

ANDREW K. MOFFIT
Chairman

JOSEPH D. CATALDI
Vice Chairman

BRUCE T. MILLER
Ex-Officio

CARISSA R. RICHARD
Secretary

FERNANDO S. CUNHA, ESQ.
Legal Advisor



DAVID N. CICILLINE
Mayor

PAMELA M. MARCHAND, P.E.
Chief Engineer & General Manager

JOSEPH DE LUCA
City Councilman

MICHAEL A. SOLOMON
City Councilman

JOHN A. FARGNOLI
Member

EVERETT BIANCO
Member

July 1, 2009

Luly Massaro, Commission Clerk
RI Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 3832: Compliance Filing-Conservation Rates

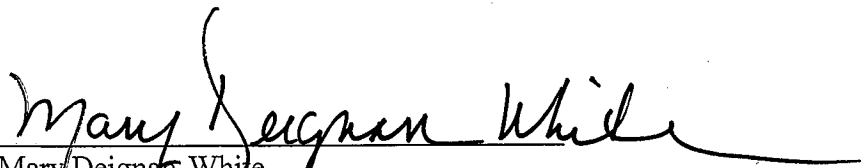
Dear Luly:

Enclosed for filing is an original and nine copies of Providence Water's Compliance filing regarding conservation rates as required by item #9 of Report and Order # 19145, effective November 1, 2007.

Michael R. McElroy, Esq., will be representing Providence Water as our Attorney in this matter. He may be contacted at 21 Dryden Lane, Post Office Box 6721, Providence, RI 02940.

If you have any questions, I can be reached at 521-6300, extension 7217.

Sincerely,


Mary Deignan-White
Regulatory Manager

cc: Service List Dk 3832

H:\WPDOCS\PUC\LMconservationf7109.wpd

WWW.PROVWATER.COM

552 ACADEMY AVENUE • PROVIDENCE, RHODE ISLAND • 02908 • (401) 521-6300 • FAX (401) 331-5081 • TDD (401) 751-0203

**DIRECT TESTIMONY OF
HAROLD J. SMITH
RAFTELIS FINANCIAL CONSULTANTS, INC.**

**for
PROVIDENCE WATER SUPPLY BOARD**

**COMPLIANCE FILING RE: CONSERVATION
DOCKET # _____**

June 2009

PRE-FILED DIRECT TESTIMONY OF

HAROLD J. SMITH

GENERAL MATTERS

1 **Q. Please state your name and business address.**

2 A. My name is Harold J. Smith and my business address is, 1031 South Caldwell Street,
3 Suite 100, Charlotte, NC 28203.

4
5 **Q. By whom are you employed and in what capacity?**

6 A. I am a Vice President of Raftelis Financial Consultants, Inc. (RFC), a consulting firm
7 specializing in the areas of water and wastewater finance and pricing. RFC was
8 established in 1993 in Charlotte, North Carolina to provide environmental and
9 management consulting services to public and private sector clients. RFC is a national
10 leader in the development of water and wastewater rates.

11
12 **Q. Please describe your educational background and work experience.**

13 A. I obtained a Master of Business Administration from Wake Forest University in 1997 and
14 a Bachelor of Science in Natural Resources from the University of the South in 1987. I
15 am also a Licensed Professional Geologist in North Carolina. As an employee of RFC I
16 have been involved on engagements involving a wide range of technical specialties
17 including water utility cost of service and rate structure studies and water utility financial
18 planning studies.

19
20 **Q. Have you previously testified before any regulatory agencies or in court on utility
21 rate related matters?**

22 A. Yes. I provided testimony before this Commission in Providence Water Supply
23 Board's (Providence Water) two most recent rate filings (Docket Nos. 3832 and
24 4061) and in Newport Water's four most recent rate filings (Docket Nos. 3578, 3675,
25 3818 and 4025). I have also provided testimony on water rate related matters before

1 the Tennessee Regulatory Authority as well as in state court proceedings in Arizona
2 and Connecticut.

3
4 **Q. Do you belong to any professional organizations or committees?**

5 A. Yes. I am a member of the American Water Works Association where I served as the
6 chairman of the Strategic Management Practices Committee and I am a member of the
7 Financial Management Committee of the New England Water Works Association.

8
9 **Q. Have you ever developed conservation rate structures for water utilities?**

10 A. Yes, I have assisted numerous utilities with the development of rate structures designed
11 to promote conservation including the San Antonio Water System in Texas, the Cities of
12 Peoria and Scottsdale in Arizona, the City of North Myrtle Beach in South Carolina and
13 the Town of North Kingstown in Rhode Island. In addition to my personal experience,
14 RFC has developed conservation rates for dozens of water utilities across the country.

15
16 **Q. What is the purpose of your testimony?**

17 A. Providence Water hired RFC to develop conservation rate structures in compliance with
18 the Commission's Order in Docket No. 3832. My testimony describes the process that
19 was used to determine possible conservation rate structures and provides calculations and
20 schedules in support of two possible conservation rate structure options that Providence
21 Water is presenting to the Commission for review.

22
23 **Q. Have you prepared any Exhibits to accompany your testimony?**

24 A. Yes, Exhibits identified as Schedules HJS-1 through HJS-6, HJS-A and Figure 1 have
25 been prepared by me or have been prepared under my supervision. HJS-1 shows the
26 calculation of rates under the two possible conservation rate structure options. HJS-2 and
27 HJS-3 summarize the rates under each option. HJS-4 shows projected revenues under
28 each rate option. HJS-5 and HJS-6 show the impacts on customer bills under each rate
29 option. HJS-A is a summary of the monthly consumption data for Providence Water's
30 single family residential customers based on February 2008 through January 2009

1 monthly meter readings. I have also included Figure 1 which shows consumption by
2 month for the same period.

3 **SUMMARY**

4
5 **Q. Please summarize your findings and recommendations to the Commission in this**
6 **proceeding.**

7 A. Working with Providence Water management and staff, RFC identified two conservation
8 rate structure options that could promote more responsible use of water by Providence
9 Water's customers and could be implemented by Providence Water using available data.
10 RFC then used the costs and revenues that Providence Water is requesting in Docket No.
11 4061 to calculate rates under each of these options.

12
13 **Q. Briefly describe the two rate structures.**

14 A. Option 1 is a three block inclining block rate structure that would be applicable to
15 Providence Water's retail single family residential customers. It involves charging a
16 higher unit rate for water usage at levels above specific predetermined levels. It would be
17 effective all year. Option 2 is a seasonal rate structure that would be applicable to
18 Providence Water's retail single family residential customers. It involves charging a
19 higher unit rate for consumption above a specific predetermined consumption level
20 during the peak demand season.

21
22 **Q. Is Providence Water requesting a revenue increase in this rate filing?**

23 A. No. As mentioned previously, the rates under the two conservation rate structure
24 options were calculated using costs and revenues that Providence Water is requesting
25 in Docket No. 4061. However, as shown on Schedule HJS-4, each of the two
26 proposals results in Providence Water collecting slightly higher revenues than those
27 requested in Docket No. 4061. This difference in revenues is simply the result of
28 rounding the rates calculated under each option to the appropriate number of decimal
29 places.

30

1 **Q. Would all rates increase by the same amount?**

2 A. No. First, the conservation rate options would only affect the commodity rates
3 assessed to Providence Water's single family residential customers; therefore the
4 other rates and charges would remain the same as those requested in Docket No.
5 4061. Second, since both options involve a change in rate structure, the change from
6 the rates currently in effect will be dependent either on the amount of water consumed
7 or on the time of year in which water is consumed. The changes from the rates
8 currently in effect and those proposed in Docket No. 4061 are shown on Schedules
9 HJS-2 and HJS-3.

10
11 **Q. Why have you not developed rate structures for Providence Water's other
12 customer classes?**

13 A. Conservation rate structures are typically designed to target discretionary water usage
14 and while it is generally relatively easy to distinguish between discretionary and non-
15 discretionary consumption for single family residential customers, it is very difficult
16 to do so for other classes. For instance, the commercial class includes customers that
17 require significant amounts of water to perform their normal business activities and
18 some that require very little water at all.

19
20 **Q. Please describe the process used to select the two rate structure options
21 presented in this filing.**

22 A. As the Commission may recall, in response to a data request in Docket No. 3832
23 (PUC DR 1-7) I submitted information on various conservation rate structures that are
24 currently in use by water utilities. The structures discussed included uniform rates,
25 inclining block rates, seasonal rates, and marginal cost rates. In my discussion I
26 described the nature of each structure and discussed the advantages and disadvantages
27 of each structure. Additionally, I pointed out the reasons why only inclining block
28 and seasonal rates would be appropriate for implementation by Providence Water. In
29 short, uniform rates were eliminated from consideration because they would result in
30 a less equitable recovery of costs from customers than the existing rate structure and

1 marginal cost rates were eliminated because the development of such rates is
2 extremely complicated and it is unlikely that they would result in conservation
3 benefits that could not be achieved with inclining block rates or seasonal rates.
4

5 **Q. Is that where the rate structure selection process ended?**

6 A. No, once it was determined which rate structures would be appropriate, it was
7 necessary to develop the details of each structure such as the number of rate blocks
8 for the inclining block structure and the seasonal period for the seasonal rates.
9

10 **INCLINING BLOCK RATE OPTION**

11
12 **Q. Please describe how you developed the details of the inclining block rate
13 structure.**

14 A. When developing any kind of rate structure, it is first necessary to determine whether
15 the utility has the data needed to support the calculation of fair and equitable rates
16 that will allow the utility to recover its costs of providing service. To achieve these
17 objectives, and send the appropriate conservation message, an inclining block
18 structure should be based on customer demand data resulting from meter reads
19 performed at least monthly. This type of data is necessary to develop a full
20 understanding of the customers' demand characteristics such that their response to the
21 conservation signals can be predicted.
22

23 **Q. Does Providence Water have this type of data?**

24 A. To a limited extent it does. Although Providence Water bills the vast majority of its
25 customers on a quarterly basis, it has been collecting monthly data on all of its
26 customers since February of 2008. Therefore it does have one complete year's worth
27 of monthly data. While this is enough data to develop an inclining block rate
28 structure, it is not enough data to make accurate predictions regarding how customers
29 will respond to the pricing signals that the inclining block structure sends. As a
30 result, the implementation of a rate structure based solely on one year's worth of data

1 may not have the desired conservation impact, or it could have undesirable
2 repercussions such as revenue shortfalls.

3
4 **Q. How did you determine the appropriate number of blocks and block cut-offs for**
5 **the inclining block structure?**

6 A. The number of blocks and block cut-offs are to a large degree dependent upon the
7 type of demand that the utility wishes to target with its conservation message. In
8 Providence Water's case, it was decided that the utility wished to target all
9 discretionary consumption, but to also recognize that some discretionary water use,
10 such as responsible lawn irrigation, has benefits to the community. A three block
11 inclining block structure helps achieve this objective by charging a relatively low unit
12 rate for non-discretionary usage; a slightly higher rate for consumption that could be
13 attributed to responsible lawn irrigation; and a still higher rate for usage that could be
14 considered to be excessive.

15
16 **Q. Please discuss what you mean by discretionary and non-discretionary**
17 **consumption.**

18 A. For the residential class, non-discretionary consumption is consumption that is
19 necessary to support a modern lifestyle. It includes water for such things as drinking,
20 cooking, bathing, clothes washing, and toilet flushing.

21
22 **Q. How much non-discretionary water does a typical residential customer use?**

23 A. Obviously the level of non-discretionary usage varies by customer depending on a
24 number of variables, with the dominant variable being family size. Larger families
25 typically require more water than small families. One common way of determining
26 the typical level of non-discretionary usage within a service area is to look at
27 consumption during the winter months when outdoor water use is at a minimum. In
28 the case of Providence Water, average consumption by single family residential
29 customers in November of 2008 (the month with the lowest consumption) is
30 approximately 6.26 hcf per month. Therefore, based on this analysis, it is assumed

1 that typical non-discretionary consumption for Providence Water's single family
2 residential customers is approximately 6 hcf per month.

3
4 **Q. What about discretionary consumption?**

5 A. Discretionary consumption is water use other than non-discretionary use and includes
6 such things as lawn irrigation, pool filling and car washing although many will make
7 the argument that lawn irrigation is not truly discretionary. This argument is valid to
8 some extent in that many people have invested a significant amount of money and
9 time in their lawns and landscapes and proper irrigation is necessary to maintain that
10 investment. Thus many utilities consider a reasonable level of lawn irrigation to be
11 non-discretionary consumption.

12
13 **Q. What is considered to be a reasonable level of lawn irrigation?**

14 A. Determining an appropriate level of consumption for lawn irrigation is based on a
15 number of assumptions relating to such things as customer's lot size and
16 precipitation. Experts in lawn maintenance indicate that a typical lawn requires no
17 more than 1 inch of water per week. Therefore a 1/4 acre lawn would require
18 approximately 0.9 hundred cubic feet (hcf) (675 gallons) per week or 3.6 hcf (2,700
19 gallons) per month. However, it should be recognized the average monthly
20 precipitation in Rhode Island during the period of May through August is
21 approximately 3.25 inches. Therefore not all of the water that a lawn requires has to
22 be provided through irrigation. If one assumes that half of a lawn's water needs are
23 provided by normal precipitation, the amount that must be provided by irrigation is
24 approximately 1.8 hcf per month. Thus irrigation consumption at or below 2 hcf per
25 month would be considered reasonable.

1 **Q. How was this information factored into the decisions about consumption block**
2 **cut-offs?**

3 **A.** As mentioned previously, Providence Water's primary objective with respect to
4 conservation was to reduce discretionary water use and specifically to target
5 excessive lawn irrigation. Therefore, we developed a three block structure with the
6 first consumption block cut-off set at an amount equal to the average use during the
7 winter or 6 hcf. The cut-off for the second consumption block was set at amount that
8 would allow for enough discretionary consumption to support a responsible level of
9 lawn irrigation. In this case that amount was 8 hcf. Any consumption above 8 hcf
10 would be sold at the Block 3 rate.

11
12 **Q. Once you had determined the appropriate block cut-offs, how did you determine**
13 **what the rate for each block would be?**

14 **A.** The first step in the development of the rates for each block is the allocation of costs
15 to the Base/Extra Capacity cost categories of Base, Maximum Day, and Maximum
16 Hour. In this instance, this allocation had already been performed in Providence
17 Water's last full rate filing (Docket No. 3832). The Commission approved
18 allocations in that filing resulted in approximately 74% of the costs associated with
19 providing service to the residential class being allocated to the Base cost category and
20 20% and 6% being allocated to the Maximum Day and Maximum Hour categories,
21 respectively. These same allocations were used to allocate the single family
22 residential commodity costs from Docket 4061 to the three cost categories.

23
24 Once the costs have been allocated to the appropriate cost categories, the resulting
25 categorized costs must be allocated to the appropriate consumption block. In this
26 case, all of the Base costs are assigned to the Block 1 rate and sixty percent of the
27 Maximum Day costs are assigned to the Block 2 rate. The remaining forty percent of
28 the Maximum Day costs and all of the Maximum Hour costs are assigned to the
29 Block 3 rate.

30

1 The rates for each consumption block are then calculated by first dividing the Block 1
2 costs by the total single family residential consumption to determine the Block 1 rate.
3 The Block 2 rate is determined by dividing the Block 2 costs by consumption within
4 Blocks 2 and 3 and adding that incremental rate to the Block 1 rate. The Block 3 rate
5 is determined by dividing the Block 3 costs by the Block 3 consumption and adding
6 that incremental rate to the Block 2 rate.

7
8 **Q. Please explain the basis for the allocation of costs to the blocks.**

9 A. There is no industry standard allocation for what costs should be allocated in which
10 blocks. The percentage allocations of Base, Maximum Day, and Maximum Hour to
11 each of the blocks were developed to achieve what I believe are reasonable cost
12 differentials between Blocks 1, 2, and 3 that will achieve Providence Water's
13 conservation pricing objectives. The purpose of expressing the costs as a percentage
14 of Base, Maximum Day, and Maximum Hour is to provide a mechanism for the
15 updating of these rates in the future in a manner consistent with this filing.

16
17 **SEASONAL RATES OPTION**

18
19 **Q. Please explain how you developed the seasonal rate structure option.**

20 A. The first step in the process of developing a seasonal rate structure is the
21 determination of the length of the peak demand season. This is done by examining
22 billing data by month. As shown on the attached Figure 1, which shows monthly
23 billings for the single family residential customer, the months of June through
24 October had significantly higher usage than the other months. In the one year of data
25 shown in Figure 1, May did not have higher than average usage. However,
26 depending on the weather we would expect that outdoor irrigation would typically
27 begin by May, so we set the peak demand season to also include May, resulting in the
28 seasonal period being the six month period beginning in May and ending in October.

29

1 **Q. What is the next step in the process?**

2 A. The next step is to determine the appropriate consumption level at which a higher rate
3 will be applied during the high demand season. As was the case with the inclining
4 block rate, this consumption level was set at a level that would allow for non-
5 discretionary use and a reasonable level of lawn irrigation usage, or 8 hcf per month.

6

7 **Q. Once you have determined the seasonal period and the seasonal consumption**
8 **cut-off, how do you determine the seasonal rates?**

9 A. As with the inclining block structure, the next step is the allocation of costs to the
10 Base/Extra Capacity cost categories. Once again, the allocations from Docket No.
11 3832 were used. Then the costs from each category are allocated to the two rate
12 components, Non-seasonal/Seasonal Below Cut-off and Seasonal Above Cut-off. In
13 this case all of the Base costs and fifty percent of the Maximum Day costs were
14 allocated to the Non-seasonal/Seasonal Below Cut-off component. The remaining
15 fifty percent of the Maximum Day costs and all of the Maximum Hour costs were
16 allocated to the Seasonal Above Cut-off rate component.

17

18 The rates are calculated by first dividing the costs allocated to the Non-
19 seasonal/Seasonal Below Cut-off component by the total single family residential
20 consumption to arrive at the Non-seasonal/Seasonal Below Cut-off rate. The
21 Seasonal Above Cut-off rate is calculated by dividing the costs allocated to the
22 Seasonal Above Cut-off component by the Seasonal Above Cut-off consumption and
23 adding that incremental rate to the Non-seasonal/Seasonal Below Cut-off rate.

24

25 **Q. Please explain the basis for the allocation of costs between the Non-**
26 **Seasonal/Seasonal Below Cut-off and Seasonal Above Cut-off rates.**

27 A. As with the inclining block structure, there is no industry standard allocation for what
28 costs should be allocated to each of the components. The percentage allocations of
29 Base, Maximum Day, and Maximum Hour to each of the components were developed
30 to achieve what I believe are reasonable cost differentials between the Non-

1 Seasonal/Seasonal Below Cut-off and Seasonal Above Cut-off rates that will achieve
2 Providence Water's conservation pricing objectives. The purpose of expressing the
3 costs as a percentage of Base, Maximum Day, and Maximum Hour is to provide a
4 mechanism for the updating of these rates in the future in a manner consistent with
5 this filing.

6
7 **ASSOCIATED ISSUES**
8

9 **Q. What about multi-family residential customers?**

10 A. Since multi-family customers include two to three unit structures, multiple unit high
11 rise complexes and heavily landscaped multi-unit complexes, it is impossible to set
12 predetermined consumption block cut-offs that allow for an appropriate level of non-
13 discretionary use for all customers in the class. The same is true for the commercial
14 and industrial classes as well. Fair and equitable conservation rates for these classes
15 should use individualized consumption block cut-offs based on each customer's usage
16 patterns. However, Providence Water does not have enough historical data to
17 develop this type of individualized rate structure.

18
19 **Q. What rates are you proposing for these customers?**

20 A. For multi-family residential customers I am proposing that the multi-family
21 residential customers would become a separate class and would be charged the
22 residential rate that is approved in Docket 4061. Similarly, I am proposing that the
23 rates approved in Docket 4061 for the commercial and industrial class be used for
24 customers in these classes.

25
26 **Q. Would there be any changes to the service charges?**

27 A. No, the only changes would be to the volume charges for the single family residential
28 customers. However, for either rate structure to be effective, customers must be
29 billed on a monthly basis such that they have an opportunity to change their

1 consumption patterns. Therefore, it will be necessary to increase the billing
2 frequency for these customers from quarterly to monthly.

3
4 **Q. Do both of the rate structure options generate sufficient revenues?**

5 A. Yes, as shown on Schedule HJS-1, both rate structures generate slightly more revenue
6 that necessary if it assumed that consumption in the rate year is equal to the
7 consumption during the very limited period in which monthly consumption data was
8 collected. However, if the rate structures do what they are supposed to do and
9 consumption decreases, they may not generate sufficient revenues.

10
11 **Q. Have you done anything to reduce the possibility of revenue shortfalls?**

12 A. Yes, we have adjusted the consumption to reflect a decrease in usage for that
13 consumption which would incur a higher volume rate under the inclining block or
14 seasonal rate structure.

15
16 **Q. How much of a decline in consumption have you assumed?**

17 A. One study found that the price elasticity of demand for water is somewhere in the
18 range of -0.1 to -0.5¹, which means that for every 10 percent increase in price, the
19 demand would decrease by 1 to 5 percent. We have assumed a price elasticity of
20 approximately -0.2 for the blocks with increased pricing, which results in a decrease
21 in usage of 1% in Block 2 and 10% in Block 3 for the inclining block rates and a
22 decrease in usage of 10% for the Seasonal Above Cut-off usage. For the usage in
23 Block 1 of the inclining block structure and the Non-seasonal and Seasonal Below
24 Cut-off usage we have not assumed a change in usage. We do not believe there will
25 be an increase in this usage even though the price will decrease because this usage is
26 primarily for non-discretionary indoor usage and a reasonable amount of outdoor
27 irrigation.

28

¹ David Mitchell, M. Cubed, and W. Michael Hanemann, "Setting Urban Water Rates for Efficiency and Conservation," California Urban Water Conservation Council, October 1994, p. 4.

1 **Q. Have you determined how customer's bills would be impacted under the**
2 **conservation rate options?**

3 A. Yes. Schedules HJS-5 and HJS-6 show the impact on customers' bills under various
4 levels of consumption for each rate structure option. As shown, customers whose
5 consumption is primarily non-discretionary would have significantly lower monthly
6 bills while those that have large amounts of discretionary consumption would
7 experience large increases in their monthly bills.

8
9 **Q. Are you recommending that either of the two proposed rate structures be**
10 **approved for implementation by Providence Water?**

11 A. No. At this point in time I would not recommend that the Commission require
12 Providence Water to implement either of the two options. Given that our
13 understanding of the demand characteristics of Providence Water's customers is
14 based on only one year's worth of monthly data it is possible that their actual long
15 term demand characteristics are significantly different than we have assumed in the
16 development of these rate structure options. Instead, I would recommend that the
17 current rate structure remain in effect until Providence Water can collect at least two
18 additional years of monthly billing data. At that time the currently proposed options
19 should be reexamined and adjusted if necessary.

20

21 **Q. Does this conclude your testimony?**

22 A. Yes.

PROVIDENCE WATER SUPPLY BOARD
Docket No. 3832
Data Requests of the Public Utilities Commission
Set 1

Comm. 1-7: Provide optional rate designs that reflect seasonal and/or increasing block rates that will serve to promote conservation.

Response: Providence Water has asked our Rate consultant to provide some information regarding conservation rates, particularly as they might pertain to Providence Water. While Providence Water is concerned about conservation, we would not want to implement a new conservation rate structure without the proper amount of study and planning. Mr. Harold Smith has provided the following information.

There are a number of rate structures that are oriented toward promoting conservation. A discussion of the most common "conservation" rate structures follows:

Uniform Rates

True uniform rates are the same regardless of customer class or consumption. Some utilities have uniform rates structures that vary by customer class, but not by consumption.

Some of the advantages of uniform rates include:

- More conservation oriented than declining block rates;
- Rate impacts are less dramatic;
- Less data intensive; and
- Relatively easy to calculate and implement.

Some of the disadvantages include:

- Often fail to recognize differences in cost of service by customer class;
- May not send a strong enough conservation message;
- May not target conservation message to the appropriate customer class.

While not typically considered a conservation rate structure, uniform rates are often utilized as a transition structure from declining block rates, in which the volumetric rate decreases as consumption increases, to a more conservation oriented structure. This structure only promotes conservation for those customers whose true unit cost of service is below the uniform rate per unit.

As mentioned above, one of the major disadvantages of uniform rates is that they may not recognize the fact that large volume customers with a relative constant demand are cheaper to serve than residential customers that use relatively little water, but have a high peaking factor. This problem can be overcome by setting uniform rates by class; however, this severely reduces the structure's effectiveness in promoting conservation. Additionally, uniform rates do not target discretionary water use so they tend to penalize those customers that have relatively high non-discretionary water demands.

PROVIDENCE WATER SUPPLY BOARD
Docket No. 3832
Data Requests of the Public Utilities Commission
Set 1

1-7 cont'd

With regard to Providence Water, a move to a uniform rate for all customers, regardless of class might send some conservation signals, but only to commercial and industrial users that are currently charged a rate that is less than the residential rate. Since this approach would primarily target non-discretionary use by these large volume customers to the benefit of residential users that irrigate it is unlikely that Providence Water or the Commission would choose this approach.

Increasing Block Rates

Increasing or inclining block rate structures price water at increasingly higher per unit rates as consumption increases. The price of water for essential use is less than discretionary use. Typically, water for essential use is priced below cost of service to reward users that are responsive to conservation initiatives.

Some of the advantages of increasing block rates include:

- Send a strong conservation message;
- Can be targeted at discretionary water use;
- Great deal of flexibility;
- Usually easy to understand by customers; and
- Can generate surplus revenues

Some of the disadvantages include:

- Very data intensive;
- Can result in significant revenue shortfalls;
- Can be difficult to calculate and implement;
- Can result in severe adverse rate impacts for some customers

Increasing block rates are the most common of the various conservation rate structures. Approximately 36% of the 230 utilities that responded to the 2006 RFC/AWWA Water and Wastewater Rate Survey use some form of increasing block rate structure. Increasing block rates are arguably the most effective conservation rate structure in that they send a clear message that excessive water use will result in a large water bill.

Increasing block rates are very flexible in that the consumption blocks and the differential between the unit price at each block can be set to achieve a variety of conservation messages. For instance, a utility seeking to curb excessive irrigation can implement a three block structure for residential customers where the first block of usage is set below the average winter daily usage and is priced slightly below the cost of service; the second block is set at average winter daily usage and is priced at or slightly above cost of service and the third block is for all water over average winter daily usage and is priced significantly higher than the cost of service.

PROVIDENCE WATER SUPPLY BOARD
Docket No. 3832
Data Requests of the Public Utilities Commission
Set 1

1-7 cont'd

The primary long-term disadvantage of increasing block rates is that they can result in significant revenue volatility if consumption projections for each consumption block are off. For example, if a utility is relying on the third consumption block to generate a significant portion of its revenue, a wet summer which results in minimal irrigation demand could result in a revenue shortfall. As such, utilities that utilize an increasing block rate structure should be able to change rates on relatively short notice or maintain an operating reserve that is sufficient to cover any revenue shortfalls that may occur.

From a short-term perspective, a change to increasing block rates from uniform or declining block rates will require a significant amount of data regarding customer demand patterns and many times the utility's billing system will require significant modification or replacement in order to gather the additional data and accommodate billing under the more complex rate structure. Additionally, the move to increasing block rates can have severe impacts on some customers, depending on where their demand falls in relation to the consumption block cut-offs.

With respect to Providence Water, a move to an increasing block structure would most likely have some conservation benefits; however, careful study will be required in order to design a rate structure that balances the potential advantages and disadvantages of increasing block rates and achieves Providence Water's conservation objectives. Additionally, prior to moving to an increasing block rate structure, Providence Water should begin billing or reading all of its customers on a monthly basis such that it can generate the data needed to develop a fair and equitable increasing block rate structure.

Seasonal Rates

Seasonal rates, or rates that fluctuate according to the time of year in which water is consumed, can have conservation benefits for utilities that have significant fluctuations in usage during different times of the year. Since facilities are constructed to meet peak demand during the "season", a large portion of the capacity remains idle during the "off-season." Peak demands are created through lawn irrigation, additional water usage for sanitary purposes, pool usage, seasonal industrial operations (canning, fishing, etc.), and tourist impacts in resort areas (skiing during the winter, water sports during the summer, etc.). Higher rates during the peak season not only encourage conservation during the peak season, but they also allow the utility to recover the costs for the facilities needed to meet peak demand from the customers that cause the peak demand.

Some of the advantages of seasonal rates include:

- Promote efficient use of facilities during the season and off-season;
- Promote conservation during the peak season;
- Understood and accepted by customers; and
- Can be tailored to meet different pricing objectives.

PROVIDENCE WATER SUPPLY BOARD

Docket No. 3832

Data Requests of the Public Utilities Commission

Set 1

1-7 cont'd

Some of the disadvantages include:

- Impact on demand and therefore revenue can be unpredictable;
- Must be based on monthly billing data; and
- Can cause problems when actual weather conditions are out of synch with rate seasons.

There are actually two different types of seasonal rates

- Specific seasonal rates in which there are two distinct sets of rates or two rate structures, one for the "season" and one for the "off-season" and the
- Surcharge rate approach where consumption above a threshold is charged a higher rate during the season.

Of the two seasonal structures, the surcharge approach is the easiest to develop and easiest to communicate to customers and can be developed to address specific conservation objectives, however, the specific seasonal rates approach allows for more specific targeting of the conservation message. Regardless of the approach used, monthly consumption data is necessary to determine whether seasonality of consumption exists and then to identify the peak season.

Seasonal rates may or may not be appropriate for Providence Water. As was the case with increasing block rates, Providence Water should implement monthly billing or reading in order to gather the data necessary to assess whether seasonal rates are appropriate. Once the data has been gathered, careful analysis of the data will provide an indication as to whether seasonal rates are the proper course.

Marginal Cost Rates

Marginal cost pricing involves setting rates equal to the cost of the next unit(s) of service, whether that next unit is provided using existing facilities (short-term marginal costs) or new facilities (long-term marginal costs). This pricing approach is based on relatively complex economic theory and is only used by a few utilities in an effort to achieve specific demand management goals.

Some of the advantages of marginal cost rates include:

- Very rarely results in a revenue shortfall; and
- Effectively communicates desired demand management message;

Some of the disadvantages include:

- Initial impact on demand and revenues can be unpredictable;
- Difficult to develop;
- Legally untested;
- Difficult to communicate and understand; and
- May generate excessive surpluses.

PROVIDENCE WATER SUPPLY BOARD

Docket No. 3832

Data Requests of the Public Utilities Commission

Set 1

1-7 cont'd

Marginal cost pricing is a relatively new concept for the water industry, but theoretically it should be effective in managing demand. In fact, they are more accurately characterized as "demand management" rates as opposed to "conservation" rates because there are some circumstances in which marginal cost pricing may actually encourage increased consumption. For instance, if a utility has significant capacity already available in its system, marginal cost pricing could result in rates that are below average cost, thereby encouraging customers to consume water up to the available capacity. However, once that capacity has been utilized, the next increment of capacity must be provided by new facilities at a much higher marginal cost, therefore the rates associated with that capacity would be significantly higher. This differential between long-term and short-term marginal costs can lead to serious rate equity issues.

At this point in time it is unlikely that marginal cost pricing would provide benefits to Providence Water that could not be achieved using less complex, more common approaches such as increasing block or seasonal rates. However, if these approaches do not yield the desired demand management results, marginal cost pricing could be considered.

Prepared by: Jeanne Bondarevskis and Harold Smith 6/13/07

Providence Water Supply Board
 Conservation Rate Filing
 Calculation of Inclinng Block and Seasonal Rates

Schedule HJS-1

Single Family Residential Test Year units of service (HCF)	4,995,260	(HJS-A)
Proposed Residential Volume Rate (per HCF)	\$ 2,350	(HJS-14 of Docket No. 4061)
Single Family Residential Volume Rate Revenue	\$ 11,738,860	
Allocation of Residential Volume Costs from Docket No. 3832 (HJS-B)		
Base	\$ 17,857,847	74.18%
Maximum Day	\$ 4,875,637	20.25%
Maximum Hour	\$ 1,340,219	5.57%
Allocation of Single Family Residential Volume Costs		
Base	\$ 8,707,874	74.18%
Maximum Day	\$ 2,377,466	20.25%
Maximum Hour	\$ 653,520	5.57%

Block Rate Calculations					
Consumption within blocks					
Block 1	Cut-off =	2,718,439	HCF	54.4%	
Block 2	Cut-off =	523,054	HCF	10.5%	
Block 3		1,753,768	HCF	35.1%	
Allocation of Costs to Blocks					
		Base	Max. Day	Max. Hour	Totals
Block 1		100.00%	0.00%	0.00%	
Block 2		0.00%	80.00%	0.00%	
Block 3		0.00%	40.00%	100.00%	
Block 1		\$ 8,707,874	\$ -	\$ -	\$ 8,707,874
Block 2		\$ -	\$ 1,426,480	\$ -	\$ 1,426,480
Block 3		\$ -	\$ 950,987	\$ 653,520	\$ 1,604,507
Test Year units of service					
Block 1		2,718,439	HCF	54%	
Block 2		523,053	HCF	10%	
Block 3		1,753,768	HCF	35%	
Change in Usage due to Pricing Change					
Block 1		0.0%			
Block 2		-1.0%			
Block 3		-10.0%			
Test Year units of service based on adjusted pricing					
Block 1		2,718,439	HCF		
Block 2		517,823	HCF		
Block 3		1,578,391	HCF		
Proposed Block Rates					
Block 1	Cut-off =	6	\$ 1.809 per HCF		
Block 2	Cut-off =	8	\$ 2.490 per HCF	138%	
Block 3			\$ 3.507 per HCF	141%	194%
					Revenue Check
Block 1 revenues					\$ 4,917,656
Block 2 revenues					\$ 1,269,379
Block 3 revenues					\$ 5,535,417
Total revenues					\$ 11,742,451
Surplus/(Deficit)					\$ 3,591

Providence Water Supply Board
 Conservation Rate Filing
 Calculation of Inclinng Block and Seasonal Rates

Schedule HJS-1

Seasonal Rate Calculations		Cut-off =			
Non-seasonal/Seasonal below cut-off consumption	3,606,916	HCF		72.2%	
Seasonal above cut-off consumption	1,388,344	HCF		27.8%	
Allocation of Costs to Rates					
	Base	Max. Day	Max. Hour	Totals	
Non-seasonal/Seasonal below cut-off consumption	100.00%	50.00%	0.00%		
Seasonal above cut-off consumption	0.00%	50.00%	100.00%		
Non-seasonal/Seasonal below cut-off consumption	\$ 8,707,874	\$ 1,188,733	\$ -	\$ 9,896,607	
Seasonal above cut-off consumption	\$ -	\$ 1,188,733	\$ 653,520	\$ 1,842,253	
Test Year units of service					
Non-seasonal/Seasonal below cut-off consumption	3,606,916	HCF			
Seasonal above cut-off consumption	1,388,344	HCF			
Change in Usage due to Pricing Change					
Non-seasonal/Seasonal below cut-off consumption	0.0%				
Seasonal above cut-off consumption	-10.0%				
Test Year units of service based on adjusted pricing					
Non-seasonal/Seasonal below cut-off consumption	3,606,916	HCF			
Seasonal above cut-off consumption	1,249,510	HCF			
Proposed Seasonal Rates					
Non-seasonal/Seasonal below cut-off consumption	\$ 2.038	per HCF			
Seasonal above cut-off consumption	\$ 3.513	per HCF			
				Revenue Check	
Non-seasonal/Seasonal below cut-off revenue				\$	7,350,894
Seasonal above cut-off revenue				\$	4,389,528
Total Revenue				\$	11,740,422
Surplus/(Deficit)				\$	1,561

Providence Water Supply Board
 Conservation Rate Filing
 Summary of Rates - Inclining Block

Schedule HJS-2

Retail Consumption:

	Current	Docket 4061	Conservation Filing	% Change From Current	% Change From 4061
Block 1	\$ 2,134	\$ 2,350	\$ 1,809	-15.23%	-23.02%
Block 2	\$ 2,134	\$ 2,350	\$ 2,490	16.68%	5.96%
Block 3	\$ 2,134	\$ 2,350	\$ 3,507	64.34%	49.23%
per HCF	\$ 2,134	\$ 2,350	\$ 2,350	10.12%	0.00%
per HCF	\$ 2,049	\$ 2,256	\$ 2,256	10.10%	0.00%
per HCF	\$ 2,011	\$ 2,214	\$ 2,214	10.09%	0.00%

Service Charges:

(Meter size inches)	Quarterly			Monthly		
	Conservation Filing	% Change From Current	% Change From 4061	Conservation Filing	% Change From Current	% Change From 4061
5/8"	\$ 15.73	17.32	10.11%	\$ 9.28	10.22	10.13%
3/4"	\$ 16.70	18.39	10.12%	\$ 9.60	10.57	10.10%
1"	\$ 19.60	21.58	10.10%	\$ 10.57	11.64	10.12%
1.5"	\$ 23.47	25.84	10.10%	\$ 11.86	13.06	10.12%
2"	\$ 34.11	37.55	10.09%	\$ 15.41	16.97	10.12%
3"	\$ 112.49	123.83	10.08%	\$ 41.53	45.72	10.09%
4"	\$ 141.51	155.78	10.08%	\$ 51.21	56.38	10.10%
6"	\$ 209.25	230.35	10.08%	\$ 73.78	81.22	10.08%
8"	\$ 286.65	315.55	10.08%	\$ 99.59	109.63	10.08%
10"	\$ 356.80	392.77	10.08%	\$ 122.97	135.37	10.08%
12"	\$ 428.95	469.99	10.08%	\$ 146.35	161.11	10.09%

Wholesale:

	Current	Docket 4061	Conservation Filing	% Change From Current	% Change From 4061
per HCF	\$ 1,089.13	\$ 1,198.676	\$ 1,198.676	10.08%	0.00%
per Million Gallons	\$ 1,455.77	\$ 1,602.52	\$ 1,602.52	10.08%	0.00%

Public Fire Supply:

	Current	Docket 4061	Conservation Filing	% Change From Current	% Change From 4061
per Hydrant	\$ 291.06	\$ 320.40	\$ 320.40	10.08%	0.00%

Private Fire Supply:

(Service size inches)	Quarterly			Monthly		
	Conservation Filing	% Change From Current	% Change From 4061	Conservation Filing	% Change From Current	% Change From 4061
3/4"	\$ 18.59	18.59	10.13%	\$ 10.22	10.22	10.13%
1"	\$ 22.02	22.02	10.10%	\$ 10.57	10.57	10.10%
1.5"	\$ 27.11	27.11	10.11%	\$ 11.64	11.64	10.12%
2"	\$ 40.26	40.26	10.09%	\$ 13.06	13.06	10.12%
4"	\$ 156.72	172.52	10.08%	\$ 45.72	45.72	10.09%
6"	\$ 253.42	278.97	10.08%	\$ 81.22	81.22	10.08%
8"	\$ 380.78	418.17	10.08%	\$ 109.63	109.63	10.08%
10"	\$ 526.08	579.11	10.08%	\$ 135.37	135.37	10.08%
12"	\$ 700.38	770.98	10.08%	\$ 161.11	161.11	10.09%
16"	\$ 1,149.93	1,265.85	10.08%	\$ 214.92	214.92	10.08%

Providence Water Supply Board
 Conservation Rate Filing
 Summary of Rates - Seasonal

Schedule HJS-3

Retail Consumption:

	Current	Docket 4061	Conservation Filing	% Change From Current	% Change From 4061
Non-Seasonal	\$ 2,134	\$ 2,350	\$ 2,038	-4.50%	-13.28%
Seasonal Below Cut-off	\$ 2,134	\$ 2,350	\$ 2,038	-4.50%	-13.28%
Seasonal Above Cut-off	\$ 2,134	\$ 2,350	\$ 3,513	64.82%	49.49%
Multi-Family Residential per HCF	\$ 2,134	\$ 2,350	\$ 2,350	10.12%	0.00%
Commercial per HCF	\$ 2,049	\$ 2,256	\$ 2,256	10.10%	0.00%
Industrial per HCF	\$ 2,011	\$ 2,214	\$ 2,214	10.09%	0.00%

Service Charge:

(Meter size inches)	Quarterly			Monthly		
	Conservation Filing	% Change From Current	% Change From 4061	Conservation Filing	% Change From Current	% Change From 4061
5/8"	\$ 17.32	10.11%	10.11%	\$ 10.22	10.13%	10.13%
3/4"	\$ 18.39	10.12%	10.12%	\$ 10.57	10.10%	10.10%
1"	\$ 21.58	10.10%	10.10%	\$ 11.64	10.12%	10.12%
1.5"	\$ 25.84	10.10%	10.10%	\$ 13.06	10.12%	10.12%
2"	\$ 37.55	10.09%	10.09%	\$ 16.97	10.12%	10.12%
3"	\$ 123.83	10.08%	10.08%	\$ 45.72	10.09%	10.09%
4"	\$ 155.78	10.08%	10.08%	\$ 56.38	10.10%	10.10%
6"	\$ 230.35	10.08%	10.08%	\$ 81.22	10.08%	10.08%
8"	\$ 286.65	10.08%	10.08%	\$ 109.63	10.08%	10.08%
10"	\$ 392.77	10.08%	10.08%	\$ 135.37	10.08%	10.08%
12"	\$ 469.99	10.08%	10.08%	\$ 161.11	10.09%	10.09%

Wholesale:

	Current	Docket 4061	Conservation Filing	% Change From Current	% Change From 4061
Consumption per HCF	\$ 1,086.93	\$ 1,198.76	\$ 1,198.76	10.08%	0.00%
Consumption per Million Gallons	\$ 1,455.77	\$ 1,602.52	\$ 1,602.52	10.08%	0.00%

Public Fire Supply:

	Current	Docket 4061	Conservation Filing	% Change From Current	% Change From 4061
per Hydrant	\$ 291.06	\$ 320.40	\$ 320.40	10.08%	0.00%

Private Fire Supply:

(Service size inches)	Quarterly			Monthly		
	Conservation Filing	% Change From Current	% Change From 4061	Conservation Filing	% Change From Current	% Change From 4061
3/4"	\$ 18.59	10.13%	10.13%	\$ 0.00	0.00%	0.00%
1"	\$ 22.02	10.10%	10.10%	\$ 0.00	0.00%	0.00%
1.5"	\$ 27.11	10.11%	10.11%	\$ 0.00	0.00%	0.00%
2"	\$ 40.26	10.09%	10.09%	\$ 0.00	0.00%	0.00%
4"	\$ 172.52	10.08%	10.08%	\$ 0.00	0.00%	0.00%
6"	\$ 278.97	10.08%	10.08%	\$ 0.00	0.00%	0.00%
8"	\$ 419.17	10.08%	10.08%	\$ 0.00	0.00%	0.00%
10"	\$ 579.11	10.08%	10.08%	\$ 0.00	0.00%	0.00%
12"	\$ 770.98	10.08%	10.08%	\$ 0.00	0.00%	0.00%
16"	\$ 1,265.85	10.08%	10.08%	\$ 0.00	0.00%	0.00%

Providence Water Supply Board
Conservation Rate Filing

Calculation of Revenues at Present and Proposed Rates

Schedule HJS-4

	Consumption /Units	Revenues Current	Docket No. 4061		Inclining Block		Seasonal	
			Revenues Proposed	Percent Increase	Revenues Proposed	Percent Increase	Revenues Proposed	Percent Increase
Retail Customers								
Residential Sales								
Single Family	4,995,260	\$ 10,659,884	\$ 11,738,860	10.12%	\$ 11,742,451	10.16%	\$ 11,740,422	10.14%
Multi Family	5,197,547	\$ 11,091,566	\$ 12,214,236	10.12%	\$ 12,214,236	10.12%	\$ 12,214,236	10.12%
<i>Subtotal Residential</i>		\$ 21,751,450	\$ 23,953,096	10.12%	\$ 23,956,687	10.14%	\$ 23,954,658	10.13%
Commercial Sales	4,060,451	\$ 8,319,864	\$ 9,160,377	10.10%	\$ 9,160,377	10.10%	\$ 9,160,377	10.10%
Industrial Sales	377,235	\$ 758,620	\$ 835,198	10.09%	\$ 835,198	10.09%	\$ 835,198	10.09%
<i>Sub-total Retail</i>	14,630,493	\$ 30,829,934	\$ 33,948,672		\$ 33,952,263		\$ 33,950,233	
Wholesale	14,415,751	\$ 15,697,498	\$ 17,279,814	10.08%	\$ 17,279,814	10.08%	\$ 17,279,814	10.08%
Total Consumption Revenue	29,046,244	\$ 46,527,432	\$ 51,228,487	10.10%	\$ 51,232,078	10.11%	\$ 51,230,048	10.11%
Service Charges	287,852	\$ 4,999,279	\$ 5,504,393	10.20%	\$ 5,504,393	10.10%	\$ 5,504,393	10.10%
Private Fire Service Charge	1,820	\$ 1,833,075	\$ 2,017,886	10.08%	\$ 2,017,886	10.08%	\$ 2,017,886	10.08%
Public Fire Protection	6,082	\$ 1,770,227	\$ 1,948,673	10.08%	\$ 1,948,673	10.08%	\$ 1,948,673	10.08%
Miscellaneous Revenues		\$ 1,402,137	\$ 1,402,137	0.00%	\$ 1,402,137	0.00%	\$ 1,402,137	0.00%
Miscellaneous Income		\$ 375,000	\$ 375,000	0.00%	\$ 375,000	0.00%	\$ 375,000	0.00%
Tax Refund Contribution		\$ 1,777,137	\$ 1,777,137		\$ 1,777,137		\$ 1,777,137	
<i>Subtotal Miscellaneous</i>		\$ 3,554,274	\$ 3,554,274		\$ 3,554,274		\$ 3,554,274	
Total Revenue		\$ 56,907,150	\$ 62,476,576	9.79%	\$ 62,480,167	9.79%	\$ 62,478,137	9.79%

Providence Water Supply Board
 Conservation Rate Filing
 Customer Bill Impacts-Inclining Block Rates

Schedule HJS-5

Monthly Consumption (hcf)	Bill at Docket No. 4061 Rates	Proposed		
		Bill at Proposed Rates	\$ Increase	% Increase
2	\$14.92	\$13.84	-\$1.08	-7.3%
4	\$19.62	\$17.46	-\$2.16	-11.0%
6	\$24.32	\$21.07	-\$3.25	-13.3%
8	\$29.02	\$26.05	-\$2.97	-10.2%
10	\$33.72	\$33.07	-\$0.65	-1.9%
12	\$38.42	\$40.08	\$1.66	4.3%
15	\$45.47	\$50.60	\$5.13	11.3%
20	\$57.22	\$68.14	\$10.92	19.1%
40	\$104.22	\$138.28	\$34.06	32.7%
50	\$127.72	\$173.35	\$45.63	35.7%
75	\$186.47	\$261.02	\$74.55	40.0%
100	\$245.22	\$348.70	\$103.48	42.2%
200	\$480.22	\$699.40	\$219.18	45.6%
300	\$715.22	\$1,050.10	\$334.88	46.8%
400	\$950.22	\$1,400.80	\$450.58	47.4%
2	\$16.34	\$15.26	-\$1.08	-6.6%
4	\$21.04	\$18.88	-\$2.16	-10.3%
6	\$25.74	\$22.49	-\$3.25	-12.6%
8	\$30.44	\$27.47	-\$2.97	-9.7%
12	\$39.84	\$41.50	\$1.66	4.2%
15	\$46.89	\$52.02	\$5.13	10.9%
20	\$58.64	\$69.56	\$10.92	18.6%
25	\$70.39	\$87.09	\$16.70	23.7%
35	\$93.89	\$122.16	\$28.27	30.1%
50	\$129.14	\$174.77	\$45.63	35.3%
75	\$187.89	\$262.44	\$74.55	39.7%
100	\$246.64	\$350.12	\$103.48	42.0%
200	\$481.64	\$700.82	\$219.18	45.5%
300	\$716.64	\$1,051.52	\$334.88	46.7%
400	\$951.64	\$1,402.22	\$450.58	47.3%

5/8 Inch Meter

Average Winter Usage

Average Summer Usage

1 Inch Meter

Providence Water Supply Board
 Conservation Rate Filing
 Customer Bill Impacts-Seasonal Rates

Schedule HJS-6

Monthly Bill

Monthly Consumption (hcf)	Bill at Docket No. 4061 Rates	Bill at Proposed Rates (Non Season)	\$ Change (Non Season)	% Change (Non Season)	Bill at Proposed Rates (Season)	\$ Change (Season)	% Change (Season)
2	\$14.92	\$14.30	-\$0.62	-4.2%	\$14.30	-\$0.62	-4.2%
4	\$19.62	\$18.37	-\$1.25	-6.4%	\$18.37	-\$1.25	-6.4%
6	\$24.32	\$22.45	-\$1.87	-7.7%	\$22.45	-\$1.87	-7.7%
8	\$29.02	\$26.52	-\$2.50	-8.6%	\$26.52	-\$2.50	-8.6%
10	\$33.72	\$30.60	-\$3.12	-9.3%	\$30.60	-\$3.12	-9.3%
12	\$38.42	\$34.68	-\$3.74	-9.7%	\$34.68	-\$3.74	-9.7%
15	\$45.47	\$40.79	-\$4.68	-10.3%	\$40.79	-\$4.68	-10.3%
20	\$57.22	\$50.98	-\$6.24	-10.9%	\$50.98	-\$6.24	-10.9%
40	\$104.22	\$91.74	-\$12.48	-12.0%	\$91.74	-\$12.48	-12.0%
50	\$127.72	\$112.12	-\$15.60	-12.2%	\$112.12	-\$15.60	-12.2%
75	\$186.47	\$163.07	-\$23.40	-12.5%	\$163.07	-\$23.40	-12.5%
100	\$245.22	\$214.02	-\$31.20	-12.7%	\$214.02	-\$31.20	-12.7%
200	\$480.22	\$417.82	-\$62.40	-13.0%	\$417.82	-\$62.40	-13.0%
300	\$715.22	\$621.62	-\$93.60	-13.1%	\$621.62	-\$93.60	-13.1%
400	\$950.22	\$825.42	-\$124.80	-13.1%	\$825.42	-\$124.80	-13.1%

5/8 Inch Meter

Average Winter Usage

Average Summer Usage

Annual Bills

Annual Consumption (hcf)	Bill at Docket No. 4061 Rates	Bill at Proposed Rates	\$ Increase	% Increase
24	\$179.04	\$171.55	-\$7.49	-4.2%
48	\$358.08	\$320.46	-\$37.62	-10.5%
72	\$537.12	\$469.38	-\$67.74	-12.6%
96	\$716.16	\$604.29	-\$111.87	-15.6%
120	\$895.20	\$743.90	-\$151.30	-16.9%
144	\$1,074.24	\$888.51	-\$185.73	-17.3%
180	\$1,253.28	\$1,037.64	-\$215.64	-17.2%
240	\$1,707.04	\$1,371.96	-\$335.08	-19.6%
480	\$3,414.08	\$2,743.92	-\$670.16	-19.6%
600	\$4,096.80	\$3,285.84	-\$810.96	-19.8%
900	\$6,145.12	\$4,928.71	-\$1,216.41	-19.8%
1200	\$8,193.44	\$6,571.58	-\$1,621.86	-19.8%
2400	\$16,386.88	\$13,143.16	-\$3,243.72	-19.8%
3600	\$24,580.32	\$19,714.74	-\$4,865.58	-19.8%
4800	\$32,773.76	\$26,286.32	-\$6,487.44	-19.8%

1 Inch Meter

Monthly Consumption (hcf)	Bill at Docket No. 4061 Rates	Bill at Proposed Rates (Non Season)	\$ Change (Non Season)	% Change (Non Season)	Bill at Proposed Rates (Season)	\$ Change (Season)	% Change (Season)
2	\$16.34	\$15.72	-\$0.62	-3.8%	\$15.72	-\$0.62	-3.8%
4	\$21.04	\$19.79	-\$1.25	-5.9%	\$19.79	-\$1.25	-5.9%
6	\$25.74	\$23.87	-\$1.87	-7.3%	\$23.87	-\$1.87	-7.3%
8	\$30.44	\$27.94	-\$2.50	-8.2%	\$27.94	-\$2.50	-8.2%
12	\$39.84	\$36.10	-\$3.74	-9.4%	\$36.10	-\$3.74	-9.4%
15	\$46.89	\$42.21	-\$4.68	-10.0%	\$42.21	-\$4.68	-10.0%
20	\$58.64	\$52.40	-\$6.24	-10.6%	\$52.40	-\$6.24	-10.6%
25	\$70.39	\$62.59	-\$7.80	-11.1%	\$62.59	-\$7.80	-11.1%
35	\$93.89	\$82.87	-\$11.02	-11.8%	\$82.87	-\$11.02	-11.8%
50	\$129.14	\$113.54	-\$15.60	-12.1%	\$113.54	-\$15.60	-12.1%
75	\$187.89	\$164.49	-\$23.40	-12.5%	\$164.49	-\$23.40	-12.5%
100	\$246.64	\$215.44	-\$31.20	-12.7%	\$215.44	-\$31.20	-12.7%
200	\$481.64	\$419.24	-\$62.40	-13.0%	\$419.24	-\$62.40	-13.0%
300	\$716.64	\$623.04	-\$93.60	-13.1%	\$623.04	-\$93.60	-13.1%
400	\$951.64	\$826.84	-\$124.80	-13.1%	\$826.84	-\$124.80	-13.1%

Annual Consumption (hcf)	Bill at Docket No. 4061 Rates	Bill at Proposed Rates	\$ Increase	% Increase
24	\$196.08	\$188.59	-\$7.49	-3.8%
48	\$392.16	\$353.18	-\$38.98	-9.9%
72	\$588.24	\$507.27	-\$80.97	-13.8%
96	\$784.32	\$646.24	-\$138.08	-17.7%
144	\$1,176.48	\$908.55	-\$267.93	-22.8%
180	\$1,568.64	\$1,161.42	-\$407.22	-26.0%
240	\$2,057.76	\$1,415.16	-\$642.60	-31.2%
300	\$2,546.88	\$1,714.18	-\$832.70	-32.7%
400	\$3,395.84	\$2,285.52	-\$1,110.32	-32.7%
600	\$5,093.76	\$3,285.84	-\$1,807.92	-35.5%
900	\$7,640.64	\$4,928.71	-\$2,711.93	-35.5%
1200	\$10,187.52	\$6,571.58	-\$3,615.94	-35.5%
2400	\$20,375.04	\$13,143.16	-\$7,231.88	-35.5%
3600	\$30,562.56	\$19,714.74	-\$10,847.82	-35.5%
4800	\$40,750.08	\$26,286.32	-\$14,463.76	-35.5%

Providence Water Supply Board
 Conservation Rate Filing
 Consumption Data - Single Family Residential

Schedule HJS-A

USAGE BLOCK	# OF BILLS	USAGE BILLED	Total		Percent of Bills	Cumulative Percent of Bills		
			Cumulative Usage	Cumulative Usage %				
<= 0		10,432	(15,474)		0	0.21%	0	0.21%
0-1	1	19,324	8,317	539,029	11%	0.17%	1	-0.14%
1-2	2	27,271	44,462	1,059,662	21%	0.89%	2	0.75%
2-3	3	40,773	106,320	1,547,104	31%	2.13%	3	2.88%
3-4	4	50,015	180,704	1,990,415	40%	3.62%	4	6.49%
4-5	5	55,093	254,209	2,381,813	48%	5.09%	5	11.58%
5-6	6	53,629	300,840	2,718,439	54%	6.02%	6	17.60%
6-7	7	48,545	320,419	3,002,974	60%	6.41%	7	24.02%
7-8	8	41,472	314,909	3,241,492	65%	6.30%	8	30.32%
8-9	9	34,332	294,915	3,441,333	69%	5.90%	9	36.23%
9-10	10	29,491	283,312	3,609,317	72%	5.67%	10	41.90%
10-11	11	22,927	242,586	3,749,797	75%	4.86%	11	46.75%
11-12	12	18,351	212,670	3,869,418	77%	4.26%	12	51.01%
12-13	13	14,746	185,697	3,972,230	79%	3.72%	13	54.73%
13-14	14	12,220	166,002	4,061,220	81%	3.32%	14	58.05%
14-15	15	9,982	145,596	4,138,933	83%	2.91%	15	60.97%
15-16	16	8,376	130,606	4,207,388	84%	2.61%	16	63.58%
16-17	17	7,183	119,054	4,267,820	85%	2.38%	17	65.97%
17-18	18	5,914	104,078	4,321,752	86%	2.08%	18	68.05%
18-19	19	5,061	94,086	4,370,071	87%	1.88%	19	69.93%
19-20	20	4,743	93,067	4,413,609	88%	1.86%	20	71.80%
20-21	21	3,824	78,668	4,452,561	89%	1.57%	21	73.37%
21-22	22	3,224	69,726	4,488,123	90%	1.40%	22	74.77%
22-23	23	2,908	65,680	4,520,458	90%	1.31%	23	76.08%
23-24	24	2,562	60,443	4,550,045	91%	1.21%	24	77.29%
24-25	25	2,368	58,175	4,577,090	91%	1.16%	25	78.46%
25-30	30	8,635	238,516	4,685,066	94%	4.77%	30	83.23%
30-35	35	5,260	171,739	4,758,040	95%	3.44%	35	86.67%
35-40	40	3,322	125,330	4,809,526	96%	2.51%	40	89.18%
40-45	45	2,260	96,320	4,846,570	97%	1.93%	45	91.11%
45-50	50	1,643	78,399	4,873,945	97%	1.57%	50	92.68%
50-55	55	1,092	57,745	4,894,540	98%	1.16%	55	93.83%
55-60	60	843	48,543	4,909,953	98%	0.97%	60	94.80%
60-65	65	542	33,805	4,921,763	98%	0.68%	65	95.48%
65-70	70	438	29,574	4,931,202	98%	0.59%	70	96.07%
70-75	75	328	23,846	4,938,783	99%	0.48%	75	96.55%
75-80	80	255	19,929	4,945,007	99%	0.40%	80	96.95%
80-85	85	176	14,508	4,949,975	99%	0.29%	85	97.24%
85-90	90	133	11,673	4,954,217	99%	0.23%	90	97.47%
90-95	95	115	10,617	4,957,784	99%	0.21%	95	97.68%
95-100	100	96	9,386	4,960,870	99%	0.19%	100	97.87%
100-125	125	259	28,715	4,971,311	99%	0.57%	125	98.45%
125-150	150	97	13,237	4,977,623	99%	0.26%	150	98.71%
150-175	175	61	9,891	4,982,039	99%	0.20%	175	98.91%
175-200	200	46	8,520	4,985,034	99%	0.17%	200	99.08%
200-300	300	57	13,445	4,991,480	100%	0.27%	300	99.35%
300-400	400	17	5,982	4,995,062	100%	0.12%	400	99.47%
400-500	500	11	4,893	4,997,155	100%	0.10%	500	99.57%
> 500		16	21,579	5,010,734	100%	0.43% 500+		100.00%

560,468 4,995,260 9

	Cut-off	Usage in Block	
Block 1	2,718,439	2,718,439	54.4%
Block 2	523,054	523,054	10.5%
Block 3	1,753,768	1,753,768	35.1%
Total Annual Usage		4,995,260	

Providence Water Supply Board
 Conservation Rate Filing
 Consumption Data - Single Family Residential

Schedule HJS-A

May - October

USAGE BLOCK	# OF BILLS	USAGE BILLED	Cumulative Usage	Cumulative Usage %	Percent of Bills	Cumulative Percent of Bills
<= 0	4,935.00	-6,330.01			0	-0.13%
0-1	8,883.00	3,826.61	281,445	9%	0.08%	-0.08%
1-2	11,603.00	19,082.32	554,939	17%	0.38%	0.52%
2-3	17,408.00	45,611.32	814,341	26%	0.91%	1.96%
3-4	21,057.00	76,201.78	1,054,922	33%	1.53%	4.36%
4-5	23,359.00	107,998.50	1,273,676	40%	2.16%	7.77%
5-6	23,775.00	133,391.08	1,468,608	46%	2.67%	11.97%
6-7	22,475.00	148,385.93	1,640,085	52%	2.97%	16.65%
7-8	19,783.00	150,367.88	1,790,129	56%	3.01%	21.39%
8-9	17,419.00	149,807.70	1,921,324	60%	3.00%	26.11%
9-10	15,680.00	150,688.32	2,035,951	64%	3.02%	30.86%
10-11	12,882.00	136,379.90	2,135,688	67%	2.73%	35.16%
11-12	10,786.00	125,188.14	2,223,621	70%	2.51%	39.11%
12-13	9,064.00	114,219.06	2,301,400	72%	2.29%	42.71%
13-14	7,924.00	107,786.81	2,370,577	75%	2.16%	46.11%
14-15	6,711.00	97,985.58	2,432,301	77%	1.96%	49.20%
15-16	5,795.00	90,438.80	2,487,712	78%	1.81%	52.05%
16-17	5,192.00	86,156.74	2,537,501	80%	1.72%	54.76%
17-18	4,339.00	76,454.22	2,582,559	81%	1.53%	57.17%
18-19	3,865.00	71,929.61	2,623,419	83%	1.44%	59.44%
19-20	3,650.00	71,654.86	2,660,575	84%	1.43%	61.70%
20-21	3,041.00	62,581.89	2,694,147	85%	1.25%	63.67%
21-22	2,580.00	55,875.72	2,725,073	86%	1.12%	65.43%
22-23	2,383.00	53,807.70	2,753,301	87%	1.08%	67.13%
23-24	2,121.00	50,053.10	2,779,298	87%	1.00%	68.71%
24-25	1,985.00	48,771.79	2,803,170	88%	0.98%	70.25%
25-30	7,428.00	205,353.80	2,899,389	91%	4.11%	76.72%
30-35	4,661.00	152,267.14	2,965,086	93%	3.05%	81.52%
35-40	2,988.00	112,715.44	3,011,542	95%	2.26%	85.07%
40-45	2,048.00	87,338.37	3,045,040	96%	1.75%	87.83%
45-50	1,512.00	72,182.45	3,069,703	97%	1.45%	90.10%
50-55	998.00	52,804.40	3,088,137	97%	1.06%	91.77%
55-60	779.00	44,852.84	3,101,780	98%	0.90%	93.18%
60-65	503.00	31,367.59	3,112,087	98%	0.63%	94.17%
65-70	410.00	27,676.86	3,120,184	98%	0.55%	95.04%
70-75	300.00	21,803.66	3,126,558	98%	0.44%	95.73%
75-80	231.00	18,087.42	3,131,735	99%	0.36%	96.30%
80-85	167.00	13,766.12	3,135,721	99%	0.28%	96.73%
85-90	119.00	10,434.12	3,139,026	99%	0.21%	97.06%
90-95	93.00	8,583.86	3,141,759	99%	0.17%	97.33%
95-100	82.00	8,013.22	3,144,093	99%	0.16%	97.59%
100-125	215.00	23,570.92	3,151,589	99%	0.47%	98.33%
125-150	70.00	9,531.59	3,155,845	99%	0.19%	98.63%
150-175	50.00	8,126.24	3,158,696	99%	0.16%	98.89%
175-200	33.00	6,127.82	3,160,449	99%	0.12%	99.08%
200-300	34.00	8,005.24	3,163,854	100%	0.16%	99.33%
300-400	10.00	3,633.83	3,165,688	100%	0.07%	99.45%
400-500	4.00	1,820.67	3,166,709	100%	0.04%	99.50%
> 500	8.00	15,764.63	3,178,474	100%	0.32%	100.00%

291,436 3,172,144

Seasonal Block Cut-off		
Seasonal Usage Above Cut-off	1,388,344	27.79%
Non-Seasonal and Seasonal Below Cut-off	3,606,916	72.21%
Total Annual Usage	4,995,260	

Providence Water Supply Board
 Conservation Rate Filing
 Consumption Data - Single Family Residential

November - April

Schedule HJS-A

USAGE BLOCK	# OF BILLS	USAGE BILLED	Cumulative Usage	Cumulative Usage %	Percent of Bills	Cumulative Percent of Bills
<= 0	5,497.00	-9,145.86			0	-0.18%
0-1	10,441.00	4,490.85	257,585		14%	0.09%
1-2	15,668.00	25,379.78	504,723		28%	0.51%
2-3	23,365.00	60,708.70	732,762		40%	1.22%
3-4	28,958.00	104,501.81	935,493		51%	2.09%
4-5	31,734.00	146,210.88	1,108,137		60%	2.93%
5-6	29,854.00	167,449.03	1,249,831		68%	3.35%
6-7	26,070.00	172,032.92	1,362,889		74%	3.44%
7-8	21,689.00	164,540.77	1,451,363		79%	3.29%
8-9	16,913.00	145,107.10	1,520,009		83%	2.90%
9-10	13,811.00	132,623.57	1,573,365		86%	2.65%
10-11	10,045.00	106,205.76	1,614,108		88%	2.13%
11-12	7,565.00	87,481.70	1,645,797		90%	1.75%
12-13	5,682.00	71,477.94	1,670,831		91%	1.43%
13-14	4,296.00	58,215.44	1,690,642		92%	1.17%
14-15	3,271.00	47,610.58	1,706,632		93%	0.95%
15-16	2,581.00	40,167.54	1,719,676		94%	0.80%
16-17	1,991.00	32,896.89	1,730,318		94%	0.66%
17-18	1,575.00	27,623.66	1,739,193		95%	0.55%
18-19	1,196.00	22,156.64	1,746,652		95%	0.44%
19-20	1,093.00	21,412.58	1,753,034		96%	0.43%
20-21	783.00	16,085.68	1,758,414		96%	0.32%
21-22	644.00	13,849.92	1,763,050		96%	0.28%
22-23	525.00	11,871.94	1,767,157		96%	0.24%
23-24	441.00	10,390.24	1,770,748		97%	0.21%
24-25	383.00	9,403.17	1,773,920		97%	0.19%
25-30	1,207.00	33,162.05	1,785,677		97%	0.66%
30-35	599.00	19,471.74	1,792,954		98%	0.39%
35-40	334.00	12,614.98	1,797,984		98%	0.25%
40-45	212.00	8,981.40	1,801,530		98%	0.18%
45-50	131.00	6,216.94	1,804,242		98%	0.12%
50-55	94.00	4,940.91	1,806,403		99%	0.10%
55-60	64.00	3,689.96	1,808,173		99%	0.07%
60-65	39.00	2,437.77	1,809,676		99%	0.05%
65-70	28.00	1,897.02	1,811,018		99%	0.04%
70-75	28.00	2,042.10	1,812,225		99%	0.04%
75-80	24.00	1,841.47	1,813,271		99%	0.04%
80-85	9.00	741.73	1,814,253		99%	0.01%
85-90	14.00	1,238.70	1,815,192		99%	0.02%
90-95	22.00	2,032.97	1,816,025		99%	0.04%
95-100	14.00	1,372.77	1,816,778		99%	0.03%
100-125	46.00	5,144.40	1,819,722		99%	0.10%
125-150	27.00	3,705.82	1,821,778		99%	0.07%
150-175	11.00	1,765.19	1,823,343		100%	0.04%
175-200	13.00	2,392.21	1,824,585		100%	0.05%
200-300	23.00	5,440.14	1,827,625		100%	0.11%
300-400	7.00	2,348.58	1,829,374		100%	0.05%
400-500	7.00	3,072.17	1,830,446		100%	0.06%
> 500	8.00	5,813.95	1,832,260		100%	0.12%
	269,032	1,823,116				

Figure 1 - Monthly Consumption

