetical investment of $1,000 is used for demonstration purposes. Page 11 shows the development of weighted average service lives and salvage values used as input into the computations. Using current property tax rates and incremental income tax rates, the calculation of annual utility revenue requirements stemming from the initial $1,000 investment is shown on page 7.

Page 3 displays two different fixed charge rates—the "engineer's" and "economist's" fixed charge rates. The first fixed charge rate is akin to a banker's conventional fixed rate mortgage. It represents the payment, expressed as a percentage of the original investment that must be made in current-year dollars in order to equate to the present worth of the utility's revenue requirements. The economist's fixed charge rate differs slightly, in that is assumes that payments will escalate each year by the rate of inflation. Inherent in the engineer's fixed charge rate is the assumption that an asset is depleted more rapidly at the outset than toward the end of its service life. The economist's fixed charge rates make the opposite assumption—that an asset's utility at the beginning of its service life is equal to its value at the end of its service life. In the gas utility industry, old plant can be nearly as useful as new plant. As an example, meters provide the same service at the beginning of their lives as they do at their end. Consequently, the

1 economist's fixed charge rate was used to convert one-time plant investments into
2 annual revenue requirements.
3

4 **Summary of MCS Results**

5 **Q. Please describe Schedules JLH-3-12 and -13.**

6 A. Schedule JLH-3-12 tabulates the long-run marginal costs computed on Schedules
7 JLH-3-9, -10 and -11. In addition, this schedule calculates the revenues that
8 would be generated if the Company were to introduce full marginal cost-based
9 pricing and if customers were to continue to consume as they have in the past.
10
11 Schedule JLH-3-13 derives unit costs based on billed sales in the winter and
12 summer months. Seasonal revenue requirements from Schedule JLH-3-12 were
13 divided by seasonal sales to derive unit costs. If marginal cost based rates were
14 not constrained to utility allowed revenues and if economic efficiency were the
15 only goal of rate design, these marginal cost figures could be considered marginal
16 cost-based prices. Obviously, these prices would be impractical to implement
17 without further adjustment and consideration.

18 **IV. TABULATION OF RATE DESIGN DATA**

19 **Q. Please describe Schedule JLH-3-14.**

20 A. This schedule, consisting of five pages summarizes the information necessary for
21 rate design. Although most of this information is provided on other schedules, I

have provided these summaries for simple access to the majority of the information to be gleaned from my studies. Pages 1 and 2 of Schedule JLH-3-14 tabulate annual cost information from the COSS, including detail about indirect gas costs. In addition, accounting costs to serve are compared to marginal costs to serve and present revenues.

Page 3 presents the results of the marginal cost study and also shows equi-proportionally adjusted marginal costs so that the adjusted marginal costs match the COSS revenue requirements at the claimed rate of return.

Page 4 summarizes the gas cost data from Exhibit BSG/JLH-1, gas cost allocation for use in the proposed CGAC. Finally, page 5 displays indirect gas cost details including costs by season for use in constructing the proposed CGAC.

Q. Does this conclude your testimony?

A. Yes, it does.

Schedule JLH-3-1
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Production Investment Summary-Modified Peaker

Line No.	Description		COMPANY TOTAL
	COST FOR REINFORCEMENT		(1)
1			
2	Current Cost of Capacity Expansion {1}		$329.48
3			
4			
5			
6	First Year of Capacity Shortfall {2}		2007
7			
8			
9	Base year of study		2004
10			
11			
12	Years Before Additions (9)-(6)		3
13			
14	After Tax Cost of Capital {3}		7.73%
15	Inflation Rate {3}		2.50%
16			
17			
18			
19	Present Worth of Capacity Cost {4}		
20	(2)*[1+(15)]^(12)/[1+(14)]^(12)		$283.76
21			
22	Percentatge Related to Transportation	{5}	28.6%
23			
24	**Transportation Related Investement**	(20)*(22)	**$81.05**
25			
26	**Gas Supply Related Plant Investement**	(20)*[1-(22)]	**$202.71**

NOTES:
1 Source: Schedule JLH-3- 1, page 2. Design Day data from Schedule JLH-3-2, page 4
2 Source: Company's 2002 IRP Filing
3 Source: Schedule JLH-3- 8, page 1.
4 Cost in test year dollars sufficient to purchase the designated unit in the first year of capacity shortfall allowing for interest and price escalation.
5 Source: Schedule JLH-3- 1, page 3.

Schedule JLH-3-1
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Marginal Production Plant Investment

Line No.	Description				Option A 14,000 Dt/day Plant	Option B 12,000 Dt/day Plant
	Construct New LNG Plant					
1	Equipment including: tanks @ 70,000 DT,			No. Tanks	2	1
2	premanufactured tanks, sendout, truck unload,				$3,700,000	$2,500,000
3	tank control valves, tank load controls and pump			{1}		
4	& Control Building Equipment which includes heat source,					
5	scada equipment,communications, odorization,					
6	primary power and back-up power					
7	Engineering, Legal & Permitting				$700,000	$500,000
8	Land: 5 Acres				$300,000	$200,000
9	Interconnect to Utilities Assumes .5 miles				$250,000	$200,000
10	Site Work, Site Utilities				$900,000	$800,000
11						
12	Direct Cost of Facility			sum(thru 11)	$5,850,000	$4,200,000
13						
14	Owner costs and Contingency		{2}	10%	585,000	$420,000
15						
16	Total Cost of Facility			(12) + (14)	6,435,000	4,620,000
17						
18	Price escalation	2.5%	{3}	0	0%	0.0%
19						
20	Cost of Facility			(16)*[1+(18)]	$6,435,000	$4,620,000
21						
22	Unit Rating, MCFH			{1}	700	600
23	Heat Rate, DT/MCF			{4}	1.051	1.051
24	Hours per Day				24	24
25						
26	Capacity, Dt			(22)*(23)*(24)	17,657	15,134
27						
28	Unit Cost of Expansion			(20)/(26)	$364.45	$305.26
29						
30	Estimated Reserves for Supplemental Capacity			{5}	8%	8%
31						
32	Adj Cost of Production Capacity, $/Dt			(28)*[1+(30)]	$393.36	$329.48
33						
34	**Marginal Cost Estimate**					**$329.48**

NOTES:
1 Source: Engineering estimate developed by Northstar Industries Services
2 Overhead loader:for miscellaneous owner costs.
3 No escalation required to restate estimate in test year prices.
4 Source: Average of Bay State's existing LNG facilities.
5 Source: Schedule JLH-3- 1, page 4.

Schedule JLH-3-1
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Distribution-related Production Plant Investment {1}

Line No.	Description				
1	Required for Pressure Support, Dt	{1}	51,129	Dt	
2					
3					
4	LNG Capacity, Dt	{2}	119,000	Dt	
5	LP Capacity, Dt		60,000	Dt	
6					
7	Pressure Support % of Manufactured Gas Capability	(1)/[(4)+(5)]			28.6%
8					
9					
10					
11					
12	**Transportation Related Local Production Plant**	**(7)**			**28.6%**

NOTES:
1 Source: Design hour load flow study results performed by Company engineering personnel.
2 Source: Company's 2002 IRP Filing.

Schedule JLH-3-1
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Reserves for Supplemental Capacity

Line No.	Year of Forecast	Current Year	Year 2	Year 3	Average	
	(1)	(2)	(3)	(4)	(5)	
	Forecasted Total Capability					
1						
2						
3	2002	457,540	457,550	457,560	457,550	
4						
5						
6						
7		Total	average column 5 lines 1-6			457,550
8						
9	**Forecasted Peak Day Sendout Requirements**					
10						
11						
12	2002	417,660	423,910	430,200	423,923	
13						
14						
15						
16		Total	average column 5 lines 10-15			423,923
17						
18						
19	**Reserve**			[(7)-(16)]/(16)		8%
20						
21						
22						
23	**Reserve for Supplemental Capacity**			(19)		**8%**

NOTES:
1 Source: Company Forecast and Supply Plans, excluding third party supplies and loads.

Schedule JLH-3-2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Estimates for Distribution Capacity Cost

Line No.	Description				Quantity	
	(1)				(2)	
1						
2	**HISTORICAL INVESTMENTS**	**{1}**				
3	CAPACITY INCREMENT - 1976 to 2004					
4	2004 Design Day Sendout			551,630		
5	1976 Design Day Sendout			226,225		
6	Increase in Design Day Sendout (5)-(4)				325,406	
7						
8	PLANT INVESTMENTS					
9	Investments to Increase Capacity, Current $'s					
10	Total Investment	1976	2004		149,025,071	
11						
12	UNIT COST					
13	**Avg Unit Cost for Historical Investments**	**(10)/(6)**				**$457.97**
14						
15						
16	**PROSPECTIVE ADDITIONS**					
17	REINFORCEMENT (From Stoner Model Analysis)		{2}			
18	Estimate of upgrades					
19	to existing facilities.			$38,510,264		
20	Estimated Additional Load, DT/Design Day			193,203		
21	Average Cost for Upgrades	(19)/20)		$199.33		
22	Trended Cost for Upgrades		{2}		$199.33	
23						
24	NEW MAIN EXTENSIONS					
25	Unit Cost for New Main Extensions	{3}			$256.33	
26						
27	UNIT COSTS					
28	**Unit Costs for Prospective Additions**	**(22)+(25)**				**$455.66**
29						
30						
31	**TRENDED COST APPROXIMATION (Slope of Regression Line)**					**#REF!**
32	Unit Costs based on slope of Regression Line		{4}			
33						
34						
35						
36						
37						
38						
39						
40						
41	**For purposes of further study, assume long run marginal**					
42	**costs will be estimated by prospective additions (28)**				**$455.66**	**per Dt**

NOTES:
1 Source: Cost data from Schedule JLH-3- 2, Page 2.
2 Source: Schedule JLH-3- 2, Page 3.
3 Source: Schedule JLH-3- 2, Page 4.
4 Source: Schedule JLH-3- 2, Page 5.

Schedule JLH-3-2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Historical Plant Investment Data - Capacity-Related

Line No.	Description	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	DISTRIBUTION INVESTMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Plant Balances {1}										
1	366 Structures And Improvements	$1,844,931	$1,913,890	$1,952,676	$1,959,160	$1,961,978	$1,993,364	$2,002,029	$1,998,707	$2,020,171	$2,033,417
2	367 Gas Mains	76,414,980	79,465,232	83,297,494	88,635,549	93,270,684	96,191,023	98,693,273	101,536,011	105,996,052	110,878,560
3	368 Compressor Station Equipment	146,417	136,246	136,246	136,246	136,246	136,246	406,988	406,988	406,988	406,988
4	369 Meas & Reg Sta Equipment	1,592,424	1,653,290	1,706,712	1,753,697	1,853,113	1,902,018	2,084,438	2,321,386	2,415,363	2,642,916
5	379 Other Equipment	0	0	0	0	0	0	0	0	0	0
6											
7	Net Capacity-related										
8	Distribution Plant										
9	Balances Lines 1 through 5	79,998,751	83,168,658	87,093,128	92,484,652	97,222,020	100,222,652	103,186,728	106,263,093	110,838,574	115,961,881
10											
11	Net Plant Additions {2}		3,169,907	3,924,470	5,391,524	4,737,369	3,000,631	2,964,077	3,076,365	4,575,481	5,123,307
12											
13											
14	Handy-Whitman - Jan 1	130	139	149	159	177	194	212	222	229	235
15	Plastic - Mains - Jul 1	135	144	154	168	188	203	218	228	234	236
16	Wtd. Avg. Annual Index	134.75	144.00	154.00	168.00	186.75	203.00	217.50	226.75	233.00	236.50
17	(14i)/4+(15i)/2+(14j)/4										
18											
19	Current Cost of Additions										
20	(11)*Current Index/(16)	$0	$8,739,256	$10,116,977	$12,740,685	$10,070,872	$5,868,229	$5,410,292	$5,386,182	$7,795,992	$8,600,223
21											
22	Correction Factor for Replm'ts {2}	29.8%	48.9%	43.9%	42.9%	33.6%	49.9%	85.9%	32.2%	48.2%	79.6%
23											
24	Net Additions	0	4,271,252	4,438,285	5,462,132	3,384,142	2,926,639	4,649,299	1,732,799	3,758,634	6,848,798
25											
26	**Cum Growth Related Invest**	0	4,271,252	8,709,537	14,171,669	17,555,811	20,482,450	25,131,748	26,864,548	30,623,182	37,471,980

NOTES:
1 Source: Annual Reports
2 Source: Engineering department estimates examining constructed cost of main extensions and main reinforcements versus replacement of retirements and municapl projects.

Schedule JLH-3-2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Historical Plant Investment Data - Capacity-Related

Line No.	Description	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	DISTRIBUTION INVESTMENT	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Plant Balances {1}										
1	366 Structures And Improvements	$2,133,867	$2,188,638	$2,214,620	$2,229,707	$2,238,331	$2,236,550	$2,248,310	$2,226,343	$2,226,343	$2,226,343
2	367 Gas Mains	116,750,717	124,052,027	132,885,285	140,175,869	148,335,840	157,817,818	166,024,437	195,530,271	208,955,287	219,451,772
3	368 Compressor Station Equipment	406,988	406,988	330,195	329,926	329,926	329,926	327,724	327,265	327,265	327,265
4	369 Meas & Reg Sta Equipment	2,725,995	2,943,130	3,106,227	3,235,709	3,550,900	3,860,414	4,613,886	5,887,091	5,962,860	6,995,249
5	379 Other Equipment	0	0	0	0	493,459	499,533	510,252	510,252	510,252	510,252
6											
7	Net Capacity-related										
8	Distribution Plant										
9	Balances Lines 1 through 5	122,017,567	129,590,783	138,536,326	145,971,211	154,948,456	164,744,242	173,724,609	204,481,221	217,982,006	229,510,880
10											
11	Net Plant Additions {2}	6,055,686	7,573,216	8,945,543	7,434,885	8,977,245	9,795,786	8,980,367	30,756,612	13,500,785	11,528,874
12											
13											
14	Handy-Whitman - Jan 1	239	243	254	277	283	294	296	307	313	319
15	Plastic - Mains - Jul 1	241	246	257	280	289	299	302	310	315	322
16	Wtd. Avg. Annual Index	241.00	247.25	261.25	280.00	288.75	297.00	301.75	310.00	315.50	322.00
17	(14i)/4+(15i)/2+(14j)/4										
18											
19	Current Cost of Additions										
20	(11)*Current Index/(16)	$9,975,550	$12,160,027	$13,593,801	$10,541,605	$12,342,740	$13,094,030	$11,815,098	$39,388,306	$16,988,310	$14,214,171
21											
22	Correction Factor for Replm'ts {2}	80.1%	86.9%	59.8%	58.4%	58.4%	58.4%	47.1%	47.1%	38.3%	35.4%
23											
24	Net Additions	7,985,544	10,565,031	8,135,231	6,159,437	7,211,836	7,650,813	5,561,157	18,539,376	6,508,221	5,033,238
25											
26	**Cum Growth Related Invest**	45,457,524	56,022,555	64,157,785	70,317,222	77,529,058	85,179,871	90,741,028	109,280,404	115,788,625	120,821,863

NOTES:
1 Source: Annual Reports
2 Source. Engineering department estimates examinin

Schedule JLH-3-2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Historical Plant Investment Data - Capacity-Related

Line No.	Description	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	DISTRIBUTION INVESTMENT	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
	Plant Balances {1}										
1	366 Structures And Improvements	$2,226,343	$2,230,782	$2,225,309	$2,256,512	$2,264,738	$2,228,753	$2,228,753	$2,187,663	$2,187,663	
2	367 Gas Mains	228,525,905	236,736,592	248,208,062	257,592,946	266,727,243	277,197,784	287,767,030	295,736,340	308,733,201	
3	368 Compressor Station Equipment	327,265	327,265	327,265	327,265	327,265	327,265	327,265	327,265	327,265	
4	369 Meas & Reg Sta Equipment	7,793,386	8,268,274	8,639,369	9,081,534	10,067,647	9,986,196	10,779,639	11,275,919	12,355,156	
5	379 Other Equipment	510,252	510,252	510,252	510,252	510,252	510,252	510,252	510,252	510,252	
6											
7	Net Capacity-related										
8	Distribution Plant										
9	Balances Lines 1 through 5	239,383,151	248,073,164	259,910,257	269,768,509	279,897,144	290,250,249	301,612,938	310,037,439	324,113,537	
10											
11	Net Plant Additions {2}	9,872,270	8,690,014	11,837,093	9,858,251	10,128,635	10,353,105	11,362,689	8,424,501	14,076,098	
12											
13											
14	Handy-Whitman - Jan 1	325	333	341	346	354	364	369	376	389	*411*
15	Plastic - Mains - Jul 1	330	337	344	351	357	367	376	379	394	
16	Wtd. Avg. Annual Index	329.50	337.00	343.75	350.50	358.00	366.75	374.25	380.75	397.00	
17	(14i)/4+(15i)/2+(14j)/4										
18											
19	Current Cost of Additions										
20	(11)*Current Index/(16)	$11,894,662	$10,237,197	$13,670,766	$11,166,122	$11,232,034	$11,207,042	$12,053,407	$8,784,049	$14,076,098	
21											
22	Correction Factor for Replm'ts {2}	33.4%	31.0%	29.2%	31.2%	25.7%	24.3%	22.8%	24.4%	21.8%	
23											
24	Net Additions	3,972,817	3,173,531	3,997,332	3,488,297	2,890,002	2,719,949	2,749,382	2,143,308	3,068,589	
25											
26	**Cum Growth Related Invest**	124,794,681	127,968,212	131,965,544	135,453,840	138,343,843	141,063,792	143,813,174	145,956,482	149,025,071	

NOTES:
1 Source: Annual Reports
2 Source: Engineering department estimates examinin

Schedule JLH-3-2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Capacity Related Investment - Distribution Reinforcement

Line No.	Year	Desgin Day Load Dt	Reinf Cost Constant $	Cumulative Total
	(1)	(2)	(3)	(4)
	INVESTMENT FOR REINFORCEMENT	{1}	{2}	
1		497,437		
2	2005	512,360	6,615,136	0
3	2006	527,660	3,007,853	3,007,853
4	2007	545,420	4,432,904	7,440,757
5	2008	561,780	5,027,412	12,468,169
6	2009	578,480	2,925,787	15,393,956
7	2010	595,840	3,575,057	18,969,013
8	2011	613,540	3,903,169	22,872,182
9	2012	631,860	4,778,560	27,650,742
10	2013	650,840	3,358,309	31,009,051
11	2014	670,760	3,323,889	34,332,940
12	2015	690,640	4,177,324	38,510,264
13				
14				
15	Total Reinforcement Cost		$38,510,264	
16	Total Increase in DT	193,203		
17				
18				
19	Incremental Average Cost	(15)/(16) {3}	**$199.33**	**$'s per Dt**

NOTES:
1 Hypothetical growth used as inmput to develop per unit marginal distribution investment for system simulation.
2 Source: Stoner Model expansion requirements for each division conducted by distribution engineering.
3 Based on weighted average of sources anticipated to be dispatched on a design day and their heat contents.

Schedule JLH-3-2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Distribution Main Extension Investment

Line No.	Year	Installed Footage	Cumulative Footage	Cost	Cost per Foot	Cost Index	Costs in 2004 $'s	Costs Per Foot 2004 $'s	Design Day Demand
		(1)	(2) sum(1)*30%	(3) (4)*(1)	(4)	(5)	(6) (3)*(5)	(7) (4)X(5)	(8)
		{1}	{4}		{2}	{3}			
1	1976	47,483	14,131	947,761	$19.96	2.946	2,792,290	$ 58.81	226,225
2	1977	79,978	23,802	1,490,790	$18.64	2.757	4,110,025	$ 51.39	221,937
3	1978	115,865	48,614	1,681,201	$14.51	2.578	4,334,005	$ 37.41	231,994
4	1979	155,575	94,915	2,288,508	$14.71	2.363	5,407,962	$ 34.76	255,527
5	1980	92,933	122,573	1,557,557	$16.76	2.126	3,311,112	$ 35.63	251,000
6	1981	61,738	140,947	1,456,449	$23.59	1.956	2,848,326	$ 46.14	265,000
7	1982	112,763	174,506	2,150,292	$19.07	1.825	3,924,901	$ 34.81	283,000
8	1983	56,910	191,443	914,543	$16.07	1.751	1,601,206	$ 28.14	261,000
9	1984	150,823	236,330	1,728,980	$11.46	1.704	2,945,944	$ 19.53	266,366
10	1985	271,898	317,250	3,261,508	$12.00	1.679	5,474,920	$ 20.14	271,605
11	1986	269,169	397,357	2,960,635	$11.00	1.647	4,877,063	$ 18.12	292,425
12	1987	319,507	492,446	3,533,789	$11.06	1.606	5,674,072	$ 17.76	307,637
13	1988	429,811	620,363	4,734,339	$11.01	1.520	7,194,383	$ 16.74	317,241
14	1989	376,011	732,268	3,990,137	$10.61	1.418	5,657,444	$ 15.05	340,491
15	1990	250,108	806,702	2,673,016	$10.69	1.375	3,675,108	$ 14.69	366,674
16	1991	257,936	883,467	2,748,702	$10.66	1.337	3,674,191	$ 14.24	377,978
17	1992	342,896	985,517	3,026,546	$8.83	1.316	3,981,901	$ 11.61	387,149
18	1993	317,934	1,080,137	2,807,491	$8.83	1.281	3,595,400	$ 11.31	405,800
19	1994	299,272	1,169,204	2,651,559	$8.86	1.258	3,336,511	$ 11.15	421,578
20	1995	340,506	1,270,542	3,059,636	$8.99	1.233	3,772,284	$ 11.08	436,181
21	1996	239,119	1,341,707	2,820,003	$11.79	1.205	3,397,697	$ 14.21	453,181
22	1997	268,427	1,421,593	2,555,229	$9.52	1.178	3,010,166	$ 11.21	469,409
23	1998	236,039	1,491,841	2,469,662	$10.46	1.155	2,852,235	$ 12.08	477,243
24	1999	183,258	1,546,381	2,140,453	$11.68	1.133	2,424,422	$ 13.23	434,840
25	2000	164,610	1,595,371	2,337,462	$14.20	1.109	2,592,102	$ 15.75	445,550
26	2001	168,113	1,645,403	1,882,866	$11.20	1.082	2,038,167	$ 12.12	455,990
27	2002	140,347	1,687,172	1,501,713	$10.70	1.061	1,592,999	$ 11.35	465,290
28	2003	119,082	1,722,612	1,475,426	$12.39	1.043	1,538,396	$ 12.92	545,890
29	2004	176,311	1,775,084	1,421,067	$8.06	1.000	1,421,067	$ 8.06	551,630
30									557,890
31									
32	Totals	6,044,422		68,267,319	$11.29		103,056,299	$17.05	331,666
33									
34	Since								
35	1983	5,321,177		55,780,218	$10.48		74,726,471	$14.04	291,524
36									
37									
38	MARGINAL COST ESTIMATES								
39									
40	Incremental Cost Per DT, All Years				Row 32, column	(6) / (8)	$310.72		
41									
42	Post '83 Incremental Cost Per DT				Row 35, column	(6) / (8)	$256.33		
43									
44	**Marginal Cost for Main Additions - Load Growth**				{4}	(42)	**$256.33**		

NOTES:
1 Source: Annual footage installed for main extensions, taken from plant records, DOT report, engineering records.
2 Source: Cost accounting records for main extensions.
3 Source: Handy Whitman Index of Public Utility Construction Costs for Plastic Mains.
4 Data from 1976 to 1983 considered invalid since it is from an alternate source and erroneously includes costs for relpacement of retirements.

BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Regression Analysis of Distribution Capacity Costs

Line No.	Year	Total Capacity Related Net Distribution Investment	Design Day Sendout Sales & Trans	Cumulative Investment
		(1) {1}	(2)	(3)
1				
2	1976		226,225	$0
3	1977	4,271,252	221,937	4,271,252
4	1978	4,438,285	231,994	8,709,537
5	1979	5,462,132	255,527	14,171,669
6	1980	3,384,142	251,000	17,555,811
7	1981	2,926,639	265,000	20,482,450
8	1982	4,649,299	283,000	25,131,748
9	1983	1,732,799	261,000	26,864,548
10	1984	3,758,634	266,366	30,623,182
11	1985	6,848,798	271,605	37,471,980
12	1986	7,985,544	292,425	45,457,524
13	1987	10,565,031	307,637	56,022,555
14	1988	8,135,231	317,241	64,157,785
15	1989	6,159,437	340,491	70,317,222
16	1990	7,211,836	366,674	77,529,058
17	1991	7,650,813	377,978	85,179,871
18	1992	5,561,157	387,149	90,741,028
19	1993	18,539,376	405,800	109,280,404
20	1994	6,508,221	421,578	115,788,625
21	1995	5,033,238	436,181	120,821,863
22	1996	3,972,817	453,181	124,794,681
23	1997	3,173,531	469,409	127,968,212
24	1998	3,997,332	477,243	131,965,544
25	1999	3,488,297	434,840	135,453,840
26	2000	2,890,002	445,550	138,343,843
27	2001	2,719,949	455,990	141,063,792
28	2002	2,749,382	465,290	143,813,174
29	2003	2,143,308	545,890	145,956,482
30	2004	3,068,589	551,630	149,025,071
31				
32				
33				After Cochrane
34			Before Adjm't	Orcott Adjm't
35				
36				
37			Investment (3)	
38	REGRESSION RESULTS		vs Design Day (2)	
39	Slope =		508.91	#REF!
40	Y Intercept =		-106116261	#REF!
41	Coefficient of Determination (R**2)		95.7%	#REF!
42	t value		24.5	#REF!
43	Durbin Watson Statistic		#REF!	#REF!
44	MARGINAL COST ESTIMATES			
45	Trended Cost Per Dt			#REF!
46				
47	Average Cost Per Dt			
48	1976-2004			$457.97
49				
50	**Simplistic marginal cost estimate (30)*(45){2}**			**#REF!**

NOTES:
1 Source: Schedule JLH-3- 2, Page 2.
2 Trend is chosen despite its possible auto-serial correlation.

Schedule JLH-3-3
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Services and Meters Investment

Line No.	Description		<-- Residential -->		<-- Small C&I -->		<-- Medium C&I -->		<-- Large C&I -->		<-- Extra Large C&I -->	
			R3/R4 Heat	R1/R2 NonHt	G50 Lo Winter	G40 Hi Winter	G51 Lo Winter	G41 Hi Winter	G52 Lo Winter	G42 Hi Winter	G53 Lo Winter	G43 Hi Winter
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	**SERVICE COSTS**											
2												
3												
4	Representative Cost	{1}	$1,769	$1,769	$2,529	$2,529	$3,096	$3,096	$10,273	$10,273	$17,882	$17,882
5												
6												
7												
8	Services per Customer Charge	{2}	0.87	0.87	0.87	0.87	0.87	0.87	1.54	1.54	1.54	1.54
9												
10												
11												
12	**Average Service Cost per Customer**		$1,548	$1,548	$2,212	$2,212	$2,708	$2,708	$15,851	$15,851	$27,592	$27,592
13	(4)*(8)											
14												
15												
16	**METER COSTS**											
17	Replacement Cost New (RCN) for Meter, Regulator and Installation											
18												
19												
20	Customers		222,208	33,376	3,326	16,684	1,756	4,683	249	619	67	15
21												
22												
23	Meters per Customer	{3}	1.073	1.128	1.124	1.093	1.143	1.109	1.526	2.283	1.369	5.104
24												
25												
26	Current Unit Cost per Meter	{3}	$268	$263	$687	$458	$1,904	$2,088	$3,508	$2,351	$7,628	$3,109
27												
28												
29												
30	**Avg Meter Cost per Customer**		$287	$297	$772	$500	$2,177	$2,316	$5,353	$5,368	$10,444	$15,870
31	(23)*(26)											

NOTES:
1 Source: Typical service costs derived from engineering estimate for the average costs for new services.
2 Source: Services per customer dervied from 1992 Marginal cost Study for Large and Extra Large classes, the remainder adjusted to account for the total number of services.
3 Source: 2004 Replacement Cost New Analysis.

Schedule JLH-3-4
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Commodity Costs

Line No.	Description	<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter		Total Company
	LOAD WEIGHTED MARGINAL COMMODITY	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1													
2	Winter Marginal Commodity Cost {1}												
3	Total Winter	$9.909	$9.791	$9.798	$9.962	$9.792	$9.934	$9.796	$9.897	$9.841	$9.830		$9.907
4													
5													
6													
7													
8													
9	Summer Marginal Commodity Cost {1}												
10	Total Summer	$7.690	$7.692	$7.691	$7.690	$7.692	$7.690	$7.693	$7.690	$7.690	$7.691		$7.691

NOTES:
1 Source: Schedule JLH-3- 4, Page 3.

Schedule JLH-3-4
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Calendar Sales Data Excluding Transportation for the Test Year

Line	Description	January	February	March	April	May	June	July	August	September	October	November	December	Total	Winter (6)	Summer (6)
1	SALES DATA BY MONTH {1}															
2	R3/R4 Heat	46,287,193	39,547,306	34,360,155	20,598,816	10,172,934	5,953,247	5,296,293	5,297,971	6,100,531	13,002,540	23,492,169	37,594,585	247,703,740	201,880,224	45,823,516
3	R1/R2 NonHt	711,670	624,690	630,069	529,990	471,590	412,402	412,513	412,540	427,769	516,230	572,453	672,342	6,394,258	3,741,214	2,653,044
4	G50 Lo Winter	515,282	454,502	458,448	370,998	357,718	280,042	262,569	273,997	297,972	361,734	368,490	444,452	4,446,204	2,612,172	1,834,032
5	G40 Hi Winter	5,249,954	4,500,696	3,460,826	1,793,588	587,016	289,410	218,941	245,666	313,163	780,194	2,018,855	3,852,901	23,311,210	20,876,820	2,434,390
6	G51 Lo Winter	1,573,316	1,337,421	1,294,426	1,140,036	959,677	865,016	875,764	875,516	910,547	1,115,861	1,277,952	1,493,375	13,718,907	8,116,526	5,602,381
7	G41 Hi Winter	7,979,880	6,985,265	5,860,135	3,207,490	1,257,815	579,484	523,448	464,315	596,432	1,702,902	3,406,616	6,072,697	38,636,479	33,512,083	5,124,396
8	G52 Lo Winter	695,711	564,964	693,462	522,181	429,678	423,373	399,538	581,401	437,425	589,893	581,826	746,439	6,665,891	3,804,583	2,861,308
9	G42 Hi Winter	3,223,246	2,865,142	2,706,359	1,585,628	717,253	333,487	272,789	291,769	403,059	865,611	1,536,441	2,682,904	17,483,688	14,599,720	2,883,968
10	G53 Lo Winter	387,755	273,520	232,277	234,924	184,364	136,053	123,490	130,334	144,532	148,236	494,126	664,386	3,153,997	2,286,988	867,009
11	G43 Hi Winter	860,842	710,357	723,982	484,696	261,790	160,565	168,786	171,458	195,824	344,826	150,414	198,406	4,431,946	3,128,697	1,303,249
12																
13																
14																
15																
16	TOTAL Company	67,484,849	57,863,863	50,420,139	30,468,347	15,399,835	9,433,079	8,554,131	8,744,967	9,827,254	19,428,027	33,899,342	54,422,487	365,946,320	294,559,027	71,387,293
17																
18																
19																
20	CLASS MONTHLY PERCENT															
21	OF ANNUAL TOTAL SALES															
22	R3/R4 Heat (2)/sum(2)	18.6865%	15.9656%	13.8715%	8.3159%	4.1069%	2.4034%	2.1382%	2.1388%	2.4628%	5.2492%	9.4840%	15.1772%	100.0000%	81.5007%	18.4993%
23	R1/R2 NonHt	11.1298%	9.7695%	9.8537%	8.2885%	7.3752%	6.4496%	6.4513%	6.4517%	6.6899%	8.0733%	8.9526%	10.5148%	100.0000%	58.5090%	41.4910%
24	G50 Lo Winter	11.5893%	10.2222%	10.3110%	8.3442%	8.0455%	6.2985%	5.9055%	6.1625%	6.7017%	8.1358%	8.2877%	9.9962%	100.0000%	58.7506%	41.2494%
25	G40 Hi Winter	22.5212%	19.3070%	14.8462%	7.6941%	2.5182%	1.2415%	0.9392%	1.0539%	1.3434%	3.3469%	8.6604%	16.5281%	100.0000%	89.5570%	10.4430%
26	G51 Lo Winter	11.4682%	9.7487%	9.4353%	8.3100%	6.9953%	6.3053%	6.3836%	6.3818%	6.6372%	8.1337%	9.3153%	10.8855%	100.0000%	59.1631%	40.8369%
27	G41 Hi Winter	20.6537%	18.0795%	15.1674%	8.3017%	3.2555%	1.4998%	1.3548%	1.2018%	1.5437%	4.4075%	8.8171%	15.7175%	100.0000%	86.7369%	13.2631%
28	G52 Lo Winter	10.4369%	8.4754%	10.4031%	7.8336%	6.4459%	6.3513%	5.9938%	8.7220%	6.5621%	8.8494%	8.7284%	11.1979%	100.0000%	57.0754%	42.9246%
29	G42 Hi Winter	18.4357%	16.3875%	15.4793%	9.0692%	4.1024%	1.9074%	1.5602%	1.6688%	2.3053%	4.9510%	8.7879%	15.3452%	100.0000%	83.5048%	16.4952%
30	G53 Lo Winter	12.2941%	8.6722%	7.3645%	7.4485%	5.8454%	4.3137%	3.9153%	4.1323%	4.5825%	4.6999%	15.6667%	21.0649%	100.0000%	72.5108%	27.4892%
31	G43 Hi Winter	19.4236%	16.0281%	16.3355%	10.9364%	5.9069%	3.6229%	3.8084%	3.8687%	4.4185%	7.7805%	3.3939%	4.4767%	100.0000%	70.5942%	29.4058%
32																
33																
34																
35																
36	TOTAL Company	18.4412%	15.8121%	13.7780%	8.3259%	4.2082%	2.5777%	2.3375%	2.3897%	2.6854%	5.3090%	9.2635%	14.8717%	100.0000%	80.4924%	19.5076%

NOTES:
1 All sales data shown as weather normalized calendar month data.

Schedule JLH-3-4
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Weighted Average Marginal Commodity Cost

	Total Company		January	February	March	April	May	June	July	August	September	October	November	December	Total	Winter (6)	Summer (6)
1	Monthy Marginal Cost	{1}	10.3018	10.3018	10.1318	7.7753	7.6553	7.6853	7.6953	7.7053	7.7053	7.7053	9.7618	10.0718			
2																	
3		{2}															
4	R3/R4 Heat		1.925	1.645	1.405	0.647	0.314	0.185	0.165	0.165	0.190	0.404	0.926	1.529	$9.499	$9.909	$7.690
5	R1/R2 NonHt		1.147	1.006	0.998	0.644	0.565	0.496	0.496	0.497	0.515	0.622	0.874	1.059	$8.920	$9.791	$7.692
6	G50 Lo Winter		1.194	1.053	1.045	0.649	0.616	0.484	0.454	0.475	0.516	0.627	0.809	1.007	$8.929	$9.798	$7.691
7	G40 Hi Winter		2.320	1.989	1.504	0.598	0.193	0.095	0.072	0.081	0.104	0.258	0.845	1.665	$9.725	$9.962	$7.690
8	G51 Lo Winter		1.181	1.004	0.956	0.646	0.536	0.485	0.491	0.492	0.511	0.627	0.909	1.096	$8.935	$9.792	$7.692
9	G41 Hi Winter		2.128	1.863	1.537	0.645	0.249	0.115	0.104	0.093	0.119	0.340	0.861	1.583	$9.636	$9.934	$7.690
10	G52 Lo Winter		1.075	0.873	1.054	0.609	0.493	0.488	0.461	0.672	0.506	0.682	0.852	1.128	$8.894	$9.796	$7.693
11	G42 Hi Winter		1.899	1.688	1.568	0.705	0.314	0.147	0.120	0.129	0.178	0.381	0.858	1.546	$9.533	$9.897	$7.690
12	G53 Lo Winter		1.267	0.893	0.746	0.579	0.447	0.332	0.301	0.318	0.353	0.362	1.529	2.122	$9.250	$9.841	$7.690
13	G43 Hi Winter		2.001	1.651	1.655	0.850	0.452	0.278	0.293	0.298	0.340	0.600	0.331	0.451	$9.201	$9.830	$7.691
14																	
15																	
16																	
17																	
18	TOTAL Company		1.900	1.629	1.396	0.647	0.322	0.198	0.180	0.184	0.207	0.409	0.904	1.498	$9.474	$9.907	$7.691

NOTES:
1 Source: Schedule JLH-3-4, Page 6
2 Monthly values are computed by multiplying the class percentage of its annual sales taken from Schedule JLH-3- 4, pages 2 and 3, times the month's marginal commodity cost. These values are intermediate results in the computation of load weighted averages. Consequently, only the annual and seasonal totals have a practical interpretation.

Development of Capacity Related Production Expense (Maintenance Expenses)

Line No.	Year	Capacity Related Expenses (Maintenance)	Cost Index GDP-IPD	Expense 2004 Dollars	Design Day Sendout	Average Cost per Des'n Day Dt
	(1)	(2)	(3)	(4)	(5)	(6)
		{1}				
1	1976	598,982	2.6924	$1,612,708	226,225	$7.13
2	1977	738,431	2.5315	1,869,368	221,937	8.42
3	1978	367,059	2.3653	868,191	231,994	3.74
4	1979	450,164	2.1843	983,290	255,527	3.85
5	1980	455,795	2.0026	912,788	251,000	3.64
6	1981	494,143	1.8307	904,607	265,000	3.41
7	1982	432,537	1.7254	746,303	283,000	2.64
8	1983	226,253	1.6597	375,521	261,000	1.44
9	1984	566,320	1.5997	905,931	266,366	3.40
10	1985	557,989	1.5524	866,238	271,605	3.19
11	1986	549,801	1.5190	835,134	292,425	2.86
12	1987	769,160	1.4786	1,137,273	307,637	3.70
13	1988	592,394	1.4298	847,003	317,241	2.67
14	1989	437,708	1.3777	603,021	340,491	1.77
15	1990	636,805	1.3265	844,701	366,674	2.30
16	1991	811,829	1.2816	1,040,479	377,978	2.75
17	1992	644,291	1.2528	807,197	387,149	2.08
18	1993	543,824	1.2246	665,945	405,800	1.64
19	1994	688,268	1.1991	825,285	421,578	1.96
20	1995	589,802	1.1750	693,029	436,181	1.59
21	1996	834,798	1.1532	962,651	453,181	2.12
22	1997	502,971	1.1343	570,516	469,409	1.22
23	1998	466,499	1.1218	523,341	477,243	1.10
24	1999	350,621	1.1058	387,732	434,840	0.89
25	2000	360,430	1.0823	390,081	445,550	0.88
26	2001	359,189	1.0569	379,630	455,990	0.83
27	2002	346,384	1.0397	360,145	465,290	0.77
28	2003	427,780	1.0210	436,774	545,890	0.80
29	2004	411,816	1.0000	411,816	551,630	0.75
30						
31						
32					Unadjusted	With C-O Adjm't
33				Expense (4)	Avg Cost (6)	Avg Cost (6)
34	REGRESSION RESULTS			vs Demand (5)	vs Year (1)	vs Year (1)
35	Slope =			-2.2913	-0.1710	-0.1371
36	Y Intercept =			1,613,566	342.7450	158.5049
37	Coefficent of Determination (R**2)			42.39%	66.40%	35.57%
38	t Value			(4.5)	(7.3)	(3.8)
39	Dubin Watson Statistic				1.33	2.27
40						
41	MARGINAL COST ESTIMATES					
42	Trended Cost Per Dt					$0.54
43						
44	Average Cost Per Dt					
45	1976-2004					$2.17
46	1999-2004					$0.82
47						
48	Last Two Year Average Cost per Dt					$0.77
49						
50	Assumed Marginal Cost			(48) {2}		$0.77
51						
52	Percentatge Related to Transportation				{3}	28.6%
53	**Transportation Related Production Expense**				(50)*(52)	**$0.22**
54						
55	Gas Supply Related Expense (from above)				(50)*[1-(52)]	$0.55
56						
57	Other Gas Supply Related Expense				{4}	4.02
58						
59	**Total Gas Supply Related Expense**				(55) + (57)	**$4.58**

NOTES:
1 Source: Booked maintenance expenses for Manufactured Gas Accounts
2 The weak statistical relationshipis are not confirmed by the average costs shown. Since the slope suggests that there is a declining trend, the short term average is used.
3 Source: Schedule JLH-3-1, page 3.
4 Source: Schedule JLH-3-4, page 5.

Schedule JLH-3-4
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Capacity Related Production Expense (Other Gas Supply,Dispatch and Regulatory Expenses)

Line No.	Year	Total Other Prod'n Expenses Acct 813	Distribution Related Expenses {2} Acct 813	Production Related Expenses Acct 813	Total Sys Control Expenses Acct 851	Distribution Related Expenses {2} Acct 851	Production Related Expenses Acct 851	Total Outside Services Acct 923	Distribution Related Expenses {2} Acct 923	Production Related Expenses Acct 923	Cost Index	Production Expense 2004 Dollars	Production Expense 2005 Dollars	Design Day Sendout
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		{1}	line 15 * col (2)	(2)-(3)		line 15 * col (5)	(5)-(6)		line 15 * col (8	(8)-(9)		(11)*[(4)+(7)+(10)]	(11)*[(3)+(9)]	
1	1976	114,979	0	114,979	350,169	350,169	0	528,326	17,717	29,975	2.6924	$390,278	47,702	226,225
2	1977	80,208	0	80,208	403,802	403,802	0	640,119	21,466	36,318	2.5315	$294,992	54,342	221,937
3	1978	164,795	0	164,795	442,290	442,290	0	518,770	17,397	29,433	2.3653	$459,402	41,148	231,994
4	1979	62,114	0	62,114	433,974	433,974	0	700,421	23,488	39,740	2.1843	$222,479	51,305	255,527
5	1980	167,900	0	167,900	561,287	561,287	0	829,515	27,817	47,064	2.0026	$430,493	55,708	251,000
6	1981	275,013	0	275,013	593,874	593,874	0	656,229	22,006	37,232	1.8307	$571,614	40,286	265,000
7	1982	393,025	0	393,025	671,150	671,150	0	850,176	28,510	48,236	1.7254	$761,356	49,192	283,000
8	1983	1,993,724	0	1,993,724	673,774	673,774	0	543,119	18,213	30,815	1.6597	$3,360,204	30,229	261,000
9	1984	2,387,300	0	2,387,300	714,674	714,674	0	1,364,380	45,754	77,410	1.5997	$3,942,750	73,191	266,366
10	1985	2,830,541	0	2,830,541	760,487	760,487	0	1,066,997	35,781	60,538	1.5524	$4,488,195	55,548	271,605
11	1986	2,293,454	0	2,293,454	590,930	590,930	0	966,757	32,420	54,851	1.5190	$3,567,018	49,245	292,425
12	1987	1,526,657	0	1,526,657	594,774	594,774	0	1,668,153	55,941	94,646	1.4786	$2,397,244	82,713	307,637
13	1988	1,613,352	0	1,613,352	623,209	623,209	0	1,304,078	43,732	73,989	1.4298	$2,412,556	62,527	317,241
14	1989	1,914,829	0	1,914,829	681,843	681,843	0	1,879,476	63,027	106,635	1.3777	$2,784,926	86,831	340,491
15	1990	1,862,217	0	1,862,217	769,736	769,736	0	2,530,491	84,859	143,572	1.3265	$2,660,612	112,562	366,674
16	1991	1,794,161	0	1,794,161	811,527	811,527	0	2,148,488	72,048	121,898	1.2816	$2,455,713	92,341	377,978
17	1992	2,262,438	0	2,262,438	865,630	865,630	0	2,573,962	86,316	146,038	1.2528	$3,017,448	108,141	387,149
18	1993	7,225,905	0	7,225,905	1,005,441	1,005,441	0	4,258,716	142,814	241,625	1.2246	$9,144,442	174,884	405,800
19	1994	15,506,056	0	15,506,056	1,113,707	1,113,707	0	3,761,859	126,152	213,435	1.1991	$18,848,851	151,266	421,578
20	1995	11,666,247	0	11,666,247	1,078,014	1,078,014	0	4,053,451	135,930	229,979	1.1750	$13,978,295	159,721	436,181
21	1996	14,542,745	0	14,542,745	1,170,340	1,170,340	0	2,993,755	100,394	169,856	1.1532	$16,965,894	115,770	453,181
22	1997	11,652,291	0	11,652,291	1,231,802	1,231,802	0	5,043,482	169,131	286,151	1.1343	$13,541,687	191,844	469,409
23	1998	11,368,845	0	11,368,845	1,191,791	1,191,791	0	5,770,341	193,505	327,390	1.1218	$13,121,395	217,084	477,243
24	1999	11,865,028	0	11,865,028	1,162,803	1,162,803	0	5,324,616	178,565	302,113	1.1058	$13,454,937	197,465	434,840
25	2000	9,836,255	0	9,836,255	1,042,709	1,042,709	0	8,781,866	294,495	498,254	1.0823	$11,184,692	318,722	445,550
26	2001	10,930,713	0	10,930,713	610,374	610,374	0	20,625,960	691,681	1,170,249	1.0569	$12,789,614	731,044	455,990
27	2002	562,252	0	562,252	9,219	9,219	0	30,827,924	1,033,799	1,749,075	1.0397	$2,403,149	1,074,868	465,290
28	2003	530,993	0	530,993	0	0	0	27,975,533	938,145	1,587,240	1.0210	$2,162,763	957,867	545,890
29	2004	762,691	0	762,691	0	0	0	26,291,692	881,678	1,491,704	1.0000	$2,254,395	881,678	551,630
30														
31	Percentage in Year 2004: {2}		0.0%			100.0%			3.4%	5.7%				
32			line 13 col 3/col 2			line 13 col 6/col 5			line 29 col 9/col 8	line 29 col 10/col 8				
33														
34														
35												Expense (12)	Expense (13)	
36	REGRESSION RESULTS											vs Demand (14)	vs Demand (14)	
37	Slope =											0.0101	0.2429	
38	Y Intercept =											304,550.27	309,110.87	
39	Coefficent of Determination (R**2)											34.2%	51.4%	
40	t Value											3.7	5.3	
41														
42	MARGINAL COST ESTIMATES											Invalid	Invalid	
43	Trended Cost Per Dt													
44														
45	Average Cost Per Dt													
46	1976-2004											$15.65	$0.60	
47	1999-2004											$15.26	$1.44	
48														
49	Last Two Years' Average Cost per Dt											$4.02	$1.68	
50														
51														
52	**Distribution Related Expense**									(49) {3}			**$1.68**	
53	**Gas Supply Related Expense**									(49) {3}		**$4.02**		

NOTI Source: Booked Other Gas Supply Expense for Account 813
1 Distribution related expenses from the Accounting Cost Study for the test year are shown on line 13, Column (3) for Account 813; Column (6) for Account 851; Column (9) for Account 923.
2 All earlier year distribution related expenses are calculated using the percentage shown on line 15.
3 Since the merger with NiSource, Bay State's costs for many of these services have shifted from direct costs booked against the production and distribution accounts to the service company. The service company charges are recorded as an Outside Service in account 923. Marginal costs are estimated using an average of the experience for the last two years.

Schedule JLH-3-4
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Marginal Commodity Cost {1}

Line		2005	2006	JAN 2006	FEB 2006	MARCH 2006	APRIL 2006	MAY 2006	JUNE 2006	JULY 2006	AUG 2006	SEPT 2006	OCT 2006	NOV 2005	DEC 2005
1															
2	NYMEX Strip Price {1}		$	$ 8.390	$ 8.390	$ 8.220	$ 7.070	$ 6.950	$ 6.980	$ 6.990	$ 7.000	$ 7.000	$ 7.000	$ 7.850	$ 8.160
3															
4	Basis {2}														
5	Winter	$	1.2000												
6	Summer	$	0.2000												
7															
8															
9	Fuel Use {3}														
10	Winter		7.82%												
11	Summer		6.67%												
12															
13															
14	Total Basis Adder														
15	Winter (5)+(2)/[1-(10)]-(2)			$1.912	$1.912	$1.912								$1.912	$1.912
16	Summer (6)+(2)/[1-(11)]-(2)						$0.705	$0.705	$0.705	$0.705	$0.705	$0.705	$0.705		
17															
18	Marginal Unit {3}			$10.302	$10.302	$10.132	$7.775	$7.655	$7.685	$7.695	$7.705	$7.705	$7.705	$9.762	$10.072
19	Commodity Cost (2)+(15)+(16)														
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32															
33	Marginal Unit														
34	Commodity Cost (18)			$10.3018	$10.3018	$10.1318	$7.7753	$7.6553	$7.6853	$7.6953	$7.7053	$7.7053	$7.7053	$9.7618	$10.0718

NOTES:
1 All gas prices are in 2005 dollars, based on NYMEX strip prices as of 3/23/05.
2 Approximate difference in price at the the Tennessee Zone 6 basis compared to the Nymex Henry Hub Price.
3 Current pipeline fuel use factors.

Schedule JLH-3-5
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Capacity Related Expense - T & D

Line No.	Year	Capacity Related Expenses	Cost Index	Expense 2004 Dollars	Design Day Sendout	Avg Cost Per Des'n Day Dt
	(1)	(2)	(3)	(4)	(5)	(6)
		{1}	{2}			
1	1976	2,698,853	2.6924	$7,266,430	226,225	$32.12
2	1977	3,350,705	2.5315	8,482,448	221,937	38.22
3	1978	3,268,494	2.3653	7,730,844	231,994	33.32
4	1979	2,789,093	2.1843	6,092,196	255,527	23.84
5	1980	3,422,989	2.0026	6,854,979	251,000	27.31
6	1981	3,742,969	1.8307	6,852,095	265,000	25.86
7	1982	3,850,107	1.7254	6,643,007	283,000	23.47
8	1983	3,278,023	1.6597	5,440,661	261,000	20.85
9	1984	3,505,895	1.5997	5,608,312	266,366	21.05
10	1985	4,628,646	1.5524	7,185,645	271,605	26.46
11	1986	3,884,888	1.5190	5,901,049	292,425	20.18
12	1987	4,048,142	1.4786	5,985,548	307,637	19.46
13	1988	4,585,760	1.4298	6,556,706	317,241	20.67
14	1989	4,856,582	1.3777	6,690,804	340,491	19.65
15	1990	5,040,581	1.3265	6,686,164	366,674	18.23
16	1991	4,572,416	1.2816	5,860,228	377,978	15.50
17	1992	4,123,253	1.2528	5,165,797	387,149	13.34
18	1993	4,232,911	1.2246	5,183,455	405,800	12.77
19	1994	4,915,552	1.1991	5,894,116	421,578	13.98
20	1995	6,293,539	1.1750	7,395,029	436,181	16.95
21	1996	6,999,186	1.1532	8,071,139	453,181	17.81
22	1997	6,245,956	1.1343	7,084,742	469,409	15.09
23	1998	6,013,217	1.1218	6,745,913	477,243	14.14
24	1999	6,747,877	1.1058	7,462,087	434,840	17.16
25	2000	6,840,771	1.0823	7,403,537	445,550	16.62
26	2001	6,130,803	1.0569	6,479,700	455,990	14.21
27	2002	5,225,882	1.0397	5,433,491	465,290	11.68
28	2003	6,099,172	1.0210	6,227,392	545,890	11.41
29	2004	6,285,609	1.0000	6,285,609	551,630	11.39
30						
31						
32						Unadjusted
33					Expense (4)	Avg Cost (6)
34	**REGRESSION RESULTS**				vs Demand (5)	vs Year (1)
35	Slope =				-1.0126	(0.71)
36	Y Intercept =				6940951	1,427
37	Coefficent of Determination (R**2)				1.4%	77.3%
38	t Statistic				-0.62	-9.59
39	Durbin Watson Statistic					0.99
40	**MARGINAL COST ESTIMATES**					
41	Trended Cost Per Dt				($1.01)	$9.85
42						
43	Average Cost Per Dt					
44	1976-2004					$18.18
45	1999-2004					$16.08
46						
47	Two Year Average Cost per Dt					$11.40
48						
49						
50	**Assumed Marginal Cost {3}**				(41)	**$10.57**

NOTES:
1 Source: Schedule JLH-3- 5, Page 2.
2 Source: GDP Implicit Price Deflator.
3 While there is no direct correlation between expense and load growth, the unit costs demonstrate a statistically reliable declining trend.

Schedule JLH-3-5
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Operations Expense Data - T&D {1}

Line No.	Acct No.	Description	Reference or Notes	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
		OPERATIONS EXPENSE		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	850	SUPER & ENGINEERING	{2}	290,480	316,843	347,591	451,165	448,317	486,107	518,651	456,804	502,341	564,203
2	851	SYSTEM CONTROL&LOAD DIS	Capacity	350,169	403,802	442,290	433,974	561,287	593,874	671,150	673,774	714,674	760,487
3	852	COMMUNICATIONS EXP	{3}	285,418	352,459	371,809	444,008	517,733	544,967	534,405	540,862	508,690	611,531
4	853	COMPRESSOR STATION LABOR	Capacity	0	0	0	0	0	0	0	0	0	0
5	857	MEAS & REG STA EQUIP	Capacity	0	0	0	0	0	0	0	0	0	0
6	874	MAINS & SERVICE EXPENSE	{3}	86,753	98,821	89,778	126,935	102,937	146,340	189,333	225,234	206,276	226,442
7	878	METER&HOUSE REG EXP	Customer	481,671	525,900	701,270	979,717	983,251	1,154,689	1,046,681	1,139,982	1,258,903	1,164,638
8	879	CUSTOMER INSTALL EXP	Customer	1,072,238	1,160,422	1,320,225	1,374,692	1,559,098	1,669,347	1,552,735	1,718,765	1,977,620	2,056,003
9	880	OTHER EXPENSES	{2}	1,491,756	1,580,058	1,402,057	710,112	951,079	501,655	420,315	496,515	625,783	913,074
10	881	RENTS	{2}	375,956	462,394	507,997	712,322	674,347	701,931	610,330	598,233	792,299	773,943
11		Total Operation Expense	sum (1) thru (11)	4,434,441	4,900,698	5,183,017	5,232,925	5,798,049	5,798,910	5,543,601	5,850,168	6,586,587	7,070,319
12													
13		**MAINTENANCE**											
14	855	MAINT SUPERVISION & ENGINE	{2}	18,355	31,368	35,569	37,633	60,952	88,662	73,458	40,293	40,419	49,501
15	886	MAINT STRUCT & IMPROVE	Capacity	86,499	68,119	46,037	37,326	112,897	32,589	30,751	14,795	5,070	12,774
16	887	MAINT OF MAINS	Capacity	1,102,439	1,463,734	1,475,663	1,237,208	1,513,094	1,935,485	1,962,556	1,435,068	1,595,993	2,301,696
17	888	MAINTENANCE OF COMPRESSC	Capacity	0	0	0	0	0	0	0	0	0	0
18	889	MAINT OF MEAS&REG STA EQ	Capacity	32,790	65,123	72,505	64,849	72,165	66,649	70,504	80,205	87,060	133,648
19	892	MAINT OF SERVICES	Customer	925,043	1,001,177	1,174,745	1,652,908	1,812,342	1,780,826	1,587,307	1,266,502	1,540,916	1,818,129
20	893	MAINT METER & HOUSE REG	Customer	158,572	174,290	162,661	173,710	248,499	302,032	279,972	285,836	330,734	306,994
21	894	MAINT OF OTHER EQUIPT	{4}	80,332	99,746	142,271	173,321	315,491	357,951	435,314	303,979	683,551	428,002
22		Total Maintenance Expense	Sum (14) thru (21)	2,404,030	2,903,556	3,109,451	3,376,955	4,135,440	4,564,195	4,439,863	3,426,680	4,283,744	5,050,744
23		**TOTAL T & D EXPENSE**	(12)+(22)	6,838,471	7,804,254	8,292,468	8,609,880	9,933,489	10,363,105	9,983,464	9,276,848	10,870,331	12,121,064
24													
25		Subtotals by category	{2}	2,176,547	2,390,662	2,293,214	1,911,232	2,134,695	1,778,354	1,622,754	1,591,844	1,960,843	2,300,720
26		(lines 1-11 and 14-21)	{3}	372,171	451,280	461,587	570,943	620,670	691,307	723,738	766,096	714,966	837,973
27			capacity	1,571,897	2,000,777	2,036,495	1,773,356	2,259,442	2,628,598	2,734,962	2,203,843	2,402,798	3,208,606
28			customer	2,637,524	2,861,788	3,358,901	4,181,027	4,603,190	4,906,895	4,466,696	4,411,086	5,108,173	5,345,763
29													
30		**Allocation of Dist Lines to Customer Component**		372,171									
31		Mains Investment	Schedule JLH-3-2, Page	76,414,980	79,465,232	83,297,494	88,635,549	93,270,684	96,191,023	98,693,273	101,536,011	105,996,052	110,878,560
32		Services Investment	Schedule JLH-3-2, Page	29,715,914	31,383,947	33,880,823	38,960,299	42,002,575	44,675,298	47,277,204	50,481,221	55,010,292	60,716,239
33		Services/(Services+Mains)	(31)/[(30)+(31)]	28%	28%	29%	31%	31%	32%	32%	33%	34%	35%
34		Customer-related Dist Lines Expense	858	104,205	127,768	133,463	174,333	192,719	219,246	234,406	254,402	244,279	296,504
35		Capacity-related Dist Lines Expense	(7)-(35)	267,966	323,513	328,124	396,610	427,951	472,061	489,333	511,694	470,687	541,469
36		**Customer & Capacity Related Allocation of Superintendence and Other Expense**											
37		Cust %	[(28)+(34)]/[(23)-(25)]	59%	55%	58%	65%	61%	60%	56%	61%	60%	57%
38		Customer Super & Other	(37)*(25)	1,280,051	1,320,199	1,334,956	1,242,654	1,312,742	1,061,894	912,450	966,392	1,177,993	1,321,876
39		Cap %	[(27)+(35)]/[(23)-(25)]	39%	43%	39%	32%	34%	36%	39%	35%	32%	38%
40		Capacity Superintendance & Other	(38)*(25)	858,990	1,026,415	903,875	619,126	735,596	642,310	625,812	562,486	632,410	878,571
41													
42		Total Customer - Related	(28)+(34)+38)	4,021,781	4,309,755	4,827,320	5,598,014	6,108,651	6,188,034	5,613,552	5,631,880	6,530,445	6,964,143
43													
44		Total Capacity - Related Expenses	(27)+(35)+(40)	2,698,853	3,350,705	3,268,494	2,789,093	3,422,989	3,742,969	3,850,107	3,278,023	3,505,895	4,628,646
45													
46		Non-Marginal Expenses	(37)-(41)-(43)	117,837	143,793	196,654	222,772	401,848	432,101	519,805	366,945	833,991	528,274

NOTES:

1 Source: Annual Reports except Account 851 where production related costs have been removed - see Schedule JLH-3-4, page 5, column 7.
2 Costs in these accounts are joint between customer and capacity components.
Individual component costs are computed by allocating on remaining expenses (superindendance and other expenses).
3 Costs in these accounts are joint between customer and capacity components.
Individual component costs are computed by allocating on plant investment in mains and services.
4 Costs in these accounts are not marginal.

Schedule JLH-3-5
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Operations Expense Data - T&D {1}

Line No.	Acct No.	Description	Reference or Notes	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		OPERATIONS EXPENSE		(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1	850	SUPER & ENGINEERING	{2}	577,681	623,522	729,205	517,146	690,572	777,664	799,205	760,808	708,997	679,596
2	851	SYSTEM CONTROL&LOAD DIS	Capacity	590,930	594,774	623,209	681,843	769,736	811,527	865,630	1,005,441	1,113,707	1,078,014
3	852	COMMUNICATIONS EXP	{3}	686,770	806,276	884,006	850,893	679,974	651,031	703,677	634,702	629,614	710,542
4	853	COMPRESSOR STATION LABOF	Capacity	0	0	0	0	0	0	0	0	0	0
5	857	MEAS & REG STA EQUIP	Capacity	0	0	0	0	0	0	0	0	0	0
6	874	MAINS & SERVICE EXPENSE	{3}	193,150	210,967	213,046	366,201	284,726	282,779	449,495	443,834	450,969	418,404
7	878	METER&HOUSE REG EXP	Customer	1,346,494	1,511,483	1,657,059	1,837,035	2,083,286	2,117,000	2,348,125	2,202,737	2,472,763	2,210,892
8	879	CUSTOMER INSTALL EXP	Customer	2,119,219	2,498,596	2,820,232	3,533,366	3,630,366	2,596,386	2,867,584	2,821,663	2,884,633	2,894,148
9	880	OTHER EXPENSES	{2}	307,775	173,310	490,505	(78,660)	108,062	463,837	500,190	653,765	750,395	5,164,894
10	881	RENTS	{2}	861,790	971,067	567,206	571,747	473,155	319,972	519,945	504,330	664,622	723,941
11	Total Operation Expense		sum (1) thru (11)	6,683,809	7,389,995	7,984,467	8,279,571	8,719,877	8,020,195	9,053,851	9,027,280	9,675,700	13,880,431
12													
13	**MAINTENANCE**												
14	855	MAINT SUPERVISION & ENGINE	{2}	46,636	37,668	36,545	25,228	19,590	3,542	248	1,084	1,026	345
15	886	MAINT STRUCT & IMPROVE	Capacity	13,601	9,789	15,319	15,152	14,962	19,853	21,927	23,312	16,043	21,814
16	887	MAINT OF MAINS	Capacity	1,974,852	2,049,961	2,516,658	2,927,494	3,091,190	2,486,047	1,835,996	1,779,695	2,220,755	2,119,598
17	888	MAINTENANCE OF COMPRESSC	Capacity	0	0	0	0	0	0	0	0	0	0
18	889	MAINT OF MEAS&REG STA EQ	Capacity	125,706	172,471	164,183	148,443	170,616	183,970	190,422	173,111	206,294	199,445
19	892	MAINT OF SERVICES	Customer	1,548,565	1,808,181	1,941,065	1,743,449	2,071,505	1,731,957	1,481,295	1,516,117	1,444,338	1,391,328
20	893	MAINT METER & HOUSE REG	Customer	306,940	358,898	288,769	251,057	302,939	334,423	399,772	255,729	319,007	304,331
21	894	MAINT OF OTHER EQUIPT	{4}	459,676	512,017	1,028,775	788,546	872,266	775,809	833,398	827,048	935,655	943,926
22	Total Maintenance Expense		Sum (14) thru (21)	4,475,974	4,948,985	5,991,314	5,899,367	6,543,068	5,535,602	4,763,058	4,576,096	5,143,119	4,980,787
23	**TOTAL T & D EXPENSE**		(12)+(22)	11,159,784	12,338,980	13,975,781	14,178,938	15,262,945	13,555,797	13,816,909	13,603,375	14,818,819	18,861,218
24													
25	Subtotals by category		{2}	1,793,881	1,805,567	1,823,461	1,035,461	1,291,379	1,565,015	1,819,588	1,919,987	2,125,040	6,568,776
26	(lines 1-11 and 14-21)		{3}	879,920	1,017,243	1,097,052	1,217,094	964,700	933,810	1,153,172	1,078,535	1,080,582	1,128,947
27			**capacity**	2,705,089	2,826,995	3,319,370	3,772,931	4,046,504	3,501,398	2,913,975	2,981,559	3,556,800	3,418,872
28			**customer**	5,321,218	6,177,158	6,707,125	7,364,906	8,088,096	6,779,766	7,096,775	6,796,246	7,120,742	6,800,698
29													
30	**Allocation of Dist Lines to Customer Component**												
31	Mains Investment		Schedule JLH-3-2, Page	116,750,717	124,052,027	132,885,285	140,175,869	148,335,840	157,817,818	166,024,437	195,530,271	208,955,287	219,451,772
32	Services Investment		Schedule JLH-3-2, Page	68,243,454	76,639,495	85,327,340	93,858,420	103,777,878	113,518,150	121,326,675	126,966,815	136,371,164	143,379,113
33	Services/(Services+Mains)		(31)/[(30)+(31)]	37%	38%	39%	40%	41%	42%	42%	39%	39%	40%
34	Customer-related Dist Lines Expense		858	324,598	388,462	428,978	488,110	397,101	390,676	486,898	424,618	426,727	446,123
35	Capacity-related Dist Lines Expense		(7)-(35)	555,322	628,781	668,073	728,984	567,599	543,134	666,275	653,917	653,855	682,823
36	**Customer & Capacity Related Allocation of Superintendence**												
37	Cust %		[(28)+(34)]/[(23)-(25)]	60%	62%	59%	60%	61%	60%	63%	62%	59%	59%
38	Customer Super & Other		(37)*(25)	1,081,361	1,125,435	1,070,775	618,671	784,279	935,873	1,150,187	1,186,639	1,263,507	3,872,522
39	Cap %		[(27)+(35)]/[(23)-(25)]	35%	33%	33%	34%	33%	34%	30%	31%	33%	33%
40	Capacity Superintendance & Other		(38)*(25)	624,477	592,366	598,317	354,667	426,477	527,885	543,003	597,435	704,897	2,191,844
41													
42	Total Customer - Related		(28)+(34)+38)	6,727,177	7,691,054	8,206,878	8,471,688	9,269,475	8,106,314	8,733,860	8,407,504	8,810,976	11,119,343
43													
44	Total Capacity - Related Expenses		(27)+(35)+(40)	3,884,888	4,048,142	4,585,760	4,856,582	5,040,581	4,572,416	4,123,253	4,232,911	4,915,552	6,293,539
45													
46	Non-Marginal Expenses		(37)-(41)-(43)	547,719	599,784	1,183,143	850,668	952,889	877,066	959,797	962,960	1,092,291	1,448,336

NOTES:
1 Source: Annual Reports except Account 851 where production re
2 Costs in these accounts are joint between customer and capacity
Individual component costs are computed by allocating on remain
3 Costs in these accounts are joint between customer and capacity
Individual component costs are computed by allocating on plant ir
4 Costs in these accounts are not marginal.

Schedule JLH-3-5
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Operations Expense Data - T&D {1}

Line No.	Acct No.	Description	Reference or Notes	1996	1997	1998	1999	2000	2001	2002	2003	2004
		OPERATIONS EXPENSE		(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
1	850	SUPER & ENGINEERING	{2}	808,708	521,198	536,044	524,966	466,272	370,108	299,173	682,411	707,572
2	851	SYSTEM CONTROL&LOAD DIS	Capacity	1,170,340	1,231,802	1,191,791	1,162,803	1,042,709	610,374	9,219	0	0
3	852	COMMUNICATIONS EXP	{3}	607,943	203,522	224,487	198,748	269,659	214,798	163,723	136,649	143,882
4	853	COMPRESSOR STATION LABOF	Capacity	0	0	0	0	0	0	0	0	0
5	857	MEAS & REG STA EQUIP	Capacity	0	0	0	0	0	0	0	0	0
6	874	MAINS & SERVICE EXPENSE	{3}	497,753	468,112	469,074	458,035	420,883	384,785	343,616	304,928	405,485
7	878	METER&HOUSE REG EXP	Customer	2,573,208	1,939,345	2,867,048	3,004,895	3,414,660	3,059,735	2,610,799	3,157,196	3,764,532
8	879	CUSTOMER INSTALL EXP	Customer	3,037,321	3,214,004	4,772,329	4,850,467	4,163,267	4,521,599	5,039,712	4,814,133	5,633,560
9	880	OTHER EXPENSES	{2}	5,502,468	4,636,517	5,085,745	5,426,819	6,171,366	5,711,597	5,682,340	5,608,747	5,923,626
10	881	RENTS	{2}	926,522	859,846	742,161	770,119	818,542	482,708	352,496	587,353	580,567
11		Total Operation Expense	sum (1) thru (11)	15,124,263	13,074,348	15,888,678	16,396,851	16,767,357	15,355,705	14,501,076	15,291,417	17,159,225
12												
13		**MAINTENANCE**										
14	855	MAINT SUPERVISION & ENGINE	{2}	147	268	453	1,553	656	273	4,736	38	4,267
15	886	MAINT STRUCT & IMPROVE	Capacity	30,779	38,782	38,251	48,995	47,997	66,013	39,815	45,636	41,025
16	887	MAINT OF MAINS	Capacity	2,498,723	2,428,882	2,452,781	2,996,956	2,874,438	2,997,398	3,090,578	3,634,701	3,789,693
17	888	MAINTENANCE OF COMPRESSC	Capacity	0	0	0	0	0	0	0	0	0
18	889	MAINT OF MEAS&REG STA EQ	Capacity	229,639	149,797	176,815	174,692	174,151	175,621	163,494	223,513	229,637
19	892	MAINT OF SERVICES	Customer	1,762,567	1,589,598	1,540,187	1,619,293	1,115,856	1,292,009	1,520,433	1,506,353	1,687,229
20	893	MAINT METER & HOUSE REG	Customer	416,006	606,797	1,133,248	1,049,522	532,123	459,233	551,074	483,020	436,322
21	894	MAINT OF OTHER EQUIPT	{4}	1,000,266	947,830	758,180	684,641	712,634	499,382	477,228	433,622	403,627
22		Total Maintenance Expense	Sum (14) thru (21)	5,938,126	5,761,953	6,099,914	6,575,652	5,457,856	5,489,928	5,847,357	6,326,883	6,591,799
23		**TOTAL T & D EXPENSE**	(12)+(22)	21,062,389	18,836,301	21,988,593	22,972,503	22,225,213	20,845,633	20,348,433	21,618,300	23,751,024
24												
25		Subtotals by category	{2}	7,237,846	6,017,830	6,364,403	6,723,457	7,456,836	6,564,687	6,338,744	6,878,549	7,216,032
26		(lines 1-11 and 14-21)	{3}	1,105,696	671,635	693,561	656,783	690,541	599,584	507,338	441,577	549,367
27			**capacity**	3,929,480	3,849,263	3,859,637	4,383,446	4,139,295	3,849,405	3,303,106	3,903,850	4,060,355
28			**customer**	7,789,102	7,349,744	10,312,811	10,524,177	9,225,905	9,332,575	9,722,017	9,960,702	11,521,643
29												
30		**Allocation of Dist Lines to Customer Component**										
31		Mains Investment	Schedule JLH-3-2, Page	228,525,905	236,736,592	248,208,062	257,592,946	266,727,243	277,197,784	287,767,030	295,736,340	308,733,201
32		Services Investment	Schedule JLH-3-2, Page	151,720,591	159,543,479	168,505,676	176,763,199	186,585,281	196,732,568	207,365,505	217,033,295	228,746,363
33		Services/(Services+Mains)	(31)/[(30)+(31)]	40%	40%	40%	41%	41%	42%	42%	42%	43%
34		Customer-related Dist Lines Expense	858	441,179	270,402	280,454	267,281	284,230	248,892	212,477	186,901	233,806
35		Capacity-related Dist Lines Expense	(7)-(35)	664,517	401,233	413,107	389,502	406,312	350,691	294,861	254,676	315,562
36		**Customer & Capacity Related Allocation of Superintendence**										
37		Cust %	[(28)+(34)]/[(23)-(25)]	60%	59%	68%	66%	64%	67%	71%	69%	71%
38		Customer Super & Other	(37)*(25)	4,308,967	3,577,395	4,315,092	4,465,241	4,801,849	4,404,423	4,494,905	4,735,547	5,130,193
39		Cap %	[(27)+(35)]/[(23)-(25)]	33%	33%	27%	29%	31%	29%	26%	28%	26%
40		Capacity Superintendance & Other	(38)*(25)	2,405,189	1,995,461	1,740,472	1,974,929	2,295,164	1,930,707	1,627,915	1,940,645	1,909,693
41												
42		Total Customer - Related	(28)+(34)+38)	12,539,248	11,197,541	14,908,357	15,256,698	14,311,984	13,985,891	14,429,400	14,883,149	16,885,641
43												
44		Total Capacity - Related Expenses	(27)+(35)+(40)	6,999,186	6,245,956	6,013,217	6,747,877	6,840,771	6,130,803	5,225,882	6,099,172	6,285,609
45												
46		Non-Marginal Expenses	(37)-(41)-(43)	1,523,955	1,392,804	1,067,019	967,928	1,072,457	728,939	693,151	635,979	579,773

NOTES:
1 Source: Annual Reports except Account 851 where production re
2 Costs in these accounts are joint between customer and capacity
Individual component costs are computed by allocating on remain
3 Costs in these accounts are joint between customer and capacity
Individual component costs are computed by allocating on plant ir
4 Costs in these accounts are not marginal.

Schedule JLH-3-6
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Customer-Related Plant Expense

Line No.	Year	Services and Meters Expenses	Mains Customer Related Expenses	Total Customer Related Expenses	Cost Index	Expense 2004 Dollars	Annual Customers	Average Cost per Customer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		{1}		(2)+(3)	{2}	(4)*(5)		(6)/(7)
1	1976	4,021,781	0	4,021,781	2.6924	10,828,301	184,779	$58.60
2	1977	4,309,755	0	4,309,755	2.5315	10,910,322	184,321	$59.19
3	1978	4,827,320	0	4,827,320	2.3653	11,417,876	185,232	$61.64
4	1979	5,598,014	0	5,598,014	2.1843	12,227,701	189,091	$64.67
5	1980	6,108,651	0	6,108,651	2.0026	12,233,364	192,620	$63.51
6	1981	6,188,034	0	6,188,034	1.8307	11,328,172	194,544	$58.23
7	1982	5,613,552	0	5,613,552	1.7254	9,685,672	195,276	$49.60
8	1983	5,631,880	0	5,631,880	1.6597	9,347,447	197,836	$47.25
9	1984	6,530,445	0	6,530,445	1.5997	10,446,628	195,276	$53.50
10	1985	6,964,143	0	6,964,143	1.5524	10,811,339	202,626	$53.36
11	1986	6,727,177	0	6,727,177	1.5190	10,218,418	207,842	$49.16
12	1987	7,691,054	0	7,691,054	1.4786	11,371,926	213,657	$53.23
13	1988	8,206,878	0	8,206,878	1.4298	11,734,170	219,556	$53.44
14	1989	8,471,688	0	8,471,688	1.3777	11,671,254	230,551	$50.62
15	1990	9,269,475	0	9,269,475	1.3265	12,295,652	255,326	$48.16
16	1991	8,106,314	0	8,106,314	1.2816	10,389,441	241,232	$43.07
17	1992	8,733,860	0	8,733,860	1.2528	10,942,173	245,550	$44.56
18	1993	8,407,504	0	8,407,504	1.2246	10,295,497	248,710	$41.40
19	1994	8,810,976	0	8,810,976	1.1991	10,565,022	252,841	$41.79
20	1995	11,119,343	0	11,119,343	1.1750	13,065,442	257,364	$50.77
21	1996	12,539,248	0	12,539,248	1.1532	14,459,684	261,170	$55.37
22	1997	11,197,541	0	11,197,541	1.1343	12,701,288	265,545	$47.83
23	1998	14,908,357	0	14,908,357	1.1218	16,724,906	265,545	$62.98
24	1999	15,256,698	0	15,256,698	1.1058	16,871,501	272,086	$62.01
25	2000	14,311,984	0	14,311,984	1.0823	15,489,381	273,808	$56.57
26	2001	13,985,891	0	13,985,891	1.0569	14,781,812	276,749	$53.41
27	2002	14,429,400	0	14,429,400	1.0397	15,002,638	279,495	$53.68
28	2003	14,883,149	0	14,883,149	1.0210	15,196,032	281,227	$54.03
29	2004	16,885,641	0	16,885,641	1.0000	16,885,641	283,032	$59.66
30								
31					Unadjusted	With C-O Adjm't		
32					Expense (6)	Expense (6)		Unit Cost (8)
33	REGRESSION RESULTS				vs Customers (7	vs Customers (7)		vs Year (1)
34	Slope =				47.5107	53.9979		-0.1418
35	Y Intercept =				1347044	-55615		336
36	Coefficent of Determination (R**2)				55.1%	28.6%		3.4%
37	t Value				5.76	3.23		-0.97
38	Durbin Watson Statistic				0.67	1.79		
39								
40	MARGINAL COST ESTIMATES							
41	Trended Cost Per Customer					$54.00		Invalid
42								
43	Average Cost Per Customer:							
44	1976-2004					$53.30		
45	1999-2004					$56.55		
46								
47	Last Two Year Average Cost per Customer					$56.85		
48								
49								
50	**Assumed Marginal Cost**	**{3}**				**$56.85**		

NOTES:
1 Source: Schedule JLH-3- 5, Page 2.
2 Source: GDP Implicit Price Deflator.
3 Recent experience departs from the weak historical trend. The average of the last two years is employed as the marginal cost estimate.

Schedule JLH-3-6
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Class Weighted Customer Plant Related Expense

{1} Estimated Marginal Cost Per Customer ($/customer/year)

Line No.	Customer Groups	Number of Customers	Service & Meter Cost Assigned	Marginal Investment	Relative Weight Per Cust	Co Avg Marginal Cost per Cust	Marginal Costs Per Cust
		—— Customer Weightings ——			------ Customer Weightings ------		
	(1)	(2) {1}	(3) {2}	(4)= (2)*(3)	(5)=(3)/line (17) {3}	(6) {4}	(7)= (5)*(6)
1	R3/R4 Heat	222,208	1,835	407,710,873	0.898	$56.85	$51.05
2	R1/R2 NonHt	33,376	1,845	61,562,806	0.903	56.85	51.32
3	G50 Lo Winter	3,326	2,985	9,926,189	1.461	56.85	83.04
4	G40 Hi Winter	16,684	2,713	45,260,224	1.328	56.85	75.48
5	G51 Lo Winter	1,756	4,886	8,579,727	2.391	56.85	135.94
6	G41 Hi Winter	4,683	5,024	23,527,085	2.459	56.85	139.78
7	G52 Lo Winter	249	21,204	5,281,584	10.378	56.85	589.97
8	G42 Hi Winter	619	21,219	13,141,726	10.385	56.85	590.39
9	G53 Lo Winter	67	38,036	2,532,555	18.616	56.85	1,058.28
10	G43 Hi Winter	15	43,462	655,549	21.272	56.85	1,209.25
11							
12							
13							
14							
15	Total	282,983	143,208	578,178,318	1.000	$56.85	**$56.85**
16							
17	Avg Cost per cust		$2,043.16				

NOTES:
1 Source: Company billing records
2 Source: Schedule JLH-3-3, Page 1, Line 12 + Line 30.
3 Relative weights based on System average = 1.00.
4 Source: Schedule JLH-3-6, Page 1.

Schedule JLH-3-6
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Customer Accounting & Marketing Expense

Line No.	Year	Customer Accounting Expenses W/O Acct 904	Marketing Services Expenses	Total Customer Related Expenses	Cost Index	Expense in 2004 Dollars	Annual Customers	Average Cost per Customer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		{1}	{1}	(2)+(3)	{2}	(4)*(5)		(6)/(7)
1	1976	3,065,522	1,245,659	4,311,181	2.6924	$11,607,484	184,779	62.82
2	1977	3,309,072	1,366,663	4,675,735	2.5315	11,836,814	184,321	64.22
3	1978	3,567,096	1,442,790	5,009,885	2.3653	11,849,691	185,232	63.97
4	1979	3,862,107	1,740,319	5,602,426	2.1843	12,237,338	189,091	64.72
5	1980	4,558,063	1,615,835	6,173,898	2.0026	12,364,030	192,620	64.19
6	1981	5,231,174	2,238,404	7,469,578	1.8307	13,674,240	194,544	70.29
7	1982	5,773,060	1,938,067	7,711,127	1.7254	13,304,846	195,276	68.13
8	1983	5,891,221	1,820,697	7,711,918	1.6597	12,799,767	197,836	64.70
9	1984	6,071,845	1,770,256	7,842,100	1.5997	12,544,856	195,276	64.24
10	1985	6,135,284	2,042,492	8,177,776	1.5524	12,695,417	202,626	62.65
11	1986	6,095,185	2,455,613	8,550,798	1.5190	12,988,453	207,842	62.49
12	1987	6,440,067	2,460,901	8,900,968	1.4786	13,160,894	213,657	61.60
13	1988	6,839,654	1,965,622	8,805,276	1.4298	12,589,758	219,556	57.34
14	1989	6,600,141	2,125,136	8,725,277	1.3777	12,020,619	230,551	52.14
15	1990	7,329,769	2,341,384	9,671,153	1.3265	12,828,464	255,326	50.24
16	1991	7,551,963	3,108,823	10,660,786	1.2816	13,663,374	241,232	56.64
17	1992	7,900,291	3,081,596	10,981,887	1.2528	13,758,603	245,550	56.03
18	1993	7,552,263	3,153,151	10,705,414	1.2246	13,109,426	248,710	52.71
19	1994	8,351,226	3,356,690	11,707,916	1.1991	14,038,671	252,841	55.52
20	1995	8,426,307	3,528,350	11,954,657	1.1750	14,046,952	257,364	54.58
21	1996	8,194,027	3,685,520	11,879,547	1.1532	13,698,947	261,170	52.45
22	1997	7,244,556	3,280,540	10,525,096	1.1343	11,938,539	265,545	44.96
23	1998	8,567,756	2,802,452	11,370,208	1.1218	12,755,641	265,545	48.04
24	1999	8,899,598	2,205,411	11,105,008	1.1058	12,280,387	272,086	45.13
25	2000	9,040,263	2,118,170	11,158,433	1.0823	12,076,398	273,808	44.11
26	2001	8,750,652	1,125,795	9,876,446	1.0569	10,438,504	276,749	37.72
27	2002	7,280,027	2,052,816	9,332,843	1.0397	9,703,610	279,495	34.72
28	2003	8,053,066	303,584	8,356,650	1.0210	8,532,329	281,227	30.34
29	2004	8,349,061	431,788	8,780,850	1.0000	8,780,850	283,032	31.02

		Expense (6) vs Customers (7)	Before Adjm't Unit Cost (8) vs Year (1)	With C-O Adjm't Unit Cost (8) vs Year (1)
30				
31				
32				
33	REGRESSION RESULTS			
34	Slope =	-13.7947	-1.1939	-1.5888
35	Y Intercept =	15533762	2430	853
36	Coefficent of Determination (R**2)	12.0%	83.87%	59.92%
37	t Probability	-1.92	-11.85	-6.23
38	Durbin-Watson Statistic		0.58	2.05
39				
40	MARGINAL COST ESTIMATES			
41	Trended Cost Per Customer	Invalid	Invalid	$ 30.12
42				
43	Average Cost Per Customer:			
44	1976-2004		$52.91	
45	1999-2004		$49.83	
46				
47	Last Two Year Average Cost per Customer		$30.68	
48				
49				
50	**Assumed Marginal Cost**	(47) {3}	**$30.68**	

NOTES:
1 Source: Cost data from Annual Reports, excluding Uncollectible Accounts Expense, Account 904.
2 Source: GDP Implict Price Deflator.
3 With an R-Squared of only 60%, the regression result is used to confirm the estimate based on the last two years.

Schedule JLH-3-6
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Class Weighted Customer Accounting & Marketing Expense

(From Accounting Cost Study) {1} Estimated Marginal Cost Per Customer ($/customer/year)

		------ Customer Weightings ------					------ Customer Weightings ------
Line No.	**Customer Groups**	**Number of Customers**	**Customer Costs Assigned**	**Average Costs Per Cust**	**Relative Weight Per Cust**	**Co Avg Cost per Cust**	**Marginal Costs Per Cust**
	(1)	(2) {1}	(3) {1}	(4)= (3)/(2)	(5)=(4)/avg(4) {2}	(6) {3}	(7)= (5)*(6)
1	R3/R4 Heat	222,208	$6,380,948	$28.72	0.918	$30.68	**$28.18**
2	R1/R2 NonHt	33,376	$849,712	$25.46	0.814	$30.68	**$24.98**
3	G50 Lo Winter	3,326	$130,046	$39.10	1.251	$30.68	**$38.37**
4	G40 Hi Winter	16,684	$660,078	$39.56	1.265	$30.68	**$38.82**
5	G51 Lo Winter	1,756	$115,710	$65.89	2.107	$30.68	**$64.65**
6	G41 Hi Winter	4,683	$338,414	$72.27	2.311	$30.68	**$70.91**
7	G52 Lo Winter	249	$70,080	$281.35	8.998	$30.68	**$276.06**
8	G42 Hi Winter	619	$161,594	$260.92	8.344	$30.68	**$256.01**
9	G53 Lo Winter	67	$114,554	$1,720.46	55.020	$30.68	**$1,688.12**
10	G43 Hi Winter	15	$27,660	$1,833.81	58.645	$30.68	**$1,799.34**
11							
12							
13							
14							
15	Total	282,983	8,848,796	$31.27	1.000	$30.68	$30.68

NOTES:
1 Customer class weighting factors were developed from 2004 Accounting Cost of Service Study based on the total of all test year costs in these accounts without uncollectibles.
2 Relative weights based on System average = 1.00
3 Source: Schedule JLH-3-6, Page 3.

Schedule JLH-3-6
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Class Weighted Uncollectible Accounts Expense

(From Accounting Cost Study)

Line No.	Customer Groups	UnCollectible Account Expense	Revenues (Firm) Assigned	Percent UnCollectible
	(1)	(2) {1}	(3) {1}	(3)/(2) {2}
1	Res Ht	8,185,483	331,590,664	2.5%
2	Res NonHt	1,185,903	16,939,871	7.0%
3	Sm Lo Wntr	220,619	6,359,348	3.5%
4	Sm Hi Wntr	1,117,566	33,620,240	3.3%
5	Md Lo Wntr	136,388	16,288,662	0.8%
6	Md Hi Wntr	384,625	48,311,134	0.8%
7	Lg Lo Wntr	42,482	9,387,490	0.5%
8	Lg Hi Wntr	103,390	23,925,108	0.4%
9	Ex Lg Lo Wntr	56,618	8,599,628	0.7%
10	Ex Lg Hi Wntr	14,220	5,446,019	0.3%
11				
12				
13				
14				
15	Total	11,447,294	500,468,164	2.3%

NOTES:

1 Uncollectible account expense and revenues were developed from the 2004 Accounting Cost of Service Study.

Schedule JLH-3-7
BAY STATE GAS COMPANY
MARGINAL COST ANALYSIS

Development of A & G Loading Factors

Line No.	Description	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1		17,717											
2	**Nonplant Related Expenses {1}**												
4	920 Salary	1,820,584	2,069,894	2,140,763	2,486,309	3,214,501	4,126,027	4,774,207	4,952,138	5,179,362	5,555,720	5,535,785	5,983,875
5	921 Office Supplies	420,144	590,972	560,940	735,907	1,047,651	1,317,193	1,600,159	1,119,067	1,127,857	1,223,595	1,249,640	3,107,186
6	922 Admin Exp Trans CR	(307,001)	(393,585)	(363,893)	(509,520)	(631,145)	(959,837)	(1,648,933)	(2,339,149)	(1,693,637)	(2,057,614)	(2,557,091)	(2,955,676)
7	923 Outside Service	480,633	582,335	471,940	637,193	754,633	596,990	773,429	494,091	1,241,215	970,678	879,487	1,517,567
8	925 Injury & Damages	915,903	1,154,635	860,025	1,026,147	833,651	631,627	809,264	741,604	602,428	987,734	1,888,657	2,089,629
9	926 Pension	2,823,088	3,316,018	3,154,332	3,868,166	4,483,374	4,464,462	5,499,922	6,347,753	5,805,087	6,061,693	8,313,925	8,013,202
10	929 Duplicate Charges												
12	Total Non-Plant	6,153,349	7,320,268	6,824,108	8,244,202	9,702,665	10,176,461	11,808,048	11,315,504	12,262,312	12,741,805	15,310,403	17,755,783
16	**Plant Related Expenses {1}**												
18	924 Property Ins	361,674	143,976	147,036	128,865	237,104	180,704	191,345	76,110	(202,502)	77,460	159,892	174,286
19	928 Regulatory Exp	17,717	21,466	17,397	23,488	27,817	22,006	28,510	18,213	45,754	35,781	32,420	55,941
20	930 Misc	962,640	943,065	824,255	917,099	1,109,496	1,094,661	921,302	1,024,357	0	1,352,513	1,477,916	1,333,613
21	931 Rents	274,865	496,922	611,943	879,486	1,166,346	1,011,322	1,178,762	1,261,652	1,253,019	1,333,718	1,603,809	1,627,572
22	932 Gen Plt Maint	296,184	376,269	436,291	472,383	473,321	603,153	746,016	618,615	805,384	845,490	1,009,062	364,542
23	Total Plant Related Expenses	$1,551,405	$1,837,722	$1,889,886	$2,292,457	$2,776,980	$2,731,143	$2,874,591	$2,922,837	$2,104,156	$3,567,503	$4,123,206	$3,381,668
25	Total Allocable O&M (Total O&M less non-labor production												
26	costs and A&G expenses)	19,513,479	22,250,357	19,922,467	23,271,464	24,857,457	30,517,324	29,405,918	26,556,387	27,975,461	30,632,249	30,427,070	31,180,551
28	**A & G Loading Factor Nonplant Rel Exp**												
29	Line (11)/(26) {2}	31.53%	32.90%	34.25%	35.43%	39.03%	33.35%	40.16%	42.61%	43.83%	41.60%	50.32%	56.95%
30	**2 Yr Avg = 151.43% {2}**												
33	Total Gross Plant $ {1}	143,632,532	149,391,083	157,165,783	169,771,531	181,568,688	190,346,100	198,796,127	208,815,290	222,279,260	239,671,162	257,415,303	279,808,707
36	**A & G Loading Factor Plant Rel Exp**												
37	Line (23)/(33)	1.08%	1.23%	1.20%	1.35%	1.53%	1.43%	1.45%	1.40%	0.95%	1.49%	1.60%	1.21%
38	**2 Yr Avg = 1.15% {2}**												

NOTES:
1 Source: Annual Reports; 'Account 923 excludes costs from Schedule JLH-3-4, page 5, columns 9 and 10 - excludes dispatch and gas acquisition-related costs.
2 The average of the last two years' data is employed; post-merger practices and procedures have departed significantly, making historical trends irrelevant.

Schedule JLH-3-7
BAY STATE GAS COMPANY
MARGINAL COST ANALYSIS

Development of A & G Loading Factors

Line No.	Description	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
1													
2	**Nonplant Related Expenses {1}**												
3													
4	920 Salary	7,259,799	8,011,647	8,032,870	9,467,552	9,705,671	10,823,517	9,248,796	9,809,210	10,362,261	11,412,721	14,784,874	10,421,538
5	921 Office Supplies	2,802,412	2,457,854	2,814,013	3,164,089	3,206,676	3,276,569	3,166,363	3,201,446	4,158,699	4,311,113	4,895,839	4,327,158
6	922 Admin Exp Trans CR	(2,881,218)	(3,512,832)	(4,727,616)	(5,511,697)	(5,470,676)	(6,239,654)	(6,853,864)	(7,189,629)	(8,162,355)	(9,751,402)	(10,131,051)	(7,106,277)
7	923 Outside Service	1,186,358	1,709,814	2,302,060	1,954,541	2,341,607	3,874,276	3,422,271	3,687,541	2,723,505	4,588,201	5,249,445	4,844,139
8	925 Injury & Damages	1,638,256	2,253,914	1,577,409	2,450,692	1,832,837	2,322,888	2,177,839	2,855,911	2,454,402	2,963,834	3,485,961	1,345,223
9	926 Pension	7,576,529	8,719,804	8,389,837	9,780,207	10,724,329	12,028,304	11,444,754	10,819,439	10,966,152	10,695,968	12,594,474	6,995,152
10	929 Duplicate Charges												
11													
12	Total Non-Plant	17,582,135	19,640,202	18,388,574	21,305,385	22,340,444	26,085,899	22,606,159	23,183,917	22,502,665	24,220,435	30,879,541	20,826,935
13													
14													
15													
16	**Plant Related Expenses {1}**												
17													
18	924 Property Ins	88,309	80,792	87,156	19,055	0	91	32	(32)	0	0	0	0
19	928 Regulatory Exp	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941
20	930 Misc	1,446,997	1,984,915	1,971,021	1,995,268	2,394,367	4,903,497	2,006,744	2,534,688	2,347,097	15,062,215	7,848,796	6,003,540
21	931 Rents	1,711,548	2,011,929	2,832,412	2,981,965	1,901,069	2,177,842	2,535,622	1,970,915	3,765,566	4,170,125	7,116,298	8,883,545
22	932 Gen Plt Maint	1,210,171	1,203,748	1,079,685	1,507,153	1,536,037	1,583,137	1,378,686	1,406,597	1,726,133	1,577,565	1,743,811	1,625,229
23	Total Plant Related Expenses	$4,424,656	$5,256,532	$5,939,058	$6,540,327	$5,887,414	$8,720,417	$5,976,992	$5,968,141	$7,894,737	$20,865,846	$16,764,845	$16,568,254
24													
25	Total Allocable O&M (Total O&M less non												
26	costs and A&G expenses)	30,960,032	19,334,182	23,095,023	24,906,441	25,509,092	21,738,529	25,669,079	23,431,110	21,595,287	22,258,319	19,698,256	17,648,026
27													
28	**A & G Loading Factor Nonplant Rel Exp**												
29	Line (11)/(26) {2}	56.79%	101.58%	79.62%	85.54%	87.58%	120.00%	88.07%	98.95%	104.20%	108.82%	156.76%	118.01%
30	**2 Yr Avg = 151.43% {2}**												
31													
32													
33	Total Gross Plant $ {1}	305,112,959	334,761,100	366,897,081	404,641,106	453,526,938	484,374,596	521,419,597	524,039,680	549,911,360	556,241,513	583,781,696	623,959,680
34													
35													
36	**A & G Loading Factor Plant Rel Exp**												
37	Line (23)/(33)	1.45%	1.57%	1.62%	1.62%	1.30%	1.80%	1.15%	1.14%	1.44%	3.75%	2.87%	2.66%
38	**2 Yr Avg = 1.15% {2}**												

NOTES:
1 Source: Annual Reports; 'Account 923 exc
2 The average of the last two years' data is e

Schedule JLH-3-7
BAY STATE GAS COMPANY
MARGINAL COST ANALYSIS

Development of A & G Loading Factors

Line No.	Description	2000	2001	2002	2003	2004
1						
2	**Nonplant Related Expenses {1}**					
3						
4	920 Salary	11,043,253	9,113,288	3,578,366	1,893,253	1,745,741
5	921 Office Supplies	4,411,422	2,315,338	4,443,023	4,710,814	4,283,153
6	922 Admin Exp Trans CR	(8,134,099)	(6,597,740)	(5,328,937)	(4,981,878)	(3,814,124)
7	923 Outside Service	7,989,117	18,764,030	28,045,050	25,450,148	23,918,310
8	925 Injury & Damages	588,084	759,037	292,579	2,581,040	2,728,423
9	926 Pension	8,134,691	6,948,285	11,649,448	14,096,916	14,062,530
10	929 Duplicate Charges					
11						
12	Total Non-Plant	24,032,466	31,302,238	42,679,529	43,750,293	42,924,033
13						
14						
15						
16	**Plant Related Expenses {1}**					
17						
18	924 Property Ins	3,678,199	0	0	0	0
19	928 Regulatory Exp	55,941	55,941	55,941	55,941	55,941
20	930 Misc	2,814,453	1,515,315	911,337	266,075	700,677
21	931 Rents	7,919,353	7,172,581	7,625,741	5,512,270	6,105,507
22	932 Gen Plt Maint	1,372,918	1,061,544	1,202,165	1,843,031	2,057,048
23	Total Plant Related Expenses	$12,162,665	$9,805,381	$9,795,184	$7,677,317	$8,919,173
24						
25	Total Allocable O&M (Total O&M less non					
26	costs and A&G expenses)	18,968,488	15,421,037	27,291,790	29,117,592	28,126,325
27						
28	**A & G Loading Factor Nonplant Rel Exp**					
29	Line (11)/(26) {2}	126.70%	202.98%	156.38%	150.25%	152.61%
30	**2 Yr Avg = 151.43% {2}**					
31						
32						
33	Total Gross Plant $ {1}	632,919,841	651,939,155	679,266,106	707,780,906	730,886,896
34						
35						
36	**A & G Loading Factor Plant Rel Exp**					
37	Line (23)/(33)	1.92%	1.50%	1.44%	1.08%	1.22%
38	**2 Yr Avg = 1.15% {2}**					

NOTES:
1 Source: Annual Reports; 'Account 923 exc
2 The average of the last two years' data is e

Schedule JLH-3-7
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Miscellaneous Loading Factors

Line No.	Description	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1	**Commodity Cost Loading Factor**												
2	Direct Gas Costs {2}	61,606,335	75,707,202	76,328,183	91,810,785	127,418,026	164,687,627	203,089,341	194,502,442	196,172,517	200,709,843	162,436,553	158,658,476
3	Commodity {1}	0	0	0	0	0	0	0	0	0	0	0	0
4													
5	Loading Factor - Line (3)/(2)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6	**2 yr Avg = 0.00% {3}**												
7													
8													
9													
10	**Materials and Supplies and Prepayments Loader**												
11	Materials and Supplies {2}	5,103,221	4,141,850	5,808,060	7,164,022	8,525,822	10,704,651	4,666,353	8,906,535	26,651,345	24,384,398	17,890,312	13,681,214
12	Fuel Inventory (included above)	4,125,400	2,987,922	4,477,578	5,363,282	7,077,367	9,254,545	3,290,795	7,530,977	25,275,787	23,008,840	16,514,754	12,305,656
13	Prepayments	1,770,207	2,446,876	3,330,282	3,796,894	3,900,428	5,494,994	582,036	579,570	705,422	885,499	693,734	1,481,706
14	Fuel Related Prepayments	0	0	0	0	0	0	0	0	0	0	0	0
15	Total Utility Plant {2}	143,632,532	149,391,083	157,165,783	169,771,531	181,568,688	190,346,100	198,796,127	208,815,290	222,279,260	239,671,162	257,415,303	279,808,707
16													
17	Non-Fuel Loader (11-12+13-14)/(15)	1.91%	2.41%	2.97%	3.30%	2.95%	3.65%	0.98%	0.94%	0.94%	0.94%	0.80%	1.02%
18	**2 yr Avg = 0.93% {3}**												
19													
20													
21													
22	**Fuel Inventory & Prepay Loading Factor**												
23	Fuel Inventory {2}	4,125,400	2,987,922	4,477,578	5,363,282	7,077,367	9,254,545	3,290,795	7,530,977	25,275,787	23,008,840	16,514,754	12,305,656
24	Fuel Related Prepayments	0	0	0	0	0	0	0	0	0	0	0	0
25	Total Gas Cost	48,699,195	60,667,652	65,298,194	77,740,906	102,929,500	126,229,860	168,339,535	176,946,756	173,896,472	178,878,480	149,869,403	147,596,964
26													
27	Fuel Inventory Factor (23+24)/(25)	8.47%	4.93%	6.86%	6.90%	6.88%	7.33%	1.95%	4.26%	14.53%	12.86%	11.02%	8.34%
28	**2 yr Avg = 12.34% {3}**												
29													
30													
31													
32	**General Plant Loading Factor**												
33	Total General Plant	7,515,687	7,659,852	7,746,001	7,933,080	8,810,983	9,699,425	10,328,394	10,757,017	11,773,445	13,654,040	14,951,107	16,676,536
34	Total Utility Plant	143,632,532	149,391,083	157,165,783	169,771,531	181,568,688	190,346,100	198,796,127	208,815,290	222,279,260	239,671,162	257,415,303	279,808,707
35													
36	Gen Plant Factor Line (33)/(34-33)	5.52%	5.40%	5.18%	4.90%	5.10%	5.37%	5.48%	5.43%	5.59%	6.04%	6.17%	6.34%
37	**2 yr Avg = 6.25% {3}**												
38													
39													
40	**Loss Factor**												
41													
42	**Planning Average = 99.00% {4}**												
43													
44													
45													

NOTES:
1 Source: Schedule JLH-3-4, page 5, column 3 - Account 813 consists of distribution related percentage only
2 Source: Annual Reports
3 The average of the last two years' data is employed; post-merger practices and procedures have departed significantly, making historical trends irrelevant.
4 Estimate provided by planning personnel for forward looking studies.

Schedule JLH-3-7
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Miscellaneousmiscellaneous Loading Factors

Line No.	Description	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
1	**Commodity Cost Loading Factor**												
2	Direct Gas Costs {2}	158,708,765	190,986,324	180,199,259	188,100,237	193,092,084	209,661,267	216,359,313	205,036,576	196,781,868	238,838,343	189,993,884	161,761,142
3	Commodity {1}	0	0	0	0	0	0	0	0	0	0	0	0
4													
5	Loading Factor - Line (3)/(2)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6	**2 yr Avg = 0.00% {3}**												
7													
8													
9													
10	**Materials and Supplies and Prepayment**												
11	Materials and Supplies {2}	14,583,250	11,435,185	21,826,008	12,785,279	18,974,297	24,111,680	21,828,787	15,140,192	25,214,235	26,484,054	28,815,034	22,775,027
12	Fuel Inventory (included above)	13,207,692	10,059,627	20,450,450	10,776,783	16,726,183	21,938,035	20,105,897	13,719,977	23,391,984	22,659,921	25,316,306	19,055,370
13	Prepayments	1,742,390	6,312,294	4,605,506	6,437,521	8,695,959	14,359,238	23,426,488	5,418,133	4,430,017	3,201,778	4,005,655	3,756,438
14	Fuel Related Prepayments	0	0	0	0	0	0	0	0	0	0	0	0
15	Total Utility Plant {2}	305,112,959	334,761,100	366,897,081	404,641,106	453,526,938	484,374,596	521,419,597	524,039,680	549,911,360	556,241,513	583,781,696	623,959,680
16													
17	Non-Fuel Loader (11-12+13-14)/(15)	1.02%	2.30%	1.63%	2.09%	2.41%	3.41%	4.82%	1.30%	1.14%	1.26%	1.29%	1.20%
18	**2 yr Avg = 0.93% {3}**												
19													
20													
21													
22	**Fuel Inventory & Prepay Loading Facto**												
23	Fuel Inventory {2}	13,207,692	10,059,627	20,450,450	10,776,783	16,726,183	21,938,035	20,105,897	13,719,977	23,391,984	22,659,921	25,316,306	19,055,370
24	Fuel Related Prepayments	0	0	0	0	0	0	0	0	0	0	0	0
25	Total Gas Cost	147,702,363	177,600,713	161,488,754	175,793,922	183,468,329	208,788,883	215,703,741	206,929,176	199,904,686	242,698,117	195,388,355	166,506,958
26													
27	Fuel Inventory Factor (23+24)/(25)	8.94%	5.66%	12.66%	6.13%	9.12%	10.51%	9.32%	6.63%	11.70%	9.34%	12.96%	11.44%
28	**2 yr Avg = 12.34% {3}**												
29													
30													
31													
32	**General Plant Loading Factor**												
33	Total General Plant	17,529,484	17,727,378	19,925,795	38,612,510	42,983,981	48,109,596	54,534,846	62,047,458	70,639,596	50,403,586	51,301,196	57,981,874
34	Total Utility Plant	305,112,959	334,761,100	366,897,081	404,641,106	453,526,938	484,374,596	521,419,597	524,039,680	549,911,360	556,241,513	583,781,696	623,959,680
35													
36	Gen Plant Factor Line (33)/(34-33)	6.10%	5.59%	5.74%	10.55%	10.47%	11.03%	11.68%	13.43%	14.74%	9.96%	9.63%	10.24%
37	**2 yr Avg = 6.25% {3}**												
38													
39													
40	**Loss Factor**												
41													
42	**Planning Average = 99.00% {4}**												
43													
44													
45													

NOTES:
1 Source: Schedule JLH-3-4, page 5, colum
2 Source: Annual Reports
3 The average of the last two years' data is e
4 Estimate provided by planning personnel fo

Schedule JLH-3-7
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Miscellaneous Loading Factors

Line No.	Description	2000	2001	2002	2003	2004
1	**Commodity Cost Loading Factor**					
2	Direct Gas Costs {2}	219,225,809	254,634,392	192,783,718	270,533,734	326,788,343
3	Commodity {1}	0	0	0	0	0
4						
5	Loading Factor - Line (3)/(2)	0.00%	0.00%	0.00%	0.00%	0.00%
6	**2 yr Avg = 0.00% {3}**					
7						
8						
9						
10	**Materials and Supplies and Prepayment**					
11	Materials and Supplies {2}	31,260,282	28,272,117	23,100,193	36,229,206	43,506,405
12	Fuel Inventory (included above)	27,493,064	24,143,461	19,108,997	33,071,194	39,865,870
13	Prepayments	3,634,025	3,808,395	1,772,512	3,375,037	3,274,122
14	Fuel Related Prepayments	0	0	0	0	0
15	Total Utility Plant {2}	632,919,841	651,939,155	679,266,106	707,780,906	730,886,896
16						
17	Non-Fuel Loader (11-12+13-14)/(15)	1.17%	1.22%	0.85%	0.92%	0.95%
18	**2 yr Avg = 0.93% {3}**					
19						
20						
21						
22	**Fuel Inventory & Prepay Loading Facto**					
23	Fuel Inventory {2}	27,493,064	24,143,461	19,108,997	33,071,194	39,865,870
24	Fuel Related Prepayments	0	0	0	0	0
25	Total Gas Cost	222,146,068	260,364,509	192,496,113	267,307,389	324,135,849
26						
27	Fuel Inventory Factor (23+24)/(25)	12.38%	9.27%	9.93%	12.37%	12.30%
28	**2 yr Avg = 12.34% {3}**					
29						
30						
31						
32	**General Plant Loading Factor**					
33	Total General Plant	46,722,416	45,725,927	45,493,574	45,356,669	39,149,672
34	Total Utility Plant	632,919,841	651,939,155	679,266,106	707,780,906	730,886,896
35						
36	Gen Plant Factor Line (33)/(34-33)	7.97%	7.54%	7.18%	6.85%	5.66%
37	**2 yr Avg = 6.25% {3}**					
38						
39						
40	**Loss Factor**					
41						
42	**Planning Average = 99.00% {4}**					
43						
44						
45						

NOTES:
1 Source: Schedule JLH-3-4, page 5, colum
2 Source: Annual Reports
3 The average of the last two years' data is e
4 Estimate provided by planning personnel fc

BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Levelized Fixed Charge Rates

Line No.	Description		Engineer's Fixed Charge Rate	Economist's Fixed Charge Rate
1	FIXED CHARGE RATE RESULTS			Over
2				Book
3	Levelized Cost for:	{1}		Life
4	Production Plant		12.71%	9.91%
5	Mains (Cap-related Dist)		12.00%	8.60%
6	Services Investment		11.39%	8.10%
7	Meters Investment		10.51%	7.76%
8				
9				
10	INCREMENTAL COST OF CAPITAL	{2}		
11	Debt		5.45%	46.00%
12	Preferred		0.00%	0.00%
13	Common		11.50%	54.00%
14	Other		0.00%	0.00%
15	Weighted Cost of Incremental Capital			8.72%
16				
17				
18	After Tax Cost of New Capital	{3}		7.73%
19	Incremental Tax Rate	{4}		39.23%
20	Tax Effected Cost of Capital	{5}		12.73%
21	Property Tax Rate	{6}		1.94%
22	Gross Receipts Tax Rate			0.00%
23	Inflation Rate	{7}		2.50%
24	Property Tax Escalation Rate	{7}		2.50%
25				
26				

NOTES:
1 Source: Schedule JLH-3- 8, pages 3, 4, 5, & 6.
2 Weighted average current cost of raising capital in 2004.
3 Wtd Cost of Capital (15) less tax savings on debt interest.
4 Incremental tax rate assumed to be 35% Federal and 6.5%State tax which results in a combined effective rate of 39.23%.
5 Tax effected cost of capital, (15) plus tax component on return.
6 Current composite average tax rate applicable to all plant except meters.
7 MAC Estimate based on EIA Energy Outlook 2005

BAY STATE GAS COMPANY

GAS MARGINAL COST STUDY

LEVELIZED FIXED CHARGE ANALYSIS

INPUT DATA

LINE NO.	VARIABLE	Peaking Plant	Capacity - Related Distribution	Services	Meters
1	Plant Data				
2					
3	CAPITALIZED COST	$1,000	$1,000	$1,000	$1,000
4	BOOK LIFE	30	52	55	42
5	SALVAGE VALUE	-1%	-15%	-170%	-33%
6	MACRS LIFE	20	20	20	20
7					
8					
9	Capital Structure				
10					
11	DEBT RATIO	46.00%	46.00%	46.00%	46.00%
12	PREFERRED RATIO	0.00%	0.00%	0.00%	0.00%
13	COMMON RATIO	54.00%	54.00%	54.00%	54.00%
14	OTHER _____	0.00%	0.00%	0.00%	0.00%
15					
16	Cost of Capital				
17					
18	DEBT COST	5.45%	5.45%	5.45%	5.45%
19	PREFERRED COST	0.00%	0.00%	0.00%	0.00%
20	COMMON COST	11.50%	11.50%	11.50%	11.50%
21	OTHER	0.00%	0.00%	0.00%	0.00%
22	WTD COST OF CAPITAL	8.72%	8.72%	8.72%	8.72%
23	AFTER TAX COST / CAP	7.73%	7.73%	7.73%	7.73%
24					
25	Tax Data				
26					
27	TAX RATE	39.23%	39.23%	39.23%	39.23%
28	ITC RATE	0.00%	0.00%	0.00%	0.00%
29	REVENUE TAX RATE	0.00%	0.00%	0.00%	0.00%
30	PROPERTY TAX RATE	1.94%	1.94%	1.94%	0.00%
31	PROPERTY INSURANCE	0.00%	0.00%	0.00%	0.00%
32	PROPERTY TAX BASIS	2	2	2	2
33	1 = Original Cost				
34	2 = Depreciated Bal				
35					
36	Misc. Data				
37					
38	INFLATION RATE	2.50%	2.50%	2.50%	2.50%
39	PROP TAX ESC RATE	2.50%	2.50%	2.50%	2.50%
40	RETURN BASIS	2	2	2	2
41	1 = Begin of Year				
42	2 = Avg Begin & End				
43	3 = End of Year				

BAY STATE GAS COMPANY

GAS MARGINAL COST STUDY

LEVELIZED FIXED CHARGE ANALYSIS

Peaker Plant

LINE NO.	ITEM	-- Current Dollars -- (Engineer's FCR) CURRENT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT	-- Constant Dollars -- (Economist's FCR) CONSTANT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT
1	INTEREST ON DEBT	$15.33	1.53%	$11.94	1.19%
2	RETURN ON PREF	$0.00	0.00%	$0.00	0.00%
3	RETURN ON COMMON	$37.97	3.80%	$29.58	2.96%
4					
5	RETURN	$53.29	5.33%	$41.53	4.15%
6					
7	DEPRECIATION	$33.51	3.35%	$26.11	2.61%
8					
9	INCOME TAX	$20.10	2.01%	$15.67	1.57%
10	DEFERRED TAXES	$4.40	0.44%	$3.43	0.34%
11					
12	INCOME TAX	$24.50	2.45%	$19.09	1.91%
13					
14	REVENUE TAX	$0.00	0.00%	$0.00	0.00%
15	PROPERTY TAX	$15.83	1.58%	$12.34	1.23%
16	PROPERTY INSURANCE	$0.00	0.00%	$0.00	0.00%
17					
18	OTHER	$15.83	1.58%	$12.34	1.23%
19					
20					
21	TOTAL REVENUE REQ'D	**$127.14**	**12.71%**	**$99.07**	**9.91%**

BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY
LEVELIZED FIXED CHARGE ANALYSIS
Capacity Related Distribution

LINE NO.	ITEM	-- Current Dollars -- (Engineer's FCR) CURRENT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT	-- Constant Dollars -- (Economist's FCR) CONSTANT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT
1	INTEREST ON DEBT	$15.76	1.58%	$11.29	1.13%
2	RETURN ON PREF	$0.00	0.00%	$0.00	0.00%
3	RETURN ON COMMON	$39.05	3.90%	$27.97	2.80%
4					
5	RETURN	$54.81	5.48%	$39.27	3.93%
6					
7	DEPRECIATION	$22.02	2.20%	$15.78	1.58%
8					
9	INCOME TAX	$17.77	1.78%	$12.73	1.27%
10	DEFERRED TAXES	$7.43	0.74%	$5.32	0.53%
11					
12	INCOME TAX	$25.20	2.52%	$18.05	1.81%
13					
14	REVENUE TAX	$0.00	0.00%	$0.00	0.00%
15	PROPERTY TAX	$18.00	1.80%	$12.90	1.29%
16	PROPERTY INSURANCE	$0.00	0.00%	$0.00	0.00%
17					
18	OTHER	$18.00	1.80%	$12.90	1.29%
19					
20					
21	TOTAL REVENUE REQ'D	**$120.03**	**12.00%**	**$85.99**	**8.60%**

BAY STATE GAS COMPANY

GAS MARGINAL COST STUDY

LEVELIZED FIXED CHARGE ANALYSIS

Services Investment

LINE NO.	ITEM	-- Current Dollars -- (Engineer's FCR) CURRENT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT	-- Constant Dollars -- (Economist's FCR) CONSTANT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT
1	INTEREST ON DEBT	$10.54	1.05%	$7.50	0.75%
2	RETURN ON PREF	$0.00	0.00%	$0.00	0.00%
3	RETURN ON COMMON	$26.10	2.61%	$18.57	1.86%
4					
5	RETURN	$36.64	3.66%	$26.07	2.61%
6					
7	DEPRECIATION	$49.09	4.91%	$34.93	3.49%
8					
9	INCOME TAX	$19.38	1.94%	$13.79	1.38%
10	DEFERRED TAXES	($2.53)	-0.25%	($1.80)	-0.18%
11					
12	INCOME TAX	$16.85	1.68%	$11.99	1.20%
13					
14	REVENUE TAX	$0.00	0.00%	$0.00	0.00%
15	PROPERTY TAX	$11.31	1.13%	$8.05	0.80%
16	PROPERTY INSURANCE	$0.00	0.00%	$0.00	0.00%
17					
18	OTHER	$11.31	1.13%	$8.05	0.80%
19					
20					
21	TOTAL REVENUE REQ'D	**$113.89**	**11.39%**	**$81.03**	**8.10%**

BAY STATE GAS COMPANY

GAS MARGINAL COST STUDY

LEVELIZED FIXED CHARGE ANALYSIS

Metering Equipment

LINE NO.	ITEM	-- Current Dollars -- (Engineer's FCR) CURRENT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT	-- Constant Dollars -- (Economist's FCR) CONSTANT LEVELIZED DOLLARS	PERCENT OF CAPITAL INVESTMENT
1	INTEREST ON DEBT	$14.45	1.44%	$10.66	1.07%
2	RETURN ON PREF	$0.00	0.00%	$0.00	0.00%
3	RETURN ON COMMON	$35.78	3.58%	$26.42	2.64%
4					
5	RETURN	$50.23	5.02%	$37.08	3.71%
6					
7	DEPRECIATION	$31.77	3.18%	$23.45	2.35%
8					
9	INCOME TAX	$18.76	1.88%	$13.85	1.38%
10	DEFERRED TAXES	$4.34	0.43%	$3.20	0.32%
11					
12	INCOME TAX	$23.09	2.31%	$17.05	1.71%
13					
14	REVENUE TAX	$0.00	0.00%	$0.00	0.00%
15	PROPERTY TAX	$0.00	0.00%	$0.00	0.00%
16	PROPERTY INSURANCE	$0.00	0.00%	$0.00	0.00%
17					
18	OTHER	$0.00	0.00%	$0.00	0.00%
19					
20					
21	TOTAL REVENUE REQ'D	**$105.09**	**10.51%**	**$77.58**	**7.76%**

Schedule JLH-3-8
BAY STATE GAS COMPANY
Development of Revenue Requirements Stream

Peaking

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Deprec'N	Book Deprec'N	Deferred Tax	Taxable Income	Inc Tax Payable	Revenue Tax	Property Tax	Property Insurance	ANNUAL Reveus Reqm'Ts	% of Original Investm'T	Present Worth Of Rev Req'Mt
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	1,000.00														
1	982.46	24.63	0.00	61.01	37.50	33.51	1.57	96.39	37.81	0.00	19.44	0.00	177.96	17.80%	165.19
2	940.59	23.58	0.00	58.41	72.19	33.51	15.17	57.43	22.53	0.00	19.25	0.00	172.45	17.24%	148.58
3	892.97	22.39	0.00	55.45	66.77	33.51	13.05	57.98	22.74	0.00	19.05	0.00	166.19	16.62%	132.91
4	847.40	21.24	0.00	52.62	61.77	33.51	11.09	58.33	22.88	0.00	18.83	0.00	160.16	16.02%	118.89
5	803.72	20.15	0.00	49.91	57.13	33.51	9.27	58.50	22.95	0.00	18.58	0.00	154.36	15.44%	106.36
6	761.78	19.10	0.00	47.31	52.85	33.51	7.59	58.50	22.95	0.00	18.31	0.00	148.75	14.87%	95.14
7	721.47	18.09	0.00	44.80	48.88	33.51	6.03	58.34	22.88	0.00	18.01	0.00	143.32	14.33%	85.08
8	682.65	17.11	0.00	42.39	45.22	33.51	4.59	58.04	22.77	0.00	17.68	0.00	138.06	13.81%	76.08
9	644.67	16.16	0.00	40.03	44.62	33.51	4.36	54.76	21.48	0.00	17.33	0.00	132.87	13.29%	67.96
10	606.81	15.21	0.00	37.68	44.62	33.51	4.36	50.89	19.96	0.00	16.95	0.00	127.67	12.77%	60.62
11	568.94	14.26	0.00	35.33	44.62	33.51	4.36	47.02	18.45	0.00	16.54	0.00	122.45	12.24%	53.96
12	531.08	13.31	0.00	32.98	44.62	33.51	4.36	43.16	16.93	0.00	16.10	0.00	117.19	11.72%	47.94
13	493.22	12.36	0.00	30.63	44.62	33.51	4.36	39.29	15.41	0.00	15.63	0.00	111.90	11.19%	42.49
14	455.35	11.42	0.00	28.28	44.62	33.51	4.36	35.42	13.89	0.00	15.12	0.00	106.57	10.66%	37.56
15	417.49	10.47	0.00	25.93	44.62	33.51	4.36	31.55	12.38	0.00	14.58	0.00	101.21	10.12%	33.11
16	379.63	9.52	0.00	23.57	44.62	33.51	4.36	27.68	10.86	0.00	14.00	0.00	95.81	9.58%	29.09
17	341.76	8.57	0.00	21.22	44.62	33.51	4.36	23.81	9.34	0.00	13.39	0.00	90.38	9.04%	25.47
18	303.90	7.62	0.00	18.87	44.62	33.51	4.36	19.94	7.82	0.00	12.73	0.00	84.91	8.49%	22.21
19	266.04	6.67	0.00	16.52	44.62	33.51	4.36	16.07	6.30	0.00	12.03	0.00	79.39	7.94%	19.28
20	228.17	5.72	0.00	14.17	44.62	33.51	4.36	12.21	4.79	0.00	11.29	0.00	73.83	7.38%	16.64
21	194.69	4.88	0.00	12.09	22.31	33.51	(4.39)	31.09	12.20	0.00	10.51	0.00	68.79	6.88%	14.39
22	169.95	4.26	0.00	10.55	0.00	33.51	(13.14)	50.87	19.95	0.00	9.68	0.00	64.81	6.48%	12.59
23	149.59	3.75	0.00	9.29	0.00	33.51	(13.14)	48.79	19.14	0.00	8.80	0.00	61.34	6.13%	11.06
24	129.22	3.24	0.00	8.02	0.00	33.51	(13.14)	46.71	18.32	0.00	7.87	0.00	57.82	5.78%	9.67
25	108.86	2.73	0.00	6.76	0.00	33.51	(13.14)	44.63	17.51	0.00	6.89	0.00	54.24	5.42%	8.42
26	88.50	2.22	0.00	5.50	0.00	33.51	(13.14)	42.55	16.69	0.00	5.85	0.00	50.62	5.06%	7.30
27	68.13	1.71	0.00	4.23	0.00	33.51	(13.14)	40.47	15.87	0.00	4.76	0.00	46.93	4.69%	6.28
28	47.77	1.20	0.00	2.97	0.00	33.51	(13.14)	38.39	15.06	0.00	3.61	0.00	43.19	4.32%	5.37
29	27.41	0.69	0.00	1.70	0.00	33.51	(13.14)	36.31	14.24	0.00	2.40	0.00	39.39	3.94%	4.54
30	7.05	0.18	0.00	0.44	0.00	33.51	(13.14)	34.23	13.42	0.00	1.13	0.00	35.53	3.55%	3.80
31	1.01	0.03	0.00	0.06	5.16	0.00	2.02	(5.06)	(1.98)	0.00	0.00	0.00	0.13	0.01%	0.01
32	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
33	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
34	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
35	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
36	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
37	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
38	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
39	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
40	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
41	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
42	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
43	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
44	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
45	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
46	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
47	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
48	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
49	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
50	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
51	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
52	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
53	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
54	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
55	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
56	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
57	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
58	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
59	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
60	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
61	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
62	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
63	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
64	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
65	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
TOTAL		$322.46	$0.00	$798.75	$1,005.16	$1,005.16	($0.00)	$1,314.27	$515.52	$0.00	$386.33	$0.00	$3,028.22		1,468
PRESENT WORTH		$176.98	$0.00	$438.39	$516.40	$386.88	$50.81	$591.80	$232.14	$0.00	$182.81	$0.00	$1,467.99	146.80%	
LEVELIZED PAYMENT		$15.33	$0.00	$37.97	$44.72	$33.51	$4.40	$51.25	$20.10	$0.00	$15.83	$0.00	$127.14	12.71%	

Schedule JLH-3-8
BAY STATE GAS COMPANY
Development of Revenue Requirements Stream

Capacity Related Distribution

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Deprec'N	Book Deprec'N	Deferred Tax	Taxable Income	Inc Tax Payable	Revenue Tax	Property Tax	Property Insurance	ANNUAL Revenue Reqm'Ts	% of Original Investm'T	Present Worth Of Rev Req'Mt
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	1,000.00														
1	985.95	24.72	0.00	61.23	37.50	22.02	6.07	85.27	33.45	0.00	19.44	0.00	166.92	16.69%	154.94
2	951.06	23.84	0.00	59.06	72.19	22.02	19.68	47.01	18.44	0.00	19.48	0.00	162.53	16.25%	140.03
3	910.42	22.82	0.00	56.54	66.77	22.02	17.55	48.27	18.94	0.00	19.52	0.00	157.39	15.74%	125.87
4	871.83	21.86	0.00	54.14	61.77	22.02	15.59	49.34	19.35	0.00	19.55	0.00	152.51	15.25%	113.21
5	835.12	20.94	0.00	51.86	57.13	22.02	13.77	50.22	19.70	0.00	19.56	0.00	147.86	14.79%	101.88
6	800.17	20.06	0.00	49.69	52.85	22.02	12.09	50.93	19.98	0.00	19.57	0.00	143.41	14.34%	91.72
7	766.84	19.22	0.00	47.62	48.88	22.02	10.54	51.49	20.20	0.00	19.56	0.00	139.16	13.92%	82.62
8	735.00	18.43	0.00	45.64	45.22	22.02	9.10	51.91	20.36	0.00	19.54	0.00	135.09	13.51%	74.44
9	703.99	17.65	0.00	43.72	44.62	22.02	8.86	49.34	19.35	0.00	19.51	0.00	131.11	13.11%	67.06
10	673.11	16.87	0.00	41.80	44.62	22.02	8.86	46.18	18.12	0.00	19.46	0.00	127.14	12.71%	60.36
11	642.23	16.10	0.00	39.88	44.62	22.02	8.86	43.03	16.88	0.00	19.40	0.00	123.15	12.31%	54.27
12	611.34	15.33	0.00	37.96	44.62	22.02	8.86	39.87	15.64	0.00	19.32	0.00	119.14	11.91%	48.73
13	580.46	14.55	0.00	36.05	44.62	22.02	8.86	36.72	14.40	0.00	19.23	0.00	115.12	11.51%	43.71
14	549.57	13.78	0.00	34.13	44.62	22.02	8.86	33.56	13.16	0.00	19.12	0.00	111.08	11.11%	39.15
15	518.69	13.00	0.00	32.21	44.62	22.02	8.86	30.41	11.93	0.00	19.00	0.00	107.02	10.70%	35.01
16	487.81	12.23	0.00	30.29	44.62	22.02	8.86	27.25	10.69	0.00	18.85	0.00	102.95	10.29%	31.26
17	456.92	11.46	0.00	28.37	44.62	22.02	8.86	24.09	9.45	0.00	18.69	0.00	98.85	9.89%	27.86
18	426.04	10.68	0.00	26.46	44.62	22.02	8.86	20.94	8.21	0.00	18.50	0.00	94.74	9.47%	24.79
19	395.16	9.91	0.00	24.54	44.62	22.02	8.86	17.78	6.98	0.00	18.30	0.00	90.60	9.06%	22.00
20	364.27	9.13	0.00	22.62	44.62	22.02	8.86	14.63	5.74	0.00	18.07	0.00	86.45	8.64%	19.49
21	337.76	8.47	0.00	20.98	22.31	22.02	0.11	34.23	13.43	0.00	17.82	0.00	82.82	8.28%	17.33
22	320.00	8.02	0.00	19.87	0.00	22.02	(8.64)	54.72	21.46	0.00	17.55	0.00	80.29	8.03%	15.59
23	306.62	7.69	0.00	19.04	0.00	22.02	(8.64)	53.35	20.93	0.00	17.25	0.00	78.29	7.83%	14.11
24	293.24	7.35	0.00	18.21	0.00	22.02	(8.64)	51.98	20.39	0.00	16.93	0.00	76.26	7.63%	12.78
25	279.85	7.02	0.00	17.38	0.00	22.02	(8.64)	50.62	19.85	0.00	16.57	0.00	74.21	7.42%	11.53
26	266.47	6.68	0.00	16.55	0.00	22.02	(8.64)	49.25	19.32	0.00	16.20	0.00	72.13	7.21%	10.40
27	253.09	6.34	0.00	15.72	0.00	22.02	(8.64)	47.88	18.78	0.00	15.79	0.00	70.01	7.00%	9.37
28	239.70	6.01	0.00	14.89	0.00	22.02	(8.64)	46.51	18.25	0.00	15.35	0.00	67.87	6.79%	8.43
29	226.32	5.67	0.00	14.05	0.00	22.02	(8.64)	45.15	17.71	0.00	14.88	0.00	65.70	6.57%	7.57
30	212.94	5.34	0.00	13.22	0.00	22.02	(8.64)	43.78	17.17	0.00	14.37	0.00	63.49	6.35%	6.79
31	199.55	5.00	0.00	12.39	0.00	22.02	(8.64)	42.41	16.64	0.00	13.84	0.00	61.25	6.12%	6.08
32	186.17	4.67	0.00	11.56	0.00	22.02	(8.64)	41.04	16.10	0.00	13.26	0.00	58.97	5.90%	5.44
33	172.79	4.33	0.00	10.73	0.00	22.02	(8.64)	39.68	15.56	0.00	12.65	0.00	56.66	5.67%	4.85
34	159.40	4.00	0.00	9.90	0.00	22.02	(8.64)	38.31	15.03	0.00	12.00	0.00	54.30	5.43%	4.31
35	146.02	3.66	0.00	9.07	0.00	22.02	(8.64)	36.94	14.49	0.00	11.31	0.00	51.91	5.19%	3.83
36	132.64	3.33	0.00	8.24	0.00	22.02	(8.64)	35.57	13.95	0.00	10.57	0.00	49.47	4.95%	3.39
37	119.25	2.99	0.00	7.41	0.00	22.02	(8.64)	34.21	13.42	0.00	9.80	0.00	46.99	4.70%	2.99
38	105.87	2.65	0.00	6.57	0.00	22.02	(8.64)	32.84	12.88	0.00	8.98	0.00	44.47	4.45%	2.62
39	92.48	2.32	0.00	5.74	0.00	22.02	(8.64)	31.47	12.34	0.00	8.11	0.00	41.90	4.19%	2.29
40	79.10	1.98	0.00	4.91	0.00	22.02	(8.64)	30.10	11.81	0.00	7.19	0.00	39.27	3.93%	2.00
41	65.72	1.65	0.00	4.08	0.00	22.02	(8.64)	28.74	11.27	0.00	6.22	0.00	36.60	3.66%	1.73
42	52.33	1.31	0.00	3.25	0.00	22.02	(8.64)	27.37	10.74	0.00	5.20	0.00	33.88	3.39%	1.48
43	38.95	0.98	0.00	2.42	0.00	22.02	(8.64)	26.00	10.20	0.00	4.12	0.00	31.10	3.11%	1.26
44	25.57	0.64	0.00	1.59	0.00	22.02	(8.64)	24.63	9.66	0.00	2.98	0.00	28.26	2.83%	1.07
45	12.18	0.31	0.00	0.76	0.00	22.02	(8.64)	23.27	9.13	0.00	1.79	0.00	25.36	2.54%	0.89
46	(1.20)	(0.03)	0.00	(0.07)	0.00	22.02	(8.64)	21.90	8.59	0.00	0.53	0.00	22.40	2.24%	0.73
47	(14.58)	(0.37)	0.00	(0.91)	0.00	22.02	(8.64)	20.53	8.05	0.00	0.00	0.00	20.17	2.02%	0.61
48	(27.97)	(0.70)	0.00	(1.74)	0.00	22.02	(8.64)	19.16	7.52	0.00	0.00	0.00	18.46	1.85%	0.52
49	(41.35)	(1.04)	0.00	(2.57)	0.00	22.02	(8.64)	17.80	6.98	0.00	0.00	0.00	16.76	1.68%	0.44
50	(54.73)	(1.37)	0.00	(3.40)	0.00	22.02	(8.64)	16.43	6.44	0.00	0.00	0.00	15.06	1.51%	0.36
51	(68.12)	(1.71)	0.00	(4.23)	0.00	22.02	(8.64)	15.06	5.91	0.00	0.00	0.00	13.35	1.34%	0.30
52	(81.50)	(2.04)	0.00	(5.06)	0.00	22.02	(8.64)	13.69	5.37	0.00	0.00	0.00	11.65	1.17%	0.24
53	28.46	0.71	0.00	1.77	145.11	0.00	56.92	(142.21)	(55.78)	0.00	0.00	0.00	3.62	0.36%	0.07
54	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
55	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
56	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
57	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
58	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
59	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
60	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
61	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
62	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
63	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
64	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
65	(0.00)	(0.00)	0.00	(0.00)	0.00	0.00	0.00	(0.00)	(0.00)	0.00	0.00	0.00	(0.00)	0.00%	(0.00)
TOTAL		$434.44	$0.00	$1,076.13	$1,145.11	$1,145.11	($0.00)	$1,770.68	$694.55	$0.00	$674.91	$0.00	$4,025.14		1,520
PRESENT WORTH		$199.58	$0.00	$494.38	$518.69	$278.83	$94.08	$573.61	$225.00	$0.00	$227.90	$0.00	$1,519.78	151.98%	
LEVELIZED PAYMENT		$15.76	$0.00	$39.05	$40.96	$22.02	$7.43	$45.30	$17.77	$0.00	$18.00	$0.00	$120.03	12.00%	

Schedule JLH-3-8
BAY STATE GAS COMPANY
Development of Revenue Requirements Stream

Services

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Deprec'N	Book Deprec'N	Deferred Tax	Taxable Income	Inc Tax Payable	Revenue Tax	Property Tax	Property Insurance	ANNUAL Reveue Reqm'Ts	% of Original Investm'T	Present Worth Of Rev Req'Mt
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	1,000.00														
1	977.73	24.51	0.00	60.72	37.50	49.09	(4.55)	111.50	43.73	0.00	19.44	0.00	192.94	19.29%	179.09
2	926.38	23.22	0.00	57.53	72.19	49.09	9.06	71.56	28.07	0.00	18.94	0.00	185.92	18.59%	160.18
3	869.29	21.79	0.00	53.98	66.77	49.09	6.94	71.14	27.91	0.00	18.42	0.00	178.12	17.81%	142.45
4	814.25	20.41	0.00	50.56	61.77	49.09	4.97	70.53	27.66	0.00	17.85	0.00	170.55	17.06%	126.61
5	761.09	19.08	0.00	47.26	57.13	49.09	3.15	69.73	27.35	0.00	17.24	0.00	163.18	16.32%	112.44
6	709.69	17.79	0.00	44.07	52.85	49.09	1.47	68.76	26.97	0.00	16.59	0.00	155.99	15.60%	99.77
7	659.90	16.54	0.00	40.98	48.88	49.09	(0.08)	67.64	26.53	0.00	15.90	0.00	148.96	14.90%	88.43
8	611.61	15.33	0.00	37.98	45.22	49.09	(1.52)	66.37	26.03	0.00	15.16	0.00	142.08	14.21%	78.29
9	564.16	14.14	0.00	35.03	44.62	49.09	(1.76)	62.12	24.37	0.00	14.38	0.00	135.26	13.53%	69.18
10	516.82	12.96	0.00	32.09	44.62	49.09	(1.76)	57.28	22.47	0.00	13.55	0.00	128.41	12.84%	60.96
11	469.49	11.77	0.00	29.16	44.62	49.09	(1.76)	52.45	20.57	0.00	12.67	0.00	121.50	12.15%	53.54
12	422.15	10.58	0.00	26.22	44.62	49.09	(1.76)	47.61	18.68	0.00	11.73	0.00	114.54	11.45%	46.85
13	374.82	9.40	0.00	23.28	44.62	49.09	(1.76)	42.77	16.78	0.00	10.74	0.00	107.53	10.75%	40.83
14	327.48	8.21	0.00	20.34	44.62	49.09	(1.76)	37.94	14.88	0.00	9.69	0.00	100.46	10.05%	35.40
15	280.14	7.02	0.00	17.40	44.62	49.09	(1.76)	33.10	12.98	0.00	8.59	0.00	93.33	9.33%	30.53
16	232.81	5.84	0.00	14.46	44.62	49.09	(1.76)	28.26	11.09	0.00	7.42	0.00	86.14	8.61%	26.16
17	185.47	4.65	0.00	11.52	44.62	49.09	(1.76)	23.43	9.19	0.00	6.19	0.00	78.88	7.89%	22.23
18	138.14	3.46	0.00	8.58	44.62	49.09	(1.76)	18.59	7.29	0.00	4.89	0.00	71.56	7.16%	18.72
19	90.80	2.28	0.00	5.64	44.62	49.09	(1.76)	13.75	5.40	0.00	3.53	0.00	64.17	6.42%	15.58
20	43.47	1.09	0.00	2.70	44.62	49.09	(1.76)	8.92	3.50	0.00	2.09	0.00	56.71	5.67%	12.78
21	0.51	0.01	0.00	0.03	22.31	49.09	(10.51)	26.84	10.53	0.00	0.58	0.00	49.73	4.97%	10.41
22	(33.70)	(0.84)	0.00	(2.09)	0.00	49.09	(19.26)	45.65	17.91	0.00	0.00	0.00	44.80	4.48%	8.70
23	(63.54)	(1.59)	0.00	(3.95)	0.00	49.09	(19.26)	42.60	16.71	0.00	0.00	0.00	41.01	4.10%	7.39
24	(93.37)	(2.34)	0.00	(5.80)	0.00	49.09	(19.26)	39.55	15.51	0.00	0.00	0.00	37.21	3.72%	6.23
25	(123.21)	(3.09)	0.00	(7.65)	0.00	49.09	(19.26)	36.50	14.32	0.00	0.00	0.00	33.41	3.34%	5.19
26	(153.04)	(3.84)	0.00	(9.50)	0.00	49.09	(19.26)	33.45	13.12	0.00	0.00	0.00	29.62	2.96%	4.27
27	(182.88)	(4.58)	0.00	(11.36)	0.00	49.09	(19.26)	30.40	11.93	0.00	0.00	0.00	25.82	2.58%	3.46
28	(212.71)	(5.33)	0.00	(13.21)	0.00	49.09	(19.26)	27.36	10.73	0.00	0.00	0.00	22.02	2.20%	2.74
29	(242.55)	(6.08)	0.00	(15.06)	0.00	49.09	(19.26)	24.31	9.53	0.00	0.00	0.00	18.23	1.82%	2.10
30	(272.38)	(6.83)	0.00	(16.91)	0.00	49.09	(19.26)	21.26	8.34	0.00	0.00	0.00	14.43	1.44%	1.54
31	(302.22)	(7.58)	0.00	(18.77)	0.00	49.09	(19.26)	18.21	7.14	0.00	0.00	0.00	10.63	1.06%	1.06
32	(332.05)	(8.32)	0.00	(20.62)	0.00	49.09	(19.26)	15.16	5.95	0.00	0.00	0.00	6.84	0.68%	0.63
33	(361.89)	(9.07)	0.00	(22.47)	0.00	49.09	(19.26)	12.11	4.75	0.00	0.00	0.00	3.04	0.30%	0.26
34	(391.72)	(9.82)	0.00	(24.33)	0.00	49.09	(19.26)	9.06	3.56	0.00	0.00	0.00	(0.76)	-0.08%	(0.06)
35	(421.56)	(10.57)	0.00	(26.18)	0.00	49.09	(19.26)	6.02	2.36	0.00	0.00	0.00	(4.55)	-0.46%	(0.34)
36	(451.39)	(11.32)	0.00	(28.03)	0.00	49.09	(19.26)	2.97	1.16	0.00	0.00	0.00	(8.35)	-0.83%	(0.57)
37	(481.23)	(12.06)	0.00	(29.88)	0.00	49.09	(19.26)	(0.08)	(0.03)	0.00	0.00	0.00	(12.15)	-1.21%	(0.77)
38	(511.06)	(12.81)	0.00	(31.74)	0.00	49.09	(19.26)	(3.13)	(1.23)	0.00	0.00	0.00	(15.94)	-1.59%	(0.94)
39	(540.90)	(13.56)	0.00	(33.59)	0.00	49.09	(19.26)	(6.18)	(2.42)	0.00	0.00	0.00	(19.74)	-1.97%	(1.08)
40	(570.73)	(14.31)	0.00	(35.44)	0.00	49.09	(19.26)	(9.23)	(3.62)	0.00	0.00	0.00	(23.53)	-2.35%	(1.20)
41	(600.57)	(15.06)	0.00	(37.30)	0.00	49.09	(19.26)	(12.28)	(4.81)	0.00	0.00	0.00	(27.33)	-2.73%	(1.29)
42	(630.40)	(15.80)	0.00	(39.15)	0.00	49.09	(19.26)	(15.32)	(6.01)	0.00	0.00	0.00	(31.13)	-3.11%	(1.38)
43	(660.24)	(16.55)	0.00	(41.00)	0.00	49.09	(19.26)	(18.37)	(7.21)	0.00	0.00	0.00	(34.92)	-3.49%	(1.42)
44	(690.07)	(17.30)	0.00	(42.85)	0.00	49.09	(19.26)	(21.42)	(8.40)	0.00	0.00	0.00	(38.72)	-3.87%	(1.46)
45	(719.91)	(18.05)	0.00	(44.71)	0.00	49.09	(19.26)	(24.47)	(9.60)	0.00	0.00	0.00	(42.52)	-4.25%	(1.49)
46	(749.74)	(18.80)	0.00	(46.56)	0.00	49.09	(19.26)	(27.52)	(10.79)	0.00	0.00	0.00	(46.31)	-4.63%	(1.51)
47	(779.58)	(19.54)	0.00	(48.41)	0.00	49.09	(19.26)	(30.57)	(11.99)	0.00	0.00	0.00	(50.11)	-5.01%	(1.51)
48	(809.41)	(20.29)	0.00	(50.26)	0.00	49.09	(19.26)	(33.62)	(13.19)	0.00	0.00	0.00	(53.91)	-5.39%	(1.51)
49	(839.25)	(21.04)	0.00	(52.12)	0.00	49.09	(19.26)	(36.66)	(14.38)	0.00	0.00	0.00	(57.70)	-5.77%	(1.50)
50	(869.08)	(21.79)	0.00	(53.97)	0.00	49.09	(19.26)	(39.71)	(15.58)	0.00	0.00	0.00	(61.50)	-6.15%	(1.48)
51	(898.92)	(22.54)	0.00	(55.82)	0.00	49.09	(19.26)	(42.76)	(16.77)	0.00	0.00	0.00	(65.30)	-6.53%	(1.46)
52	(928.75)	(23.28)	0.00	(57.68)	0.00	49.09	(19.26)	(45.81)	(17.97)	0.00	0.00	0.00	(69.09)	-6.91%	(1.44)
53	(958.59)	(24.03)	0.00	(59.53)	0.00	49.09	(19.26)	(48.86)	(19.16)	0.00	0.00	0.00	(72.89)	-7.29%	(1.41)
54	(988.42)	(24.78)	0.00	(61.38)	0.00	49.09	(19.26)	(51.91)	(20.36)	0.00	0.00	0.00	(76.69)	-7.67%	(1.37)
55	(1,018.26)	(25.53)	0.00	(63.23)	0.00	49.09	(19.26)	(54.95)	(21.56)	0.00	0.00	0.00	(80.48)	-8.05%	(1.34)
56	333.41	8.36	0.00	20.70	1,700.00	0.00	666.83	(1,665.93)	(653.46)	0.00	0.00	0.00	42.43	4.24%	0.65
57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
TOTAL		($189.87)	$0.00	($470.33)	$2,700.00	$2,700.00	$0.00	($773.88)	($303.56)	$0.00	$245.59	$0.00	$1,981.84		1,448
PRESENT WORTH		$133.99	$0.00	$331.91	$542.12	$624.22	($32.21)	$628.24	$246.43	$0.00	$143.83	$0.00	$1,448.18	144.82%	
LEVELIZED PAYMENT		$10.54	$0.00	$26.10	$42.63	$49.09	($2.53)	$49.41	$19.38	$0.00	$11.31	$0.00	$113.89	11.39%	

Schedule JLH-3-8
BAY STATE GAS COMPANY
Development of Revenue Requirements Stream

Meters

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Deprec'N	Book Deprec'N	Deferred Tax	Taxable Income	Inc Tax Payable	Revenue Tax	Property Tax	Property Insurance	ANNUAL Revenue Reqm'Ts	% of Original Investm'T	Present Worth Of Rev Req'Mt
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	1,000.00														
1	982.99	24.64	0.00	61.04	37.50	31.77	2.25	94.71	37.15	0.00	0.00	0.00	156.85	15.69%	145.59
2	942.17	23.62	0.00	58.51	72.19	31.77	15.86	55.85	21.91	0.00	0.00	0.00	151.66	15.17%	130.67
3	895.61	22.45	0.00	55.62	66.77	31.77	13.73	56.51	22.16	0.00	0.00	0.00	145.73	14.57%	116.55
4	851.10	21.34	0.00	52.85	61.77	31.77	11.77	56.97	22.35	0.00	0.00	0.00	140.07	14.01%	103.98
5	808.47	20.27	0.00	50.21	57.13	31.77	9.95	57.24	22.45	0.00	0.00	0.00	134.65	13.46%	92.78
6	767.60	19.24	0.00	47.67	52.85	31.77	8.27	57.35	22.50	0.00	0.00	0.00	129.44	12.94%	82.79
7	728.34	18.26	0.00	45.23	48.88	31.77	6.71	57.30	22.48	0.00	0.00	0.00	124.45	12.44%	73.88
8	690.58	17.31	0.00	42.88	45.22	31.77	5.28	57.11	22.40	0.00	0.00	0.00	119.64	11.96%	65.93
9	653.65	16.39	0.00	40.59	44.62	31.77	5.04	53.94	21.16	0.00	0.00	0.00	114.94	11.49%	58.79
10	616.84	15.46	0.00	38.31	44.62	31.77	5.04	50.18	19.68	0.00	0.00	0.00	110.26	11.03%	52.35
11	580.04	14.54	0.00	36.02	44.62	31.77	5.04	46.42	18.21	0.00	0.00	0.00	105.58	10.56%	46.53
12	543.23	13.62	0.00	33.73	44.62	31.77	5.04	42.66	16.73	0.00	0.00	0.00	100.89	10.09%	41.27
13	506.42	12.70	0.00	31.45	44.62	31.77	5.04	38.90	15.26	0.00	0.00	0.00	96.21	9.62%	36.53
14	469.62	11.77	0.00	29.16	44.62	31.77	5.04	35.14	13.78	0.00	0.00	0.00	91.53	9.15%	32.26
15	432.81	10.85	0.00	26.88	44.62	31.77	5.04	31.38	12.31	0.00	0.00	0.00	86.84	8.68%	28.41
16	396.00	9.93	0.00	24.59	44.62	31.77	5.04	27.62	10.83	0.00	0.00	0.00	82.16	8.22%	24.95
17	359.20	9.01	0.00	22.31	44.62	31.77	5.04	23.85	9.36	0.00	0.00	0.00	77.47	7.75%	21.84
18	322.39	8.08	0.00	20.02	44.62	31.77	5.04	20.09	7.88	0.00	0.00	0.00	72.79	7.28%	19.04
19	285.58	7.16	0.00	17.73	44.62	31.77	5.04	16.33	6.41	0.00	0.00	0.00	68.11	6.81%	16.54
20	248.78	6.24	0.00	15.45	44.62	31.77	5.04	12.57	4.93	0.00	0.00	0.00	63.42	6.34%	14.30
21	216.35	5.42	0.00	13.44	22.31	31.77	(3.71)	31.57	12.38	0.00	0.00	0.00	59.30	5.93%	12.41
22	192.66	4.83	0.00	11.96	0.00	31.77	(12.46)	51.45	20.18	0.00	0.00	0.00	56.28	5.63%	10.93
23	173.36	4.35	0.00	10.77	0.00	31.77	(12.46)	49.48	19.41	0.00	0.00	0.00	53.83	5.38%	9.70
24	154.05	3.86	0.00	9.57	0.00	31.77	(12.46)	47.51	18.63	0.00	0.00	0.00	51.37	5.14%	8.60
25	134.75	3.38	0.00	8.37	0.00	31.77	(12.46)	45.54	17.86	0.00	0.00	0.00	48.91	4.89%	7.60
26	115.44	2.89	0.00	7.17	0.00	31.77	(12.46)	43.56	17.09	0.00	0.00	0.00	46.46	4.65%	6.70
27	96.13	2.41	0.00	5.97	0.00	31.77	(12.46)	41.59	16.31	0.00	0.00	0.00	44.00	4.40%	5.89
28	76.83	1.93	0.00	4.77	0.00	31.77	(12.46)	39.62	15.54	0.00	0.00	0.00	41.54	4.15%	5.16
29	57.52	1.44	0.00	3.57	0.00	31.77	(12.46)	37.64	14.77	0.00	0.00	0.00	39.09	3.91%	4.51
30	38.21	0.96	0.00	2.37	0.00	31.77	(12.46)	35.67	13.99	0.00	0.00	0.00	36.63	3.66%	3.92
31	18.91	0.47	0.00	1.17	0.00	31.77	(12.46)	33.70	13.22	0.00	0.00	0.00	34.17	3.42%	3.39
32	(0.40)	(0.01)	0.00	(0.02)	0.00	31.77	(12.46)	31.73	12.44	0.00	0.00	0.00	31.72	3.17%	2.92
33	(19.70)	(0.49)	0.00	(1.22)	0.00	31.77	(12.46)	29.75	11.67	0.00	0.00	0.00	29.26	2.93%	2.50
34	(39.01)	(0.98)	0.00	(2.42)	0.00	31.77	(12.46)	27.78	10.90	0.00	0.00	0.00	26.80	2.68%	2.13
35	(58.32)	(1.46)	0.00	(3.62)	0.00	31.77	(12.46)	25.81	10.12	0.00	0.00	0.00	24.35	2.43%	1.80
36	(77.62)	(1.95)	0.00	(4.82)	0.00	31.77	(12.46)	23.84	9.35	0.00	0.00	0.00	21.89	2.19%	1.50
37	(96.93)	(2.43)	0.00	(6.02)	0.00	31.77	(12.46)	21.86	8.58	0.00	0.00	0.00	19.43	1.94%	1.23
38	(116.24)	(2.91)	0.00	(7.22)	0.00	31.77	(12.46)	19.89	7.80	0.00	0.00	0.00	16.98	1.70%	1.00
39	(135.54)	(3.40)	0.00	(8.42)	0.00	31.77	(12.46)	17.92	7.03	0.00	0.00	0.00	14.52	1.45%	0.79
40	(154.85)	(3.88)	0.00	(9.62)	0.00	31.77	(12.46)	15.94	6.25	0.00	0.00	0.00	12.06	1.21%	0.61
41	(174.15)	(4.37)	0.00	(10.82)	0.00	31.77	(12.46)	13.97	5.48	0.00	0.00	0.00	9.61	0.96%	0.45
42	(193.46)	(4.85)	0.00	(12.01)	0.00	31.77	(12.46)	12.00	4.71	0.00	0.00	0.00	7.15	0.71%	0.31
43	65.55	1.64	0.00	4.07	334.21	0.00	131.09	(327.51)	(128.47)	0.00	0.00	0.00	8.34	0.83%	0.34
44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00
TOTAL		$309.74	$0.00	$767.24	$1,334.21	$1,334.21	($0.00)	$1,262.43	$495.19	$0.00	$0.00	$0.00	$2,906.38		1,299
PRESENT WORTH		$178.61	$0.00	$442.42	$529.47	$392.78	$53.62	$591.28	$231.93	$0.00	$0.00	$0.00	$1,299.36	129.94%	
LEVELIZED PAYMENT		$14.45	$0.00	$35.78	$42.82	$31.77	$4.34	$47.82	$18.76	$0.00	$0.00	$0.00	$105.09	10.51%	

BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Development of Weighted Plant Book Lives and Salvage

Line No.		Description	2004 Plant Balance	Average Service Life	Net Salvage Value
			(1)	(2)	(3)
1	MANUFACTURED GAS PLANT		{1}	{2}	{2}
2	304	LAND & LAND RIGHTS	0	0	0%
3	305	STRUCTURES & IMPROVEME	2,368,951	42	-5%
4	306	BOILER PLANT EQUIPMENT	0	0	0%
5	307	OTHER POWER EQUIPMENT	0	0	0%
6	311	LP GAS EQUIPMENT	4,339,415	36	0%
7	313	GENERATING EQUIPMENT - I	0	0	0%
8	320	OTHER EQUIPMENT	819,245	20	0%
9	321	LNG EQUIPMENT	15,428,067	27	0%
10					
11		**Total Manufactured Gas Plant**	**22,955,678**	**30**	**-0.5%**
12					
13					
14	DISTRIBUTION INVESTMENT (excluding Customer Equip)				
15	364	Land & Land Rights	0	0	0%
16	365	(374) Right Of Way	79,051	75	0%
17	366	(375) Structures And Improvem	2,108,612	54	-5%
18	367	(376.1) Cast Iron	5,674,038	75	-15%
19	367	(376.2) Steel Mains - Coated/W	146,194,595	55	-15%
20	367	(376.3) Steels Mains - Bare	2,546,698	74	-15%
21	367	(376.4) Plastic Mains	125,655,798	55	-15%
22	367	(376.5) Joint Seals	20,062,435	23	-15%
23	367	(376.6) Cathodic Protection	8,599,637	19	-15%
24	368	(394.1) Compressor Station Eq	327,265	22	0%
25	369	(378) Meas & Reg Sta Equipme	12,355,152	39	-5%
26	0	(379) Other Equipment	510,252	35	0%
27					
28		**Total Distribution Capacity-Related**	**324,113,533**	**52**	**-15%**
29					
30					
31	SERVICES INVESTMENT				
32	380	(380.2) Steel - Coated/Wrappe	58,856,439	56	-170%
33	380	(380.3) Steel - Bare	571,866	60	-170%
34	380	(380.4) Plastic	169,135,061	55	-170%
35	380	(380.5) Copper	182,997	55	-170%
36					
37		**Total Services Investment**	**228,746,363**	**55**	**-170%**
38					
39					
40	METERS INVESTMENT				
41	381	Gas Meters	24,915,974	28	2%
42	382	Meter Installations	45,198,411	53	-60%
43	383	Regulators	13,612,047	31	-10%
44					
45		**Total Meter-Related**	**$83,726,432**	**42**	**-33%**

NOTES:
1 Plant balances taken from Annual Report of 12/31/104
2 Service lives and salvage values based on current depreciation study.

Schedule JLH-3-9
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Capacity Costs

Line No.	Description		--- PRODUCTION --- Supply Related	Transp. Related	--TRANSMISSION & DISTRIBUTION-- Mains Reinforce	Mains Extension DD SO	Total Distribution	Total Production & Distribution
			(1)	(2)	(3)	(4)	(5)	(6)
	PLANT INVESTMENT							
1	Long-Run Unit Costs - $/Design Day Dt	{1}	$202.71	$81.05	$199.33	$256.33	$455.66	$739.41
2	General Plant Loading Factor	{2}	6.25%	6.25%	6.25%	6.25%		
3	Unit Costs + Loading Factor (1)+(1)*(2)		215.38	86.12	211.79	272.36	$484.15	$785.65
4								
5	Fixed Charge Rate	{3}	9.91%	9.91%	8.60%	8.60%		
6	A & G Exp Plant-Related Loading Factor	{4}	1.15%	1.15%	1.15%	1.15%		
7	Total Rate (5)+(6)		11.06%	11.06%	9.75%	9.75%		
8								
9	Annualized Cost (3)*(7)		$23.82	$9.52	$20.65	$26.56	$47.21	$80.56
10	**OPERATING EXPENSES**							
11	Production capacity costs	{5}	$4.58	$0.22				$4.80
12	Distribution capacity costs	{6}			$1.68	$10.57	$12.25	$12.25
13	A&G Exp Non-Plant Loading Factor	{4}	151.43%	151.43%	151.43%	151.43%		
14	Plant + Labor Loading [(11)+(12)]*[1+(13)]		$11.51	$0.56	$4.21	$26.59	$30.80	$42.86
15								
16	**WORKING CAPITAL**							
17	Materials & Supplies + Prepayments Rate	{2}	0.93%	0.93%	0.93%	0.93%		
18	M&S Cost (3)*(17)		2.01	0.80	1.98	2.55		
19	Working Cash O&M Allowance {7} (14)*11.56%		1.33	0.06	0.49	3.07		
20	Total Working Capital (18)+(19)		$3.34	$0.87	$2.47	$5.62	$8.09	$12.30
21								
22	Working Capital Rev. Req'd {8} (20)*12.73%		$0.43	$0.11	$0.31	$0.72	$1.03	$1.57
23								
24	System Seasonal Capacity Related Cost							
25	$/Des'n Day Dt (9)+(14)+(22)		$35.75	$10.19	$25.18	$53.86	$79.04	$124.99
26								
27	Loss Factor	{2}	0.990	0.990	0.990	0.990	0.990	0.990
28	Inflation Adjustment	{9}	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%
29								
30	**Annual Capacity Cost (25)*[1+(28)]/(27)**		**$37.770**	**$10.765**	**$26.602**	**$56.899**	**$83.502**	**$132.037**

NOTES:
1 Sources: Production taken from Schedule JLH-3- 1, Page 1. Distribution taken from Schedule JLH-3- 2, page 1.
2 Source: Schedule JLH-3- 7, page 2.
3 Source: Schedule JLH-3-8, Page 1.
4 Source: Schedule JLH-3- 7, page 1.
5 Source: Schedule JLH-3- 4, page 4.
6 Source: Reinforcement from Schedule JLH-3- 4, page 5 and extentions from Schedule JLH-3- 5, page 1.
7 Working cash computed on the basis of 45 days net lag from expense to revenue.
8 Revenue requirement for working cash computed as the after tax cost of capital, i.e. debt costs plus equity costs increased by taxes equals 12.73%.
9 Inflation adjustment to restate marginal costs to rate year dollars.

Schedule JLH-3-10
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Commodity Costs

Line No.	Description	<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter	Total Company
	PLANT INVESTMENT											
1	Not Applicable	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
2												
3												
4	OPERATING EXPENSES											
5												
6	Forecasted Incremental Commodity Costs											
7	Winter Period {1}	$9.909	$9.791	$9.798	$9.962	$9.792	$9.934	$9.796	$9.897	$9.841	$9.830	$9.907
8												
9	Adjustment for A&G and Working Capital {2}	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%
10												
11	**Winter Commodity Cost (7)*(9)**	**$10.255**	**$10.133**	**$10.139**	**$10.309**	**$10.134**	**$10.280**	**$10.138**	**$10.242**	**$10.185**	**$10.173**	**$10.252**
12												
13												
14												
15												
16												
17	Forecasted Incremental Commodity Costs											
18	Summer Period {1}	$7.690	$7.692	$7.691	$7.690	$7.692	$7.690	$7.693	$7.690	$7.690	$7.691	$7.691
19												
20	Adjustment for A&G and Working Capital {2}	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%	103.49%
21												
22	**Summer Commodity Cost (18)*(20)**	**$7.959**	**$7.960**	**$7.959**	**$7.958**	**$7.960**	**$7.958**	**$7.962**	**$7.958**	**$7.958**	**$7.960**	**$7.959**

NOTES:
1 Source: Schedule JLH-3- 4, page 1.
2 Source: Schedule JLH-3- 10, page 2.

Schedule JLH-3-10 Page 2 of 2
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Commodity Costs

Line No.	Description			WINTER	SUMMER
	PLANT INVESTMENT				
1	Not Applicable			$0.00	$0.00
2					
3	OPERATING EXPENSES				
4	Seasonal Weighted Average Gas	{1}{2}		$ 9.91	$ 7.69
5					
6	Non-Gas Producion O&M Loading Factor	{3}		0.00%	0.00%
7	A&G Exp Non-Plant Loading Factor	{4}		151.43%	151.43%
8	Other Production O&M	(4)*(6)*[1+(7)]		$0.000	$0.000
9					
10	Total Variable Commodity Cost (4)+(8)			$9.907	$7.691
11					
12	WORKING CAPITAL				
13	Fuel Inventory Rate	{3}		12.34%	12.34%
14	Fuel Inventory Cost (4)*(13)			1.22	0.95
15	Working Cash Allow	[(4)*25.30+(8)*42]/365	{5}	$0.687	$0.533
16	Total Working Capital (14)+(15)			$1.909	$1.482
17					
18	Working Capital Rev. Required	(16)*12.73%		$0.243	$0.189
19		{6}			
20	System Seasonal Commodity Related Cost				
21	$/Dt	(10)+(18)		$10.150	$7.879
22					
23	Loss Factor	{7}		0.990	0.990
24					
25	Date of Dispacth Prices		02-May-06		
26	Midpoint of Rate Year		02-May-06		
27	Commodity Inflation Adjustment	{8}		0.00%	0.00%
28					
29	Marginal Commodity Cost (21)/(23)*[1+(27)]			$10.252	$7.959
30					
31	**Ratio to Incremental Supply Costs**	**(29)/(4)**		**1.0349**	**1.0349**

NOTES:
1 Source: Schedule JLH-3- 4 , page 3.
2 Source: Schedule JLH-3- 4 , page 2.
3 Source: Schedule JLH-3- 7 , page 2.
4 Source: Schedule JLH-3- 7 , page 1.
5 Working cash computed on the basis of 25.30 days net lag for gas and 42.21 days for other expenses.
6 Revenue requirement for working cash computed as the after tax cost of capital, i.e. debt costs plus equity costs increased by taxes equals 12.73%.
7 Source: Schedule JLH-3- 7 , page 2.
8 Source: Schedule JLH-3- 8 , page 1.

Schedule JLH-3-11
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Customer Costs

Line No.	Description	<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter
	PLANT INVESTMENT										
1	Meters and Regulators {1}	$287.16	$296.85	$772.27	$500.37	$2,177.24	$2,315.55	$5,352.84	$5,367.91	$10,443.94	$15,869.90
2	General Plant Loading Factor {2}	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%
3	Unit Costs + Loading Factor (1)+(1)*(2)	305.12	315.42	820.57	531.66	2,313.39	2,460.35	5,687.58	5,703.58	11,097.04	16,862.30
4	Fixed Charge Rate {3}	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%
5	Meters Carrying Costs (3)*(4)	23.67	24.47	63.66	41.25	179.48	190.89	441.27	442.51	860.96	1,308.26
6	Services {1}	1,547.66	1,547.66	2,212.45	2,212.45	2,708.48	2,708.48	15,851.24	15,851.24	27,591.93	27,591.93
7	General Plant Loading Factor {2}	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%
8	Unit Costs + Loading Factor (6)+(6)*(7)	1,644.44	1,644.44	2,350.80	2,350.80	2,877.85	2,877.85	16,842.47	16,842.47	29,317.34	29,317.34
9	Fixed Charge Rate {3}	8.10%	8.10%	8.10%	8.10%	8.10%	8.10%	8.10%	8.10%	8.10%	8.10%
10	Services Carrying Costs (8)*(9)	133.25	133.25	190.49	190.49	233.19	233.19	1,364.74	1,364.74	2,375.58	2,375.58
11											
12	Total Plant Carrying Costs (5)+(10)	$156.92	$157.72	$254.15	$231.73	$412.68	$424.08	$1,806.02	$1,807.26	$3,236.55	$3,683.84
13											
14	A & G Exp Plant-Related Loading Factor {4}	1.15%	1.15%	1.15%	1.15%	1.15%	1.15%	1.15%	1.15%	1.15%	1.15%
15											
16	Annualized Cost (12)+(12)*(14)	$158.73	$159.54	$257.08	$234.40	$417.43	$428.97	$1,826.83	$1,828.09	$3,273.85	$3,726.30
17											
18											
19	**OPERATING EXPENSES**										
20	Plant Related O&M $/Customer {5}	$51.05	51.32	83.04	75.48	$135.94	$139.78	$589.97	$590.39	$1,058.28	$1,209.25
21	Customer Acctg & Mktg Expenses {6}	$28.18	$24.98	$38.37	$38.82	$64.65	$70.91	$276.06	$256.01	$1,688.12	$1,799.34
22	A&G Exp Non-Plant Loading Factor {4}	151.43%	151.43%	151.43%	151.43%	151.43%	151.43%	151.43%	151.43%	151.43%	151.43%
23	Plant + Labor Loading (20+21+[20+21]*22)	$199.20	$191.84	$305.27	$287.39	$504.35	$529.75	$2,177.48	$2,128.12	$6,905.35	$7,564.58
24											
25	**WORKING CAPITAL - $/Customer**										
26	Materials & Supplies + Prepayments Rate {3}	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%
27	M&S Cost [(3)+(8)]*(26)	18.22	18.32	29.64	26.94	48.51	49.89	210.55	210.70	377.69	431.57
28	Working Cash O&M Allowance {7} (23) 11.56%	23.04	22.19	35.30	33.23	58.32	61.26	251.81	246.10	798.56	874.80
29	Total Working Capital (27)+(28)	$41.26	$40.50	$64.94	$60.17	$106.84	$111.15	$462.37	$456.81	$1,176.25	$1,306.37
30	{8}										
31	Working Capital Rev. Requirement (29)' 12.73%	$5.25	$5.15	$8.26	$7.66	$13.60	$14.14	$58.84	$58.13	$149.68	$166.24
32											
33	Annual Customer Related Cost	$363.18	$356.54	$570.61	$529.45	$935.37	$972.86	$4,063.15	$4,014.33	$10,328.88	$11,457.11
34	$/Customer (16)+(23)+(31)										
35	Inflation Adjustment {9}	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%
36											
37	**Annual Customer Related Cost (33)*[1+(35)]**	**$379.84**	**$372.88**	**$596.78**	**$553.73**	**$978.27**	**$1,017.47**	**$4,249.47**	**$4,198.42**	**$10,802.52**	**$11,982.49**

NOTES:
1 Meter investment from Schedule JLH-3- 3, Page 1.
2 Source: Schedule JLH-3- 7, page 2.
3 Source: Schedule JLH-3- 8, page 1.
4 Source: Schedule JLH-3- 7, page 1.
5 Source: Schedule JLH-3- 6, page 2.
6 Source: Schedule JLH-3- 6, page 4.
7 Working cash computed on the basis of 45 days net lag from expense to revenue.
8 Revenue requirement for working cash computed as tax rate divided by 1 minus tax rate multiplied by the cost of equity all added to the cost of capital.
9 Source: Price escalation to mid-point of rate year.

Schedule JLH-3-12
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Sales Cost Estimates

SALES ONLY

Line No.	Description		<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter	Total Company
1	**Uncollectible Account Expense Percentage {1}**		2.5%	7.0%	3.5%	3.3%	0.8%	0.8%	0.5%	0.4%	0.7%	0.3%	
2													
3	**CUSTOMER CHARGE $'s per month**	{2}											
4	Customer Charge w/o Uncollectibles		$31.65	$31.07	$49.73	$46.14	$81.52	$84.79	$354.12	$349.87	$900.21	$998.54	
5													
6	**WINTER CHARGES**												
7	Gas Supply Demand Charge $'s per Dt	{3}	$37.77	$37.77	$37.77	$37.77	$37.77	$37.77	$37.77	$37.77	$37.77	$37.77	
8	Delivery Demand Charge - Pressure Support	{3}	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	
9	Delivery Demand Charge - Reinforcements	{3}	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	
10													
11	Delivery Demand Charge - Mains Ext	{3} {5}	$46.37	$33.29	$33.43	$50.96	$33.66	$49.35	$32.48	$47.51	$41.26	$40.17	
12	Commodity Charge $'s per Dt	{4}	$10.255	$10.133	$10.139	$10.309	$10.134	$10.280	$10.138	$10.242	$10.185	$10.173	
13													
14	**SUMMER CHARGES**												
15	Gas Supply Demand Charge $'s per Dt		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
16	Delivery Demand Charge - Mains Ext	{3} {5}	$10.53	$23.61	$23.47	$5.94	$23.24	$7.55	$24.42	$9.39	$15.64	$16.73	
17	Commodity Charge $'s per Dt	{4}	$7.959	$7.960	$7.959	$7.958	$7.960	$7.958	$7.962	$7.958	$7.958	$7.960	
18													
19													
20	**CALENDAR MONTH BILLING DETERMINANTS (2004) - Bundled Sales Only**												
21	Customers		222,171	33,371	2,987	15,909	1,271	3,652	92	278	8	5	279,743
22	Design Day Dt -Sales		271,873	3,209	2,413	31,916	7,202	48,100	2,882	19,186	2,036	4,846	393,663
23	Winter Dt -Sales		20,188,022	374,121	261,217	2,087,682	811,653	3,351,208	380,458	1,459,972	228,699	312,870	29,455,903
24	Summer Dt -Sales		4,582,352	265,304	183,403	243,439	560,238	512,440	286,131	288,397	86,701	130,325	7,138,729
25													
26	**REVENUES RESULTING FROM FULL MARGINAL COST PRICING**												
27													
28	Total Customer Charge	(4)*(21)*12/[1-(1)]	86,524,535	13,380,381	1,846,802	9,111,900	1,253,711	3,745,788	391,305	1,170,468	82,462	61,070	117,568,424
29													
30													
31													
32	Winter												
33	Winter Supply Cost	(7)*(22)/[1-(1)]	10,528,498	130,347	94,412	1,246,929	274,311	1,831,310	109,344	727,795	77,392	183,524	15,203,862
34	Winter Delivery Pressure Support	(8)*(22)/[1-(1)]	3,000,835	37,151	26,909	355,400	78,184	521,960	31,165	207,436	22,058	52,308	4,333,408
35	Winter Delivery Reinforcements	(9)*(22)/[1-(1)]	7,415,518	91,807	66,497	878,247	193,205	1,289,843	77,014	512,606	54,510	129,261	10,708,508
36													0
37	Winter Demand Main Ext.	(11)*(22)/[1-(1)]	12,926,765	114,891	83,561	1,682,300	244,487	2,392,919	94,017	915,551	84,540	195,175	18,734,205
38	Winter Commodity	(12)*(23)/[1-(1)]	212,265,311	4,076,198	2,743,771	22,262,310	8,294,627	34,726,870	3,874,568	15,017,664	2,344,645	3,191,225	308,797,189
39	Total Winter		246,136,926	4,450,394	3,015,150	26,425,187	9,084,814	40,762,903	4,186,107	17,381,053	2,583,145	3,751,494	357,777,174
40	Summer												
41	Summer Supply Cost	(15)*(22)/[1-(1)]	0	0	0	0	0	0	0	0	0	0	0
42	Summer Demand Main Ext.	(16)*(22)/[1-(1)]	2,934,165	81,474	58,669	196,169	168,756	365,906	70,707	180,854	32,050	81,300	4,170,047
43	Summer Commodity	(18)*(24)/[1-(1)]	37,391,915	2,270,765	1,512,202	2,003,913	4,497,290	4,110,631	2,288,428	2,304,930	694,556	1,040,055	58,114,683
44	Total Summer		40,326,079	2,352,238	1,570,871	2,200,081	4,666,045	4,476,536	2,359,135	2,485,785	726,605	1,121,354	62,284,731
45													
46	Supply Subtotal	(33)+(38)+(41)+(43)	260,185,724	6,477,310	4,350,385	25,513,152	13,066,227	40,668,811	6,272,339	18,050,389	3,116,593	4,414,804	382,115,735
47	Delivery Subtotal	(28)+(34)+(35)+(37)+(42)	112,801,817	13,705,704	2,082,438	12,224,016	1,938,343	8,316,416	664,208	2,986,916	275,620	519,115	155,514,593
48	**Total Marginal Annual Cost**		372,987,541	20,183,013	6,432,824	37,737,169	15,004,570	48,985,227	6,936,547	21,037,306	3,392,212	4,933,919	537,630,328

NOTES:
1 Source: Schedule JLH-3-6, page 5.
2 Source: Schedule JLH-3- 11, line (37)/12
3 Source: Schedule JLH-3- 9, page 1.
4 Source: Schedule JLH-3- 10, page 1.
5 Main Extension demand charges are computed on a design day demand basis and then allocated to seasons on the basis of class seasonal volumes.

Schedule JLH-3-12
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Delivery Cost Estimates

DELIVERY ONLY

Line No.	Description		<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter	Total Company
1	**Uncollectible Account Expense Percentage {1}**		2.5%	7.0%	3.5%	3.3%	0.8%	0.8%	0.5%	0.4%	0.7%	0.3%	
2													
3	**CUSTOMER CHARGE $'s per month**	{2}											
4	Customer Charge w/o Uncollectibles		$31.65	$31.07	$49.73	$46.14	$81.52	$84.79	$354.12	$349.87	$900.21	$998.54	
5													
6	**WINTER CHARGES**												
7	Gas Supply Demand Charge $'s per Dt	{3}	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
8	Delivery Demand Charge - Pressure Support	{3}	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	$10.77	
9	Delivery Demand Charge - Reinforcements	{3}	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	$26.60	
10													
11	Delivery Demand Charge - Mains Ext	{3} {5}	$44.99	$30.63	$35.50	$48.55	$34.39	$47.68	$33.08	$47.41	$29.38	$46.13	
12	Commodity Charge $'s per Dt	{4}	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	
13													
14	**SUMMER CHARGES**												
15	Gas Supply Demand Charge $'s per Dt		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
16	Delivery Demand Charge - Mains Ext	{3} {5}	$11.91	$26.27	$21.40	$8.35	$22.51	$9.22	$23.82	$9.49	$27.52	$10.77	
17	Commodity Charge $'s per Dt	{4}	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	
18													
19													
20	**CALENDAR MONTH BILLING DETERMINANTS**	**(2004) - Delivery Only**											
21	Customers		37	5	338	775	485	1,031	157	342	59	10	3,239
22	Design Day Dt		87	1	470	2,532	4,191	19,071	8,474	29,808	23,973	6,459	95,066
23	Winter Dt		6,290	103	49,770	162,113	462,438	1,300,790	1,095,205	2,220,666	2,636,897	408,251	8,342,522
24	Summer Dt		1,665	88	30,008	27,890	302,610	251,621	788,733	444,506	2,469,927	95,358	4,412,405
25													
26	**REVENUES RESULTING FROM FULL MARGINAL COST PRICING**												
27													
28	Total Customer Charge	(4)*(21)*12/[1-(1)]	14,280	1,971	209,219	444,037	478,712	1,057,173	671,978	1,441,036	641,573	120,139	5,080,117
29													
30													
31													0
32	Winter												
33	Winter Supply Cost	(7)*(22)/[1-(1)]	0	0	0	0	0	0	0	0	0	0	0
34	Winter Delivery Pressure Support	(8)*(22)/[1-(1)]	955	10	5,237	28,190	45,501	206,948	91,638	322,285	259,788	69,719	1,030,271
35	Winter Delivery Reinforcements	(9)*(22)/[1-(1)]	2,360	26	12,942	69,661	112,439	511,399	226,451	796,416	641,977	172,286	2,545,956
36													0
37	Winter Demand Main Ext.	(11)*(22)/[1-(1)]	3,991	30	17,269	127,125	145,369	916,532	281,572	1,419,336	709,004	298,724	3,918,952
38	Winter Commodity	(12)*(23)/[1-(1)]	0	0	0	0	0	0	0	0	0	0	0
39	Total Winter		7,306	66	35,448	224,975	303,309	1,634,880	599,661	2,538,038	1,610,769	540,729	7,495,180
40	Summer												
41	Summer Supply Cost	(15)*(22)/[1-(1)]	0	0	0	0	0	0	0	0	0	0	0
42	Summer Demand Main Ext.	(16)*(22)/[1-(1)]	1,056	25	10,412	21,871	95,126	177,291	202,780	284,105	664,109	69,775	1,526,551
43	Summer Commodity	(18)*(24)/[1-(1)]	0	0	0	0	0	0	0	0	0	0	0
44	Total Summer		1,056	25	10,412	21,871	95,126	177,291	202,780	284,105	664,109	69,775	1,526,551
45													
46	Supply Subtotal	(33)+(38)+(41)+(43)	0	0	0	0	0	0	0	0	0	0	0
47	Delivery Subtotal	(28)+(34)+(35)+(37)+(42)	22,643	2,063	255,078	690,883	877,147	2,869,343	1,474,419	4,263,179	2,916,451	730,642	14,101,848
48	**Total Marginal Annual Cost**		22,643	2,063	255,078	690,883	877,147	2,869,343	1,474,419	4,263,179	2,916,451	730,642	14,101,848

NOTES:
1 Source: Schedule JLH-3-6, page 5.
2 Source: Schedule JLH-3- 11, line (37)/12
3 Source: Schedule JLH-3- 9, page 1.
4 Source: Schedule JLH-3- 10, page 1.
5 Main Extension demand charges are computed on a design day demand basis and then allocated to seasons on the basis of class seasonal volumes.

Schedule JLH-3-12
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Sales and Delivery Cost Estimates {1}

SALES AND DELIVERY

Line No.	Description		<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter	Total Company
1													
2	**CALENDAR MONTH BILLING DETERMINANTS (2004) - Sales and Delivery**												
3	Customers		222,208	33,376	3,326	16,684	1,756	4,683	249	619	67	15	282,983
4	Design Day Dt		271,959	3,210	2,883	34,448	11,393	67,171	11,356	48,994	26,009	11,306	488,729
5	Winter Dt		20,194,312	374,224	310,988	2,249,795	1,274,090	4,651,999	1,475,663	3,680,638	2,865,595	721,120	37,798,424
6	Summer Dt		4,584,017	265,393	213,411	271,329	862,848	764,061	1,074,864	732,903	2,556,627	225,683	11,551,134
7			24,778,329	639,617	524,399	2,521,124	2,136,938	5,416,059	2,550,527	4,413,541	5,422,223	946,803	49,349,558
8	**REVENUES RESULTING FROM FULL MARGINAL COST PRICING (Adjusted for uncollectibles)**												
9													
10	Customer		86,538,815	13,382,352	2,056,021	9,555,937	1,732,423	4,802,960	1,063,283	2,611,504	724,035	181,209	122,648,540
11													
12													
13													
14	Winter												
15	Winter Supply Cost		10,528,498	130,347	94,412	1,246,929	274,311	1,831,310	109,344	727,795	77,392	183,524	15,203,862
16	Winter Delivery Pressure Support		3,001,790	37,162	32,146	383,590	123,685	728,908	122,803	529,722	281,847	122,027	5,363,680
17	Winter Delivery Reinforcements		7,417,878	91,833	79,439	947,908	305,644	1,801,243	303,485	1,309,023	696,486	301,547	13,254,464
18													
19	Winter Demand Main Ext.		12,930,756	114,920	100,830	1,809,425	389,856	3,309,451	375,589	2,334,887	793,544	493,900	22,653,158
20	Winter Commodity		212,265,311	4,076,198	2,743,771	22,262,310	8,294,627	34,726,870	3,874,568	15,017,664	2,344,645	3,191,225	308,797,189
21	Total Winter		246,144,233	4,450,460	3,050,598	26,650,162	9,388,123	42,397,782	4,785,768	19,919,090	4,193,914	4,292,223	365,272,353
22	Summer												
23	Summer Supply Cost		0	0	0	0	0	0	0	0	0	0	0
24	Summer Demand Main Ext.		2,935,221	81,499	69,081	218,039	263,882	543,197	273,487	464,960	696,159	151,075	5,696,599
25	Summer Commodity		37,391,915	2,270,765	1,512,202	2,003,913	4,497,290	4,110,631	2,288,428	2,304,930	694,556	1,040,055	58,114,683
26	Total Summer		40,327,136	2,352,264	1,581,283	2,221,952	4,761,171	4,653,828	2,561,915	2,769,890	1,390,715	1,191,129	63,811,282
27													
28	Supply Subtotal	(15)+(20)+(23)+(25)	260,185,724	6,477,310	4,350,385	25,513,152	13,066,227	40,668,811	6,272,339	18,050,389	3,116,593	4,414,804	382,115,735
29	Delivery Subtotal	(10)+(16)+(17)+(19)+(24)	112,824,460	13,707,766	2,337,517	12,914,899	2,815,490	11,185,759	2,138,627	7,250,095	3,192,070	1,249,757	169,616,441
30	**Total Marginal Annual Cost**		373,010,184	20,185,076	6,687,902	38,428,051	15,881,717	51,854,570	8,410,966	25,300,484	6,308,663	5,664,562	551,732,176

NOTES:
1 Source: Schedule JLH-3-12, page 1 + page 2

Schedule JLH-3-13
BAY STATE GAS COMPANY
GAS MARGINAL COST STUDY

Summary of Marginal Unit Costs per Dt

Line No.	Description	<-- Residential --> R3/R4 Heat	R1/R2 NonHt	<-- Small C&I --> G50 Lo Winter	G40 Hi Winter	<-- Medium C&I --> G51 Lo Winter	G41 Hi Winter	<-- Large C&I --> G52 Lo Winter	G42 Hi Winter	<-- Extra Large C&I --> G53 Lo Winter	G43 Hi Winter	Total Company
1	CUSTOMER CHARGE (with uncollectibles)											
2	Customer Charge $'s per Month {1}	$32.45	$33.41	$51.52	$47.73	$82.21	$85.47	$355.73	$351.39	$906.18	$1,001.16	
3												
4												
5												
6												
7	WINTER CHARGES {2}											
8	Supply Demand Charge $'s per Dt	$0.522	$0.348	$0.361	$0.597	$0.338	$0.546	$0.287	$0.498	$0.338	$0.587	
9	Delivery Demand Charge - Pressure Support	$0.149	$0.099	$0.103	$0.170	$0.097	$0.157	$0.083	$0.144	$0.098	$0.169	
10	Delivery Demand Charge - Reinforcements	$0.367	$0.245	$0.255	$0.421	$0.240	$0.387	$0.206	$0.356	$0.243	$0.418	
11	Demand Main Ext	$0.640	$0.307	$0.324	$0.804	$0.306	$0.711	$0.255	$0.634	$0.277	$0.685	
12	Commodity Charge $'s per Dt	$10.514	$10.895	$10.504	$10.664	$10.219	$10.362	$10.184	$10.286	$10.252	$10.200	
13												
14	SUMMER CHARGES {2}											
15	Demand Charge $'s per Dt	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	
16	Demand Main Ext	$0.640	$0.307	$0.324	$0.804	$0.306	$0.711	$0.254	$0.634	$0.272	$0.669	
17	Commodity Charge $'s per Dt	$8.160	$8.559	$8.245	$8.232	$8.027	$8.022	$7.998	$7.992	$8.011	$7.980	
18												
19	TOTAL CHARGES											
20	Bundled Sales											
21	Customer (2)	$32.45	$33.41	$51.52	$47.73	$82.21	$85.47	$355.73	$351.39	$906.18	$1,001.16	
22	Winter sum (8) thru (12)	$12.192	$11.896	$11.548	$12.657	$11.200	$12.164	$11.015	$11.919	$11.209	$12.059	
23	Summer (15)+(16)+(17)	$8.800	$8.866	$8.569	$9.035	$8.333	$8.733	$8.252	$8.627	$8.283	$8.650	
24	Annual Average	$11.565	$10.639	$10.418	$12.386	$10.314	$12.178	$11.023	$12.977	$17.707	$12.372	
25	Delivery											
26	Customer (2)	$32.45	$33.41	$51.52	$47.73	$82.21	$85.47	$355.73	$351.39	$906.18	$1,001.16	
27	Winter (9)+(10)+(11)	$1.156	$0.652	$0.683	$1.396	$0.643	$1.255	$0.543	$1.134	$0.618	$1.272	
28	Summer (16)	$0.640	$0.307	$0.324	$0.804	$0.306	$0.711	$0.254	$0.634	$0.272	$0.669	
29	Annual Average	$1.061	$0.509	$0.537	$1.332	$0.507	$1.178	$0.422	$1.051	$0.455	$1.129	
30												
31	CALENDAR MONTH BILLING DETERMINANTS (2004) - BUNDLED SALES LOADS (SALES Only)											
32	Customers	222,171	33,371	2,987	15,909	1,271	3,652	92	278	8	5	279,743
33	Design Day Dt	271,873	3,209	2,413	31,916	7,202	48,100	2,882	19,186	2,036	4,846	393,663
34	Winter Dt	20,188,022	374,121	261,217	2,087,682	811,653	3,351,208	380,458	1,459,972	228,699	312,870	29,455,903
35	Summer Dt	4,582,352	265,304	183,403	243,439	560,238	512,440	286,131	288,397	86,701	130,325	7,138,729
36	Total Annual Dt	24,770,374	639,426	444,620	2,331,121	1,371,891	3,863,648	666,589	1,748,369	315,400	443,195	36,594,632
37												
38	CALENDAR MONTH BILLING DETERMINANTS (2004) - TOTAL DELIVERY LOADS (SALES and Delivery)											
39	Customers	222,208	33,376	3,326	16,684	1,756	4,683	249	619	67	15	282,983
40	Design Day Dt	271,959	3,210	2,883	34,448	11,393	67,171	11,356	48,994	26,009	11,306	488,729
41	Winter Dt	20,194,312	374,224	310,988	2,249,795	1,274,090	4,651,999	1,475,663	3,680,638	2,865,595	721,120	37,798,424
42	Summer Dt	4,584,017	265,393	213,411	271,329	862,848	764,061	1,074,864	732,903	2,556,627	225,683	11,551,134
43	Total Annual Dt	24,778,329	639,617	524,399	2,521,124	2,136,938	5,416,059	2,550,527	4,413,541	5,422,223	946,803	49,349,558

NOTES:
1 Source: Schedule JLH-3-12, page 3, line10 divided by total customers divided by 12 for a monthly charge result.
2 Source: Schedule JLH-3- 12 revenues divided by billing month normalized determinants.

Bay State Gas Company
Summary of Cost Study Results
Derivation of Gas Supply Charges

Line No. (1)	Rate Class: Size (2)	Load Factor (3)	Rate Class (4)	Gas Supply Revenue Reqm't (ACS): Production Capacity (7) from COSS	Commodity (8) from COSS	Total Gas Supply (9) =(6)+(7)	Direct Gas Costs (10) from COSS	Indirect Gas Costs (11) =(9)-(10)	Allocated Costs of Net Revenue Items: LP & LNG Excl 904 (12) from COSS	Bad Debts Incl LP&LNG (13) from COSS	Dispatching & Acq Costs (14) from COSS	Other (15) from COSS	Other A&G and Misc. (16) =(17)-(12)-(13)-(14)-(15)	Total Net Rev Items (17) =(11)
1	Resi Ht	Low	R3 & R4	$40,759,325	$190,339,292	231,098,617	219,829,907	11,268,710	3,671,759	5,461,799	$1,010,360	$0	1,124,792	11,268,710
2	Resi No-Ht	High	R1 & R2	613,512	5,470,056	6,083,568	5,529,189	554,379	27,033	423,489	25,413	0	78,444	554,379
3	Low C&I	Low	G-40	4,684,692	17,632,509	22,317,201	21,089,132	1,228,069	446,535	715,490	96,928	0	-30,884	1,228,069
4	Low C&I	High	G-50	425,433	3,586,776	4,012,209	3,840,213	171,996	21,996	135,652	17,650	0	-3,302	171,996
5	Med C&I	Low	G-41	6,903,709	28,551,592	35,455,301	34,520,005	935,297	665,039	223,023	158,657	0	-111,423	935,297
6	Med C&I	High	G-51	1,255,266	10,834,215	12,089,481	11,915,793	173,689	62,041	84,455	54,766	0	-27,574	173,689
7	High C&I	Low	G-42	2,766,871	12,905,657	15,672,529	15,349,723	322,806	261,505	26,344	70,549	0	-35,592	322,806
8	High C&I	High	G-52	523,232	5,315,091	5,838,324	5,793,209	45,115	18,265	10,061	26,626	0	-9,838	45,115
9	Large C&I	Low	G-43	724,101	3,265,949	3,990,050	3,916,584	73,466	61,455	720	18,001	0	-6,710	73,466
10	Large C&I	High	G-53	320,043	2,488,650	2,808,693	2,772,528	36,165	23,226	1,410	12,743	0	-1,213	36,165
11	Outdoor Lght	High	OL	170	2,179	2,349	2,336	13	0	0	11	0	2	13
12	Total			58,976,356	280,391,966	339,368,322	324,558,618	14,809,704	5,258,855	7,082,443	1,491,704	0	976,702	14,809,704

Bad Debt Expense	7,082,443
divided by Direct Gas Costs	324,558,618
Equal Bad Debt Percentage	2.182%

Total CGA Recovery	339,368,322
Total Base Recovery	161,102,537
Total Revenue Req	500,470,859

Bay State Gas Company
Summary of Cost Study Results
Derivation of Gas Supply Charges

Bay State Gas Company

Comparison of Revenue Requirements

Line No. (1)	Rate Class: Size (2)	Load Factor (3)	Rate Class (4)	Gas Costs for New Rates: Test Year Gas Revenues (18) Present Revs	Gas Supply Costs to Serve (19) =(10)+(17)	Proposed LF-Specific CGA Revenues (20) Billed CGA rates	Net Revenues in Base Rates: Present Base Revenues (21) from COSS	COSS Target Base Cust Rev (22) from COSS	COSS Target Base Dem Rev (23) from COSS	Adjusted MCS Target Base Revenues (24) Equi-proportional Adj	Total Revenues: Total Present Revenues (25) =(18)+(21)	COSS Target Total Revenues (26) =(19)+(22)+(23)	MBA Based CGA & Delivery Rates from MCS (27) =(20)+(24)	Approximate Rate Impact (28) =(26)/(25)-1
1	Resi Ht	Low	R3 & R4	234,814,387	$231,098,617	230,375,075	88,615,368	$62,124,121	$38,367,926	107,161,232	323,429,755	331,590,664	337,536,307	2.5%
2	Resi No-Ht	High	R1 & R2	5,511,562	6,083,568	5,732,881	5,318,456	9,698,726	1,157,576	13,019,704	10,830,018	16,939,871	18,752,586	56.4%
3	Low C&I	Low	G-40	22,247,044	22,317,201	21,754,848	9,699,385	6,932,274	4,370,765	12,266,636	31,946,429	33,620,240	34,021,484	5.2%
4	Low C&I	High	G-50	3,866,483	4,012,209	3,986,530	1,909,395	1,698,975	648,164	2,220,185	5,775,878	6,359,348	6,206,714	10.1%
5	Med C&I	Low	G-41	35,221,249	35,455,301	36,013,753	11,649,120	4,652,883	8,202,950	10,624,290	46,870,369	48,311,134	46,638,042	3.1%
6	Med C&I	High	G-51	11,596,626	12,089,481	12,301,668	3,645,189	1,880,092	2,319,089	2,674,166	15,241,815	16,288,662	14,975,835	6.9%
7	High C&I	Low	G-42	15,330,940	15,672,529	16,274,464	6,990,910	1,940,726	6,311,854	6,886,176	22,321,850	23,925,108	23,160,640	7.2%
8	High C&I	High	G-52	5,705,059	5,838,324	5,974,558	3,306,388	918,286	2,630,881	2,031,278	9,011,447	9,387,490	8,005,836	4.2%
9	Large C&I	Low	G-43	3,762,537	3,990,050	4,102,744	1,140,742	144,636	1,311,333	1,187,026	4,903,279	5,446,019	5,289,769	11.1%
10	Large C&I	High	G-53	2,748,279	2,808,693	2,836,371	5,569,435	609,537	5,181,399	3,031,844	8,317,714	8,599,628	5,868,215	3.4%
11	Outdoor Lght	High	OL	2,247	2,349	2,442	479	87	257	0	2,726	2,693	2,442	-1.2%
12	Total			340,806,415	339,368,322	339,355,333	137,844,867	90,600,343	70,502,194	161,102,537	478,651,282	500,470,859	500,457,870	4.6%

Diff due to rounding

Diff due to rounding

Excludes items moved from base rates

Based on LF CGA rates, i.e. averaging HLF and LLF C&I.

From Present Rates

Bay State Gas Company
Summary of Cost Study Results
Marginal Cost Study

Equiproportional Adjustments of MCS

Line No.	Rate Class Size	Summer Use	Rate Class	Sales THERMS	Transportation THERMS	Marginal Cost Estimates Gas Supply	Delivery Service	Total Annual MCS	Percent of Total MCS Gas Supply	Delivery Service	Adjusted to Total Present Revenues Gas Supply	Delivery Service	Total Annual MCS
(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
											339,368,322	161,102,537	
1	Resi Ht	Low	R3 & R4	247,703,740	79,549	260,185,724	112,824,460	373,010,184	68.09%	66.52%	231,078,661	107,161,232	338,239,893
2	Resi No-Ht	High	R1 & R2	6,394,258	1,908	6,477,310	13,707,766	20,185,076	1.70%	8.08%	5,752,691	13,019,704	18,772,395
3	Low C&I	Low	G-40	23,311,210	1,900,026	25,513,152	12,914,899	38,428,051	6.68%	7.61%	22,658,987	12,266,636	34,925,623
4	Low C&I	High	G-50	4,446,204	797,782	4,350,385	2,337,517	6,687,902	1.14%	1.38%	3,863,706	2,220,185	6,083,891
5	Med C&I	Low	G-41	38,636,479	15,524,113	40,668,811	11,185,759	51,854,570	10.64%	6.59%	36,119,178	10,624,290	46,743,467
6	Med C&I	High	G-51	13,718,907	7,650,476	13,066,227	2,815,490	15,881,717	3.42%	1.66%	11,604,504	2,674,166	14,278,670
7	High C&I	Low	G-42	17,483,688	26,651,718	18,050,389	7,250,095	25,300,484	4.72%	4.27%	16,031,086	6,886,176	22,917,263
8	High C&I	High	G-52	6,665,891	18,839,377	6,272,339	2,138,627	8,410,966	1.64%	1.26%	5,570,651	2,031,278	7,601,929
9	Large C&I	Low	G-43	4,431,946	5,036,085	4,414,804	1,249,757	5,664,562	1.16%	0.74%	3,920,919	1,187,026	5,107,944
10	Large C&I	High	G-53	3,153,997	51,068,230	3,116,593	3,192,070	6,308,663	0.82%	1.88%	2,767,938	3,031,844	5,799,783
11	Outdoor Lght	High	OL	2,728	0			0	0.00%	0.00%	0	0	0
12	Total			365,949,048	127,549,264	382,115,735	169,616,441	551,732,176	100.00%	100.00%	339,368,322	161,102,537	500,470,859

Adjustment Factor 0.88812967 0.949804961

Bay State Gas Company
Summary of Cost Study Results
Unadjusted (Raw) Marginal Cost Study Results

Line No.	Rate Class Size	Summer Use	Rate Class	Sales THERMS	Transportation THERMS	Marginal Cost Study Results, $/Customer or $/therm Customer Charge	Winter Supply Capacity	Winter Supply Commodity	Summer Supply Capacity	Summer Supply Commodity	Winter Delivery Rate	Summer Delivery Rate	Annual Delivery Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	Resi Ht	Low	R3 & R4	247,703,740	79,549	$32.45	$0.0522	$1.0514	$0.0000	$0.8160	$0.1156	$0.0640	$0.1061
2	Resi No-Ht	High	R1 & R2	6,394,258	1,908	$33.41	$0.0348	$1.0895	$0.0000	$0.8559	$0.0652	$0.0307	$0.0509
3	Low C&I	Low	G-40	23,311,210	1,900,026	$47.73	$0.0597	$1.0664	$0.0000	$0.8232	$0.1396	$0.0804	$0.1332
4	Low C&I	High	G-50	4,446,204	797,782	$51.52	$0.0361	$1.0504	$0.0000	$0.8245	$0.0683	$0.0324	$0.0537
5	Med C&I	Low	G-41	38,636,479	15,524,113	$85.47	$0.0546	$1.0362	$0.0000	$0.8022	$0.1255	$0.0711	$0.1178
6	Med C&I	High	G-51	13,718,907	7,650,476	$82.21	$0.0338	$1.0219	$0.0000	$0.8027	$0.0643	$0.0306	$0.0507
7	High C&I	Low	G-42	17,483,688	26,651,718	$351.39	$0.0498	$1.0286	$0.0000	$0.7992	$0.1134	$0.0634	$0.1051
8	High C&I	High	G-52	6,665,891	18,839,377	$355.73	$0.0287	$1.0184	$0.0000	$0.7998	$0.0543	$0.0254	$0.0422
9	Large C&I	Low	G-43	4,431,946	5,036,085	$1,001.16	$0.0587	$1.0200	$0.0000	$0.7980	$0.1272	$0.0669	$0.1129
10	Large C&I	High	G-53	3,153,997	51,068,230	$906.18	$0.0338	$1.0252	$0.0000	$0.8011	$0.0618	$0.0272	$0.0455
11													
12	Total			365,946,320	127,549,264								

Bay State Gas Company
Summary of Cost Study Results
Equi-Proportionally Adjusted Marginal Cost Study Results

Line No.	Rate Class Size	Summer Use	Rate Class	Sales THERMS	Transportation THERMS	Equi-Proportionally Adjusted Marginal Cost Study Results Customer Charge	Winter Supply Capacity	Winter Supply Commodity	Summer Supply Capacity	Summer Supply Commodity	Winter Delivery Rate	Summer Delivery Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	Resi Ht	Low	R3 & R4	247,703,740	79,549	$30.83	$0.0463	$0.9338	$0.0000	$0.7247	$0.1098	$0.0608
2	Resi No-Ht	High	R1 & R2	6,394,258	1,908	$31.74	$0.0309	$0.9677	$0.0000	$0.7602	$0.0619	$0.0292
3	Low C&I	Low	G-40	23,311,210	1,900,026	$45.33	$0.0530	$0.9471	$0.0000	$0.7311	$0.1326	$0.0763
4	Low C&I	High	G-50	4,446,204	797,782	$48.93	$0.0321	$0.9329	$0.0000	$0.7323	$0.0649	$0.0307
5	Med C&I	Low	G-41	38,636,479	15,524,113	$81.18	$0.0485	$0.9203	$0.0000	$0.7124	$0.1192	$0.0675
6	Med C&I	High	G-51	13,718,907	7,650,476	$78.08	$0.0300	$0.9076	$0.0000	$0.7129	$0.0611	$0.0290
7	High C&I	Low	G-42	17,483,688	26,651,718	$333.75	$0.0443	$0.9136	$0.0000	$0.7098	$0.1077	$0.0603
8	High C&I	High	G-52	6,665,891	18,839,377	$337.88	$0.0255	$0.9045	$0.0000	$0.7103	$0.0516	$0.0242
9	Large C&I	Low	G-43	4,431,946	5,036,085	$950.90	$0.0521	$0.9059	$0.0000	$0.7088	$0.1208	$0.0636
10	Large C&I	High	G-53	3,153,997	51,068,230	$860.69	$0.0301	$0.9105	$0.0000	$0.7115	$0.0587	$0.0259
11												
12	Total			365,946,320	127,549,264							

Bay State Gas Company
Summary of Cost Study Results
Seasonal Cost and Sales Data

Sales and Transportation Volumes

Line No. (1)	Rate Class Size (2)	Load Factor (3)	Rate Class (4)	Sales Annual THERMS (5)	Sales Winter THERMS (6)	Sales Summer THERMS (7)	Trans Annual THERMS (8)	Trans Winter THERMS (9)	Trans Summer THERMS (10)	Sales &Trans Annual THERMS (11)	Sales &Trans Winter THERMS (12)	Sales &Trans Summer THERMS (13)
1	Resi Ht	Low	R3 & R4	247,703,740	201,880,224	45,823,516	79,549	62,900	16,649	247,783,289	201,943,124	45,840,165
2	Resi No-Ht	High	R1 & R2	6,394,258	3,741,214	2,653,044	1,908	1,027	881	6,396,166	3,742,241	2,653,925
3	Low C&I	Low	G-40	23,311,210	20,876,820	2,434,390	1,900,026	1,621,127	278,899	25,211,236	22,497,947	2,713,289
4	Low C&I	High	G-50	4,446,204	2,612,172	1,834,032	797,782	497,704	300,078	5,243,986	3,109,876	2,134,110
5	Med C&I	Low	G-41	38,636,479	33,512,083	5,124,396	15,524,113	13,007,904	2,516,209	54,160,592	46,519,987	7,640,605
6	Med C&I	High	G-51	13,718,907	8,116,526	5,602,381	7,850,476	4,624,378	3,026,098	21,369,383	12,740,904	8,628,479
7	High C&I	Low	G-42	17,483,688	14,599,720	2,883,968	26,651,718	22,206,659	4,445,059	44,135,406	36,806,379	7,329,027
8	High C&I	High	G-52	6,665,891	3,804,583	2,861,308	18,839,377	10,952,045	7,887,332	25,505,268	14,756,628	10,748,640
9	Large C&I	Low	G-43	4,431,946	3,128,697	1,303,249	5,036,085	4,082,507	953,578	9,468,031	7,211,204	2,256,827
10	Large C&I	High	G-53	3,153,997	2,286,988	867,009	51,068,230	26,368,965	24,699,265	54,222,227	28,655,953	25,566,274
11	Outdoor Lght	High	OL	2,728	1,395	1,333	0	0	0	2,728	1,395	1,333
12	Total			365,949,048	294,560,422	71,388,626	127,549,264	83,425,216	44,124,048	493,498,312	377,985,638	115,512,674

Bay State Gas Company
Summary of Cost Study Results
Customer Component Costs and Target Charges

Line No. (1)	Rate Class Size (2)	Load Factor (3)	Rate Class (4)	COSS Target Base Cust Rev (5) from COSS	Total Annual Customers (6)	Customer Charge $/MO/Cust (7)	COSS Target Base Cust Wint (8)	COSS Target Base Cust Summ (9)
1	Resi Ht	Low	R3 & R4	$62,124,121	2,686,494	$23.30	$31,062,061	$31,062,061
2	Resi No-Ht	High	R1 & R2	9,698,726	400,515	$24.22	4,849,363	4,849,363
3	Low C&I	Low	G-40	6,932,274	200,206	$34.63	3,466,137	3,466,137
4	Low C&I	High	G-50	1,698,975	39,908	$42.57	849,487	849,487
5	Med C&I	Low	G-41	4,652,883	56,195	$82.80	2,326,441	2,326,441
6	Med C&I	High	G-51	1,880,092	21,073	$89.22	940,046	940,046
7	High C&I	Low	G-42	1,940,726	7,432	$261.13	970,363	970,363
8	High C&I	High	G-52	918,286	2,989	$307.22	459,143	459,143
9	Large C&I	Low	G-43	144,636	181	$799.10	72,318	72,318
10	Large C&I	High	G-53	609,537	799	$762.87	304,768	304,768
11	Outdoor Lght	High	OL	87	144	$0.61	44	44
12	Total			90,600,343	3,395,936	$26.68	45,300,172	45,300,172

Bay State Gas Company
Summary of Cost Study Results
Seasonal Distribution Revenue Requirement

Line No. (1)	Rate Class Size (2)	Load Factor (3)	Rate Class (4)	COSS Target Base Dem Rev (5) from COSS	Prop Resp Allocator Winter (6)	Prop Resp Allocator Summer (7)	COSS Dem Rev Winter (8)	COSS Dem Rev Summer (9)	Distribution Rate Base (10) from COSS
1	Resi Ht	Low	R3 & R4	$38,367,926	49.810%	3.096%	$36,123,024	$2,244,903	228,590,466
2	Resi No-Ht	High	R1 & R2	1,157,576	0.840%	0.174%	959,041	198,536	17,817,354
3	Low C&I	Low	G-40	4,370,765	5.839%	0.186%	4,236,009	134,756	25,270,507
4	Low C&I	High	G-50	648,164	0.711%	0.141%	540,967	107,197	4,722,501
5	Med C&I	Low	G-41	8,202,950	11.728%	0.523%	7,852,735	350,214	36,540,684
6	Med C&I	High	G-51	2,319,089	2.864%	0.566%	1,936,596	382,493	11,146,787
7	High C&I	Low	G-42	6,311,854	9.088%	0.499%	5,983,418	328,435	26,258,806
8	High C&I	High	G-52	2,630,881	3.289%	0.703%	2,167,571	463,309	11,106,815
9	Large C&I	Low	G-43	1,311,333	1.857%	0.152%	1,212,081	99,252	4,945,453
10	Large C&I	High	G-53	5,181,399	6.269%	1.668%	4,092,710	1,088,689	19,854,998
11	Outdoor Lght	High	OL	257	0.00030%	0.00009%	200	58	948
12	Total			70,502,194	92.294%	7.706%	65,104,352	5,397,842	386,255,320

Bay State Gas Company
Summary of Cost Study Results
Seasonal Direct Gas Costs

Line No. (1)	Rate Class Size (2)	Load Factor (3)	Rate Class (4)	Base Demand Winter (5)	Base Demand Summer (6)	Base Commodity Winter (7)	Base Commodity Summer (8)	Remaining Demand Winter (9)	Remaining Demand Summer (10)	Remaining Commodity Winter (11)	Remaining Commodity Summer (12)	Total Direct Gas Winter (13)	Total Direct Gas Summer (14)	Total Direct Gas (15)
1	Resi Ht	Low	R3 & R4	$1,925,953	$1,937,014	$23,882,789	$25,774,928	$30,570,354	$1,343,446	$122,896,291	$11,499,133	$179,275,387	$40,554,521	$219,829,908
2	Resi No-Ht	High	R1 & R2	149,988	150,853	1,859,928	2,007,356	223,101	9,804	964,903	183,256	3,197,920	2,331,269	5,529,189
3	Low C&I	Low	G-40	84,462	84,128	1,047,370	1,111,479	3,742,160	164,453	13,989,348	865,732	18,863,339	2,225,792	21,089,131
4	Low C&I	High	G-50	97,543	97,755	1,209,588	1,297,388	184,212	8,095	746,170	199,462	2,237,513	1,602,700	3,840,213
5	Med C&I	Low	G-41	179,567	178,806	2,226,727	2,392,932	5,583,052	245,353	21,901,851	1,811,716	29,891,197	4,628,807	34,520,004
6	Med C&I	High	G-51	318,369	320,198	3,947,934	4,260,866	520,328	22,866	2,196,572	328,662	6,983,201	4,932,592	11,915,793
7	High C&I	Low	G-42	102,632	102,641	1,272,691	1,360,146	2,193,371	96,390	9,242,012	979,840	12,810,705	2,539,017	15,349,722
8	High C&I	High	G-52	178,327	164,486	2,211,344	2,146,249	153,069	6,727	687,278	245,730	3,230,018	2,563,191	5,793,209
9	Large C&I	Low	G-43	60,962	61,872	753,815	823,598	515,138	22,638	1,433,551	245,009	2,763,466	1,153,117	3,916,584
10	Large C&I	High	G-53	46,143	46,199	572,199	612,715	194,536	8,549	1,199,742	92,445	2,012,621	759,908	2,772,528
11	Outdoor Lght	High	OL	87	82	1,076	1,091	0	0	0	0	1,163	1,173	2,336
12	Total			3,144,034	3,144,034	38,985,458	41,788,747	43,879,319	1,928,323	175,257,718	16,430,986	261,266,529	63,292,089	324,558,618

Bay State Gas Company
Summary of Cost Study Results
Indirect Gas Costs

Derivation of Prices for Recovery

Line No. (1)	Rate Class Size (2)	Load Factor (3)	Rate Class (4)	Indirect Gas Costs (5)	Bad Debt Acct 904 (6)	Other Indirect Costs (7) =(5)-(6)	Other Indirect Winter (8)	Other Indirect Summer (9) =(7)-(8)	Indirect Excl WC and BD (10) =(8)+(9)
							Allocated Using Remaining Demand		
1	Resi Ht	Low	R3 & R4	$11,268,710	$5,461,799	$5,806,911	$5,562,463	$244,448	$5,806,911
2	Resi No-Ht	High	R1 & R2	554,379	423,489	130,890	125,380	5,510	130,890
3	Low C&I	Low	G-40	1,228,069	715,490	512,579	491,002	21,578	512,579
4	Low C&I	High	G-50	171,996	135,652	36,344	34,814	1,530	36,344
5	Med C&I	Low	G-41	935,297	223,023	712,274	682,290	29,984	712,274
6	Med C&I	High	G-51	173,689	84,455	89,234	85,477	3,756	89,234
7	High C&I	Low	G-42	322,806	26,344	296,462	283,982	12,480	296,462
8	High C&I	High	G-52	45,115	10,061	35,054	33,578	1,476	35,054
9	Large C&I	Low	G-43	73,466	720	72,746	69,683	3,062	72,746
10	Large C&I	High	G-53	36,165	1,410	34,755	33,292	1,463	34,755
11	Outdoor Lght	High	OL	13	0	13	0	13	13
12	Total			14,809,704	7,082,443	7,727,261	7,401,961	325,300	7,727,261
	Total LLF			13,828,347	6,427,376	7,400,971	7,089,419	311,552	7,400,971
	Total HLF			981,356	655,067	326,290	312,542	13,748	326,290
	Unit Cost								
	Low Load Factor						$ 0.0259	$ 0.0054	
	High Load Factor						$ 0.0152	$ 0.0010	

Recovery of Indirect Gas Costs

Line No. (1)	Rate Class Size (2)	Winter Use (3)	Rate Class (4)	Sales Winter Therms (5)	Sales Summer Therms (6)	Indirect Gas Cost Revenues Winter (7)	Summer (8)	Total (9)
1	Low Load Factor Rate (Rounded)					$ 0.0259	$ 0.0054	
2	High Load Factor Rate (Rounded)					$ 0.0152	$ 0.0010	
3								
4								
5								
6	Resi Ht	Low	R3 & R4	201,880,224	45,823,516	$5,228,698	$247,447	$5,476,145
7	Resi No-Ht	High	R1 & R2	3,741,214	2,653,044	56,866	2,653	$59,519
8	Low C&I	Low	G-40	20,876,820	2,434,390	540,710	13,146	$553,855
9	Low C&I	High	G-50	2,612,172	1,834,032	39,705	1,834	$41,539
10	Med C&I	Low	G-41	33,512,083	5,124,396	867,963	27,672	$895,635
11	Med C&I	High	G-51	8,116,526	5,602,381	123,371	5,602	$128,974
12	High C&I	Low	G-42	14,599,720	2,883,968	378,133	15,573	$393,706
13	High C&I	High	G-52	3,804,583	2,861,308	57,830	2,861	$60,691
14	Large C&I	Low	G-43	3,128,697	1,303,249	81,033	7,038	$88,071
15	Large C&I	High	G-53	2,286,988	867,009	34,762	867	$35,629
16	Outdoor Lght	High	OL	1,395	1,333	21	1	$23
17	Low Load Factor Subtotal			273,997,544	57,569,519	7,096,536	310,875	$7,407,412
18	High Load Factor Subtotal			20,562,878	13,819,107	312,556	13,819	$326,375
19	Total			294,560,422	71,388,626	7,409,092	324,695	7,733,787

Cost Study Summary Master.XLS Indirect Gas Costs