



April 1, 2021

The Hon. Jorge O. Elorza
Mayor
Ricky Caruolo
General Manager

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

RE: Dk 4994; New Cost of Service Study

BOARD OF DIRECTORS

Xaykham Khamsyvoravong
Chairperson

Joseph D. Cataldi
Vice Chairperson

Michael J. Correia
Councilperson

Jo-Ann Ryan
Councilperson

Sara Silveria
Ex-Officio

Cristen L. Raucci, Esq.
Member

Dr. Alma M. Guerrero Bready
Member

Carissa R. Richard
Secretary

William E. O'Gara, Esq.
Legal Advisor

Dear Mrs. Massaro:

Enclosed please find an original and five copies of Providence Water's new Cost of Service Study (COSS) pursuant to Commission's Order No. 23928 issued October 20, 2020. As part of this study, Providence Water also includes a report regarding the hydraulic modeling performed by Pare Corporation engineers supporting Providence Water's new COSS.

Per, Commission's Order No. 23928 item 10, Providence Water estimates the new COSS cost at \$101,078. Providence Water was granted an initial allowance of \$30,000 to be used to develop the new COSS; as such, Providence Water plans to seek an amended rate case expense for the difference.

An electronic copy has been provided to the service list.

Thank you for your attention to this matter.

Sincerely,

Mary L. Deignan-White

Mary L. Deignan-White
Division Manager-Finance

cc: service list(via email)

MEMBER

Rhode Island Water Works Assn.
New England Water Works Assn.
American Water Works Assn.
Water Research Foundation

An EPA WaterSense Partner

(401) 521-6300

125 Dupont Drive
Providence, RI 02907

www.provwater.com

Follow us @provwater

Like us at:
facebook.com/Providencewater

1 COMPLIANCE TESTIMONY OF
2 HAROLD J. SMITH, VICE PRESIDENT
3 RAFTELIS FINANCIAL CONSULTANTS, INC.
4
5
6
7
8
9

10
11 for
12

13 PROVIDENCE WATER SUPPLY BOARD
14 DOCKET # 4994
15
16
17
18
19
20
21

22
23 April 1, 2020
24

1 **INTRODUCTION**

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

3 A. My name is Harold J. Smith and my business address is, 5916 DTC Parkway, Suite 850,
4 Greenwood Village, Colorado.

5
6 **Q. Are you the same Harold Smith who submitted direct and rebuttal testimony on behalf
7 of the Providence Water Supply Board (Providence Water) in Docket 4994?**

8 A. Yes, I am.

9
10 **Q. Please describe the purpose of your testimony.**

11 A. My testimony overviews the development of a new cost of service study (new COSS), reflective
12 of the Commission's order 23928 (the Order) issued on October 20, 2020. This order requires
13 Providence Water to "perform a new allocated cost of service study, taking into account the
14 Commission's directives...".

15
16 **Q. How does the new COSS relate to the COSS that Providence Water filed as part of the
17 Amended Settlement Agreement dated August 25, 2020 (the ASA COSS)?**

18 A. The COSS filed on August 25, 2020 was included in an Amended Settlement Agreement (ASA)
19 entered into by Providence Water, Kent County Water Authority (KCWA), and the City of
20 Warwick (Warwick). The other intervenors (Bristol County Water Authority and the City of East
21 Providence) and the Division of Public Utilities and Carriers (the Division) did not sign the ASA.
22 The ASA amended the initial settlement agreement filed by Providence Water on July 3, 2020 (the
23 July 3 settlement agreement).

24
25 The primary difference between the two settlement agreements was the development of individual
26 wholesale rates under the ASA versus the uniform wholesale rate proposed under the July 3
27 settlement agreement. These rates were calculated by using individual peaking factors for each
28 wholesale customer without any other material changes to the approach used in the July 3
29 settlement agreement. The ASA did not fully implement the result of this new calculation. Instead,
30 at the Commission's direction, the calculated rates reflected one-third of the change between the

1 rates in the July 3 settlement agreement, and those fully reflective of the individual wholesale
2 peaking factors. These rates went into effect on August 27, 2020. The new COSS retains the
3 individual wholesale rate design of the ASA COSS, but also reflects the directives established in
4 the Order.

5
6 **Q. What directives did the Commission establish in the Order?**

7 A. The Commission's order identified the following five issues that should be addressed by the
8 new COSS:

- 9 1. Transmission and Distribution Labor Cost Allocation
- 10 2. Central Operations Facility Allocation
- 11 3. Non-Revenue Water Allocation
- 12 4. Pumping Cost Allocation
- 13 5. Unidirectional Flushing Cost Allocation

14
15 **Q. Are these the only issues that can be addressed by the new COSS?**

16 A. No. The Order states that the new COSS should, at a minimum, address these specific issues.
17 However, the Order also indicates the Commission's objective to approve individual wholesale
18 rates which "have taken into account all relevant factors, in a manner that is fair to all the affected
19 parties" (p. 33 of the Order).

20
21 **Q. Does "all relevant factors" mean that the new COSS should be determined without any
22 regard for the approach used in the ASA COSS?**

23 A. No. The Order is clear that the new COSS is intended to be refinement of the ASA COSS, not
24 a complete departure from it. The ASA COSS calculated individual wholesale rates by using
25 individual peaking factors but did not reflect all of the differences in how each wholesale customer
26 is served by Providence Water. In particular, it did not address the differences in the infrastructure
27 used to deliver water to each wholesale customer.

1 **Q. Based on your answer to the previous two questions, how does your approach to**
2 **developing the new COSS relate to the five specific issues identified in the Order?**

3 A. The new COSS has those five issues as its foundation. These were the primary areas of
4 disagreement among the parties to Docket 4994. In certain circumstances (discussed in greater
5 detail below), it was appropriate to extend the logic of the approach used to address these issues
6 to other areas as well.

7

8 **Q. How is the remainder of your testimony organized?**

9 A. The balance of my testimony is focused on how the new COSS addresses each of the five issues
10 identified in the Order, the resultant rate impacts and suggestions for gradualism in implementation
11 of the new rates.

12

13 **Q. Have you included any schedules to accompany your testimony?**

14 A. Yes. I have generally included the same schedules as those included in my direct and rebuttal
15 testimonies, and the two settlement agreements. I have not included those used to develop the
16 revenue requirement for the rate year. The revenue requirement for the new COSS is based on
17 Rate Year 2 from the ASA and has not changed. The new COSS focuses on developing an
18 appropriate allocation of costs, using the Rate Year 2 revenue requirement. Accordingly, the
19 schedules attached to my testimony include:

- 20 • HJS-1: Cost of Service Summary
- 21 • HJS-13a: Allocation Factors
- 22 • HJS-13b: Pumping and Storage Allocation
- 23 • HJS-13c: Inch-Miles
- 24 • HJS-13d: T&D Labor Allocation
- 25 • HJS-13e: T&D Contract Services Allocation
- 26 • HJS-13f: Net Plant in Service
- 27 • HJS-13g: Central Operations Facility Square Footage Allocation
- 28 • HJS-14a&b: Allocation of RY 2022 Revenue Requirement
- 29 • HJS-15a: Pro-Forma Water Sales
- 30 • HJS-15b: Assignment of Non-Revenue Water (NRW)
- 31 • HJS-16a-c: Customer Class Units of Service
- 32 • HJS-16d: Summary of Customer Class Units of Service
- 33 • HJS-17: Unit Cost of Service
- 34 • HJS-18: Customer Class Cost of Service

- 1 • HJS-19: Development of Volumetric Rates
- 2 • HJS-20a&b: Development of Meter Service Charge and Providence Fire Protection Service
- 3 Charge
- 4 • HJS-21a&b: Development of Private Fireline Charge and Hydrant Charge
- 5 • HJS-22: Proposed Rates
- 6 • HJS-23: Comparison of Revenues by Customer Class
- 7 • HJS-24: Revenue Proof
- 8 • HJS-25: Comparison of Typical Bill Impacts
- 9

10 **TRANSMISSION AND DISTRIBUTION LABOR ALLOCATION**

11 **Q. Mr. Smith please provide a brief overview of the transmission and distribution (T&D)**
12 **labor allocation issue.**

13 A. Bristol County Water Authority (BCWA) contested the level of T&D labor expenses being
14 allocated to wholesale customers. BCWA witness Pamela Marchand contended that
15 no more than 5% of T&D labor expense should be allocated to any of the wholesale customers
16 because these costs were incurred to maintain smaller mains, which are not used by wholesale
17 customers. BCWA, Ms. Marchand argued, was only served by mains 30 inches in diameter and
18 larger and should therefore be allocated only minimal T&D labor expenses.

19
20 **Q. What percentage of T&D labor costs were allocated to wholesale customers (in total) in**
21 **the ASA COSS?**

22 A. Just under 5%.

23
24 **Q. Could you explain how you arrived at the 5% figure?**

25 A. Certainly. HJS Amended Settlement-14a indicates the allocation of T&D labor. Taking into
26 account line items 60150 through 60560, these costs were \$6.1 million in the test year. Of this,
27 \$5.3 million (about 87%) was allocated to retail customers only. Retail only costs include work on
28 customer service lines, meters and fire hydrants. It also includes work on mains 12 inches and
29 smaller. The ASA COSS estimated this work by splitting T&D related work orders between
30 transmission (defined as greater than 12 inches in diameter) and distribution (defined as 12 inches
31 in diameter and smaller). This split was 40% transmission and 60% distribution based on inch-

1 miles. The detailed allocation of T&D labor based on work orders is shown in HJS Amended
2 Settlement-13d.

3
4 Wholesale and retail customers *shared* in the remaining \$783,000 (13%) in proportion to their
5 demand. Because these mains are used to support base, maximum day, and maximum hour service,
6 they were split between those three cost components. The details behind this allocation are
7 described in my direct testimony in this case. The allocation was \$259,000 to base, \$199,000 to
8 max day and \$326,000 to max hour. Wholesale customers represented 43%, 53% and 23% of the
9 demand for each category, respectively. Accordingly, the wholesale share of costs can be
10 calculated as follows:

- 11 • Base costs: $\$259,000 \times 0.43 = \$111,000$
- 12 • Max Day costs: $\$199,000 \times 0.53 = \$105,000$
- 13 • Max Hour costs: $\$326,000 \times 0.23 = \$75,000$
- 14 • Total: $\$111,000 + \$105,000 + \$75,000 = \$291,000$
- 15 • \$291,000 is just under 5% of the total T&D labor costs of \$6.1 million.

16

17 **Q. What direction did the Commission provide on this issue in the Order?**

18 A. The Commission ordered Providence Water to address this issue in the new COSS “with data
19 that firmly supports the allocators for future years.”

20

21 **Q. How does the new COSS address this issue?**

22 A. The new COSS allocates T&D labor costs based on the proportion of Providence Water’s pipe
23 network that each individual wholesale customer uses.

24

25 **Q. What data did you use to support this allocation?**

26 A. I used data developed by Pare Corporation (Pare), an engineering consultant retained by
27 Providence Water. Pare used Providence Water’s hydraulic model to determine the pipe (by length
28 and diameter) used by each wholesale customer under normal operating conditions. The details of

1 the hydraulic model analysis are described in a memorandum developed by Pare dated March 4,
2 2021, attached hereto.

3

4 **Q. What do you mean by “normal operating conditions”?**

5 A. Providence Water’s T&D system is designed to provide service under base, maximum day, and
6 maximum hour demand conditions. The hydraulic model analysis was conducted under these three
7 scenarios, which reflects the way that Providence Water typically operates.

8

9 **Q. Mr. Smith, could you describe, in detail, the hydraulic modeling data and how it was used**
10 **in the allocation of T&D labor costs?**

11 A. Yes. The output from the hydraulic modeling analysis is the number of inch-miles (length of
12 pipe multiplied by diameter) used by each wholesale customer. The inch-miles for retail are
13 determined by subtracting the wholesale inch-miles from the total for the system. The breakdown,
14 by customer, is shown on HJS-13c.

15

16 HJS-14a indicates the allocation of T&D labor costs, which total \$6.3 million in rate year 2. Similar
17 to the ASA COSS, the new COSS attributes a certain portion directly to retail customers only. This
18 included work on customer service lines, meters, and fire hydrants. In the new COSS, however all
19 T&D labor (i.e., excluding service lines, meters, and fire hydrants) is shared between retail and
20 wholesale customers, without a direct allocation to retail only. The new COSS does not use a
21 defined diameter cut-off (i.e., 12 inches) like the ASA COSS. Instead, it uses the hydraulic model
22 results to evaluate each customer’s use of all the mains without presuming that a certain size is too
23 small to be used to provide wholesale service. Put differently, the new COSS lets the data inform
24 the decision as to which mains should be shared, rather than using a rigid cut-off.

25

26 Accordingly, the retail only component in the new COSS is \$4.3 million (68%). The retail only
27 portion is smaller because, as noted above, it does not presume that a certain size main is, by
28 definition, used to serve retail customers only. The balance of T&D labor costs, \$2 million (32%),
29 is shared by retail and wholesale customers based on inch-miles.

30

1 The allocation to each customer is based on their share of inch-miles relative to the total. This
2 allocation involves determining a unit cost per inch-mile (see HJS-17) and multiplying by each
3 customer's inch-miles (see HJS-18).

4
5 **Q. What are the key differences in the approach used for allocating T&D labor under the**
6 **ASA COSS and the new COSS?**

7 A. There are two differences. The first difference is that new COSS does not presume that a certain
8 size main should be, by definition, considered a "retail only" main. Instead, data from the hydraulic
9 model analysis is used to determine which mains are actually used, regardless of size. The ASA
10 COSS, by contrast, automatically defined 60% of Providence Water's T&D system as "retail only"
11 based on the 12 inch cut-off. This change, on its own, would tend to *increase* T&D labor costs
12 included in the wholesale rates.

13
14 The second change is that inch-miles, rather than demand, are used to allocate T&D labor. As
15 noted above, wholesale represents approximately 43%, 53% and 23% of base, max day and max
16 hour demand, respectively. That said, they only use about 13% of the inch-miles. Switching from
17 demand to inch-miles, on its own, would tend to *decrease* T&D labor costs included in the
18 wholesale rates.

19
20 The combined impact of the two changes is to slightly *decrease* the allocation of T&D labor costs
21 to wholesale customers (as a group). Wholesale customers are being allocated a smaller proportion
22 of Providence Water's full pipe network under the new COSS, versus a larger allocation of a
23 narrowly defined (i.e., only larger than 12 inches) pipe network under the ASA COSS. Under the
24 ASA COSS, this allocation was just under 5%. Under the new COSS, this allocation is around 4%.

25
26 **Q. Mr. Smith, could you overview how you modified your schedules to reflect this change?**

27 A. The ASA COSS had two primary groupings of cost components (see my direct testimony in
28 this case for a more detailed explanation): common to all and retail only. Common to all costs
29 were those incurred to serve all customers (retail and wholesale). These costs were allocated to
30 each customer class (i.e., the 3 retail classes and each individual wholesale customer) based on

1 demand (base, max day, and max hour). Retail only costs were those incurred to serve retail
2 customers only. These costs were allocated among the 3 retail classes and fire protection but were
3 not allocated to wholesale customers. The new COSS adds additional columns to each schedule to
4 reflect the inch-miles approach to allocating T&D labor costs. These columns are labeled
5 “Common to All – T&D.” Costs that are common to all customers that are not related to T&D are
6 now allocated to the columns labeled “Common to All – Supply, Treatment and Low Service”. I
7 will provide additional explanation of this category later in my testimony.

8
9 **Q. Mr. Smith, how did you approach the allocation of the remaining (non-labor) T&D**
10 **operating expenses and the net plant in service for T&D?**

11 A. I extended this same approach to the allocation of the remaining T&D operating expenses and
12 the T&D net plant in service allocator. Namely, the other non-labor operating costs were allocated
13 based on inch-miles. I also adjusted the T&D net plant in service allocator (see HJS-13f) so that
14 T&D net plant in service is now allocated to the new “Common to All – T&D” component. This
15 allocation does not directly impact the allocation of T&D capital costs but is used in the
16 development of capital cost allocators, which are used to allocate the funding for Providence
17 Water’s restricted funds.

18
19 **Q. Mr. Smith, does this result in a more equitable allocation of T&D costs among Providence**
20 **Water’s customer classes?**

21 A. Yes. While the difference between wholesale and retail is not substantial, the hydraulic model
22 analysis demonstrates that the use of Providence Water’s T&D system is not purely proportionate
23 to demand, as the ASA COSS presumed. Kent County, for example, is Providence Water’s second
24 largest customer, but requires the least of amount of T&D infrastructure. Smithfield is the opposite,
25 requiring the most infrastructure relative to the amount of water delivered. This approach improves
26 the alignment between the way each customer uses the system and the way in which costs are
27 allocated among the wholesale customers.

1 **CENTRAL OPERATIONS FACILITY ALLOCATION**

2 **Q. Mr. Smith please provide a brief overview of the Central Operations Facility (COF) issue.**

3 A. First, it is important to recognize that the allocation of the COF is an allocation of the net plant
4 in service for the COF (i.e., the depreciated value of the facility per Providence Water's accounting
5 records). The allocated net plant in service is then used in the development of the capital allocators,
6 which are in turn used to allocate Providence Water's capital costs.

7
8 The issue, as it relates to the Order, pertains to the COF allocator on HJS Amended Settlement-
9 13g. In my direct testimony I developed this allocator by allocating the square footage of each area
10 of the building, in accordance with its purpose. Those which could not be directly assigned were
11 allocated in proportion to all directly assignable space. The point of disagreement centered on the
12 Commercial Services area, which is used for Providence Water's customer service, billing and
13 collection activities. In my direct testimony, I allocated the square footage for this area to the retail
14 only cost components category, attributing none of the square footage to Providence Water's
15 wholesale customers. The Division's expert, Mr. Mierzwa, objected to this allocation and proposed
16 adjusting the allocator such that 10% of commercial services square footage was assigned to
17 wholesale customers. BCWA objected to this assignment based on the fact that wholesale
18 customers represent a small fraction of the total number of Providence Water customers (i.e., 7 out
19 of about 78,000). The 10% allocation was ultimately incorporated into the ASA COSS.

20
21 **Q. What direction did the Commission provide on this issue in the Order?**

22 A. The Commission ordered Providence Water to address this issue in the new COSS "with data
23 that firmly supports the allocators for future years."

24
25 **Q. How does the new COSS address this issue?**

26 A. The new COSS adjusts the allocation such that 6.67% of commercial services square footage
27 is attributed to wholesale customers.

1 **Q. What data did you use to support this allocation?**

2 A. This allocation is based on the number of billing cycles for retail and wholesale customers.
3 While Providence Water's wholesale customers only represent a small proportion of the total,
4 greater effort is required to test and read their meters, generate bills, and process payment. In fact,
5 Providence Water has 1 billing cycle dedicated to its 7 wholesale customers and 14 for the
6 remaining 78,000. Accordingly, the new COSS adjusts the allocator for Commercial Services
7 square footage, such that only 6.7% (1 out of 15 billing cycles) of Commercial Services square
8 footage is attributed to wholesale customers.

9

10 **Q. Does this approach result in an equitable attribution of commercial services square**
11 **footage to wholesale customers?**

12 A. It does. The approach of taking the ratio of the 7 wholesale customers relative to the total is
13 predicated on the presumption that each wholesale customer is the same as any typical retail
14 customer, which is not the case. While they are only 7 customers, they are more than 20% of
15 Providence Water's revenues and require more manual meter reading, billing and collection
16 processes. This is evidenced by the fact that they have their own billing cycle, while the remaining
17 cycles are used to bill the other 78,000 customers.

18

19 **NON-REVENUE WATER (NRW) ALLOCATION**

20 **Q. Mr. Smith please provide a brief overview of the non-revenue water (NRW) issue.**

21 A. The issue with respect to NRW related to the allocation of "Water Quality and Testing" volumes
22 from Providence Water's Lost and Unaccounted for Water Report. These volumes included
23 102,823 hundred cubic feet (HCF) of water related to the draining of the Ridge Road tank so that
24 it could be repaired. This tank is used to serve the retail distribution system in that area. Under the
25 ASA COSS these volumes were allocated, in part, to wholesale customers resulting in an overall
26 allocation of Water Quality and Testing volumes to wholesale of 47.4%.

27

28

29

30

1 **Q. What direction did the Commission provide on this issue in the Order?**

2 A. The Commission accepted the 47.4% allocation in the ASA COSS but ordered “Providence
3 Water to address this issue in its new allocated COSS with data that firmly support the allocators
4 for rate years two and three.”

5
6 **Q. How does the new COSS address this issue?**

7 A. The new COSS addresses this issue by allocating the volume associated with draining the Ridge
8 Road tank to retail customers only. Further, it uses the data from the hydraulic model analysis to
9 refine the allocation of main flushing and real losses. The allocation of NRW is indicated on HJS-
10 15b.

11
12 **Q. What data did you use to support these allocations?**

13 A. I used output from the hydraulic model analysis to refine these allocations. Main flushing and
14 real losses under the ASA COSS were allocated using an approach similar to the allocation of
15 T&D costs (i.e., shared transmission mains were defined as 16” and above, then allocated based
16 on demand). The hydraulic modeling analysis allows for a refinement of this approach such that
17 each customer can be allocated their share of losses based on the proportion of Providence Water’s
18 system that is used to deliver water to them. Main flushing volumes, in the new COSS, are now
19 allocated based on length of pipe 12 inches and smaller, which represents the largest diameter pipe
20 that is flushed by Providence Water. Real Losses, which represent the physical losses in the system
21 (leakage) are now allocated based on pipe length, plus an allowance for retail service lines of 225
22 miles.

23
24 **Q. What is the impact of the allocation of Water Quality and Testing volumes to wholesale
25 customers?**

26 A. Under the new COSS, with the Ridge Road tank volumes reallocated to retail only, the
27 wholesale share of these volumes has been *reduced* from 47.4% to 43.2%.

28
29

1 **Q. What proportion of total NRW is being assigned to wholesale customers in the new**
2 **COSS?**

3 A. Under the new COSS total NRW allocated to wholesale customers has been reduced from
4 16.2% to 14.1%.

5

6 **PUMPING COSTS ALLOCATION**

7 **Q. Mr. Smith please provide a brief overview of the pumping costs allocation issue.**

8 A. Most of Providence Water's system is fed by gravity and does not require any additional
9 pumping. All customers use the gravity portion of the system. There are some customers, however,
10 which are served by the gravity system and a series of pump stations. Customers that only use the
11 gravity portion of the system are referred to as low service customers. Customers that use the
12 gravity system and require pumping are referred to as high service customers. Bristol County, East
13 Providence, Kent County and Warwick are low service customers and do not require additional
14 pumping. Greenville, Lincoln and Smithfield are high service customers and are served by two
15 pump stations: the Neutaconkanut Pump Station and the Bath Street Pump Station. The allocations
16 in my direct testimony in this case did not make a distinction between these two groups because
17 Providence Water was not proposing individual wholesale rates. In my direct testimony, there was
18 one class (wholesale) making this distinction unnecessary. The ASA COSS did include individual
19 wholesale rates, but—like Providence Water's initial filing—did not distinguish between high and
20 low service customers. The only differentiator in the ASA COSS was individual wholesale
21 customer peaking factors.

22

23 **Q. What direction did the Commission provide on this issue in the Order?**

24 A. The Commission ordered Providence Water to address this issue in its new COSS by allocating
25 pumping costs "based upon the benefits received by each wholesale customer."

26

27 **Q. How does the new COSS address this issue?**

28 A. The new COSS addresses this issue by differentiating between the low service system, which
29 is used by all customers, and the high service system, which is used by retail customers, Greenville,
30 Lincoln and Smithfield only.

1 **Q. Mr. Smith, could you describe how you modified your schedules to reflect this change?**

2 A. I added two groups of cost components titled “CTA – Supply, Treatment & Low Service” and
3 “High Service and Retail” to each relevant schedule. CTA – Supply Treatment and Low Service
4 costs are those which relate to Providence Water’s source of supply, treatment plant and the
5 Aqueduct and Neutaconkanut Reservoirs. These costs are incurred to serve all customers and are
6 allocated based on base, maximum day, and maximum hour demand for each customer class on
7 Schedule HJS-16d. High Service and Retail costs relate to Providence Water pump stations which
8 are used to serve certain wholesale customers and Providence Water’s retail customers. These
9 costs are allocated based on base, maximum day and maximum hour demand for retail, Greenville,
10 Lincoln and Smithfield.

11
12 Schedule HJS-13b indicates the development of Factors 18 and 19, which are used to allocate
13 pumping costs. Factor 18 is based on pump station capacity and is used to allocate pump station
14 net plant in service on Schedule HJS-13f. Factor 19 is based on pump station power costs and is
15 used to allocate pumping expenses on HJS-14a.

16
17 Schedule HJS-19 provides an overview of how these components are incorporated into the ultimate
18 volumetric rates for each class.

19
20 **Q. Mr. Smith, did you also evaluate Providence Water’s storage assets to ensure they were
21 appropriately allocated for the purpose of developing individual wholesale rates?**

22 A. Yes. Providence Water has a number of treated water storage reservoirs and elevated storage
23 tanks which work in concert with the pump stations to meet the demands of Providence Water
24 customers (retail and wholesale). Based on discussions with Providence Water staff, I created
25 Factor 20, which is used to allocate Providence Water’s storage costs. It is based on the use and
26 capacity of each reservoir and tank. The Aqueduct and Neutaconkanut reservoirs are used to serve
27 all customers. The Longview reservoir is used by high service customers only. The Lawton hill
28 reservoir and the two elevated storage tanks are used by retail customers only.

1 **Q. Mr. Smith, does this result in a more equitable allocation of pumping and storage costs**
2 **among Providence Water’s customer classes?**

3 A. Yes. Following these changes, the new COSS recognizes the difference in how Providence
4 Water’s pump stations, reservoirs and tanks are used to serve each customer class. This was not
5 relevant under the ASA COSS because wholesale, as a group, used all of these assets. Under an
6 individual wholesale rate determination, however, it is appropriate to differentiate the use of these
7 assets, by wholesale customer.

8
9 **RATE IMPACTS AND SUGGESTIONS FOR GRADUALISM**

10 **Q. Mr. Smith, please overview the impacts of the new COSS Providence Water’s customer**
11 **classes.**

12 A. The impact of these changes is shown on HJS-23. Based on the revenue requirement from the
13 ASA, Providence Water requires an overall revenue increase of 5.2% in FY 2022. Under the new
14 COSS, retail customers (in total) would see an 7.8% increase from the rates that are currently in
15 effect. Wholesale customers (in total) would see a 4.4% decrease from the rates that are currently
16 in effect. The impact among wholesale customers varies substantially, however. East Providence,
17 Kent County and Warwick would see rate decreases. Bristol County, Greenville, Lincoln and
18 Smithfield would see rate increases. While Bristol County’s increase is just below the overall
19 revenue increase, the increases for Greenville, Lincoln and Smithfield are all more than double the
20 overall revenue increase.

21
22 **Q. Mr. Smith, given these impacts, would it be appropriate for the Commission to consider**
23 **a more gradual phase-in of these changes?**

24 A. Yes, and there are a few different approaches that could be considered. The Commission could
25 employ the same approach used in the ASA COSS. Namely, moving 1/3rd of the way to cost of
26 service rates in FY 2022 and another 1/3rd in FY 2023. Another approach would be to establish a
27 percentage increase cap of 1.75 times¹ the overall revenue requirement increase. Classes above the
28 cap would be limited to an increase of that amount, with the difference recovered via higher

¹ The 1.75x cap was a Division recommendation for Providence Water’s fire and service charges, which was ultimately incorporated into the ASA.

1 increases to customers below the cap. In either case, further cost of service based adjustments
2 could then be evaluated in Providence Water's next full rate filing.

3

4 **Q. Mr. Smith, does this conclude your testimony?**

5 A. Yes it does.

6

Schedule HJS-1: Cost of Service Summary

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

	Existing Rate Year FY 2021	Rate Year 2		Rate Year 3	
		Rate Year FY 22 Adj.	Rate Year FY 2022	Rate Year FY 23 Adj.	Rate Year FY 2023
Revenue					
Service Charge	\$ 10,056,362	\$ 912,263	\$ 10,968,625	\$ 459,762	\$ 11,428,386
East Smithfield Debt Surcharge	\$ 82,451	\$ -	\$ 82,451	\$ -	\$ 82,451
Retail Sales	\$ 47,025,424	\$ 3,537,335	\$ 50,562,759	\$ 2,119,392	\$ 52,682,152
Wholesale Sales	\$ 18,456,517	\$ (807,750)	\$ 17,648,767	\$ 502,049	\$ 18,150,816
Private Fire Protection	\$ 3,972,965	\$ 346,984	\$ 4,319,949	\$ 181,075	\$ 4,501,025
Retail FPSC	\$ 1,885,959	\$ 172,884	\$ 2,058,843	\$ 86,299	\$ 2,145,141
Public Fire Protection	\$ 1,976,466	\$ 143,935	\$ 2,120,401	\$ 88,879	\$ 2,209,280
Miscellaneous Revenue	[D] \$ 1,543,163	\$ -	\$ 1,543,163	\$ -	\$ 1,543,163
TOTAL REVENUE	\$ 84,999,307	\$ 4,305,651	\$ 89,304,958	\$ 3,437,456	\$ 92,742,415
Total Rate Revenues	\$ 83,456,144	\$ 4,305,651	\$ 87,761,795	\$ 3,437,456	\$ 91,199,252
Expenses					
Operations					
Operations and Maintenance	\$ 36,019,363	\$ 1,026,295	\$ 37,045,658	\$ 1,150,832	\$ 38,196,489
Insurance	\$ 2,051,057	\$ -	\$ 2,051,057	\$ -	\$ 2,051,057
Chemical & Sludge	\$ 3,600,000	\$ -	\$ 3,600,000	\$ -	\$ 3,600,000
City Service	\$ 839,167	\$ -	\$ 839,167	\$ -	\$ 839,167
Property Taxes	\$ 7,629,145	\$ 305,166	\$ 7,934,311	\$ 317,372	\$ 8,251,684
Capital Reimbursement	\$ (1,888,937)	\$ (56,668)	\$ (1,945,605)	\$ (48,640)	\$ (1,994,245)
Net Operations	[B] \$ 48,249,794	\$ 1,274,793	\$ 49,524,587	\$ 1,419,564	\$ 50,944,151
Capital					
Capital Fund	\$ 2,127,000	\$ -	\$ 2,127,000	\$ -	\$ 2,127,000
Western Cranston Fund	\$ 40,000	\$ -	\$ 40,000	\$ -	\$ 40,000
IFR Fund	\$ 29,300,000	\$ 2,000,000	\$ 31,300,000	\$ 1,000,000	\$ 32,300,000
Meter Replacement Fund	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -	\$ 1,000,000
Vehicle/Equipment Fund	\$ 1,550,000	\$ (50,000)	\$ 1,500,000	\$ (50,000)	\$ 1,450,000
Lead Service Replacement Fund	\$ 1,000,000	\$ 1,000,000	\$ 2,000,000	\$ 1,000,000	\$ 3,000,000
E. Smithfield Debt Service	\$ 82,451	\$ -	\$ 82,451	\$ -	\$ 82,451
Revenue Reserve Fund ⁽¹⁾	[C] \$ 408,618	\$ 21,124	\$ 429,742	\$ 16,848	\$ 446,590
Capital	[A] \$ 35,508,070	\$ 2,971,124	\$ 38,479,194	\$ 1,966,848	\$ 40,446,041
TOTAL EXPENSES	\$ 83,757,864	\$ 4,245,917	\$ 88,003,781	\$ 3,386,412	\$ 91,390,192
Operating Reserve (Unrestricted) ⁽²⁾	\$ 1,225,854	\$ 63,372	\$ 1,289,226	\$ 50,543	\$ 1,339,770
Total Incl. Reserves	\$ 84,983,718	\$ 4,309,289	\$ 89,293,007	\$ 3,436,955	\$ 92,729,962
Net Revenue Requirement	\$ 83,440,555		\$ 87,749,844		\$ 91,186,799
Revenues Over (Under) Expenses⁽³⁾	\$ 15,589		\$ 11,951		\$ 12,452
Total Increase to Break-Even ⁽⁴⁾			5.07%		3.85%
Rate Revenue Increase to Break-Even⁽⁵⁾			5.17%		3.92%
Notes:			Step Increase (Wholesale)⁽⁶⁾		2.84%
			Step Increase (Retail)⁽⁷⁾		4.19%

(1) Revenue Reserve is ((A+B)-C)-(D))*0.005

(2) Operating Reserve is ((A+B)-C)-(D))*0.015

(3) Slight revenue surplus due to rounding

(4) Based on Total Revenues

(5) Rate Revenues Only, Excludes East Smithfield

(6) **Excludes** increase to Lead Service Replacement Fund

(7) **Includes** increase to Lead Service Replacement Fund

Schedule HJS-13a: Allocation Factors

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Factor	Description	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only							
		Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
		All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
1	99.5% CTA Base 0.5% Direct Fire	99.50%	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%	0.50%	100.00%
2	CTA Base, Max Day	56.57%	43.43%	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%	100.00%
3	CTA Base, Max Day, Max Hour	33.02%	25.35%	41.63%	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%	100.00%
4	99.5% CTASTL Base 0.5% Direct Fire	0.00%	0.00%	0.00%	0.00%	99.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	100.00%
5	CTASTL Base, Max Day	0.00%	0.00%	0.00%	0.00%	56.57%	43.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
6	CTASTL Base, Max Day, Max Hour	0.00%	0.00%	0.00%	0.00%	33.02%	25.35%	41.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
7	HSR Base	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	99.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	100.00%
8	HSR Base, Max Day	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	56.57%	43.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
9	HSR Base, Max Day, Max Hour	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.02%	25.35%	41.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
10	99.5% Retail Base, 0.5% Direct Fire	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	99.50%	0.00%	0.00%	0.00%	0.50%	100.00%
11	Retail Base, Max Day	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	56.57%	43.43%	0.00%	0.00%	0.00%	100.00%
12	Retail Base, Max Day, Max Hour	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.02%	25.35%	41.63%	0.00%	0.00%	100.00%
13	100% CTA Base Inch-Miles (<=12")	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
14	100% M&S	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%	100.00%	0.00%	0.00%	100.00%
15	100% Billing	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%	100.00%	0.00%	100.00%
16	50% M&S, 50% Billing	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%	50.00%	50.00%	0.00%	100.00%
17	100% Public Fire	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%	100.00%	100.00%
18	As Pump Station Capacity	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.51%	15.75%	25.86%	12.50%	9.60%	15.76%	0.00%	0.00%	0.00%	100.00%
19	As Pump Station Electric Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.70%	15.89%	26.09%	12.32%	9.46%	15.54%	0.00%	0.00%	0.00%	100.00%
20	As Storage Capacity	0.00%	0.00%	0.00%	0.00%	23.56%	18.09%	29.70%	6.84%	5.25%	8.63%	2.62%	2.01%	3.30%	0.00%	0.00%	0.00%	100.00%
21	As T&D Work/Service Orders	10.71%	8.22%	13.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	49.69%	0.01%	17.86%	100.00%
22	As T&D Contract Services	30.31%	23.27%	38.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.20%	0.00%	0.00%	100.00%
23	As T&D Plant Excl. M&S, Land, Structures	0.00%	0.00%	0.00%	0.00%	11.65%	8.94%	14.69%	3.38%	2.60%	4.26%	1.30%	0.99%	1.63%	0.00%	0.00%	50.55%	100.00%
24	As Total Plant Excl. Gen. Plant	17.12%	13.14%	21.58%	0.00%	23.93%	2.73%	0.61%	0.16%	0.12%	0.21%	0.07%	0.05%	0.08%	17.97%	0.00%	2.21%	100.00%
25	As Total Plant Excl. Land, COF	19.34%	14.85%	24.38%	0.00%	14.31%	3.06%	0.66%	0.18%	0.14%	0.22%	0.07%	0.06%	0.09%	20.30%	0.00%	2.33%	100.00%
26	As Total Plant Excl. Land	19.78%	14.56%	23.90%	0.00%	13.60%	2.88%	0.62%	0.17%	0.13%	0.21%	0.33%	0.05%	0.09%	20.67%	0.39%	2.61%	100.00%
27	As Central Operations Facility Square Footage	24.42%	11.44%	18.78%	0.00%	6.06%	0.96%	0.21%	0.06%	0.04%	0.07%	3.06%	0.02%	0.03%	24.62%	4.59%	5.66%	100.00%
28	As Labor O&M Excl. A&G	3.15%	2.42%	3.97%	7.02%	41.12%	0.00%	0.00%	0.00%	0.00%	0.00%	14.62%	0.00%	0.00%	0.00%	22.23%	5.46%	100.00%
29	As Non-Labor O&M Excl. A&G	8.74%	6.71%	11.02%	1.98%	16.62%	11.79%	0.00%	2.43%	1.86%	3.06%	1.48%	1.14%	1.87%	10.66%	17.92%	2.73%	100.00%
30	As Total O&M Excl. A&G	4.21%	3.24%	5.31%	6.06%	36.47%	2.24%	0.00%	0.46%	0.35%	0.58%	0.28%	0.22%	0.35%	13.87%	21.41%	4.94%	100.00%
31	As Total Insurance Before Adjustment	6.37%	4.89%	8.03%	4.12%	27.00%	6.79%	0.00%	1.40%	1.07%	1.76%	0.85%	0.65%	1.07%	12.34%	19.75%	3.89%	100.00%
32	As Total Chemicals Before Adjustment	0.00%	0.00%	0.00%	0.00%	82.07%	17.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.30%	100.00%
33	As Total Revenue Requirement Before Reserves	9.53%	7.30%	11.99%	2.68%	29.92%	6.86%	0.34%	0.47%	0.36%	0.59%	0.21%	0.16%	0.26%	14.59%	11.67%	3.07%	100.00%
34	As Retail Req. Excl. Bad Debt	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.52%	0.86%	48.94%	38.93%	10.05%	100.00%

Factor	Description	Base	MDEC	MHEC	Total
1	100% CTA Base	100.00%			100.00%
2	CTA Base, Max Day				
	System Demand (Ccf/Day)	65,720	50,462	-	116,182
	Allocation Factor (%)	56.57%	43.43%	0.00%	100.00%
3	CTA Base, Max Day, Max Hour				
	System Demand (Ccf/Day)	65,720	50,462	82,860	199,042
	Allocation Factor (%)	33.02%	25.35%	41.63%	100.00%
4	100% Retail Base	100.00%			100.00%
5	Retail Base, Max Day	56.57%	43.43%	0.00%	100.00%
6	Retail Base, Max Day, Max Hour	33.02%	25.35%	41.63%	100.00%

Schedule HJS-13b: Pumping and Storage Allocation (Factors 18, 19 and 20)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Station	Capacity (mgd)	Factor	Percent of Capacity	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only							
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.		
Neutaconkanut	38.6	9	35.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.72%	9.00%	14.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bath Street	28.9	9	26.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.79%	6.75%	11.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aqueduct	11.5	12	10.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.50%	2.69%	4.41%	0.00%	0.00%	0.00%	0.00%
Fruit Hill	4.3	12	3.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.31%	1.01%	1.65%	0.00%	0.00%	0.00%	0.00%
Alpine Estates	1.7	12	1.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.53%	0.41%	0.67%	0.00%	0.00%	0.00%	0.00%
Cranston	3.8	12	3.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.16%	0.89%	1.47%	0.00%	0.00%	0.00%	0.00%
Dean Estates	5.1	12	4.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.55%	1.19%	1.96%	0.00%	0.00%	0.00%	0.00%
Greenville	2.5	12	2.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.77%	0.59%	0.97%	0.00%	0.00%	0.00%	0.00%
Ashby Street	1.4	12	1.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.44%	0.34%	0.55%	0.00%	0.00%	0.00%	0.00%
Structure "D" PS	8.0	12	7.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.43%	1.87%	3.06%	0.00%	0.00%	0.00%	0.00%
Waltham	2.7	12	2.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%	0.62%	1.02%	0.00%	0.00%	0.00%	0.00%
Totals	108.7		100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.51%	15.75%	25.86%	12.50%	9.60%	15.76%	0.00%	0.00%	0.00%	0.00%

Factor 18 - As Pump Station Capacity	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.51%	15.75%	25.86%	12.50%	9.60%	15.76%	0.00%	0.00%	0.00%	0.00%
---	----------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	---------------	---------------	---------------	---------------	--------------	---------------	--------------	--------------	--------------	--------------

Station	Power Cost	Factor	Percent of Power	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only							
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.		
Neutaconkanut	\$ 321,096	9	37.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.46%	9.57%	15.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bath Street	\$ 212,118	9	24.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.23%	6.32%	10.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aqueduct	\$ 182,312	12	21.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.08%	5.43%	8.92%	0.00%	0.00%	0.00%	0.00%
Fruit Hill	\$ 39,175	12	4.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.52%	1.17%	1.92%	0.00%	0.00%	0.00%	0.00%
Alpine Estates	\$ 3,637	12	0.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.11%	0.18%	0.00%	0.00%	0.00%	0.00%
Cranston	\$ 17,420	12	2.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.68%	0.52%	0.85%	0.00%	0.00%	0.00%	0.00%
Dean Estates	\$ 31,886	12	3.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.24%	0.95%	1.56%	0.00%	0.00%	0.00%	0.00%
Greenville	\$ 23,469	12	2.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	0.70%	1.15%	0.00%	0.00%	0.00%	0.00%
Ashby Street	\$ -	12	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%	0.00%	0.00%	0.00%	0.00%
Structure "D" PS	\$ 7,048	12	0.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.21%	0.34%	0.00%	0.00%	0.00%	0.00%
Waltham	\$ 12,502	12	1.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	0.37%	0.61%	0.00%	0.00%	0.00%	0.00%
Totals	\$ 850,664		100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.70%	15.89%	26.09%	12.32%	9.46%	15.54%	0.00%	0.00%	0.00%	0.00%

Factor 19 - As Pump Station Electric Costs	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.70%	15.89%	26.09%	12.32%	9.46%	15.54%	0.00%	0.00%	0.00%	0.00%
---	----------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	---------------	---------------	---------------	---------------	--------------	---------------	--------------	--------------	--------------	--------------

Reservoir/Tank	Capacity (mg)	Factor	Percent of Capacity	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only							
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.		
Aqueduct Res	43.3	6	36.17%	0.00%	0.00%	0.00%	0.00%	11.94%	9.17%	15.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Neutaconkanut Res	42.1	6	35.17%	0.00%	0.00%	0.00%	0.00%	11.61%	8.92%	14.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Longview Res	24.8	9	20.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.84%	5.25%	8.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Lawton Hill Res.	5.0	12	4.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.38%	1.06%	1.74%	0.00%	0.00%	0.00%	0.00%
Ridge Rd. Tank	3.5	12	2.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.97%	0.74%	1.22%	0.00%	0.00%	0.00%	0.00%
Greenville Tank	1.0	12	0.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.21%	0.35%	0.00%	0.00%	0.00%	0.00%
Totals	119.7		100.00%	0.00%	0.00%	0.00%	0.00%	23.56%	18.09%	29.70%	6.84%	5.25%	8.63%	2.62%	2.01%	3.30%	0.00%	0.00%	0.00%	0.00%	0.00%

Factor 20 - As Storage Capacity	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.56%	18.09%	29.70%	6.84%	5.25%	8.63%	2.62%	2.01%	3.30%	0.00%	0.00%	0.00%	0.00%
--	----------------	--------------	--------------	--------------	--------------	--------------	--------------	---------------	---------------	---------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------

Schedule HJS-13c: Inch-Miles (Base Demand)

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Pipe Size	Total	Retail	Bristol County	East Providence	Greenville	Kent County	Lincoln	Smithfield	Warwick
<6"	1.59	1.59	-	-	-	-	-	-	-
6	2,703.15	2,692.21	1.38	-	0.12	-	9.43	0.01	-
8	2,785.82	2,740.70	4.70	-	11.25	-	28.17	1.00	-
10	12.29	12.29	-	-	-	-	-	-	-
12	1,162.12	1,104.37	2.54	0.04	3.44	-	42.11	9.62	-
16	714.00	657.55	1.23	-	0.52	-	46.16	8.54	-
20	163.60	158.27	0.53	-	0.14	-	4.66	0.00	-
24	647.30	498.88	13.98	0.09	79.60	-	32.19	22.42	0.14
30	507.80	302.31	170.45	-	0.13	-	16.86	11.33	6.72
36	68.70	51.75	12.52	0.02	0.05	-	1.84	2.10	0.42
42	205.60	124.92	1.64	-	0.01	-	20.73	13.46	44.84
48	154.80	91.63	2.93	0.04	1.01	-	35.70	23.37	0.12
60	264.00	222.19	0.91	1.57	8.62	-	18.30	11.07	1.34
66	106.00	70.85	7.99	4.17	0.00	-	5.42	3.55	14.02
78	345.00	100.44	15.61	109.13	-	28.85	8.64	5.63	76.70
90	406.00	323.09	14.01	7.69	9.65	0.25	16.05	10.48	24.78
102	525.70	210.63	33.60	234.99	-	-	18.61	12.06	15.81
Totals	10,773.47	9,363.67	284.02	357.74	114.54	29.10	304.87	134.64	184.89
	100.00%	86.91%	2.64%	3.32%	1.06%	0.27%	2.83%	1.25%	1.72%
<=12"	6,664.97	6,551.16	8.62	0.04	14.81	-	79.71	10.63	-
	100.00%	98.29%	0.13%	0.00%	0.22%	0.00%	1.20%	0.16%	0.00%

Schedule HJS-13c: Inch-Miles (Maximum Day Demand)

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Pipe Size	Total	Retail	Bristol County	East Providence	Greenville	Kent County	Lincoln	Smithfield	Warwick
<6"	1.60	1.60	-	-	-	-	-	-	-
6	2,703.10	2,696.58	0.25	-	0.54	-	5.71	0.02	-
8	2,785.80	2,748.84	0.48	-	9.20	-	26.13	1.15	-
10	12.30	12.30	-	-	-	-	-	-	-
12	1,162.10	1,108.48	3.22	-	3.81	-	35.54	11.05	-
16	714.00	660.85	1.34	-	0.64	-	41.37	9.80	-
20	163.60	158.29	0.56	-	0.11	-	4.63	0.01	-
24	647.30	489.49	11.96	-	66.97	-	28.86	50.02	-
30	507.80	285.60	186.04	-	0.07	-	14.95	14.62	6.52
36	68.70	46.26	17.55	-	0.10	-	1.74	2.69	0.36
42	205.60	137.74	8.77	-	0.02	-	0.03	15.50	43.54
48	154.80	93.75	3.43	-	2.88	-	26.07	28.67	-
60	264.00	203.61	0.35	0.90	12.58	-	31.03	15.47	0.06
66	106.00	67.13	12.85	-	0.16	-	0.19	4.11	21.56
78	345.00	127.76	23.40	78.83	-	24.49	-	6.48	84.04
90	406.00	298.21	20.43	0.20	14.57	0.18	23.11	14.44	34.86
102	525.70	272.33	50.90	171.50	-	-	-	13.88	17.09
Totals	10,773.40	9,408.82	341.53	251.43	111.65	24.67	239.36	187.91	208.03
	100.00%	87.33%	3.17%	2.33%	1.04%	0.23%	2.22%	1.74%	1.93%

Schedule HJS-13c: Inch-Miles (Maximum Hour Demand)

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Pipe Size	Total	Retail	Bristol County	East Providence	Greenville	Kent County	Lincoln	Smithfield	Warwick
<6"	1.60	1.60	-	-	-	-	-	-	-
6	2,703.10	2,695.72	0.19	-	0.30	-	6.87	0.02	-
8	2,785.80	2,760.47	0.47	-	6.67	-	16.69	1.50	-
10	12.30	12.30	-	-	-	-	-	-	-
12	1,162.10	1,122.78	3.13	0.03	0.53	-	21.27	14.36	-
16	714.00	675.47	1.12	-	0.12	-	24.53	12.76	-
20	163.60	158.55	0.42	-	0.07	-	4.55	0.01	-
24	647.30	547.51	8.82	0.06	42.98	-	14.91	32.83	0.19
30	507.80	297.92	171.63	-	0.04	-	15.42	15.86	6.93
36	68.70	48.97	15.66	0.01	0.01	-	0.80	2.74	0.51
42	205.60	122.29	12.62	-	0.00	-	4.15	20.19	46.35
48	154.80	107.69	2.77	0.01	0.84	-	8.25	35.04	0.20
60	264.00	232.17	1.35	1.05	1.71	-	8.25	16.60	2.87
66	106.00	65.04	9.29	1.44	0.12	-	1.00	5.32	23.79
78	345.00	109.27	23.64	69.10	-	30.13	1.24	8.44	103.18
90	406.00	311.88	18.46	3.31	1.70	0.25	7.13	15.72	47.55
102	525.70	258.73	57.75	166.71	-	-	3.03	18.08	21.40
Totals	10,773.40	9,528.36	327.32	241.72	55.09	30.38	138.09	199.47	252.97
	100.00%	88.44%	3.04%	2.24%	0.51%	0.28%	1.28%	1.85%	2.35%

Schedule HJS-13d: T&D Labor Allocation (Factor 21)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Year	Factor	Total	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only								
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
Hydrant - Install	2017	17	\$ 189,318	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 189,318
Hydrant - Install Custodian	2017	17	\$ 2,573	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,573
Hydrant - Maintenance	2017	17	\$ 2,525	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,525
Hydrant - Relocate Existing	2017	17	\$ 2,852	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,852
Hydrant - Remove	2017	17	\$ 92,751	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 92,751
Hydrant - Repair	2017	17	\$ 135,902	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 135,902
Service - Curb Box - Adjust to Grade	2017	14	\$ 18,097	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,097
Service - Curb Box - Check	2017	14	\$ 45,865	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 45,865
Service - Curb Box - Dig Up	2017	14	\$ 180,976	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 180,976
Service - Curb Stop - Close	2017	14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Service - Curb Stop - Locate	2017	14	\$ 1,168	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,168
Service - Curb Stop - Repair	2017	14	\$ 12,022	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 12,022
Service - Dig Up For Meter	2017	14	\$ 3,995	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,995
Service - Install - IFR	2017	14	\$ 134,678	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 134,678
Service - Install - T&D	2017	14	\$ 281,647	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 281,647
Service - Remove	2017	14	\$ 153,262	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 153,262
Service - Repair Leak	2017	14	\$ 178,649	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 178,649
TD Misc - Miscellaneous Maint	2017	Indirect	\$ 3,090	\$ 331	\$ 254	\$ 417	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,536
Valve - Adjust Gate Box	2017	3	\$ 30,476	\$ 10,063	\$ 7,726	\$ 12,687	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Check / Inspect	2017	3	\$ 13,317	\$ 4,397	\$ 3,376	\$ 5,544	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Install	2017	3	\$ 89,979	\$ 29,709	\$ 22,812	\$ 37,458	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Locate	2017	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Remove	2017	3	\$ 53,742	\$ 17,745	\$ 13,625	\$ 22,373	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Repair / Repack	2017	3	\$ 69,879	\$ 23,073	\$ 17,716	\$ 29,090	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Replaces Box Cover	2017	3	\$ 3,204	\$ 1,058	\$ 812	\$ 1,334	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Water Main - Install	2017	3	\$ 4,846	\$ 1,600	\$ 1,229	\$ 2,017	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Water Main - Remove	2017	3	\$ 1,129	\$ 373	\$ 286	\$ 470	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Water Main - Repair Leak	2017	3	\$ 91,906	\$ 30,346	\$ 23,300	\$ 38,260	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blowoff - Inspect	2018	3	\$ 487	\$ 161	\$ 123	\$ 203	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blowoff - Install	2018	3	\$ 7,488	\$ 2,472	\$ 1,898	\$ 3,117	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blowoff - Locate	2018	3	\$ 487	\$ 161	\$ 123	\$ 203	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blowoff - Remove	2018	3	\$ 2,048	\$ 676	\$ 519	\$ 853	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blowoff - Repair	2018	3	\$ 9,260	\$ 3,057	\$ 2,348	\$ 3,855	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hydrant - Check / Inspect	2018	17	\$ 15,350	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,350
Hydrant - Close	2018	17	\$ 902	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 902
Hydrant - Flush	2018	17	\$ 406	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 406
Hydrant - Install	2018	17	\$ 162,309	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 162,309
Hydrant - Install Custodian	2018	17	\$ 2,301	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,301
Hydrant - Maintenance	2018	17	\$ 1,980	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,980
Hydrant - Open	2018	17	\$ 51	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 51
Hydrant - Relocate Existing	2018	17	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hydrant - Remove	2018	17	\$ 63,775	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 63,775
Hydrant - Repair	2018	17	\$ 130,599	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 130,599
Hydrant - Repair/Repack Valve	2018	17	\$ 11,909	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 11,909
Service - Curb Box - Adjust to Grade	2018	14	\$ 23,247	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 23,247
Service - Curb Box - Check	2018	14	\$ 46,892	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 46,892
Service - Curb Box - Dig Up	2018	14	\$ 179,792	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 179,792
Service - Curb Stop - Close	2018	14	\$ 19,119	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 19,119
Service - Curb Stop - Locate	2018	14	\$ 4,695	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,695
Service - Curb Stop - Open	2018	14	\$ 23,311	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 23,311
Service - Curb Stop - Repair	2018	14	\$ 10,965	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,965
Service - Curb Stop - Replace	2018	14	\$ 6,194	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,194
Service - Dig Up For Meter	2018	14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Service - Install - IFR	2018	14	\$ 64,995	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 64,995
Service - Install - T&D	2018	14	\$ 294,119	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 294,119
Service - Meter - Bypass Meter	2018	14	\$ 205	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 205
Service - Remove	2018	14	\$ 100,614	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 100,614
Service - Remove Lead - CS Apps	2018	14	\$ 6,492	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,492
Service - Remove Lead - TD	2018	14	\$ 25,454	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 25,454
Service - Repair Leak	2018	14	\$ 169,990	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 169,990
TD Misc - Miscellaneous Maint	2018	Indirect	\$ 6,000	\$ 643	\$ 493	\$ 810	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,981
TD Misc - Pre-Mark for Digup	2018	Indirect	\$ 335	\$ 36	\$ 28	\$ 45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 167
TD Misc - Pre-Mark for Saw Cut	2018	Indirect	\$ 1,024	\$ 110	\$ 84	\$ 138	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 509
TD Misc - Trench Repair	2018	Indirect	\$ 393	\$ 42	\$ 32	\$ 53	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 195
Trench - Check For Failure	2018	3	\$ 100	\$ 33																	

Schedule HJS-13d: T&D Labor Allocation (Factor 21)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Year	Factor	Total	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire	
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
Valve - Install	2019	3	\$ 17,734	\$ 5,855	\$ 4,496	\$ 7,383	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valve - Install - TD	2019	3	\$ 13,701	\$ 4,524	\$ 3,473	\$ 5,703	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Valve - Locate	2019	3	\$ 741	\$ 245	\$ 188	\$ 309	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Valve - Raise Gate Box To Grade	2019	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Valve - Remove	2019	3	\$ 6,774	\$ 2,236	\$ 1,717	\$ 2,820	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Valve - Remove - TD	2019	3	\$ 755	\$ 249	\$ 191	\$ 314	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Valve - Repair / Repack	2019	3	\$ 28,008	\$ 9,248	\$ 7,101	\$ 11,660	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Valve - Replace Box Cover	2019	3	\$ 2,329	\$ 769	\$ 590	\$ 969	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Water Main - Install	2019	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Water Main - Remove	2019	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Water Main - Repair Leak	2019	3	\$ 115,527	\$ 38,145	\$ 29,289	\$ 48,093	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
DigSafe - Pre-Mark	2019	3	\$ 398	\$ 131	\$ 101	\$ 165	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Leak Detection	2019	3	\$ 477	\$ 157	\$ 121	\$ 199	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Miscellaneous Work	2019	Indirect	\$ 2,630	\$ 282	\$ 216	\$ 355	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,307	\$ 0	\$ 470	
Report Leak	2019	3	\$ 9,774	\$ 3,227	\$ 2,478	\$ 4,069	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Shut Down Not	2019	15	\$ 22	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 22	
TD Collect Sample	2019	3	\$ 142	\$ 47	\$ 36	\$ 59	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Trench - Check	2019	3	\$ 5,914	\$ 1,953	\$ 1,499	\$ 2,462	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Water Pressure	2019	3	\$ 279	\$ 92	\$ 71	\$ 116	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Water Quality Issue	2019	3	\$ 47	\$ 16	\$ 12	\$ 20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
DigSafe - Blasting	2019	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
DigSafe - Emergency	2019	3	\$ 5,209	\$ 1,720	\$ 1,321	\$ 2,168	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
DigSafe - Freeform	2019	3	\$ 107	\$ 35	\$ 27	\$ 45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
DigSafe - Regular	2019	3	\$ 1,128	\$ 372	\$ 286	\$ 469	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
DigSafe - Violation	2019	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3-Year Total (Direct Allocations)			\$6,223,596	\$666,570	\$511,813	\$840,418	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,092,737	\$321	\$1,111,735	
Indirect Allocation %			100.00%	10.71%	8.22%	13.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	49.69%	0.01%	17.86%	
3-Year Total (All Allocations)			\$6,255,138	\$ 669,949	\$ 514,407	\$ 844,678	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,108,412	\$ 323	\$ 1,117,370	
Factor 21 - As T&D Work/Service Orders			100.00%	10.71%	8.22%	13.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	49.69%	0.01%	17.86%	

Schedule HJS-13e: T&D Contract Services Allocation (Factor 22)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Year	Factor	Total	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only							
				Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
Uniforms	2017	Indirect	\$ 25,500	\$ 7,729	\$ 5,935	\$ 9,745	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,091	\$ -	\$ -
Markouts/Dig Safe	2017	3	\$ 31,727	\$ 10,476	\$ 8,044	\$ 13,208	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Switchboard Monitoring	2017	Indirect	\$ 2,929	\$ 888	\$ 682	\$ 1,119	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 240	\$ -	\$ -
Service Repair	2017	14	\$ 93,580	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 93,580	\$ -	\$ -
Police Details	2017	3	\$ 174,132	\$ 57,495	\$ 44,147	\$ 72,490	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
T&D Contractor	2017	3	\$ 47,871	\$ 15,806	\$ 12,136	\$ 19,928	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair Leak on Service	2017	14	\$ 47,130	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 47,130	\$ -	\$ -
Road Restoration - Contractor	2017	3	\$ 590,536	\$ 194,984	\$ 149,715	\$ 245,838	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Telephone	2017	Indirect	\$ 8,719	\$ 2,643	\$ 2,029	\$ 3,332	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 715	\$ -	\$ -
Uniforms	2018	Indirect	\$ 7,100	\$ 2,152	\$ 1,652	\$ 2,713	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 582	\$ -	\$ -
Markouts/Dig Safe	2018	3	\$ 32,903	\$ 10,864	\$ 8,342	\$ 13,697	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Switchboard Monitoring	2018	Indirect	\$ 3,373	\$ 1,023	\$ 785	\$ 1,289	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 277	\$ -	\$ -
Police Details	2018	3	\$ 124,242	\$ 41,022	\$ 31,498	\$ 51,721	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
T&D Contractor	2018	3	\$ 143,850	\$ 47,497	\$ 36,469	\$ 59,884	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair Leak on Service	2018	14	\$ 44,813	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 44,813	\$ -	\$ -
Road Restoration - Contractor	2018	3	\$ 538,228	\$ 177,713	\$ 136,453	\$ 224,062	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Telephone	2018	Indirect	\$ 10,860	\$ 3,292	\$ 2,528	\$ 4,150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 890	\$ -	\$ -
Markouts/Dig Safe	2019	3	\$ 31,113	\$ 10,273	\$ 7,888	\$ 12,952	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Switchboard Monitoring	2019	Indirect	\$ 3,000	\$ 909	\$ 698	\$ 1,147	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 246	\$ -	\$ -
Police Details	2019	3	\$ 150,299	\$ 49,626	\$ 38,104	\$ 62,569	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
T&D Contractor	2019	3	\$ 120,574	\$ 39,811	\$ 30,568	\$ 50,194	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair Leak on Service	2019	14	\$ 47,278	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 47,278	\$ -	\$ -
Road Restoration - Contractor	2019	3	\$ 620,956	\$ 205,028	\$ 157,427	\$ 258,501	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Misc. Expenses	2019	Indirect	\$ 9,767	\$ 2,960	\$ 2,273	\$ 3,732	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 801	\$ -	\$ -
3-Year Total (Direct Allocations)			\$ 2,839,230	\$ 860,594	\$ 660,790	\$ 1,085,045	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 232,800	\$ 0	\$ 0
Indirect Allocation %			100.00%	30.31%	23.27%	38.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.20%	0.00%	0.00%
3-Year Total			\$ 2,910,479	\$ 882,190	\$ 677,372	\$ 1,112,274	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 238,642	\$ -	\$ -
Factor 22 - As T&D Contract Services			100.00%	30.31%	23.27%	38.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.20%	0.00%	0.00%	

Schedule HJS-13f: Net Plant In Service (Factors 23, 24, 25, 26)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RI/UC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Allocation Factor	Plant in Service	Accumulated Depreciation	Net Book Value	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only					
					Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire
					All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
Source of Supply & Pumping																				
Land and Land Rights	4	\$ 38,927,814	\$ -	\$ 38,927,814	\$ -	\$ -	\$ -	\$ -	\$ 38,733,175	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 194,639
Structures and Improvements	4	22,401,415	16,642,333	5,759,082	-	-	-	-	5,730,287	-	-	-	-	-	-	-	-	-	-	28,795
Collecting & Impounding Reservoirs	4	13,373,233	8,994,270	4,378,962	-	-	-	-	4,357,068	-	-	-	-	-	-	-	-	-	-	21,895
Land & Impounding Reservoirs	4	4,306,409	-	4,306,409	-	-	-	-	4,284,877	-	-	-	-	-	-	-	-	-	-	21,532
Supply Mains	4	22,350,197	6,939,341	15,410,856	-	-	-	-	15,333,801	-	-	-	-	-	-	-	-	-	-	77,054
Other Water Source Plant	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Power Production Equipment	4	459,318	408,911	50,407	-	-	-	-	50,154	-	-	-	-	-	-	-	-	-	-	252
Electric Pumping Equipment	18	1,709,401	1,395,416	313,985	-	-	-	-	-	-	64,413	49,458	81,212	39,259	30,145	49,499	-	-	-	-
Hydraulic Pumping Equipment	18	107,721	62,678	45,043	-	-	-	-	-	-	9,240	7,095	11,650	5,632	4,324	7,101	-	-	-	-
Other Plant & Miscellaneous Equipm	18	1,150,739	1,150,739	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Source of Supply & Pumping Plant		\$ 104,786,247	\$ 35,593,689	\$ 69,192,558	\$ -	\$ -	\$ -	\$ -	\$ 68,489,362	\$ -	\$ -	\$ -	\$ 73,653	\$ 56,553	\$ 92,862	\$ 44,891	\$ 34,469	\$ 56,599	\$ -	\$ 344,168
Water Treatment Plant																				
Land and Land Rights	5	\$ 29,994	\$ -	\$ 29,994	\$ -	\$ -	\$ -	\$ -	\$ 16,967	\$ 13,027	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Structures and Improvements	5	64,787,943	54,483,966	10,303,977	-	-	-	-	5,828,601	4,475,376	-	-	-	-	-	-	-	-	-	-
Water Treatment Equipment	5	13,736,209	13,116,332	619,878	-	-	-	-	350,643	269,234	-	-	-	-	-	-	-	-	-	-
Other Plant & Miscellaneous Equipm	5	27,674,487	20,360,815	7,313,672	-	-	-	-	4,137,089	3,176,583	-	-	-	-	-	-	-	-	-	-
Total Water Treatment Plant		\$ 106,228,633	\$ 87,961,113	\$ 18,267,521	\$ -	\$ -	\$ -	\$ -	\$ 10,333,300	\$ 7,934,221	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission & Distribution Plant																				
Land and Land Rights	23	\$ 614,902	\$ -	\$ 614,902	\$ -	\$ -	\$ -	\$ -	\$ 71,623	\$ 54,995	\$ 90,303	\$ 20,799	\$ 15,970	\$ 26,224	\$ 7,967	\$ 6,118	\$ 10,045	\$ -	\$ -	\$ 310,857
Structures and Improvements	23	204,660	204,660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution Reservoirs & Standpipes	20	18,722,912	12,104,381	6,618,531	-	-	-	-	1,559,113	1,197,135	1,965,745	452,764	347,646	570,849	173,438	133,171	218,672	-	-	-
Transmission & Distribution	3	206,492,897	32,188,272	174,304,615	57,552,113	44,190,256	72,562,246	-	-	-	-	-	-	-	-	-	-	-	-	-
T&D Services	14	73,240,742	19,756,961	53,483,781	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meters & Meter Installation	14	31,296,939	24,361,180	6,935,760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53,483,781	-
Hydrants	17	11,546,412	4,779,609	6,766,803	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,935,760	-
Other Plant & Miscellaneous Equipm	2	7,834,658	7,834,658	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,766,803
Total Transmission & Distribution Plant		\$ 349,954,113	\$ 101,229,721	\$ 248,724,392	\$ 57,552,113	\$ 44,190,256	\$ 72,562,246	\$ -	\$ 1,630,737	\$ 1,252,129	\$ 2,056,048	\$ 473,563	\$ 363,616	\$ 597,073	\$ 181,405	\$ 139,288	\$ 228,717	\$ 60,419,541	\$ -	\$ 7,077,860
General Plant																				
Land and Land Rights	24	\$ 23,380	\$ -	\$ 23,380	\$ 4,002	\$ 3,073	\$ 5,046	\$ -	\$ 5,595	\$ 639	\$ 143	\$ 38	\$ 29	\$ 48	\$ 16	\$ 12	\$ 20	\$ 4,202	\$ -	\$ 516
Structures and Improvements ^{1/1}	24	5,690,927	5,648,798	42,129	7,212	5,538	9,093	-	10,082	1,151	258	69	53	86	28	22	36	7,571	-	930
Central Operations Facility	27	29,637,233	995,351	28,641,882	6,992,932	3,275,456	5,378,435	-	1,734,692	275,974	59,551	15,945	12,243	20,103	876,785	5,077	8,337	7,051,241	1,313,311	1,621,799
Office Furniture & Equipment	24	620,787	595,641	25,146	4,305	3,305	5,428	-	6,018	687	154	41	31	52	17	13	21	4,519	-	555
Transportation Equipment	24	8,897,148	7,866,240	1,030,909	176,483	135,509	222,512	-	246,710	28,170	6,305	1,678	1,288	2,116	694	533	875	185,276	-	22,759
Computer Equipment	24	11,690,744	4,739,235	6,951,508	1,190,043	913,751	1,500,417	-	1,663,588	189,952	42,514	11,315	8,688	14,266	4,679	3,593	5,900	1,249,335	-	153,466
Tools, Shop & Garage Equipment	24	846,649	657,232	189,417	32,427	24,898	40,884	-	45,330	5,176	308	237	389	98	161	34,042	-	-	-	4,182
Laboratory Equipment	1	198,137	196,548	1,589	1,581	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Power Operated Equipment	24	497,025	384,436	112,589	19,274	14,799	24,301	-	26,944	3,077	689	183	141	231	76	58	96	20,235	-	2,486
Communication Equipment	24	1,138,195	1,133,547	4,648	796	611	1,003	-	1,112	127	28	8	6	10	3	2	4	835	-	103
Miscellaneous Equipment	24	697,209	696,132	1,077	184	142	232	-	258	29	7	2	1	2	1	1	1	193	-	24
Other Tangible Plant	24	117,627	80,638	36,989	6,332	4,862	7,984	-	8,852	1,011	226	60	46	76	25	19	31	6,648	-	817
Total General Plant		\$ 60,055,059	\$ 22,993,797	\$ 37,061,262	\$ 8,435,572	\$ 4,381,945	\$ 7,195,336	\$ -	\$ 3,749,181	\$ 505,993	\$ 111,033	\$ 29,647	\$ 22,764	\$ 37,379	\$ 882,451	\$ 9,428	\$ 15,481	\$ 8,564,098	\$ 1,313,311	\$ 1,807,643
Total Plant		\$ 621,024,052	\$ 247,778,320	\$ 373,245,732	\$ 65,987,685	\$ 48,572,201	\$ 79,757,582	\$ -	\$ 84,202,580	\$ 9,692,343	\$ 2,167,081	\$ 576,862	\$ 442,932	\$ 727,314	\$ 1,108,748	\$ 183,185	\$ 300,798	\$ 68,983,638	\$ 1,313,311	\$ 9,229,471
Construction Work in Progress	24			\$ 53,315,917	\$ 9,127,262	\$ 7,008,188	\$ 11,507,738	\$ -	\$ 12,759,205	\$ 1,456,875	\$ 326,071	\$ 86,784	\$ 66,635	\$ 109,418	\$ 35,889	\$ 27,556	\$ 45,249	\$ 9,582,011	\$ -	\$ 1,177,037
Total Plant Investment		\$ 621,024,052	\$ 247,778,320	\$ 426,561,649	\$ 75,114,947	\$ 55,580,389	\$ 91,265,320	\$ -	\$ 96,961,786	\$ 11,149,218	\$ 2,493,152	\$ 663,646	\$ 509,568	\$ 836,731	\$ 1,144,636	\$ 210,742	\$ 346,047	\$ 78,565,649	\$ 1,313,311	\$ 10,406,507
(1) Net of Central Operations Facility	T&D Plant Excl. M&S, Land, Structures			\$ 13,385,334	\$ -	\$ -	\$ -	\$ -	\$ 1,559,113	\$ 1,197,135	\$ 1,965,745	\$ 452,764	\$ 347,646	\$ 570,849	\$ 173,438	\$ 133,171	\$ 218,672	\$ -	\$ -	\$ 6,766,803
Factor 23 - As T&D Plant Excl. M&S, Land, Structures		100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.65%	8.94%	14.89%	3.38%	2.60%	4.26%	1.30%	0.99%	1.63%	0.00%	0.00%	50.55%
Total Plant Excl. General Plant		\$ 336,184,470	\$ 57,552,113	\$ 44,190,256	\$ 72,562,246	\$ -	\$ 80,453,399	\$ 9,186,350	\$ 2,056,048	\$ 547,216	\$ 420,169	\$ 689,935	\$ 226,297	\$ 173,757	\$ 285,317	\$ 60,419,541	\$ -	\$ -	\$ 7,421,827	
Factor 24 - As Total Plant Excl. General Plant		100.00%	17.12%	13.14%	13.14%	0.00%	23.93%	2.73%	0.61%	0.16%	0.12%	0.21%	0.07%	0.05%	0.08%	17.97%	0.00%	0.00%	2.21%	
Total Plant Excl. Land, COF		\$ 305,007,760	\$ 58,990,751	\$ 45,293,672	\$ 74,374,100	\$ -	\$ 43,640,528	\$ 9,347,708	\$ 2,017,084	\$ 540,080	\$ 414,690	\$ 680,938	\$ 223,980	\$ 171,978	\$ 282,396	\$ 61,928,196	\$ -	\$ -	\$ 7,101,660	
Factor 25 - As Total Plant Excl. Land, COF		100.00%	19.34%	14.85%	24.38%	0.00%	14.31%	3.06%	0.66%	0.18%	0.14%	0.22%	0.07%	0.06%	0.09%	20.30%	0.00%	0.00%	2.33%	
Total Plant Excl. Land		\$ 333,649,642	\$ 65,983,683	\$ 48,569,128	\$ 79,752,536	\$ -	\$ 45,375,220	\$ 9,623,682	\$ 2,076,635	\$ 556,025	\$ 426,933	\$ 701,042	\$ 1,100,764	\$ 177,056	\$ 290,733	\$ 68,979,436	\$ 1,313,311	\$ 8,723,459		
Factor 26 - As Total Plant Excl. Land		100.00%	19.78%	14.56%	23.90%	0.00%	13.60%	2.88%	0.62%	0.17%	0.13%	0.21%	0.33%	0.05%	0.09%	20.67%	0.39%	2.61%		

Schedule HJS-13g: Central Operations Facility Square Footage for Allocation of COF Net Plant In Service (Factor 27)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Total (ft ²)	Factor	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only					
			Base	Max Day	Max Hour	Inch-Miles <=12"	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire
			All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
1ST FLOOR / COMMON SPACE / Area 516 SF	516	Indirect	126	59	97	-	31	5	1	0	0	0	16	0	0	127	24	29
1ST FLOOR / COMMON SPACE / Area 731 SF	731	Indirect	178	84	137	-	44	7	2	0	0	1	22	0	0	180	34	41
1ST FLOOR / COMMON SPACE / Area 1637 SF	1,637	Indirect	400	187	307	-	99	16	3	1	1	1	50	0	0	403	75	93
1ST FLOOR / COMMON SPACE / Area 10280 SF	10,280	Indirect	2,510	1,176	1,930	-	623	99	21	6	4	7	315	2	3	2,531	471	582
1ST FLOOR / MUSEUM / Area 1632 SF	1,632	10	-	-	-	-	-	-	-	-	-	-	1,624	-	-	-	-	8
1ST FLOOR / AUTOMOTIVE / Area 7680 SF	7,680	Indirect	1,875	878	1,442	-	465	74	16	4	3	5	235	1	2	1,891	352	435
1ST FLOOR / BOARD ROOM / Area 1041 SF	1,041	Indirect	254	119	195	-	63	10	2	1	0	1	32	0	0	256	48	59
1ST FLOOR / COMMERCIAL SERVICES / Area 9989 SF	9,989	N/A(1)	5,089	-	-	-	-	-	-	-	-	-	-	-	-	2,450	2,450	-
1ST FLOOR / ENGINEERING / Area 16804 SF	16,804	25	3,250	2,495	4,098	-	2,404	515	111	30	23	38	12	9	16	3,412	-	391
1ST FLOOR / FINANCE / Area 7232 SF	7,232	Indirect	1,766	827	1,358	-	438	70	15	4	3	5	221	1	2	1,780	332	409
1ST FLOOR / IT/ Area 6771 SF	6,771	Indirect	1,653	774	1,271	-	410	65	14	4	3	5	207	1	2	1,667	310	383
1ST FLOOR / SECURITY / Area 5731 SF	5,731	Indirect	1,399	655	1,076	-	347	55	12	3	2	4	175	1	2	1,411	263	325
1ST FLOOR / T&D / Area 14683 SF	14,683	21	1,573	1,207	1,983	-	-	-	-	-	-	-	-	-	-	7,297	1	2,623
1ST FLOOR / CENTRAL RECORDS / Area 5731 SF	5,731	Indirect	1,399	655	1,076	-	347	55	12	3	2	4	175	1	2	1,411	263	325
1ST FLOOR / PARKING GARAGE / Area 43924 SF	43,924	Indirect	10,724	5,023	8,248	-	2,660	423	91	24	19	31	1,345	8	13	10,813	2,014	2,487
1ST FLOOR / WAREHOUSE & STORAGE/ Area 1177 SF	1,177	3	389	298	490	-	-	-	-	-	-	-	-	-	-	-	-	-
1ST FLOOR / WAREHOUSE & STORAGE / Area 2777 SF	2,777	3	917	704	1,156	-	-	-	-	-	-	-	-	-	-	-	-	-
1ST FLOOR / WAREHOUSE & STORAGE / Area 5550 SF	5,550	3	1,833	1,407	2,310	-	-	-	-	-	-	-	-	-	-	-	-	-
2ND FLOOR - AREA 'H' COMMON SPACE / Area 772 SF	772	Indirect	188	88	145	-	47	7	2	0	0	1	24	0	0	190	35	44
2ND FLOOR - AREA 'H' COMMON SPACE / Area 3019 SF	3,019	Indirect	737	345	567	-	183	29	6	2	1	2	92	1	1	743	138	171
2ND FLOOR - AREA 'H' COMMON SPACE / Area 3946 SF	3,946	Indirect	963	451	741	-	239	38	8	2	2	3	121	1	1	971	181	223
2ND FLOOR - AREA 'H' DINING/CAFETERIA / Area 4575 SF	4,575	Indirect	1,117	523	859	-	277	44	10	3	2	3	140	1	1	1,126	210	259
2ND FLOOR - AREA 'H' FUTURE SPACE / Area 237 SF	237	Indirect	58	27	45	-	14	2	0	0	0	0	7	0	0	58	11	13
2ND FLOOR - AREA 'H' FUTURE SPACE / Area 540 SF	540	Indirect	132	62	101	-	33	5	1	0	0	0	17	0	0	133	25	31
2ND FLOOR - AREA 'H' FUTURE SPACE / Area 981 SF	981	Indirect	240	112	184	-	59	9	2	1	0	1	30	0	0	242	45	56
2ND FLOOR - GM/EXECUTIVE MANAGEMENT / Area 2491 SF	2,491	Indirect	608	285	468	-	151	24	5	1	1	2	76	0	1	613	114	141
2ND FLOOR - HUMAN RESOURCES (1)/ Area 1169 SF	1,169	Indirect	285	134	220	-	71	11	2	1	0	1	36	0	0	288	54	66
2ND FLOOR - HUMAN RESOURCES (2) / Area 2632 SF	2,632	Indirect	643	301	494	-	159	25	5	1	1	2	81	0	1	648	121	149
2ND FLOOR - LABORATORY /Area 837 SF	837	4	-	-	-	-	833	-	-	-	-	-	-	-	-	-	-	4
Total (Direct Allocations)	53,449		13,050	6,112	10,037	-	3,237	515	111	30	23	38	1,636	9	16	13,158	2,451	3,026
Indirect Allocation %	100.00%		24.42%	11.44%	18.78%	0.00%	6.06%	0.96%	0.21%	0.06%	0.04%	0.07%	3.06%	0.02%	0.03%	24.62%	4.59%	5.66%
Total (Direct Allocations)	165,085		40,306	18,879	31,000	-	9,998	1,591	343	92	71	116	5,054	29	48	40,642	7,570	9,348
Factor 27 - As Central Operations Facility Square Footage	100.00%		24.42%	11.44%	18.78%	0.00%	6.06%	0.96%	0.21%	0.06%	0.04%	0.07%	3.06%	0.02%	0.03%	24.62%	4.59%	5.66%

Schedule HJS-14a: Allocation of Rate Year FY 2022 Revenue Requirement

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Acct.	Description	Factor	Pro-Forma Rate Year	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only							
				Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire		
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
Operation and Maintenance																				
Source of Supply																				
60110	Salary + Wages -SOSO	4	\$ 875,276	\$ -	\$ -	\$ -	\$ -	\$ 870,899	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	4,376
60120	Salary + Wages -SOSM	4	\$ 586,738	\$ -	\$ -	\$ -	\$ -	\$ 583,804	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	2,934
60210	Payroll Clearing -SOSO	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
60220	Payroll Clearing -SOSM	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
60410	Employee Pension +Ben -SOSO	4	\$ 563,727	\$ -	\$ -	\$ -	\$ -	\$ 560,909	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	2,819
60420	Employee Pension + Ben -SOSM	4	\$ 351,839	\$ -	\$ -	\$ -	\$ -	\$ 350,080	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	1,759
60560	Overhead Rate Applied -SOSM	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
61010	Purchased Power	4	\$ 790	\$ -	\$ -	\$ -	\$ -	\$ 786	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	4
62010	Material and Supplies -SOSO	4	\$ 5,866	\$ -	\$ -	\$ -	\$ -	\$ 5,837	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	29
62020	Material and Supplies - SOSM	4	\$ 18,893	\$ -	\$ -	\$ -	\$ -	\$ 18,798	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	94
63110	Contractual Service -Eng-SOSO	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
63120	Contractual Service-Eng-SOSM	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
63610	Contractual Service Other-SOSO	4	\$ 13,827	\$ -	\$ -	\$ -	\$ -	\$ 13,758	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	69
63620	Contractual Service Other-SOSM	4	\$ 12,278	\$ -	\$ -	\$ -	\$ -	\$ 12,217	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	61
64210	Rental of Equipment-SOSO	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
64220	Rental of Equipment-SOSM	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
65010	Transportation Expense-SOSO	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
65020	Transportation Expense-SOSM	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
Total Source of Supply Expense			\$ 2,429,234	\$ -	\$ -	\$ -	\$ -	\$ 2,417,088	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	12,146
Total Source of Supply Expense			Check \$ -																	
Pumping Expenses																				
61523	Fuel or Power Purchase -PPO	19	\$ 462,861	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 95,796	\$ 73,555	\$ 120,780	\$ 57,032	\$ 43,791	\$ 71,907	\$ -	\$ -	\$ -	\$ -	-
63523	Contractual Service Other-PPO	19	\$ 13,816	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,859	\$ 2,195	\$ 3,605	\$ 1,702	\$ 1,307	\$ 2,146	\$ -	\$ -	\$ -	\$ -	-
Total Pumping Expenses			\$ 476,677	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 98,655	\$ 75,750	\$ 124,385	\$ 58,734	\$ 45,098	\$ 74,053	\$ -	\$ -	\$ -	\$ -	-

Schedule HJS-14a: Allocation of Rate Year FY 2022 Revenue Requirement

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Acct.	Description	Factor	Pro-Forma Rate Year	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire	
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
Water Treatment Expenses																				
60130	Salary + Wages -WTO	4	\$ 2,642,302	\$ -	\$ -	\$ -	\$ -	\$ 2,629,090	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 13,212
60140	Salary + Wages - WTM	4	\$ 302,915	\$ -	\$ -	\$ -	\$ -	\$ 301,401	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,515
60430	Employee Pension+Benefit-WTO	4	\$ 1,576,798	\$ -	\$ -	\$ -	\$ -	\$ 1,568,914	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,884
60440	Employee Pension+Benefit-WTM	4	\$ 261,356	\$ -	\$ -	\$ -	\$ -	\$ 260,049	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,307
61530	Purchased Power-WTO	5	\$ 134,946	\$ -	\$ -	\$ -	\$ -	\$ 76,334	\$ 58,612	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
61540	Power Purchased -WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
61630	Fuel for Purchased Power-WTO	5	\$ 200,347	\$ -	\$ -	\$ -	\$ -	\$ 113,330	\$ 87,018	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
62030	Material and Supplies -WTO	5	\$ 217,299	\$ -	\$ -	\$ -	\$ -	\$ 122,919	\$ 94,381	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
62040	Material and Supplies -WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63130	Contractual Service Eng-WTO	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63140	Contractual Service Eng-WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63630	Contractual Service Other-WTO	5	\$ 341,400	\$ -	\$ -	\$ -	\$ -	\$ 193,118	\$ 148,282	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63640	Contractual Service Other-WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
64230	Rental of Equipment -WTO	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
64240	Rental of Equipment -WTM	5	\$ 3,799	\$ -	\$ -	\$ -	\$ -	\$ 2,149	\$ 1,650	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
65030	Transportation Expense-WTO	5	\$ 1,333	\$ -	\$ -	\$ -	\$ -	\$ 754	\$ 579	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
67530	Miscellaneous Expenses-WTO	5	\$ 204,372	\$ -	\$ -	\$ -	\$ -	\$ 115,606	\$ 88,766	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
67540	Miscellaneous Expenses - WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Total Treatment Expense		\$ 5,886,867	\$ -	\$ -	\$ -	\$ -	\$ 5,383,663	\$ 479,287	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 23,917
	Check		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission + Dist. Expense																				
60150	Salary + Wages -T&DO	21	\$ 586,892	\$ 62,858	\$ 48,265	\$ 79,252	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 291,649	\$ 30	\$ 104,838
60160	Salary + Wages -T&DM	21	\$ 3,166,448	\$ 339,138	\$ 260,401	\$ 427,589	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,573,526	\$ 163	\$ 565,630
60250	Payroll Clearing-T&DO	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60260	Payroll Clearing -T&DM	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60450	Employee Pension+Benefit-T&DO	21	\$ 424,537	\$ 45,469	\$ 34,913	\$ 57,328	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 210,968	\$ 22	\$ 75,836
60460	Employee Pension+Benefit-T&DM	21	\$ 2,136,309	\$ 228,807	\$ 175,685	\$ 288,482	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,061,612	\$ 110	\$ 381,614
60550	Overhead Rate Applied-T&DO	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60560	Overhead Rate Applied -T&DM	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Less: UDF Re-Allocation	21	\$ (1,216,668)	\$ (130,310)	\$ (100,056)	\$ (164,296)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (604,608)	\$ (63)	\$ (217,336)
	Plus: UDF Re-Allocation	13	\$ 1,216,668	\$ -	\$ -	\$ -	\$ 1,216,668	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
61550	Power Purchased-T&DO	21	\$ 10,474	\$ 1,122	\$ 861	\$ 1,414	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,205	\$ 1	\$ 1,871
62050	Material and Supplies -T&DO	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
62060	Material and Supplies-T&DM	21	\$ 449,613	\$ 48,155	\$ 36,975	\$ 60,715	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 223,429	\$ 23	\$ 80,315
63150	Contractual Services Eng-T&DO	22	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63160	Contractual Services Eng-T&DM	22	\$ 47,278	\$ 14,330	\$ 11,003	\$ 18,068	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,876	\$ -	\$ -
63650	Contractual Service Other-T&DO	22	\$ 24,568	\$ 7,447	\$ 5,718	\$ 9,389	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,014	\$ -	\$ -
63660	Contractual Service Other-T&DM	22	\$ 1,002,834	\$ 303,967	\$ 233,395	\$ 383,245	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 82,227	\$ -	\$ -
65060	Transportation Expense -T&DM	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
67550	Miscellaneous Exp -T&DO	21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
67560	Miscellaneous Exp-T&DM	21	\$ 44,079	\$ 4,721	\$ 3,625	\$ 5,952	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21,904	\$ 2	\$ 7,874
	Less: UDF Re-Allocation	22	\$ (80,512)	\$ (24,404)	\$ (18,738)	\$ (30,769)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (6,602)	\$ -	\$ -
	Plus: UDF Re-Allocation	13	\$ 80,512	\$ -	\$ -	\$ -	\$ 80,512	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Total Transmission & Distribution		\$ 7,893,031	\$ 901,302	\$ 692,047	\$ 1,136,370	\$ 1,297,180	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,865,202	\$ 289	\$ 1,000,642

Schedule HJS-14a: Allocation of Rate Year FY 2022 Revenue Requirement

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Acct.	Description	Factor	Pro-Forma Rate Year	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
				Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire	
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
Customer Accounts Expense																			
60170	Salary+Wages-CAO	15	\$ 2,204,554	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60270	Payroll Clearing -CAO	15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60470	Employee Pension+Benefit-CAO	15	\$ 1,646,904	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60570	Overhead Rate Applied-CAO	15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
62070	Material and Supplies-CAO	15	\$ 4,043	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63670	Conratual Services Other -CAO	15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
65070	Transportation Expenses -CAO	15	\$ 3,002	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
67070	Bad Debt Expense	34	\$ 207,146	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,452	\$ 1,081	\$ 1,775	\$ 101,383	\$ 80,642	\$ 20,812
67570	Miscellaneous Expenses-CAO	15	\$ 640,886	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Customer Accounts			\$ 4,706,534	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,452	\$ 1,081	\$ 1,775	\$ 101,383	\$ 4,580,031	\$ 20,812
Check			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Administrative and General																			
60180	Salary+Wages -A&GO	28	\$ 6,467,811	\$ 203,802	\$ 156,485	\$ 256,955	\$ 454,168	\$ 2,659,732	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 945,594	\$ 1,437,802	\$ 353,275
60280	Payroll Clearing -A&GO	28	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60480	Employee Pension+Ben-A&GO	28	\$ 4,768,330	\$ 150,251	\$ 115,367	\$ 189,437	\$ 334,831	\$ 1,960,861	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 697,130	\$ 1,060,005	\$ 260,448
60580	Overhead Rate Applied-A&GO	28	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
61580	Purchased Power-A&GO	29	\$ 196,840	\$ 17,203	\$ 13,209	\$ 21,690	\$ 3,898	\$ 32,709	\$ 23,204	\$ -	\$ 4,776	\$ 3,667	\$ 6,022	\$ 2,914	\$ 2,236	\$ 3,671	\$ 20,984	\$ 35,274	\$ 5,380
61680	Fuel Or Power Purchased-A&GO	29	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
62080	Material and Supplies -A&GO	29	\$ 716,310	\$ 62,604	\$ 48,069	\$ 78,932	\$ 14,185	\$ 119,029	\$ 84,442	\$ -	\$ 17,381	\$ 13,346	\$ 21,914	\$ 10,604	\$ 8,136	\$ 13,360	\$ 76,364	\$ 128,366	\$ 19,579
63180	Contractual Service Eng-A&GO	29	\$ 135,951	\$ 11,882	\$ 9,123	\$ 14,981	\$ 2,692	\$ 22,591	\$ 16,026	\$ -	\$ 3,299	\$ 2,533	\$ 4,159	\$ 2,013	\$ 1,544	\$ 2,536	\$ 14,493	\$ 24,363	\$ 3,716
63280	Contractual Service Acctg-A&GO	29	\$ 51,615	\$ 4,511	\$ 3,464	\$ 5,688	\$ 1,022	\$ 8,577	\$ 6,085	\$ -	\$ 1,252	\$ 962	\$ 1,579	\$ 764	\$ 586	\$ 963	\$ 5,502	\$ 9,250	\$ 1,411
63380	Contractual Service Legal-A&GO	29	\$ 73,963	\$ 6,464	\$ 4,963	\$ 8,150	\$ 1,465	\$ 12,290	\$ 8,719	\$ -	\$ 1,795	\$ 1,378	\$ 2,263	\$ 1,095	\$ 840	\$ 1,379	\$ 7,885	\$ 13,255	\$ 2,022
63480	Contractual Service Mgmt fees-A&GO	29	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63680	Contractual Service Other-A&GO	29	\$ 2,191,638	\$ 191,545	\$ 147,074	\$ 241,502	\$ 43,400	\$ 364,184	\$ 258,359	\$ -	\$ 53,180	\$ 40,833	\$ 67,050	\$ 32,443	\$ 24,893	\$ 40,875	\$ 233,644	\$ 392,751	\$ 59,905
64280	Rental of Equipment-A&GO	29	\$ 2,686	\$ 235	\$ 180	\$ 296	\$ 53	\$ 446	\$ 317	\$ -	\$ 65	\$ 50	\$ 82	\$ 40	\$ 31	\$ 50	\$ 286	\$ 481	\$ 73
65080	Transportation Expenses-A&GO	29	\$ 10,944	\$ 956	\$ 734	\$ 1,206	\$ 217	\$ 1,819	\$ 1,290	\$ -	\$ 266	\$ 204	\$ 335	\$ 162	\$ 124	\$ 204	\$ 1,167	\$ 1,961	\$ 299
66780	Regulatory Commission Expense	29	\$ 579,065	\$ 50,609	\$ 38,859	\$ 63,808	\$ 11,467	\$ 96,223	\$ 68,263	\$ -	\$ 14,051	\$ 10,789	\$ 17,716	\$ 8,572	\$ 6,577	\$ 10,800	\$ 61,732	\$ 103,771	\$ 15,828
67580	Miscellaneous Expenses- A&GO	29	\$ 458,162	\$ 40,042	\$ 30,746	\$ 50,486	\$ 9,073	\$ 76,133	\$ 54,010	\$ -	\$ 11,117	\$ 8,536	\$ 14,017	\$ 6,782	\$ 5,204	\$ 8,545	\$ 48,843	\$ 82,105	\$ 12,523
Total Administration + General			\$ 15,653,314	\$ 740,105	\$ 568,275	\$ 933,131	\$ 876,470	\$ 5,354,594	\$ 520,714	\$ -	\$ 107,183	\$ 82,298	\$ 135,137	\$ 65,388	\$ 50,171	\$ 82,383	\$ 2,113,625	\$ 3,289,382	\$ 734,460

Schedule HJS-14a: Allocation of Rate Year FY 2022 Revenue Requirement

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Acct.	Description	Factor	Pro-Forma Rate Year	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
				Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire	
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
Insurance Fund (857)																			
62080	Material and Supplies -A&GO	29	\$ 16,500	\$ 1,442	\$ 1,107	\$ 1,818	\$ 327	\$ 2,742	\$ 1,945	\$ -	\$ 400	\$ 307	\$ 505	\$ 244	\$ 187	\$ 308	\$ 1,759	\$ 2,957	\$ 451
62080	Injuries and Damages	28	\$ 85,000	\$ 2,678	\$ 2,057	\$ 3,377	\$ 5,969	\$ 34,954	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 12,427	\$ 18,896	\$ 4,643
63680	Contract Services - Other A&GO	29	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
65780	Ins. Gen. Liability	29	\$ 1,174,839	\$ 102,679	\$ 78,840	\$ 129,458	\$ 23,265	\$ 195,223	\$ 138,495	\$ -	\$ 28,507	\$ 21,889	\$ 35,942	\$ 17,391	\$ 13,344	\$ 21,911	\$ 125,246	\$ 210,536	\$ 32,112
65880	Insurance - W/C	28	\$ 794,279	\$ 25,028	\$ 19,217	\$ 31,555	\$ 55,774	\$ 326,628	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 116,124	\$ 176,569	\$ 43,384
67580	Misc. Expense	29	\$ 5,000	\$ 437	\$ 336	\$ 551	\$ 99	\$ 831	\$ 589	\$ -	\$ 121	\$ 93	\$ 153	\$ 74	\$ 57	\$ 93	\$ 533	\$ 896	\$ 137
	Funding Adjustment	31	\$ (24,561)	\$ (1,565)	\$ (1,202)	\$ (1,973)	\$ (1,011)	\$ (6,631)	\$ (1,669)	\$ -	\$ (344)	\$ (264)	\$ (433)	\$ (210)	\$ (161)	\$ (264)	\$ (3,030)	\$ (4,850)	\$ (955)
	Total Insurance Fund		\$ 2,051,057	\$ 130,699	\$ 100,354	\$ 164,786	\$ 84,422	\$ 553,747	\$ 139,360	\$ -	\$ 28,686	\$ 22,026	\$ 36,167	\$ 17,500	\$ 13,427	\$ 22,048	\$ 253,058	\$ 405,004	\$ 79,771
	Check		\$ -																
Chemical and Sludge Maintenance Fund (878)																			
61830	Chemicals - WTO	4	\$ 2,353,312	\$ -	\$ -	\$ -	\$ -	\$ 2,341,546	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63130	Contract Services - Eng WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
63640	Contract Services - Other WTM	5	\$ 1,608,918	\$ -	\$ -	\$ -	\$ -	\$ 910,109	\$ 698,809	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
67540	Miscellaneous Expenses - WTM	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Funding Adjustment	32	\$ (362,230)	\$ -	\$ -	\$ -	\$ -	\$ (297,269)	\$ (63,886)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,076)
	Total Chemical and Sludge Maintenance Fund		\$ 3,600,000	\$ -	\$ -	\$ -	\$ -	\$ 2,954,386	\$ 634,923	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Check		\$ -																
TOTAL O&M			\$ 42,696,714	\$ 1,772,105	\$ 1,360,676	\$ 2,234,287	\$ 2,258,072	\$ 16,663,477	\$ 1,774,285	\$ -	\$ 234,523	\$ 180,074	\$ 295,689	\$ 143,075	\$ 109,777	\$ 180,259	\$ 5,333,269	\$ 8,274,707	\$ 1,882,439

Schedule HJS-14a: Allocation of Rate Year FY 2022 Revenue Requirement

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Acct.	Description	Factor	Pro-Forma Rate Year	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
				Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire	
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.	
Other Expenditures																				
Property Taxes- Other Local Govern.																				
40820	Town of North Providence	9	\$ 315,712	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 104,242	\$ 80,040	\$ 131,429	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
40821	Town of Glocester	4	\$ 82,463	\$ -	\$ -	\$ -	\$ -	\$ 82,051	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 412	
40822	Town of West. Glocester	4	\$ 4,769	\$ -	\$ -	\$ -	\$ -	\$ 4,745	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 24	
40823	Town Harmony	4	\$ 217	\$ -	\$ -	\$ -	\$ -	\$ 216	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1	
40824	Town Chepachet	4	\$ 139	\$ -	\$ -	\$ -	\$ -	\$ 138	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1	
40825	Town Scituate	5	\$ 7,031,103	\$ -	\$ -	\$ -	\$ -	\$ 3,977,250	\$ 3,053,853	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
40827	Town of Johnston	6	\$ 104,269	\$ -	\$ -	\$ -	\$ -	\$ 34,428	\$ 26,434	\$ 43,407	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
40828	Town of Foster	4	\$ 324,855	\$ -	\$ -	\$ -	\$ -	\$ 323,231	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,624	
40829	City of Cranston	6	\$ 63,507	\$ -	\$ -	\$ -	\$ -	\$ 20,969	\$ 16,101	\$ 26,438	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
40830	City of West. Warwick	6	\$ 7,278	\$ -	\$ -	\$ -	\$ -	\$ 2,403	\$ 1,845	\$ 3,030	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Property Taxes			\$ 7,934,311	\$ -	\$ -	\$ -	\$ -	\$ 4,445,430	\$ 3,098,233	\$ 72,874	\$ 104,242	\$ 80,040	\$ 131,429	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,062
Check			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Restricted Funds																				
Capital Fund	26	\$ 2,127,000	\$ 420,643	\$ 309,626	\$ 508,418	\$ -	\$ 289,265	\$ 61,350	\$ 13,238	\$ 3,545	\$ 2,722	\$ 4,469	\$ 7,017	\$ 1,129	\$ 1,853	\$ 439,741	\$ 8,372	\$ 55,612		
Western Cranston Fund	12	\$ 40,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 13,207	\$ 10,141	\$ 16,652	\$ -	\$ -	\$ -		
IFR Fund	25	\$ 31,300,000	\$ 6,053,651	\$ 4,648,052	\$ 7,632,295	\$ -	\$ 4,478,406	\$ 959,265	\$ 206,994	\$ 55,423	\$ 42,556	\$ 69,878	\$ 22,985	\$ 17,648	\$ 28,980	\$ 6,355,093	\$ -	\$ 728,775		
Meter Replacement Fund	14	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,000,000	\$ -	\$ -		
Vehicle/Equipment Fund	25	\$ 1,500,000	\$ 290,111	\$ 222,750	\$ 365,765	\$ -	\$ 214,620	\$ 45,971	\$ 9,920	\$ 2,656	\$ 2,039	\$ 3,349	\$ 1,102	\$ 846	\$ 1,389	\$ 304,557	\$ -	\$ 34,925		
Lead Service Replacement Fund	15	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000		
Revenue Reserve Fund	33	\$ 429,742	\$ 40,968	\$ 31,389	\$ 51,542	\$ 11,531	\$ 128,559	\$ 29,486	\$ 1,451	\$ 2,003	\$ 1,538	\$ 2,525	\$ 921	\$ 686	\$ 1,126	\$ 62,690	\$ 50,137	\$ 13,190		
Total Restricted Expenditures			\$ 38,396,742	\$ 6,805,373	\$ 5,211,817	\$ 8,558,021	\$ 11,531	\$ 5,110,850	\$ 1,096,073	\$ 231,603	\$ 63,627	\$ 48,855	\$ 80,221	\$ 45,232	\$ 30,450	\$ 50,000	\$ 8,162,081	\$ 2,058,509	\$ 832,501	
Check			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
City Services Expense																				
Capital Reimbursement	25	\$ (1,945,605)	\$ (376,294)	\$ (288,922)	\$ (474,423)	\$ -	\$ (278,377)	\$ (59,628)	\$ (12,867)	\$ (3,445)	\$ (2,645)	\$ (4,344)	\$ (1,429)	\$ (1,097)	\$ (1,801)	\$ (395,032)	\$ -	\$ (45,301)		
TOTAL OTHER EXPENDITURES			\$ 45,224,615	\$ 6,464,434	\$ 4,950,042	\$ 8,128,175	\$ 62,416	\$ 9,583,906	\$ 4,153,479	\$ 291,610	\$ 168,294	\$ 129,221	\$ 212,187	\$ 46,164	\$ 31,164	\$ 51,173	\$ 7,883,420	\$ 2,238,183	\$ 830,747	
Gross Revenue Requirements			\$ 87,921,329	\$ 8,236,539	\$ 6,310,718	\$ 10,362,462	\$ 2,320,488	\$ 26,247,384	\$ 5,927,764	\$ 291,610	\$ 402,817	\$ 309,295	\$ 507,876	\$ 189,238	\$ 140,942	\$ 231,432	\$ 13,216,689	\$ 10,512,890	\$ 2,713,186	

Schedule HJS-14a: Allocation of Rate Year FY 2022 Revenue Requirement

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Acct.	Description	Factor	Pro-Forma Rate Year	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only																						
				Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire																	
				All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.																
Non-Rate Revenues																																			
34	Interest on Delinquent Accounts	\$	403,127	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,825	\$	2,104	\$	3,455	\$	197,301	\$	156,938	\$	40,503										
30	Interest Earned	\$	25,636	\$	1,080	\$	829	\$	1,362	\$	1,554	\$	9,348	\$	574	\$	-	\$	72	\$	55	\$	91	\$	3,555	\$	5,489	\$	1,267						
16	Miscellaneous State revenue	\$	180,288	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	90,144	\$	90,144	\$	-								
30	Rents from Water Properties	\$	20,969	\$	883	\$	678	\$	1,114	\$	1,272	\$	7,646	\$	470	\$	-	\$	97	\$	74	\$	122	\$	59	\$	45	\$	74	\$	2,908	\$	4,490	\$	1,037
34	Flow Tests	\$	7,184	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	50	\$	37	\$	62	\$	3,516	\$	2,797	\$	722		
14	New Meters	\$	108,527	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	108,527	\$	-	\$	-		
14	Lost/Stolen Meters	\$	17,862	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	17,862	\$	-	\$	-		
16	Admin Fee NBC	\$	25,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	12,500	\$	-	\$	-		
16	Shut Off/On Service Charge	\$	197,810	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	98,905	\$	98,905	\$	-		
34	Other Miscellaneous	\$	164,852	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	1,155	\$	860	\$	1,413	\$	80,683	\$	64,177	\$	16,563		
4	Bad Checks	\$	21,183	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	106		
4	Forest Product Sales	\$	98,642	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	98,642		
4	Water Liens	\$	47,083	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	46,848		
4	Foster Property Tax Refund	\$	225,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	223,875		
TOTAL NON-RATE REVENUES			\$ 1,543,163	\$	1,964	\$	1,508	\$	2,476	\$	2,826	\$	406,944	\$	1,044	\$	-	\$	215	\$	165	\$	271	\$	4,162	\$	3,102	\$	5,094	\$	615,902	\$	435,440	\$	62,051
TOTAL NET REVENUE REQUIREMENT			\$ 86,378,166	\$	8,234,575	\$	6,309,210	\$	10,359,986	\$	2,317,662	\$	25,840,440	\$	5,926,720	\$	291,610	\$	402,602	\$	309,130	\$	507,605	\$	185,077	\$	137,839	\$	226,337	\$	12,600,787	\$	10,077,450	\$	2,651,135
Labor Related O&M Excl. A&G			\$ 17,326,594	\$	545,963	\$	419,207	\$	688,356	\$	1,216,668	\$	7,125,145	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,533,147	\$	3,851,722	\$	946,386
Factor 28 - As Labor O&M Excl. A&G			100.00%	3.15%	2.42%	3.97%	7.02%	41.12%	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%	0.00%	0.00%	0.00%	0.00%	14.62%	22.23%	5.46%					
Non-Labor Related O&M Excl. A&G			\$ 4,065,749	\$	355,338	\$	272,840	\$	448,014	\$	80,512	\$	675,605	\$	479,287	\$	-	\$	98,655	\$	75,750	\$	124,385	\$	60,186	\$	46,179	\$	75,828	\$	433,437	\$	728,599	\$	111,131
Factor 29 - As Non-Labor O&M Excl. A&G			100.00%	8.74%	6.71%	11.02%	1.98%	16.62%	11.79%	0.00%	2.43%	1.86%	3.06%	1.48%	1.14%	1.87%	10.66%	17.92%	2.73%																
Total O&M Excl. A&G			\$ 21,392,343	\$	901,302	\$	692,047	\$	1,136,370	\$	1,297,180	\$	7,800,751	\$	479,287	\$	-	\$	98,655	\$	75,750	\$	124,385	\$	60,186	\$	46,179	\$	75,828	\$	2,966,585	\$	4,580,320	\$	1,057,517
Factor 30 - As Total O&M Excl. A&G			100.00%	4.21%	3.24%	5.31%	6.06%	36.47%	2.24%	0.00%	0.46%	0.35%	0.58%	0.28%	0.22%	0.35%	13.87%	21.41%	4.94%																
Total Insurance Excluding Funding Adjustment			\$ 2,075,617	\$	132,264	\$	101,556	\$	166,759	\$	85,433	\$	560,378	\$	141,029	\$	-	\$	29,029	\$	22,289	\$	36,600	\$	17,710	\$	13,588	\$	22,312	\$	256,089	\$	409,853	\$	80,727
Factor 31 - As Total Ins. Excl Adj.			100.00%	6.37%	4.89%	8.03%	4.12%	27.00%	6.79%	0.00%	1.40%	1.07%	1.76%	0.85%	0.65%	1.07%	12.34%	19.75%	3.89%																
Total Chemicals Excluding Funding Adjustment			\$ 3,962,230	\$	-	\$	-	\$	-	\$	-	\$	3,251,654	\$	698,809	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	11,767
Factor 32 - As Total Chemicals Excl Adj.			100.00%	0.00%	0.00%	0.00%	0.00%	82.07%	17.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%																
Total Net Revenue Requirement (Excl. Reserves)			\$ 85,948,424	\$	8,193,607	\$	6,277,821	\$	10,308,444	\$	2,306,132	\$	25,711,881	\$	5,897,234	\$	290,159	\$	400,599	\$	307,592	\$	505,080	\$	184,156	\$	137,153	\$	225,211	\$	12,538,097	\$	10,027,313	\$	2,637,945
Factor 33 - As Net Revenue Requirement			100.00%	9.53%	7.30%	11.99%	2.68%	29.92%	6.86%	0.34%	0.47%	0.36%	0.59%	0.21%	0.16%	0.26%	14.59%	11.67%	3.07%																
Retail Revenue Requirement (Excl. Bad Debt)			\$ 26,797,230																				\$ 187,787	\$	139,860	\$	229,657	\$	13,115,306	\$	10,432,247	\$	2,692,373		
Factor 34 - As Retail Req. Excl. Bad Debt			100.00%	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%	0.70%	0.52%	0.86%	48.94%	38.93%	10.05%													

Schedule HJS-14b: Allocation of Rate Year Revenue Requirement (Summary)

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Pro-Forma Rate Year	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
		Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire
		All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
Net Operations and Maintenance Expense	\$ 40,751,109	\$ 1,395,811	\$ 1,071,753	\$ 1,759,864	\$ 2,258,072	\$ 16,385,100	\$ 1,714,657	\$ (12,867)	\$ 231,078	\$ 177,429	\$ 291,346	\$ 141,646	\$ 108,680	\$ 178,458	\$ 4,938,237	\$ 8,274,707	\$ 1,837,138
Restricted Funds (Excluding Revenue Reserve)	\$ 37,967,000	\$ 6,764,405	\$ 5,180,428	\$ 8,506,479	\$ -	\$ 4,982,291	\$ 1,066,587	\$ 230,152	\$ 61,624	\$ 47,317	\$ 77,696	\$ 44,311	\$ 29,764	\$ 48,874	\$ 8,099,390	\$ 2,008,372	\$ 819,312
City Services Expense	\$ 839,167	\$ 35,356	\$ 27,147	\$ 44,577	\$ 50,885	\$ 306,003	\$ 18,801	\$ -	\$ 3,870	\$ 2,971	\$ 4,879	\$ 2,361	\$ 1,811	\$ 2,975	\$ 116,372	\$ 179,674	\$ 41,484
Property Taxes Expense	\$ 7,934,311	\$ -	\$ -	\$ -	\$ -	\$ 4,445,430	\$ 3,098,233	\$ 72,874	\$ 104,242	\$ 80,040	\$ 131,429	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,062
Total Expenses Allocated	\$ 87,491,587	\$ 8,195,571	\$ 6,279,328	\$ 10,310,920	\$ 2,308,958	\$ 26,118,824	\$ 5,898,278	\$ 290,159	\$ 400,814	\$ 307,757	\$ 505,350	\$ 188,318	\$ 140,256	\$ 230,306	\$ 13,153,998	\$ 10,462,753	\$ 2,699,996
Less: Miscellaneous Revenues	\$ (1,543,163)	\$ (1,964)	\$ (1,508)	\$ (2,476)	\$ (2,826)	\$ (406,944)	\$ (1,044)	\$ -	\$ (215)	\$ (165)	\$ (271)	\$ (4,162)	\$ (3,102)	\$ (5,094)	\$ (615,902)	\$ (435,440)	\$ (62,051)
Plus: Net Operating Revenue Allowance	\$ 1,718,968	\$ 163,872	\$ 125,556	\$ 206,169	\$ 46,123	\$ 514,238	\$ 117,945	\$ 5,803	\$ 8,012	\$ 6,152	\$ 10,102	\$ 3,683	\$ 2,743	\$ 4,504	\$ 250,762	\$ 200,546	\$ 52,759
Net Revenue Requirement	\$ 87,667,393	\$ 8,357,480	\$ 6,403,377	\$ 10,514,613	\$ 2,352,254	\$ 26,226,118	\$ 6,015,179	\$ 295,963	\$ 408,611	\$ 313,744	\$ 515,181	\$ 187,839	\$ 139,896	\$ 229,716	\$ 12,788,859	\$ 10,227,859	\$ 2,690,704

Schedule HJS-15a: Pro-Forma Water Sales

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Customer Class	FY 2014	FY 2015	FY 2016	FY 2017 (1)	FY 2018	FY 2019	Adjustment (2)	Pro Forma Rate Year
Retail								
Residential	8,627,628	8,347,957	8,269,834	8,269,270	8,030,974	8,103,732	292,444	8,396,176
Commercial	3,903,139	4,230,647	4,251,054	3,927,540	4,043,827	4,031,169	10,496	4,041,665
Industrial	185,888	171,644	164,367	182,199	189,997	164,973	22,213	187,186
Sub-total Retail	12,716,655 49.17%	12,750,248 48.22%	12,685,256 49.25%	12,379,009 49.12%	12,264,797 50.62%	12,299,874 51.15%	325,153	12,625,027 52.63%
Wholesale								
Bristol County	1,608,984	1,663,045	1,579,991	1,637,658	1,602,670	1,494,845	-	1,494,845
East Providence	2,201,598	2,010,940	1,869,775	1,904,517	1,776,786	1,822,773	-	1,822,773
East Smithfield	278,534	318,959	280,994	-	-	-	-	-
Greenville	431,647	443,841	477,556	443,680	417,847	421,521	-	421,521
Johnston	337,577	433,844	421,362	392,953	386,849	385,925	(385,925)	-
Kent County	2,561,361	2,561,821	2,381,066	2,500,971	2,470,436	2,727,147	-	2,727,147
Lincoln	1,025,337	1,119,193	1,082,008	1,155,628	1,057,830	1,038,229	-	1,038,229
Smithfield	497,433	477,254	427,370	435,321	435,955	391,600	-	391,600
Warwick	4,202,875	4,665,329	4,553,730	4,349,674	3,817,571	3,466,644	-	3,466,644
Sub-total Wholesale	13,145,345 50.83%	13,694,224 51.78%	13,073,851 50.75%	12,820,403 50.88%	11,965,943 49.38%	11,748,684 48.85%	(385,925)	11,362,760 47.37%
Grand Total	25,862,000	26,444,473	25,759,107	25,199,412	24,230,740	24,048,558	(60,772)	23,987,787
(1) East Smithfield Retail								
Residential	228,489	219,570	210,360	79,063	214,949	183,987	-	214,949
Commercial	3,409	5,763	11,446	3,562	7,362	5,418	-	7,362
Industrial	8,049	12,469	26,012	6,503	13,265	7,592	-	13,265
Total East Smithfield Retail	239,948	237,802	247,818	89,128	235,576	196,997	-	235,576
(2) Johnston Retail								
Residential	276,924	298,656	315,444	310,607	293,145	292,444	-	292,444
Commercial	4,132	7,839	17,163	13,993	10,521	10,496	-	10,496
Industrial	9,756	16,961	39,006	25,548	22,266	22,213	-	22,213
Total Johnston Retail	290,811	323,456	371,613	350,148	325,932	325,153	-	325,153

Schedule HJS-15b: Assignment of Non-Revenue Water (NRW)

Providence Water Supply Board

Docket # 4994

Individual Wholesale Cost of Service Study

Per RIPUC Report and Order No. 23928

Test Year Ending June 30, 2019

Rate Years Ending June 30, 2021 through 2023

Line	Description	Units	Total	Retail	Bristol County	East Providence	Greenville	Kent County	Lincoln	Smithfield	Warwick
1	Annual Sales	HCF	23,987,787	12,625,027	1,494,845	1,822,773	421,521	2,727,147	1,038,229	391,600	3,466,644
			100.00%	52.63%	6.23%	7.60%	1.76%	11.37%	4.33%	1.63%	14.45%
2	Pipe Length ⁽¹⁾	Miles	1,249,331	1,208,131	8,670	3,890	5,350	0,370	15,770	4,190	2,960
			100.00%	96.70%	0.69%	0.31%	0.43%	0.03%	1.26%	0.34%	0.24%
3	Pipe Length <=12"	Miles	897,495	885,220	1,028	0,004	1,713	-	8,602	0,929	-
			100.00%	98.63%	0.11%	0.00%	0.19%	0.00%	0.96%	0.10%	0.00%
4	Start: Annual Water Production	HCF	28,042,451								
5	Less: Annual Sales	HCF	23,987,787								
6	Equals: Non-Revenue Water	HCF	4,054,664								
7	Less: Non-Billed Water Use										
8	Unauthorized Consumption ⁽²⁾	HCF	70,106	70,106	-	-	-	-	-	-	-
9	Customer Metering Inaccuracy ⁽³⁾	HCF	741,890	741,890	-	-	-	-	-	-	-
10	Firefighting Allowance ⁽⁴⁾	HCF	133,690	133,690	-	-	-	-	-	-	-
11	Water Quality - Aqueduct Reservoir ⁽⁴⁾⁽⁵⁾	HCF	1,075,338	565,962	67,012	81,712	18,896	122,254	46,542	17,555	155,405
12	Water Quality - Ridge Road Tank Repair ⁽⁴⁾	HCF	102,823	102,823							
13	Main Flushing/System Maintenance ⁽⁴⁾⁽⁷⁾	HCF	66,845	65,931	77	0	128	-	641	69	-
14	Other Authorized Unbilled ⁽⁴⁾	HCF	13,501	13,501	-	-	-	-	-	-	-
15	Total Non-Billed Use	HCF	2,204,193	1,693,902	67,088	81,713	19,024	122,254	47,183	17,624	155,405
16	Equals: Real Losses (Leakage)⁽⁶⁾	HCF	1,850,471	1,789,447	12,842	5,762	7,924	548	23,358	6,206	4,384
17	Total Non-Revenue Water	HCF	4,054,664	3,483,349	79,930	87,474	26,948	122,802	70,541	23,830	159,789

(1) Per Hydraulic Modeling Analysis (Avg. Day) + Estimated Service Lines for Retail (225 mi)

(2) Estimated at 0.25% of Production

(3) Estimated at 3%. Calculated as: (Sales / 0.97) - Sales

(4) Per Providence Water FY 2019

(5) Allocated based on Pro-Forma Sales

(6) Allocated based on Pipe Length

(7) Allocated based on Pipe Length <=12"

Schedule HJS-16a: Customer Class Units of Service

Providence Water Supply Board

Docket # 4994

Individual Wholesale Cost of Service Study

Per RIPUC Report and Order No. 23928

Test Year Ending June 30, 2019

Rate Years Ending June 30, 2021 through 2023

Customer Class	Base Demand			Maximum Day Extra Capacity				Maximum Hour Extra Capacity				Billing		Direct Fire
	Rate Year Sales	Plus NRW	Base	Average Day	Peaking Factor	Maximum Day	Maximum Day Extra	Average Day	Peaking Factor	Maximum Hour	Maximum Hour Extra	Meters & Services	Monthly Bills	
	HCF	HCF	HCF	HCF/d		HCF/d	HCF/d	HCF/d		HCF/d	HCF/d	5/8" Eq.		6" Eq.
Retail														
Residential	8,396,176	2,316,574	10,712,750	23,003	1.56	35,958	12,954	23,003	3.13	71,915	35,958			
Commercial	4,041,665	1,115,129	5,156,794	11,073	1.68	18,644	7,571	11,073	3.37	37,289	18,644			
Industrial	187,186	51,646	238,832	513	1.44	741	228	513	2.89	1,481	741			
Sub-total Retail	12,625,027	3,483,349	16,108,376	34,589	1.60	55,343	20,753	34,589	3.20	110,685	55,343	88,313	931,056	
Fire Protection														
Private						690	690			2,759	2,070	40,187	23,940	
Public (Providence)			69,188			1,085	1,085			4,338	3,254			3,232
Public (All Other)			71,029			1,113	1,113			4,453	3,340			3,318
Subtotal Fire Protection			140,217			2,888	2,888			11,551	8,663	40,187	23,940	6,550
Wholesale														
Bristol County	1,494,845	79,930	1,574,775	4,095	1.51	6,191	2,096	4,095	1.81	7,429	1,238			
East Providence	1,822,773	87,474	1,910,247	4,994	1.67	8,317	3,323	4,994	2.76	13,797	5,480			
Greenville	421,521	26,948	448,469	1,155	2.01	2,323	1,168	1,155	3.05	3,525	1,202			
Kent County	2,727,147	122,802	2,849,950	7,472	1.42	10,638	3,166	7,472	2.18	16,260	5,622			
Lincoln	1,038,229	70,541	1,108,770	2,844	1.90	5,402	2,557	2,844	2.23	6,354	952			
Smithfield	391,600	23,830	415,430	1,073	2.17	2,328	1,255	1,073	2.56	2,747	419			
Warwick	3,466,644	159,789	3,626,433	9,498	2.40	22,752	13,254	9,498	2.81	26,693	3,941			
Wholesale	11,362,760	571,315	11,934,074	31,131	1.86	57,951	26,821	31,131	2.47	76,806	18,855	-	-	-
Grand Total	23,987,787	4,054,664	28,182,668	65,720	1.77	116,182	50,462	65,720	3.03	199,042	82,860	128,499	954,996	6,550

Intraclass Distribution of Retail Max Day Based on Monthly Analysis

	Max Day	%
Residential	36,616	64.97%
Commercial	18,986	33.69%
Industrial	754	1.34%
	56,357	100.00%

Schedule HJS-16b: Customer Class Units of Service

Providence Water Supply Board

Docket # 4994

Individual Wholesale Cost of Service Study

Per RIPUC Report and Order No. 23928

Test Year Ending June 30, 2019

Rate Years Ending June 30, 2021 through 2023

Customer Class	Base Demand <i>Inch-Miles</i>	Maximum Day <i>Inch-Miles</i>	Maximum Hour <i>Inch-Miles</i>	Base Demand <i>Inch-Miles <=12"</i>
Retail				
Residential	6,173.49	5,810.00	5,605.82	4,319.20
Commercial	2,971.73	3,012.55	2,906.68	2,079.13
Industrial	137.63	119.67	115.47	96.29
Sub-total Retail	9,282.86	8,942.23	8,627.97	6,494.63
Fire Protection				
Private	-	111.46	215.09	-
Public (Providence)	39.87	175.23	338.15	27.90
Public (All Other)	40.93	179.90	347.15	28.64
Subtotal Fire Protection	80.80	466.59	900.39	56.53
Wholesale				
Bristol County	284.02	341.53	327.32	8.62
East Providence	357.74	251.43	241.72	0.04
Greenville	114.54	111.65	55.09	14.81
Kent County	29.10	24.67	30.38	-
Lincoln	304.87	239.36	138.09	79.71
Smithfield	134.64	187.91	199.47	10.63
Warwick	184.89	208.03	252.97	-
Wholesale	1,409.81	1,364.58	1,245.04	113.81
Grand Total	10,773.47	10,773.40	10,773.40	6,664.97

Intraclass Distribution of Retail Inch-Miles Based on Demand from HJS-16a

	Base	%	Max Day	%	Max Hour	%
Retail						
Residential	10,712,750	65.93%	35,958	61.75%	71,915	58.83%
Commercial	5,156,794	31.74%	18,644	32.02%	37,289	30.51%
Industrial	238,832	1.47%	741	1.27%	1,481	1.21%
Subtotal Retail	16,108,376	99.14%	55,343	95.04%	110,685	90.55%
Fire Protection						
Private	-	0.00%	690	1.18%	2,759	2.26%
Public (Providence)	69,188	0.43%	1,085	1.86%	4,338	3.55%
Public (All Other)	71,029	0.44%	1,113	1.91%	4,453	3.64%
Subtotal Fire Protection	140,217	0.86%	2,888	4.96%	11,551	9.45%

Schedule HJS-16c: Customer Class Units of Service

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

6" Equivalent Connections

Fire Connection Size	Accounts	Demand Factor	6" Eq. Factor	6" Eq. Conn.
5/8"	-	0.0	0.000	0.00
3/4"	2	0.5	0.004	0.01
1"	9	1.0	0.009	0.08
1-1/2"	2	2.9	0.026	0.05
2"	68	6.2	0.056	3.78
3"	-	18.0	0.162	0.00
4"	391	38.3	0.344	134.60
6"	1,245	111.3	1.000	1,245.00
8"	256	237.2	2.131	545.54
10"	4	426.6	3.832	15.33
12"	18	689.0	6.190	111.42
16"	-	1,468.4	13.192	0.00
Subtotal Private	1,995			2,056

Public Fire Hydrants (Providence Only) 3232

Public Fire Hydrants (All Other) 3318

Total Hydrants 6550

Equivalent 6" Connections	#	%
Private Firelines	2,056	23.89%
Providence Hydrants	3,232	37.56%
All Other Hydrants	3,318	38.56%
	<u>8,606</u>	100.00%

5/8" Equivalent Connections

Meter Size	Providence Accounts	All Accounts	Fire Accounts	5/8" Eq. M&S Factor	5/8" Eq. Prov FP
5/8"	25,954	57,812	-	1	1
3/4"	4,580	11,326	2	1.1	1.5
1"	2,091	5,335	9	1.4	3.75
1-1/2"	902	1,547	2	1.8	10
2"	792	1,357	68	2.9	24
3"	55	73	-	11	65
4"	20	35	391	14	110
6"	28	57	1,245	21	225
8"	15	42	256	29	340
10"	2	4	4	36.25	520
12"	-	-	18	43.5	860
16"	-	-	-	58	
	34,439	77,588	1,995		

	5/8" M&S	5/8" FP	Bills
Providence	39,820	86,908	413,268
All	88,313	n/a	931,056
Fire	40,187	n/a	23,940

Schedule HJS-16d: Summary of Customer Class Units of Service

Providence Water Supply Board

Docket # 4994

Individual Wholesale Cost of Service Study

Per RIPUC Report and Order No. 23928

Test Year Ending June 30, 2019

Rate Years Ending June 30, 2021 through 2023

Customer Class	Inch-Miles				Demand			Billing		Direct Fire
	Base	Maximum Day	Maximum Hour	Base	Base	Maximum Day Extra	Maximum Hour Extra	Meters & Services	Monthly Bills	
	<i>Inch-Miles</i>	<i>Inch-Miles</i>	<i>Inch-Miles</i>	<i>Inch-Miles <=12"</i>	<i>HCF</i>	<i>HCF/d</i>	<i>HCF/d</i>	<i>5/8" Eq.</i>	<i>Bills</i>	<i>6" Eq.</i>
Retail										
Residential	6,173.49	5,810.00	5,605.82	4,319.20	10,712,750	12,954	35,958			
Commercial	2,971.73	3,012.55	2,906.68	2,079.13	5,156,794	7,571	18,644			
Industrial	137.63	119.67	115.47	96.29	238,832	228	741			
Sub-total Retail	9,282.86	8,942.23	8,627.97	6,494.63	16,108,376	20,753	55,343	88,313	931,056	
Fire Protection										
Private	-	111.46	215.09	-		690	2,070	40,187	23,940	
Public (Providence)	39.87	175.23	338.15	27.90	69,188	1,085	3,254			3,232
Public (All Other)	40.93	179.90	347.15	28.64	71,029	1,113	3,340			3,318
Subtotal Fire Protection	80.80	466.59	900.39	56.53	140,217	2,888	8,663	40,187	23,940	6,550
Wholesale										
Bristol County	284.02	341.53	327.32	8.62	1,574,775	2,096	1,238			
East Providence	357.74	251.43	241.72	0.04	1,910,247	3,323	5,480			
Greenville	114.54	111.65	55.09	14.81	448,469	1,168	1,202			
Kent County	29.10	24.67	30.38	-	2,849,950	3,166	5,622			
Lincoln	304.87	239.36	138.09	79.71	1,108,770	2,557	952			
Smithfield	134.64	187.91	199.47	10.63	415,430	1,255	419			
Warwick	184.89	208.03	252.97	-	3,626,433	13,254	3,941			
Wholesale	1,409.81	1,364.58	1,245.04	113.81	11,934,074	26,821	18,855	-	-	-
Grand Total	10,773.47	10,773.40	10,773.40	6,664.97	28,182,668	50,462	82,860	128,499	954,996	6,550

Schedule HJS-17: Unit Cost of Service

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Total	CTA - Transmission & Distribution				CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only					
		Base	Max Day	Max Hour	Base	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire
		All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
Total Units of Service																	
Retail		9,282.86	8,942.23	8,627.97	6,494.63	16,108,376	20,753	55,343	16,108,376	20,753	55,343	16,108,376	20,753	55,343	88,313	931,056	-
Fire Protection		80.80	466.59	900.39	56.53	140,217	2,888	8,663	140,217	2,888	8,663	140,217	2,888	8,663	40,187	23,940	6,550
Bristol County		284.02	341.53	327.32	8.62	1,574,775	2,096	1,238									
East Providence		357.74	251.43	241.72	0.04	1,910,247	3,323	5,480									
Greenville		114.54	111.65	55.09	14.81	448,469	1,168	1,202	448,469	1,168	1,202						
Kent County		29.10	24.67	30.38	-	2,849,950	3,166	5,622									
Lincoln		304.87	239.36	138.09	79.71	1,108,770	2,557	952	1,108,770	2,557	952						
Smithfield		134.64	187.91	199.47	10.63	415,430	1,255	419	415,430	1,255	419						
Warwick		184.89	208.03	252.97	-	3,626,433	13,254	3,941									
Total		10,773.47	10,773.40	10,773.40	6,664.97	28,182,668	50,462	82,860	18,221,263	28,622	66,579	16,248,593	23,641	64,006	128,499	954,996	6,550
Unit Cost of Service																	
O&M Expense	\$ 39,207,946	\$ 1,393,847	\$ 1,070,246	\$ 1,757,388	\$ 2,255,246	\$ 15,978,157	\$ 1,713,613	\$ (12,867)	\$ 230,863	\$ 177,264	\$ 291,075	\$ 137,484	\$ 105,578	\$ 173,363	\$ 4,322,335	\$ 7,839,267	\$ 1,775,087
Unit Cost (\$/Unit)		\$ 129.38	\$ 99.34	\$ 163.12	\$ 338.37	\$ 0.57	\$ 33.96	\$ (0.16)	\$ 0.01	\$ 6.19	\$ 4.37	\$ 0.01	\$ 4.47	\$ 2.71	\$ 33.64	\$ 8.21	\$ 271.01
Capital Expense	\$ 37,967,000	\$ 6,764,405	\$ 5,180,428	\$ 8,506,479	\$ -	\$ 4,982,291	\$ 1,066,587	\$ 230,152	\$ 61,624	\$ 47,317	\$ 77,696	\$ 44,311	\$ 29,764	\$ 48,874	\$ 8,099,390	\$ 2,008,372	\$ 819,312
Unit Cost (\$/Unit)		\$ 627.88	\$ 480.85	\$ 789.58	\$ -	\$ 0.18	\$ 21.14	\$ 2.78	\$ 0.00	\$ 1.65	\$ 1.17	\$ 0.00	\$ 1.26	\$ 0.76	\$ 63.03	\$ 2.10	\$ 125.09
City Services Expense	\$ 839,167	\$ 35,356	\$ 27,147	\$ 44,577	\$ 50,885	\$ 306,003	\$ 18,801	\$ -	\$ 3,870	\$ 2,971	\$ 4,879	\$ 2,361	\$ 1,811	\$ 2,975	\$ 116,372	\$ 179,674	\$ 41,484
Unit Cost (\$/Unit)		\$ 3.28	\$ 2.52	\$ 4.14	\$ 7.63	\$ 0.01	\$ 0.37	\$ -	\$ 0.00	\$ 0.10	\$ 0.07	\$ 0.00	\$ 0.08	\$ 0.05	\$ 0.91	\$ 0.19	\$ 6.33
Property Tax Expense	\$ 7,934,311	\$ -	\$ -	\$ -	\$ -	\$ 4,445,430	\$ 3,098,233	\$ 72,874	\$ 104,242	\$ 80,040	\$ 131,429	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,062
Unit Cost (\$/Unit)		\$ -	\$ -	\$ -	\$ -	\$ 0.16	\$ 61.40	\$ 0.88	\$ 0.01	\$ 2.80	\$ 1.97	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.31
Net Op Rev Allowance	\$ 1,718,968	\$ 163,872	\$ 125,556	\$ 206,169	\$ 46,123	\$ 514,238	\$ 117,945	\$ 5,803	\$ 8,012	\$ 6,152	\$ 10,102	\$ 3,683	\$ 2,743	\$ 4,504	\$ 250,762	\$ 200,546	\$ 52,759
Unit Cost (\$/Unit)		\$ 15.21	\$ 11.65	\$ 19.14	\$ 6.92	\$ 0.02	\$ 2.34	\$ 0.07	\$ 0.00	\$ 0.21	\$ 0.15	\$ 0.00	\$ 0.12	\$ 0.07	\$ 1.95	\$ 0.21	\$ 8.05
Total Cost of Service	\$ 87,667,393	\$ 8,357,480	\$ 6,403,377	\$ 10,514,613	\$ 2,352,254	\$ 26,226,118	\$ 6,015,179	\$ 295,963	\$ 408,611	\$ 313,744	\$ 515,181	\$ 187,839	\$ 139,896	\$ 229,716	\$ 12,788,859	\$ 10,227,859	\$ 2,690,704
Unit Cost (\$/Unit)		\$ 775.75	\$ 594.37	\$ 975.98	\$ 352.93	\$ 0.93	\$ 119.20	\$ 3.57	\$ 0.02	\$ 10.96	\$ 7.74	\$ 0.01	\$ 5.92	\$ 3.59	\$ 99.52	\$ 10.71	\$ 410.79

Schedule HJS-18: Customer Class Cost of Service

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Description	Total	CTA - Transmission & Distribution			CTA - Supply, Treatment & Low Service			High Service & Retail			Retail Only						
		Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Base	Max Day	Max Hour	Meters & Services	Billing & Collection	Direct Fire	
		All Inch-Miles	All Inch-Miles	All Inch-Miles	Inch-Miles <=12"	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	HCF	HCF/d	HCF/d	5/8" Eq.	Bills	6" Eq.
Unit Cost of Service (\$/Unit)		\$ 775.75	\$ 594.37	\$ 975.98	\$ 352.93	\$ 0.93	\$ 119.20	\$ 3.57	\$ 0.02	\$ 10.96	\$ 7.74	\$ 0.01	\$ 5.92	\$ 3.59	\$ 99.52	\$ 10.71	\$ 410.79
Retail Service:																	
Residential Volume																	
Units of Service		6,173	5,810	5,606	4,319	10,712,750	12,954	35,958	10,712,750	12,954	35,958	10,712,750	12,954	35,958	-	-	-
Cost of Service	\$ 27,869,564	\$ 4,789,066	\$ 3,453,288	\$ 5,471,166	\$ 1,524,367	\$ 9,969,030	\$ 1,544,192	\$ 128,434	\$ 240,233	\$ 142,001	\$ 278,235	\$ 123,843	\$ 76,657	\$ 129,051	\$ -	\$ -	\$ -
Commercial Volume																	
Units of Service		2,972	3,013	2,907	2,079	5,156,794	7,571	18,644	5,156,794	7,571	18,644	5,156,794	7,571	18,644	-	-	-
Cost of Service	\$ 13,948,657	\$ 2,305,311	\$ 1,790,566	\$ 2,836,856	\$ 733,784	\$ 4,798,789	\$ 902,521	\$ 66,594	\$ 115,641	\$ 82,994	\$ 144,268	\$ 59,614	\$ 44,803	\$ 66,914	\$ -	\$ -	\$ -
Industrial Volume Charge																	
Units of Service		138	120	115	96	238,832	228	741	238,832	228	741	238,832	228	741	-	-	-
Cost of Service	\$ 596,983	\$ 106,768	\$ 71,131	\$ 112,695	\$ 33,985	\$ 222,252	\$ 27,156	\$ 2,645	\$ 5,356	\$ 2,497	\$ 5,731	\$ 2,761	\$ 1,348	\$ 2,658	\$ -	\$ -	\$ -
Meter Service Charge																	
Units of Service		-	-	-	-	-	-	-	-	-	-	-	-	-	88,313	931,056	-
Cost of Service	\$ 18,760,757	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8,789,292	\$ 9,971,466	\$ -
Fire Protection:																	
Private Fire Lines																	
Units of Service		-	111	215	-	-	690	2,070	-	690	2,070	-	690	2,070	40,187	23,940	-
Cost of Service	\$ 4,656,843	\$ -	\$ 66,250	\$ 209,926	\$ -	\$ -	\$ 82,230	\$ 7,392	\$ -	\$ 7,562	\$ 16,014	\$ -	\$ 4,082	\$ 7,427	\$ 3,999,567	\$ 256,394	\$ -
Public Fire (Providence)																	
Units of Service		40	175	338	28	69,188	1,085	3,254	69,188	1,085	3,254	69,188	1,085	3,254	-	-	3,232
Cost of Service	\$ 2,065,435	\$ 30,930	\$ 104,153	\$ 330,028	\$ 9,845	\$ 64,385	\$ 129,276	\$ 11,621	\$ 1,552	\$ 11,888	\$ 25,175	\$ 800	\$ 6,418	\$ 11,677	\$ -	\$ -	\$ 1,327,688
Public Fire (All Other)																	
Units of Service		41	180	347	29	71,029	1,113	3,340	71,029	1,113	3,340	71,029	1,113	3,340	-	-	3,318
Cost of Service	\$ 2,120,394	\$ 31,753	\$ 106,925	\$ 338,810	\$ 10,107	\$ 66,098	\$ 132,716	\$ 11,930	\$ 1,593	\$ 12,204	\$ 25,845	\$ 821	\$ 6,588	\$ 11,988	\$ -	\$ -	\$ 1,363,016
Wholesale Service:																	
Units of Service																	
Bristol County		284	342	327	9	1,574,775	2,096	1,238									
East Providence		358	251	242	0	1,910,247	3,323	5,480									
Greenville		115	112	55	15	448,469	1,168	1,202	448,469	1,168	1,202						
Kent County		29	25	30	-	2,849,950	3,166	5,622									
Lincoln		305	239	138	80	1,108,770	2,557	952	1,108,770	2,557	952						
Smithfield		135	188	199	11	415,430	1,255	419	415,430	1,255	419						
Warwick		185	208	253	-	3,626,433	13,254	3,941									
		1,410	1,365	1,245	114	11,934,074	26,821	18,855	1,972,669	4,981	2,574						
Cost of Service																	
Bristol County	\$ 2,465,525	\$ 220,327	\$ 202,995	\$ 319,457	\$ 3,042	\$ 1,465,448	\$ 249,834	\$ 4,421	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
East Providence	\$ 2,856,241	\$ 277,515	\$ 149,442	\$ 235,914	\$ 14	\$ 1,777,630	\$ 396,153	\$ 19,572	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Greenville	\$ 807,254	\$ 88,855	\$ 66,361	\$ 53,770	\$ 5,227	\$ 417,335	\$ 139,248	\$ 4,294	\$ 10,057	\$ 12,805	\$ 9,303	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Kent County	\$ 3,116,495	\$ 22,574	\$ 14,663	\$ 29,650	\$ -	\$ 2,652,095	\$ 377,431	\$ 20,082	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lincoln	\$ 1,941,987	\$ 236,502	\$ 142,268	\$ 134,773	\$ 28,132	\$ 1,031,795	\$ 304,850	\$ 3,401	\$ 24,864	\$ 28,033	\$ 7,368	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Smithfield	\$ 978,586	\$ 104,450	\$ 111,688	\$ 194,675	\$ 3,752	\$ 386,590	\$ 149,618	\$ 1,497	\$ 9,316	\$ 13,759	\$ 3,243	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Warwick	\$ 5,482,673	\$ 143,428	\$ 123,647	\$ 246,893	\$ -	\$ 3,374,672	\$ 1,579,954	\$ 14,078	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ 17,648,761	\$ 1,093,651	\$ 811,064	\$ 1,215,132	\$ 40,167	\$ 11,105,565	\$ 3,197,088	\$ 67,346	\$ 44,237	\$ 54,597	\$ 19,914	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Cost of Service	\$ 87,667,393	\$ 8,357,480	\$ 6,403,377	\$ 10,514,613	\$ 2,352,254	\$ 26,226,118	\$ 6,015,179	\$ 295,963	\$ 408,611	\$ 313,744	\$ 515,181	\$ 187,839	\$ 139,896	\$ 229,716	\$ 12,788,859	\$ 10,227,859	\$ 2,690,704

Schedule HJS-19: Development of Volumetric Rates

Providence Water Supply Board

Docket # 4994

Individual Wholesale Cost of Service Study

Per RIPUC Report and Order No. 23928

Test Year Ending June 30, 2019

Rate Years Ending June 30, 2021 through 2023

Description	Units	Residential	Commercial	Industrial	Bristol County	East Providence	Greenville	Kent County	Lincoln	Smithfield	Warwick
Unit Cost											
CTA Base - T&D	\$/Inch-Mile	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75	\$ 775.75
CTA Max Day - T&D	\$/Inch-Mile	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37	\$ 594.37
CTA Max Hour - T&D	\$/Inch-Mile	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98	\$ 975.98
CTA Base - T&D <=12"	\$/Inch-Mile	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93	\$ 352.93
CTA Base - SOS, WTP, LS	\$/HCF	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93	\$ 0.93
CTA Max Day - SOS, WTP, LS	\$/HCF/d	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20	\$ 119.20
CTA Max Hour - SOS, WTP, LS	\$/HCF/d	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57	\$ 3.57
HSR Base	\$/HCF	\$ 0.02	\$ 0.02	\$ 0.02			\$ 0.02		\$ 0.02	\$ 0.02	
HSR Max Day	\$/HCF/d	\$ 10.96	\$ 10.96	\$ 10.96			\$ 10.96		\$ 10.96	\$ 10.96	
HSR Max Hour	\$/HCF/d	\$ 7.74	\$ 7.74	\$ 7.74			\$ 7.74		\$ 7.74	\$ 7.74	
Retail Only Base	\$/HCF	\$ 0.01	\$ 0.01	\$ 0.01							
Retail Only Max Day	\$/HCF/d	\$ 5.92	\$ 5.92	\$ 5.92							
Retail Only Max Hour	\$/HCF/d	\$ 3.59	\$ 3.59	\$ 3.59							
Units											
Base	Inch-Miles	6,173	2,972	138	284	358	115	29	305	135	185
Maximum Day	Inch-Miles	5,810	3,013	120	342	251	112	25	239	188	208
Maximum Hour	Inch-Miles	5,606	2,907	115	327	242	55	30	138	199	253
Base	Inch-Miles <=12"	4,319	2,079	96	9	0	15	0	80	11	0
Base	HCF	10,712,750	5,156,794	238,832	1,574,775	1,910,247	448,469	2,849,950	1,108,770	415,430	3,626,433
Maximum Day	HCF/d	12,954	7,571	228	2,096	3,323	1,168	3,166	2,557	1,255	13,254
Maximum Hour	HCF/d	35,958	18,644	741	1,238	5,480	1,202	5,622	952	419	3,941

Schedule HJS-19: Development of Volumetric Rates

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Description	Units	Residential	Commercial	Industrial	Bristol County	East Providence	Greenville	Kent County	Lincoln	Smithfield	Warwick
Total Cost											
CTA Base - T&D		\$ 4,789,066	\$ 2,305,311	\$ 106,768	\$ 220,327	\$ 277,515	\$ 88,855	\$ 22,574	\$ 236,502	\$ 104,450	\$ 143,428
CTA Max Day - T&D		\$ 3,453,288	\$ 1,790,566	\$ 71,131	\$ 202,995	\$ 149,442	\$ 66,361	\$ 14,663	\$ 142,268	\$ 111,688	\$ 123,647
CTA Max Hour - T&D		\$ 5,471,166	\$ 2,836,856	\$ 112,695	\$ 319,457	\$ 235,914	\$ 53,770	\$ 29,650	\$ 134,773	\$ 194,675	\$ 246,893
CTA Base - T&D <=12"		\$ 1,524,367	\$ 733,784	\$ 33,985	\$ 3,042	\$ 14	\$ 5,227	\$ -	\$ 28,132	\$ 3,752	\$ -
CTA Base - SOS, WTP, LS		\$ 9,969,030	\$ 4,798,789	\$ 222,252	\$ 1,465,448	\$ 1,777,630	\$ 417,335	\$ 2,652,095	\$ 1,031,795	\$ 386,590	\$ 3,374,672
CTA Max Day - SOS, WTP, LS		\$ 1,544,192	\$ 902,521	\$ 27,156	\$ 249,834	\$ 396,153	\$ 139,248	\$ 377,431	\$ 304,850	\$ 149,618	\$ 1,579,954
CTA Max Hour - SOS, WTP, LS		\$ 128,434	\$ 66,594	\$ 2,645	\$ 4,421	\$ 19,572	\$ 4,294	\$ 20,082	\$ 3,401	\$ 1,497	\$ 14,078
HSR Base		\$ 240,233	\$ 115,641	\$ 5,356	\$ -	\$ -	\$ 10,057	\$ -	\$ 24,864	\$ 9,316	\$ -
HSR Maximum Day		\$ 142,001	\$ 82,994	\$ 2,497	\$ -	\$ -	\$ 12,805	\$ -	\$ 28,033	\$ 13,759	\$ -
HSR Maximum Hour		\$ 278,235	\$ 144,268	\$ 5,731	\$ -	\$ -	\$ 9,303	\$ -	\$ 7,368	\$ 3,243	\$ -
Retail Only Base		\$ 123,843	\$ 59,614	\$ 2,761	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Retail Only Max Day		\$ 76,657	\$ 44,803	\$ 1,348	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Retail Only Max Hour		\$ 129,051	\$ 66,914	\$ 2,658	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUS:											
Retail Service Charge Costs		\$ 5,121,572	\$ 2,563,336	\$ 109,707	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Retail Fire Protection Costs		\$ 6,674	\$ 3,340	\$ 143	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Private Fire Line Costs		\$ 221,362	\$ 110,791	\$ 4,742	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Public Fire Costs		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Rate Year Revenue Requirement		\$ 33,219,171	\$ 16,626,124	\$ 711,575	\$ 2,465,525	\$ 2,856,241	\$ 807,254	\$ 3,116,495	\$ 1,941,987	\$ 978,586	\$ 5,482,673
Rate Year Sales	HCF	8,396,176	4,041,665	187,186	1,494,845	1,822,773	421,521	2,727,147	1,038,229	391,600	3,466,644
Volumetric Rate Build-Up											
Base	\$/HCF	\$ 1.982633	\$ 1.982633	\$ 1.982633	\$ 1.129761	\$ 1.127491	\$ 1.237122	\$ 0.980757	\$ 1.272641	\$ 1.287300	\$ 1.014843
Maximum Day	\$/HCF	\$ 0.621252	\$ 0.697951	\$ 0.545618	\$ 0.302927	\$ 0.299322	\$ 0.518156	\$ 0.143774	\$ 0.457656	\$ 0.702412	\$ 0.491427
Maximum Hour	\$/HCF	\$ 0.715431	\$ 0.770631	\$ 0.660998	\$ 0.216664	\$ 0.140163	\$ 0.159818	\$ 0.018236	\$ 0.140184	\$ 0.509229	\$ 0.075281
Service Charge	\$/HCF	\$ 0.609989	\$ 0.634228	\$ 0.586086	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Retail Fire	\$/HCF	\$ 0.000795	\$ 0.000827	\$ 0.000764	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Private Fire	\$/HCF	\$ 0.026365	\$ 0.027412	\$ 0.025331	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Public Fire	\$/HCF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$/HCF	\$ 3.956464	\$ 4.113682	\$ 3.801432	\$ 1.649352	\$ 1.566976	\$ 1.915096	\$ 1.142767	\$ 1.870481	\$ 2.498941	\$ 1.581550
Rounded	\$/HCF	\$ 3.957000	\$ 4.114000	\$ 3.802000	\$ 1.649352	\$ 1.566977	\$ 1.915097	\$ 1.142768	\$ 1.870481	\$ 2.498941	\$ 1.581551
Revenues		\$ 33,223,668	\$ 16,627,410	\$ 711,681	\$ 2,465,525	\$ 2,856,243	\$ 807,254	\$ 3,116,497	\$ 1,941,987	\$ 978,586	\$ 5,482,675
COS		\$ 33,219,171	\$ 16,626,124	\$ 711,575	\$ 2,465,525	\$ 2,856,241	\$ 807,254	\$ 3,116,495	\$ 1,941,987	\$ 978,586	\$ 5,482,673
Variance due to Rounding		\$ 4,497	\$ 1,286	\$ 106	\$ 0	\$ 2	\$ 0	\$ 1	\$ 0	\$ 0	\$ 2

Schedule HJS-20a: Development of Meter Service Charge

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Meter Size	Meter Equivalency	M&S Cost Per Month	Billing Cost Per Bill	Total Cost Per Month	Existing Charge	Proposed Charge	Rounded Charge	Accounts	Revenues
5/8"	1	\$ 8.29	\$ 10.71	\$ 19.00	\$ 9.92	\$ 10.82	\$ 10.82	57,812	\$ 7,506,310
3/4"	1.1	\$ 9.12	\$ 10.71	\$ 19.83	\$ 10.57	\$ 11.53	\$ 11.53	11,326	\$ 1,567,065
1"	1.4	\$ 11.61	\$ 10.71	\$ 22.32	\$ 12.47	\$ 13.60	\$ 13.60	5,335	\$ 870,672
1.5"	1.8	\$ 14.93	\$ 10.71	\$ 25.64	\$ 15.00	\$ 16.36	\$ 16.36	1,547	\$ 303,707
2"	2.9	\$ 24.05	\$ 10.71	\$ 34.76	\$ 21.99	\$ 23.98	\$ 23.98	1,357	\$ 390,490
3"	11	\$ 91.23	\$ 10.71	\$ 101.94	\$ 73.49	\$ 80.14	\$ 80.14	73	\$ 70,203
4"	14	\$ 116.11	\$ 10.71	\$ 126.82	\$ 92.57	\$ 100.94	\$ 100.95	35	\$ 42,399
6"	21	\$ 174.17	\$ 10.71	\$ 184.88	\$ 137.07	\$ 149.47	\$ 149.48	57	\$ 102,244
8"	29	\$ 240.52	\$ 10.71	\$ 251.23	\$ 187.92	\$ 204.92	\$ 204.93	42	\$ 103,285
10"	36.25	\$ 300.65	\$ 10.71	\$ 311.36	\$ 234.01	\$ 255.18	\$ 255.19	4	\$ 12,249
12"	43.5	\$ 360.78	\$ 10.71	\$ 371.49	\$ 280.10	\$ 305.44	\$ 305.45	0	\$ -

Total Revenue Generated 77,588 \$ 10,968,625

Costs Allocated to Customer Service

Meters & Services	\$ 8,789,292
Billing & Collection	\$ 9,971,466
LESS Shift to Retail Volume Charge	\$ (7,794,615)
Total Customer Service Costs	\$ 10,966,142

Variance Due to Rounding \$ 2,482

Schedule HJS-20b: Development of Providence Retail Fire Protection Service Charge

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Meter Size	Meter Equivalency	Accounts	5/8" Equivalents	Fire Cost Per Month	Existing Charge	Proposed Charge	Rounded Charge	Revenues
5/8"	1	25,954	25,954	\$ 1.98	\$ 1.82	\$ 1.98	\$ 1.99	\$ 619,782
3/4"	1.5	4,580	6,870	\$ 2.97	\$ 2.72	\$ 2.97	\$ 2.97	\$ 163,231
1"	3.75	2,091	7,841	\$ 7.43	\$ 6.76	\$ 7.37	\$ 7.38	\$ 185,179
1.5"	10	902	9,020	\$ 19.80	\$ 18.03	\$ 19.66	\$ 19.67	\$ 212,908
2"	24	792	19,008	\$ 47.53	\$ 43.25	\$ 47.16	\$ 47.17	\$ 448,304
3"	65	55	3,575	\$ 128.73	\$ 117.11	\$ 127.70	\$ 127.71	\$ 84,289
4"	110	20	2,200	\$ 217.85	\$ 198.18	\$ 216.11	\$ 216.11	\$ 51,866
6"	225	28	6,300	\$ 445.61	\$ 405.37	\$ 442.04	\$ 442.05	\$ 148,529
8"	340	15	5,100	\$ 673.36	\$ 612.56	\$ 667.98	\$ 667.98	\$ 120,236
10"	520	2	1,040	\$ 1,029.85	\$ 936.86	\$ 1,021.62	\$ 1,021.62	\$ 24,519
12"	860	-	-	\$ 1,703.21	\$ 1,549.41	\$ 1,689.58	\$ 1,689.59	\$ -

Total Revenue Generated	\$2,058,843
Total FPSC Costs	\$ 2,065,435
LESS Shift to Retail Volume Charge	\$ (10,158)
Adjusted FPSC Costs	\$ 2,055,277

Variance Due to Rounding \$3,566

Schedule HJS-21a: Development of Private Fireline Charges

Providence Water Supply Board
 Docket # 4994
 Individual Wholesale Cost of Service Study
 Per RIPUC Report and Order No. 23928
 Test Year Ending June 30, 2019
 Rate Years Ending June 30, 2021 through 2023

Fire Connection Size	Accounts	Demand Factor	6" Eq. Factor	6" Eq. Conn.	5/8" Eq. Factor	M&S Cost Per Month	Cost Per Bill	Demand Cost Per Month	Total Cost Per Month	Existing Charge	Proposed Charge	Rounded Charge	Revenues
3/4"	2	0.5	0.004	0.01	1.10	\$9.12	\$10.71	\$ 0.07	\$ 19.90	\$ 11.34	\$ 12.37	\$ 12.37	\$ 297
1"	9	1.0	0.009	0.08	1.40	\$11.61	\$10.71	\$ 0.15	\$ 22.47	\$ 13.40	\$ 14.62	\$ 14.62	\$ 1,579
1-1/2"	2	2.9	0.026	0.05	1.80	\$14.93	\$10.71	\$ 0.42	\$ 26.06	\$ 16.50	\$ 18.00	\$ 18.00	\$ 432
2"	68	6.2	0.056	3.78	2.90	\$24.05	\$10.71	\$ 0.90	\$ 35.67	\$ 24.46	\$ 26.68	\$ 26.68	\$ 21,771
4"	391	38.3	0.344	134.60	14.00	\$116.11	\$10.71	\$ 5.59	\$ 132.42	\$104.53	\$ 113.99	\$ 113.99	\$ 534,841
6"	1,245	111.3	1.000	1,245.00	21.00	\$174.17	\$10.71	\$ 16.25	\$ 201.13	\$170.42	\$ 185.84	\$ 185.84	\$ 2,776,450
8"	256	237.2	2.131	545.54	29.00	\$240.52	\$10.71	\$ 34.63	\$ 285.86	\$258.11	\$ 281.47	\$ 281.47	\$ 864,676
10"	4	426.6	3.832	15.33	36.25	\$300.65	\$10.71	\$ 62.27	\$ 373.63	\$359.57	\$ 373.64	\$ 373.64	\$ 17,935
12"	18	689.0	6.190	111.42	43.50	\$360.78	\$10.71	\$ 100.59	\$ 472.08	\$482.35	\$ 472.08	\$ 472.08	\$ 101,969
16"	-	1,468.4	13.192	0.00	58.00	\$481.04	\$10.71	\$ 214.36	\$ 706.11	\$753.22	\$ 706.11	\$ 706.11	\$ -
	1,995			2,055.82									\$ 4,319,949

Costs Allocated to Private Fire Service

Meters & Services	\$ 3,999,567
Billing & Collection	\$ 256,394
Demand Costs	\$ 400,883
Less Costs Recovered from Retail Volume Charge	\$ (336,894)
Total Private Fire Protection Costs	\$ 4,319,949

Schedule HJS-21b: Development of Hydrant Charges

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Demand Costs (Hydrants Excluding Providence)	\$	757,378
Hydrants (Excluding Providence)		3,318
Annual Demand Costs per Hydrant	\$	228.26
<hr/>		
Annual Direct Fire Cost per Hydrant	\$	410.79
<hr/>		
Existing Annual Cost per Hydrant	\$	595.68
<hr/>		
Total Annual Cost per Hydrant	\$	639.06
<hr/>		
Proposed Annual Charge per Hydrant	\$	639.06
<hr/>		
Rounded Annual Charge per Hydrant	\$	639.06
<hr/>		
Hydrant Revenues	\$	2,120,401
<hr/>		
Costs Allocated to Hydrant Charge		
Demand	\$	757,378
Direct Fire	\$	1,363,016
LESS Shift to Retail Volume Charge	\$	-
Total Public Fire Costs (Excluding Providence)	\$	2,120,394

Schedule HJS-22: Proposed Rates

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Description	Units	Existing FY 2021		Proposed FY 2022			Proposed FY 2023		
		Rates	Revenue	% Change	Rates	Revenue	% Change	Rates	Revenue
Service Charges									
5/8"	57,812	\$ 9.92	\$ 6,881,940	9.07%	\$ 10.82	\$ 7,506,310	4.19%	\$ 11.27	\$ 7,820,945
3/4"	11,326	\$ 10.57	\$ 1,436,590	9.08%	\$ 11.53	\$ 1,567,065	4.19%	\$ 12.01	\$ 1,632,751
1"	5,335	\$ 12.47	\$ 798,329	9.06%	\$ 13.60	\$ 870,672	4.19%	\$ 14.17	\$ 907,167
1.5"	1,547	\$ 15.00	\$ 278,460	9.07%	\$ 16.36	\$ 303,707	4.19%	\$ 17.05	\$ 316,437
2"	1,357	\$ 21.99	\$ 358,085	9.05%	\$ 23.98	\$ 390,490	4.19%	\$ 24.99	\$ 406,858
3"	73	\$ 73.49	\$ 64,377	9.05%	\$ 80.14	\$ 70,203	4.19%	\$ 83.50	\$ 73,145
4"	35	\$ 92.57	\$ 38,879	9.05%	\$ 100.95	\$ 42,399	4.19%	\$ 105.18	\$ 44,176
6"	57	\$ 137.07	\$ 93,756	9.05%	\$ 149.48	\$ 102,244	4.19%	\$ 155.75	\$ 106,530
8"	42	\$ 187.92	\$ 94,712	9.05%	\$ 204.93	\$ 103,285	4.19%	\$ 213.52	\$ 107,614
10"	4	\$ 234.01	\$ 11,232	9.05%	\$ 255.19	\$ 12,249	4.19%	\$ 265.89	\$ 12,763
12"	-	\$ 280.10	\$ -	9.05%	\$ 305.45	\$ -	4.19%	\$ 318.25	\$ -
Total Service Charge	77,588		\$ 10,056,362	9.07%		\$ 10,968,625	4.19%		\$ 11,428,386
			\$ -						\$ -
Retail Fire Protection Service Charges (Providence Only)									
5/8"	25,954	\$ 1.82	\$ 566,835	9.34%	\$ 1.99	\$ 619,782	4.19%	\$ 2.07	\$ 645,760
3/4"	4,580	\$ 2.72	\$ 149,491	9.19%	\$ 2.97	\$ 163,231	4.19%	\$ 3.09	\$ 170,073
1"	2,091	\$ 6.76	\$ 169,622	9.17%	\$ 7.38	\$ 185,179	4.19%	\$ 7.69	\$ 192,941
1.5"	902	\$ 18.03	\$ 195,157	9.10%	\$ 19.67	\$ 212,908	4.19%	\$ 20.49	\$ 221,832
2"	792	\$ 43.25	\$ 411,048	9.06%	\$ 47.17	\$ 448,304	4.19%	\$ 49.15	\$ 467,095
3"	55	\$ 117.11	\$ 77,293	9.05%	\$ 127.71	\$ 84,289	4.19%	\$ 133.06	\$ 87,822
4"	20	\$ 198.18	\$ 47,563	9.05%	\$ 216.11	\$ 51,866	4.19%	\$ 225.17	\$ 54,040
6"	28	\$ 405.37	\$ 136,204	9.05%	\$ 442.05	\$ 148,529	4.19%	\$ 460.58	\$ 154,755
8"	15	\$ 612.56	\$ 110,261	9.05%	\$ 667.98	\$ 120,236	4.19%	\$ 695.98	\$ 125,276
10"	2	\$ 936.86	\$ 22,485	9.05%	\$ 1,021.62	\$ 24,519	4.19%	\$ 1,064.44	\$ 25,547
12"	-	\$ 1,549.41	\$ -	9.05%	\$ 1,689.59	\$ -	4.19%	\$ 1,760.41	\$ -
Total Retail FPSC (Providence Only)	34,439		\$ 1,885,959	9.17%		\$ 2,058,843	4.19%		\$ 2,145,141
Total Retail Service Charge Revenue			\$ 11,942,320	9.09%		\$ 13,027,467	4.19%		\$ 13,573,527
Retail Consumption Charges									
Description	Units	Existing FY 2021		Proposed FY 2022			Proposed FY 2023		
		Rates	Revenue	% Change	Rates	Revenue	% Change	Rates	Revenue
Residential	8,396,176	\$ 3.671	\$ 30,822,362	7.79%	\$ 3.957	\$ 33,223,668	4.19%	\$ 4.123	\$ 34,616,274
Commercial	4,041,665	\$ 3.847	\$ 15,548,285	6.94%	\$ 4.114	\$ 16,627,410	4.19%	\$ 4.286	\$ 17,324,366
Industrial	187,186	\$ 3.498	\$ 654,777	8.69%	\$ 3.802	\$ 711,681	4.19%	\$ 3.961	\$ 741,512
Total Retail Consumption Charge	12,625,027		\$ 47,025,424	7.52%		\$ 50,562,759	4.19%		\$ 52,682,152
East Smithfield Debt Surcharge	235,576	\$ 0.350	\$ 82,451	0.00%	\$ 0.350	\$ 82,451	0.00%	\$ 0.350	\$ 82,451
Total Retail Volume Charge Revenue			\$ 47,107,875	7.51%		\$ 50,645,211	4.18%		\$ 52,764,603
Total Retail Revenue			\$ 59,050,196	7.83%		\$ 63,672,678	4.19%		\$ 66,338,131

Schedule HJS-22: Proposed Rates

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

Description	Units	Existing FY 2021		Proposed FY 2022			Proposed FY 2023		
		Rates	Revenue	% Change	Rates	Revenue	% Change	Rates	Revenue
Wholesale Charges									
Bristol County	1,494,845	\$ 1.573918	\$ 2,352,763	4.79%	\$ 1.649352	\$ 2,465,525	2.84%	\$ 1.696271	\$ 2,535,662
East Providence	1,822,773	\$ 1.609038	\$ 2,932,911	-2.61%	\$ 1.566977	\$ 2,856,243	2.84%	\$ 1.611552	\$ 2,937,494
Greenville	421,521	\$ 1.651888	\$ 696,306	15.93%	\$ 1.915097	\$ 807,254	2.84%	\$ 1.969575	\$ 830,218
Kent County	2,727,147	\$ 1.571574	\$ 4,285,914	-27.29%	\$ 1.142768	\$ 3,116,497	2.84%	\$ 1.175276	\$ 3,205,151
Lincoln	1,038,229	\$ 1.623754	\$ 1,685,828	15.19%	\$ 1.870481	\$ 1,941,987	2.84%	\$ 1.923690	\$ 1,997,230
Smithfield	391,600	\$ 1.659247	\$ 649,762	50.61%	\$ 2.498941	\$ 978,586	2.84%	\$ 2.570028	\$ 1,006,424
Warwick	3,466,644	\$ 1.688386	\$ 5,853,034	-6.33%	\$ 1.581551	\$ 5,482,675	2.84%	\$ 1.626541	\$ 5,638,639
Total Wholesale Revenue	11,362,760		18,456,517	-4.38%		17,648,767	2.84%		18,150,816

Wholesale Charges									
Bristol County	1,118	\$ 2,104.17	\$ 2,352,763	4.79%	\$ 2,205.02	\$ 2,465,525	2.84%	\$ 2,267.74	\$ 2,535,662
East Providence	1,363	\$ 2,151.12	\$ 2,932,911	-2.61%	\$ 2,094.89	\$ 2,856,243	2.84%	\$ 2,154.48	\$ 2,937,494
Greenville	315	\$ 2,208.41	\$ 696,306	15.93%	\$ 2,560.29	\$ 807,254	2.84%	\$ 2,633.12	\$ 830,218
Kent County	2,040	\$ 2,101.03	\$ 4,285,914	-27.29%	\$ 1,527.76	\$ 3,116,497	2.84%	\$ 1,571.22	\$ 3,205,151
Lincoln	777	\$ 2,170.79	\$ 1,685,828	15.19%	\$ 2,500.64	\$ 1,941,987	2.84%	\$ 2,571.78	\$ 1,997,230
Smithfield	293	\$ 2,218.24	\$ 649,762	50.61%	\$ 3,340.83	\$ 978,586	2.84%	\$ 3,435.87	\$ 1,006,424
Warwick	2,593	\$ 2,257.20	\$ 5,853,034	-6.33%	\$ 2,114.37	\$ 5,482,675	2.84%	\$ 2,174.52	\$ 5,638,639
Wholesale (per million gallons)	8,499		18,456,517	-4.38%		17,648,767	2.84%		18,150,816

Description	Units	Existing FY 2021		Proposed FY 2022			Proposed FY 2023		
		Rates	Revenue	% Change	Rates	Revenue	% Change	Rates	Revenue
Private Fire Service Charges									
3/4"	2	\$ 11.34	\$ 272	9.08%	\$ 12.37	\$ 297	4.19%	\$ 12.89	\$ 309
1"	9	\$ 13.40	\$ 1,447	9.10%	\$ 14.62	\$ 1,579	4.19%	\$ 15.23	\$ 1,645
1-1/2"	2	\$ 16.50	\$ 396	9.09%	\$ 18.00	\$ 432	4.19%	\$ 18.75	\$ 450
2"	68	\$ 24.46	\$ 19,959	9.08%	\$ 26.68	\$ 21,771	4.19%	\$ 27.80	\$ 22,683
4"	391	\$ 104.53	\$ 490,455	9.05%	\$ 113.99	\$ 534,841	4.19%	\$ 118.77	\$ 557,260
6"	1,245	\$ 170.42	\$ 2,546,075	9.05%	\$ 185.84	\$ 2,776,450	4.19%	\$ 193.63	\$ 2,892,827
8"	256	\$ 258.11	\$ 792,914	9.05%	\$ 281.47	\$ 864,676	4.19%	\$ 293.27	\$ 900,920
10"	4	\$ 359.57	\$ 17,259	3.91%	\$ 373.64	\$ 17,935	4.19%	\$ 389.30	\$ 18,686
12"	18	\$ 482.35	\$ 104,188	-2.13%	\$ 472.08	\$ 101,969	4.19%	\$ 491.87	\$ 106,243
16"	-	\$ 753.22	\$ -	-6.25%	\$ 706.11	\$ -	4.19%	\$ 735.71	\$ -
Total			\$ 3,972,965	8.73%		\$ 4,319,949	4.19%		\$ 4,501,025
Hydrants (Excluding Providence)	3,318	\$ 595.68	\$ 1,976,466	7.28%	\$ 639.06	\$ 2,120,401	4.19%	\$ 665.85	\$ 2,209,280
Total Fire Protection Charge Revenue			5,949,431			6,440,350			6,710,305
Total Rate Revenues			83,456,144			87,761,795			91,199,252
Miscellaneous Revenues			1,543,163			1,543,163			1,543,163
Total Revenues			\$ 84,999,307	5.07%		\$ 89,304,958	3.85%		\$ 92,742,415

Schedule HJS-23: Comparison of Revenues by Customer Class

Providence Water Supply Board

Docket # 4994

Individual Wholesale Cost of Service Study

Per RIPUC Report and Order No. 23928

Test Year Ending June 30, 2019

Rate Years Ending June 30, 2021 through 2023

	FY 2021			FY 2022			FY 2023		
	Existing Rates	Proposed Rates	% Change	Existing Rates	Proposed Rates	% Change	Existing Rates	Proposed Rates	% Change
Retail									
Monthly Service Charge	\$ 7,662,995	\$ 10,056,362	31.2%	\$ 10,056,362	\$ 10,968,625	9.1%	\$ 10,968,625	\$ 11,428,386	4.2%
East Smithfield Debt Surcharge	\$ 82,451	\$ 82,451	0.0%	\$ 82,451	\$ 82,451	0.0%	\$ 82,451	\$ 82,451	0.0%
Periodic FPSC	\$ 1,434,918	\$ 1,885,959	31.4%	\$ 1,885,959	\$ 2,058,843	9.2%	\$ 2,058,843	\$ 2,145,141	4.2%
Volume Charge									
Residential	\$ 28,572,187	\$ 30,822,362	7.9%	\$ 30,822,362	\$ 33,223,668	7.8%	\$ 33,223,668	\$ 34,616,274	4.2%
Commercial	\$ 13,026,286	\$ 15,548,285	19.4%	\$ 15,548,285	\$ 16,627,410	6.9%	\$ 16,627,410	\$ 17,324,366	4.2%
Industrial	\$ 593,192	\$ 654,777	10.4%	\$ 654,777	\$ 711,681	8.7%	\$ 711,681	\$ 741,512	4.2%
Total Retail	\$ 51,372,030	\$ 59,050,196	14.9%	\$ 59,050,196	\$ 63,672,678	7.8%	\$ 63,672,678	\$ 66,338,131	4.2%
Wholesale									
Bristol County	\$ 2,019,323	\$ 2,352,763	16.5%	\$ 2,352,763	\$ 2,465,525	4.8%	\$ 2,465,525	\$ 2,535,662	2.8%
East Providence	\$ 2,462,307	\$ 2,932,911	19.1%	\$ 2,932,911	\$ 2,856,243	-2.6%	\$ 2,856,243	\$ 2,937,494	2.8%
Greenville	\$ 569,415	\$ 696,306	22.3%	\$ 696,306	\$ 807,254	15.9%	\$ 807,254	\$ 830,218	2.8%
Kent County	\$ 3,683,989	\$ 4,285,914	16.3%	\$ 4,285,914	\$ 3,116,497	-27.3%	\$ 3,116,497	\$ 3,205,151	2.8%
Lincoln	\$ 1,402,499	\$ 1,685,828	20.2%	\$ 1,685,828	\$ 1,941,987	15.2%	\$ 1,941,987	\$ 1,997,230	2.8%
Smithfield	\$ 528,996	\$ 649,762	22.8%	\$ 649,762	\$ 978,586	50.6%	\$ 978,586	\$ 1,006,424	2.8%
Warwick	\$ 4,682,944	\$ 5,853,034	25.0%	\$ 5,853,034	\$ 5,482,675	-6.3%	\$ 5,482,675	\$ 5,638,639	2.8%
Total Wholesale	\$ 15,349,475	\$ 18,456,517	20.2%	\$ 18,456,517	\$ 17,648,767	-4.4%	\$ 17,648,767	\$ 18,150,816	2.8%
Fire Protection									
Private Fire Protection	\$ 3,028,110	\$ 3,972,965	31.2%	\$ 3,972,965	\$ 4,319,949	8.7%	\$ 4,319,949	\$ 4,501,025	4.2%
Public Fire Protection	\$ 1,506,438	\$ 1,976,466	31.2%	\$ 1,976,466	\$ 2,120,401	7.3%	\$ 2,120,401	\$ 2,209,280	4.2%
Total Fire Protection	\$ 4,534,548	\$ 5,949,431	31.2%	\$ 5,949,431	\$ 6,440,350	8.3%	\$ 6,440,350	\$ 6,710,305	4.2%
Total Rate Revenues	\$ 71,256,053	\$ 83,456,144	17.1%	\$ 83,456,144	\$ 87,761,795	5.2%	\$ 87,761,795	\$ 91,199,252	3.9%
Miscellaneous Revenues	\$ 1,493,163	\$ 1,543,163		\$ 1,543,163	\$ 1,543,163		\$ 1,543,163	\$ 1,543,163	
Total Revenues	\$ 72,749,216	\$ 84,999,307	16.8%	\$ 84,999,307	\$ 89,304,958	5.1%	\$ 89,304,958	\$ 92,742,415	3.8%

Schedule HJS-24: Revenue Proof

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

	FY 2021	FY 2022	FY 2023
Net Operations & Maintenance Expense	\$ 40,751,109	\$ 40,751,109	\$ 41,853,301
Capital Expense	\$ 37,967,000	\$ 37,967,000	\$ 39,917,000
City Services Expense	\$ 839,167	\$ 839,167	\$ 839,167
Property Taxes Expense	\$ 7,934,311	\$ 7,934,311	\$ 8,251,684
Total Expenses Allocated	\$ 87,491,587	\$ 87,491,587	\$ 90,861,151
plus: Net Operating Revenue	\$ 1,718,968	\$ 1,718,968	\$ 1,786,360
Net Revenue Requirement	\$ 89,210,556	\$ 89,210,556	\$ 92,647,511
Retail			
Monthly Service Charge	\$ 10,056,362	\$ 10,968,625	\$ 11,428,386
East Smithfield Debt Surcharge	\$ 82,451	\$ 82,451	\$ 82,451
Retail FPSC	\$ 1,885,959	\$ 2,058,843	\$ 2,145,141
Volume Charge			
Residential	\$ 30,822,362	\$ 33,223,668	\$ 34,616,274
Commercial	\$ 15,548,285	\$ 16,627,410	\$ 17,324,366
Industrial	\$ 654,777	\$ 711,681	\$ 741,512
Total Retail	\$ 59,050,196	\$ 63,672,678	\$ 66,338,131
Wholesale			
Bristol County	\$ 2,352,763	\$ 2,465,525	\$ 2,535,662
East Providence	\$ 2,932,911	\$ 2,856,243	\$ 2,937,494
Greenville	\$ 696,306	\$ 807,254	\$ 830,218
Kent County	\$ 4,285,914	\$ 3,116,497	\$ 3,205,151
Lincoln	\$ 1,685,828	\$ 1,941,987	\$ 1,997,230
Smithfield	\$ 649,762	\$ 978,586	\$ 1,006,424
Warwick	\$ 5,853,034	\$ 5,482,675	\$ 5,638,639
Total Wholesale	\$ 18,456,517	\$ 17,648,767	\$ 18,150,816
Fire Protection			
Private Fire Protection	\$ 3,972,965	\$ 4,319,949	\$ 4,501,025
Public Fire Protection	\$ 1,976,466	\$ 2,120,401	\$ 2,209,280
Total Fire Protection	\$ 5,949,431	\$ 6,440,350	\$ 6,710,305
Total Rate Revenues	\$ 83,456,144	\$ 87,761,795	\$ 91,199,252
Miscellaneous Revenues	\$ 1,543,163	\$ 1,543,163	\$ 1,543,163
Total Revenues	\$ 84,999,307	\$ 89,304,958	\$ 92,742,415
Variance Due to Rounding	\$ 15,589	\$ 11,951	\$ 12,452

Schedule HJS-25: Comparison of Typical Bill Impacts

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

	FY 2021			FY 2022			FY 2023		
	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	Change
Residential - (5/8" Meter, 100 HCF)									
Service Charge	\$ 90.72	\$ 119.04	31.2%	\$ 119.04	\$ 129.84	9.1%	\$ 129.84	\$ 135.28	4.2%
Volume Charge	\$ 340.30	\$ 367.10	7.9%	\$ 367.10	\$ 395.70	7.8%	\$ 395.70	\$ 412.29	4.2%
Total	\$ 431.02	\$ 486.14	12.8%	\$ 486.14	\$ 525.54	8.1%	\$ 525.54	\$ 547.57	4.2%
Commercial - (2" Meter, 2,000 HCF)									
Service Charge	\$ 201.12	\$ 263.88	31.2%	\$ 263.88	\$ 287.76	9.0%	\$ 287.76	\$ 299.82	4.2%
Volume Charge	\$ 6,446.00	7,694.00	19.4%	7,694.00	8,228.00	6.9%	8,228.00	8,572.89	4.2%
Total	\$ 6,647.12	\$ 7,957.88	19.7%	\$ 7,957.88	\$ 8,515.76	7.0%	\$ 8,515.76	\$ 8,872.71	4.2%
Industrial - (6" Meter, 10,000 HCF)									
Service Charge	\$ 1,253.64	\$ 1,644.84	31.2%	\$ 1,644.84	\$ 1,793.76	9.1%	\$ 1,793.76	\$ 1,868.95	4.2%
Volume Charge	\$ 31,690.00	\$ 34,980.00	10.4%	\$ 34,980.00	\$ 38,020.00	8.7%	\$ 38,020.00	\$ 39,613.65	4.2%
Total	\$ 32,943.64	\$ 36,624.84	11.2%	\$ 36,624.84	\$ 39,813.76	8.7%	\$ 39,813.76	\$ 41,482.60	4.2%



MEMORANDUM

DATE: March 4, 2021

TO: Gregg Giasson, P.E. – Executive Engineer
Peter LePage – Director of Engineering

CC: Christen Constantino, Pare Corporation
Matthew Sprague, Pare Corporation

FROM: Timothy P. Thies, P.E. – Pare Corporation

RE: Transmission and Distribution Piping Evaluation
Wholesale Cost of Service Study
Providence Water Supply Board
Pare Project No. 14256.17

The purpose of this memorandum is to provide a summary of the hydraulic modeling performed by Pare Corporation (Pare) in support of Providence Water's recent wholesale cost of service study. Using Providence Water's computerized hydraulic model, Pare performed a study of the transmission and distribution piping that supplies water to each of Providence Water's wholesale customers. Specifically, those customers include:

1. Bristol County Water Authority
2. Kent County Water Authority
3. City of East Providence
4. Lincoln Water Commission
5. Greenville Water District
6. Smithfield Water Supply Board
7. City of Warwick

The purpose of the study was to identify which transmission and distribution pipes supply water to each wholesaler customer during three demand scenarios – average day demand (ADD), maximum day demand (MDD), and peak hour (or max hour) demand (PH). The model was used to trace the flow path from the Providence Water's treatment plant to each wholesale customer. Once the flow path was identified for each demand scenario, the model was used to identify how much water (in terms of flow rate) moves through each pipe segment, and how much of that flow rate can be attributed to each wholesale customer. From that data, Pare was able to tabulate how many miles of pipe each wholesale customer utilizes and what the breakdown of pipes is by diameter. Pare was also able to provide a summary of the percentage of flow in each pipe that can be attributed to any one wholesale customer.

A description of Pare's methodology is provided below, and a summary of the results are provided in the attached tables.

Draw Rate Analysis

The first step in the modeling process was to identify how much water (in terms of flow rate) each wholesale customer draws through Providence Water's system under ADD, MDD, and PH scenarios. An important element of this study is recognizing that the flow rate that each wholesale customer draws through Providence Water's system is not necessarily equal to their consumption on an average day, maximum day, or during a peak hour demand.

To illustrate how the draw rate for each wholesaler can vary from actual consumption, consider Lincoln Water Commission's (LWC) demand. LWC draws water from Providence Water through a pump station that has two pumps. LWC's consumption varies day to day and hour by hour, but when they draw water from Providence Water they do so at a relatively fixed rate. There are three draw scenarios for LWC – one when they are drawing no water from Providence Water, one when they are drawing water with one pump on, and one when they are drawing water with two pumps on. During relatively low consumption periods they will draw water using one pump. During relatively high consumption periods, LWC will draw water using two pumps. There are also times when LWC is consuming water but drawing water solely from their own storage tanks and not from Providence Water. The result is a draw rate that does not necessarily match system consumption.

The draw rate for each wholesale customer was established in the model using recent SCADA data from days when Providence Water's system demand closely matched their ADD, MDD, and PH demands. Pare examined SCADA records for selected days to evaluate how each wholesale customer draws water from the Providence Water system. Pare then set each wholesaler's draw rate in the model to a value that represents their draw rate during each demand scenario. Every wholesale customer draws water from Providence Water in their own unique way. Some, like LWC, draw their water through pumps. Others draw water through gravity connections without the use of pump but control the flow of water with control valves. Through our evaluation of SCADA data, Pare matched each wholesale customer with their unique draw rate and used that draw rate to evaluate their utilization of Providence Water's transmission and distribution piping during each demand scenario.

Back-Tracing

Starting at the point of interconnection, Pare traced the flow path of each wholesale connection back to the treatment plant. As the flow path was traced, each pipe segment in the model was flagged for the individual wholesale customer. The flagging was used to sort and extract data from the model relative to each wholesaler customer's flow path. As the flow path was mapped through the transmission and distribution piping, the path was simultaneously logged into a database created in Microsoft Excel. The type of data tracked in the database included total flow in each pipe section, portion of flow that can be attributed to each wholesale customer, pipe segment length, and pipe segment diameter.

The process of tracing the flow path from the wholesale connection to the treatment plant, called “back-tracing” starts at the connection point of each wholesaler. At that point in the system, 100% of the total flow in the pipe segment belongs to the wholesale customer. As flow is traced backwards away from the wholesale connection toward the treatment plant, the total flow in the pipe network increases as the network picks up flow from retail demand and other wholesale customers. However, the amount of flow that belongs to an individual wholesaler remains unchanged. For example, one wholesale customer may have a draw rate of 1,000 gpm. At the connection to their system, the total flow in the upstream pipe segment would be 1,000 gpm, meaning 100% of the flow in that pipe belongs to that wholesale customer.



FIGURE 1

As the flow is traced back to the treatment plant, the total flow in the pipe network might increase to say 50,000 gpm, of which only 1,000 gpm belongs to the wholesaler customer, or 2% of the flow in that pipe.

For most wholesale customers, as flow is traced backwards away from their connection, the pipe network splits. At each split, a certain percentage of the flow goes in one direction and a certain percentage goes in another direction. As the flow splits, the proportion that belongs to a wholesale customer splits proportionately. For example, if a pipe has a total flow rate of 100 gpm and splits into two pipes of 70 gpm and 30 gpm, the wholesale customers demand would split 70% and 30% accordingly. If the wholesale customer’s draw rate is 50 gpm, one path would account for 70% or 35 gpm and the other would account for 30% or 15 gpm.



FIGURE 2

The process of back-tracing is an iterative process where the engineer works backwards through the system, starting at the wholesale customer and moving toward the source, in this case the treatment plant. The engineer tracks and logs the total flow and wholesale customer flow in each pipe segment. The engineer calculates the split at each node where the pipe network splits, follows one leg of the split to the source (or to the next split in the pipes). After one leg is traced all the way back to the treatment plant, the tracer goes back to the original pipe split and works through the other pipe leg in the same manner until each pipe split has been traced back to the treatment plant. As mentioned previously, as the flow splits at junctions, the total flow that belongs to any one wholesale customer similarly splits, which leads to smaller and smaller flow rates being traced back through the system. In some cases, the flow might split many times before it gets back to the treatment plant. In some instances, the flow might split so many times that the amount of a wholesale customer's flow in a particular pipe section might be a relatively small percentage of their total draw rate. In cases where a wholesale customer's flow in a specific pipe section was less than 1% of that wholesale customer's total draw rate, Pare did not trace that flow back to the treatment plant. Tracing relatively low (i.e., less than 1% of draw rate) generally results a disproportionately large amount of back-tracing but very small amounts of transmission and distribution piping being added to the overall inventory of pipes.

Inch-Mile Analysis

Every wholesale customer uses a different combination of pipes to move water from the treatment plant to their connection. Some wholesale customers might rely solely on large pipes over 30 inches in diameter, while others might rely on smaller diameter pipes as small as 8 inches in diameter. To compare each system to every other system in terms of how much piping they utilize, Pare calculated the total amount of inch-miles that each wholesale customer utilizes. To calculate the inch-mile summary, Pare multiplied each pipe segment's length (in miles) by its diameter (in inches) and then added the results of all the pipe segments for that wholesale customer. The result is a summation of all the transmission and distribution pipes that each wholesale customer's flow touches on its way to the wholesale connection point. Understanding that the amount of flow in each pipe segment attributed to any one wholesale customer varies, anywhere from <1% to 100

percent, the inch-mile value for each pipe segment was pro-rated by the percentage of flow that can be attributed to each wholesale customer. The resulting summation is a reasonable representation of the total pipe infrastructure that each wholesale customer utilizes when it draws water through Providence Water's system.

To assist Providence Water's rate consultant, results from the piping evaluation are provided in the attached table that breaks down each wholesale customer by pipe diameter, inch-miles, and total miles of pipe utilized by each wholesale customer during an ADD, MDD, and PH scenario.

Attachments: Summary Tables 1-4 for Inch-Mile Analysis

PROVIDENCE WATER WHOLESALE COST OF SERVICE STUDY - TABLE 1

SUMMARY OF INCH-MILE ANALYSIS															
WHOLESALER	ADD (gpm)	ADD (MGD)	Total Inch Miles	Wholesale Inch Miles	% Total Inch Miles	MDD (gpm)	MDD (MGD)	Total Inch Miles	Wholesale Inch Miles	% Total Inch Miles	PH DEMAND (gpm)	PH (MGD)	Total Inch Miles	Wholesale Inch Miles	% Total Inch Miles
BCWA	2,229	3.21	1998.96	284.01	14%	3,844	5.53	1966.07	341.53	17%	4,444	6.40	1994.12	327.32	16%
EP	6,458	9.30	1410.01	357.58	25%	6,458	9.30	871.96	251.42	29%	6,458	9.30	1410.01	241.73	17%
GREENVILLE	1,167	1.68	833.22	114.54	14%	1,875	2.70	873.11	111.66	13%	1,875	2.70	822.80	55.09	7%
KCWA	4,722	6.80	134.18	29.10	22%	5,903	8.5	134.18	24.67	18%	8,194	11.80	134.18	30.38	23%
LWC	2,167	3.12	2206.48	304.87	14%	3,167	4.56	1099.91	239.36	22%	3,167	4.56	2178.07	138.09	6%
SMITHFIELD	938	1.35	2147.02	134.65	6%	1,389	2.00	3135.85	187.91	6%	1,389	2.00	2068.97	199.48	10%
WARWICK NATICK	4,134	5.95	1033.33	184.90	18%	6,858	9.88	1002.87	208.03	21%	9,167	13.20	1033.33	252.97	24%
WARWICK PETTACONSETT	1,917	2.76				2,978	4.29				4,861	7.00			

PROVIDENCE WATER WHOLESALE COST OF SERVICE STUDY - TABLE 2

AVERAGE DAY DEMAND									
		Providence	BCWA	EP	Greenville	KCWA	LWC	Smithfield	Warwick
Total	Inch Miles	10773.47	284.01	357.88	114.54	29.10	304.87	134.65	184.90
	Miles	1024.32	8.67	3.89	5.35	0.37	15.77	4.19	2.96
	Pipe Segments	37344	461	73	347	7	932	564	85
102"	Inch Miles	525.69	33.60	234.99	0	0	18.61	12.06	15.81
	Miles	5.15	0.33	2.30	0	0	0.18	0.12	0.16
	Pipe Segments	22	22	22	0	0	22	22	4
90"	Inch Miles	406.02	14.01	7.69	9.65	0.25	16.05	10.48	24.78
	Miles	4.51	0.16	0.09	0.11	0.003	0.18	0.12	0.28
	Pipe Segments	4	4	4	4	4	4	4	4
78"	Inch Miles	345.05	15.61	109.13	0	28.85	8.64	5.63	76.70
	Miles	4.42	0.20	1.40	0	0.37	0.11	0.07	0.98
	Pipe Segments	23	19	19	0	5	19	19	19
66"	Inch Miles	106.04	7.99	4.17	0.001	0	5.42	3.55	14.02
	Miles	1.61	0.12	0.06	0.00002	0	0.08	0.05	0.21
	Pipe Segments	14	11	8	1	0	10	10	10
60"	Inch Miles	263.97	0.91	1.57	8.62	0	18.30	11.07	1.34
	Miles	4.40	0.02	0.03	0.14	0	0.31	0.18	0.02
	Pipe Segments	50	14	12	30	0	47	47	8
48"	Inch Miles	154.81	2.93	0.04	1.01	0	35.70	23.37	0.12
	Miles	3.23	0.06	0.00	0.02	0	0.74	0.49	0.003
	Pipe Segments	51	7	3	6	0	39	39	3
42"	Inch Miles	205.59	1.64	0	0.01	0	20.73	13.46	44.84
	Miles	4.90	0.04	0	0.0003	0	0.49	0.32	1.07
	Pipe Segments	72	35	0	2	0	44	44	16
36"	Inch Miles	68.69	12.52	0.02	0.05	0	1.84	2.10	0.42
	Miles	1.91	0.35	0.001	0.002	0	0.05	0.06	0.01
	Pipe Segments	61	42	2	3	0	11	17	4
30"	Inch Miles	507.75	170.45	0	0.13	0	16.86	11.33	6.72
	Miles	16.93	5.68	0	0.004	0	0.56	0.38	0.22
	Pipe Segments	298	133	0	3	0	13	24	14
24"	Inch Miles	647.27	13.98	0.09	79.60	0	32.19	22.42	0.14
	Miles	26.97	0.58	0.004	3.32	0	1.34	0.93	0.006
	Pipe Segments	583	30	1	103	0	66	92	3
20"	Inch Miles	163.65	0.53	0	0.14	0	4.66	0.004	0
	Miles	8.18	0.03	0	0.01	0	0.23	0.0002	0
	Pipe Segments	197	20	0	2	0	4	1	0
16"	Inch Miles	713.98	1.23	0	0.52	0	46.16	8.54	0
	Miles	44.62	0.08	0	0.03	0	2.88	0.53	0
	Pipe Segments	1352	20	0	6	0	83	107	0
12"	Inch Miles	1162.12	2.54	0.04	3.44	0	42.11	9.62	0
	Miles	96.84	0.21	0.00	0.29	0	3.51	0.80	0
	Pipe Segments	3684	27	2	50	0	200	123	0
10"	Inch Miles	12.29	0	0	0	0	0	0	0
	Miles	1.23	0	0	0	0	0	0	0
	Pipe Segments	71	0	0	0	0	0	0	0
8"	Inch Miles	2785.82	4.70	0	11.25	0	28.17	1.00	0
	Miles	348.23	0.59	0	1.41	0	3.52	0.13	0
	Pipe Segments	11422	65	0	131	0	271	12	0
6"	Inch Miles	2703.15	1.38	0	0.12	0	9.43	0.01	0
	Miles	450.52	0.23	0	0.02	0	1.57	0.002	0
	Pipe Segments	19338	12	0	6	0	99	3	0
<6"	Inch Miles	1.59	0	0	0	0	0	0	0
	Miles	0.67	0	0	0	0	0	0	0
	Pipe Segments	102	0	0	0	0	0	0	0

PROVIDENCE WATER WHOLESALE COST OF SERVICE STUDY - TABLE 3

MAX DAY DEMAND									
		Providence	BCWA	EP	Greenville	KCWA	LWC	Smithfield	Warwick
Total	Inch Miles	10773.47	341.53	251.42	111.66	24.67	239.36	187.91	208.03
	Miles	1024.32	9.18	2.71	4.83	0.32	13.07	5.99	3.22
	Pipe Segments	37344	380	47	371	7	751	782	70
102"	Inch Miles	525.69	50.90	171.50	0	0	0	13.88	17.09
	Miles	5.15	0.50	1.68	0	0	0	0	0.17
	Pipe Segments	22	22	22	0	0	0	22	4
90"	Inch Miles	406.02	20.43	0.20	14.57	0.18	23.11	14.44	34.86
	Miles	4.51	0.23	0.00	0.16	0.002	0.26	0.16	0.39
	Pipe Segments	4	4	2	4	2	4	8	4
78"	Inch Miles	345.05	23.40	78.83	0	24.49	0	6.48	84.04
	Miles	4.42	0.30	1.01	0	0.31	0	0.08	1.08
	Pipe Segments	23	19	19	0	5	0	19	19
66"	Inch Miles	106.04	12.85	0	0.16	0	0.19	4.11	21.56
	Miles	1.61	0.19	0	0.002	0	0.003	0.06	0.33
	Pipe Segments	14	11	0	2	0	1	11	10
60"	Inch Miles	263.97	0.35	0.90	12.58	0	31.03	15.47	0.06
	Miles	4.40	0.01	0.02	0.21	0	0.52	0.26	0.001
	Pipe Segments	50	6	4	27	0	37	84	2
48"	Inch Miles	154.81	3.43	0	2.88	0	26.07	28.67	0
	Miles	3.23	0.07	0	0.06	0	0.54	0.60	0
	Pipe Segments	51	4	0	9	0	39	84	0
42"	Inch Miles	205.59	8.77	0	0.02	0	0.03	15.50	43.54
	Miles	4.90	0.21	0	0.0005	0	0.001	0.37	1.04
	Pipe Segments	72	35	0	2	0	2	46	16
36"	Inch Miles	68.69	17.55	0	0.10	0	1.74	2.69	0.36
	Miles	1.91	0.49	0	0.003	0	0.05	0.07	0.01
	Pipe Segments	61	40	0	2	0	12	28	2
30"	Inch Miles	507.75	186.04	0	0.07	0	14.95	14.62	6.52
	Miles	16.93	6.201333	0	0.002	0	0.50	0.49	0.22
	Pipe Segments	298	133	0	1	0	13	31	13
24"	Inch Miles	647.27	11.96	0	66.97	0	28.86	50.02	0
	Miles	26.97	0.50	0	2.79	0	1.20	2.08	0
	Pipe Segments	583	30	0	109	0	68	200	0
20"	Inch Miles	163.65	0.56	0	0.11	0	4.63	0.01	0
	Miles	8.18	0.03	0	0.01	0	0.23	0.0006	0
	Pipe Segments	197	20	0	1	0	4	3	0
16"	Inch Miles	713.98	1.34	0	0.64	0	41.37	9.80	0
	Miles	44.62	0.08375	0	0.04	0	2.59	0.61	0
	Pipe Segments	1352	20	0	16	0	76	108	0
12"	Inch Miles	1162.12	3.22	0	3.81	0	35.54	11.05	0
	Miles	96.84	0.27	0	0.32	0	2.96	0.92	0
	Pipe Segments	3684	25	0	54	0	190	123	0
10"	Inch Miles	12.29	0	0	0	0	0	0	0
	Miles	1.23	0	0	0	0	0	0	0
	Pipe Segments	71	0	0	0	0	0	0	0
8"	Inch Miles	2785.82	0.48	0	9.2	0	26.13	1.15	0
	Miles	348.23	0.06	0	1.15	0	3.27	0	0
	Pipe Segments	11422	8	0	129	0	243	12	0
6"	Inch Miles	2703.15	0.25	0	0.54	0	5.71	0.02	0
	Miles	450.52	0.04	0	0.09	0	0.95	0	0
	Pipe Segments	19338	3	0	17	0	62	3	0
<6"	Inch Miles	1.59	0	0	0	0	0	0	0
	Miles	0.67	0	0	0	0	0	0	0
	Pipe Segments	102	0	0	0	0	0	0	0

PROVIDENCE WATER WHOLESALE COST OF SERVICE STUDY - TABLE 4

		PEAK HOUR							
		Providence	BCWA	EP	Greenville	KCWA	LWC	Smithfield	Warwick
Total	Inch Miles	10773.47	327.32	241.73	55.09	30.38	138.09	199.48	252.97
	Miles	1024.32	8.56	2.60	2.80	0.39	8.47	6.19	3.83
	Pipe Segments	37344	401	73	307	7	888	510	85
102"	Inch Miles	525.69	57.75	166.71	0	0	3.03	18.08	21.40
	Miles	5.15	0.57	1.63	0	0	0.03	0.18	0.21
	Pipe Segments	22	22	22	0	0	22	22	4
90"	Inch Miles	406.02	18.46	3.31	1.70	0.25	7.13	15.72	47.55
	Miles	4.51	0.21	0.04	0.02	0.003	0.08	0.17	0.53
	Pipe Segments	4	4	4	4	2	4	4	4
78"	Inch Miles	345.05	23.64	69.10	0	30.13	1.24	8.44	103.18
	Miles	4.42	0.30	0.89	0	0.39	0.02	0.11	1.32
	Pipe Segments	23	19	19	0	5	19	19	19
66"	Inch Miles	106.04	9.29	1.44	0.12	0	1.00	5.32	23.79
	Miles	1.61	0.14	0.02	0.002	0	0.02	0.08	0.36
	Pipe Segments	14	11	8	3	0	10	10	10
60"	Inch Miles	263.97	1.35	1.05	1.71	0	8.25	16.6	2.87
	Miles	4.40	0.02	0.02	0.03	0	0.14	0.28	0.05
	Pipe Segments	50	14	12	30	0	47	47	8
48"	Inch Miles	154.81	2.77	0.01	0.84	0	8.25	35.04	0.2
	Miles	3.23	0.06	0.0003	0.02	0	0.17	0.73	0.004
	Pipe Segments	51	7	3	6	0	39	39	3
42"	Inch Miles	205.59	12.62	0	0.003	0	4.15	20.19	46.35
	Miles	4.90	0.30	0	0.0001	0	0.10	0.48	1.10
	Pipe Segments	72	35	0	2	0	47	44	16
36"	Inch Miles	68.69	15.66	0.01	0.01	0	0.80	2.74	0.51
	Miles	1.91	0.44	0.0003	0.0003	0	0.02	0.076	0.01
	Pipe Segments	61	42	2	2	0	14	15	4
30"	Inch Miles	507.75	171.63	0	0.04	0	15.42	15.86	6.93
	Miles	16.93	5.72	0	0.001	0	0.51	0.53	0.23
	Pipe Segments	298	134	0	1	0	28	16	14
24"	Inch Miles	647.27	8.82	0.06	42.98	0	14.91	32.83	0.19
	Miles	26.97	0.37	0.00	1.79	0	0.62	1.37	0.008
	Pipe Segments	583	33	1	106	0	73	52	3
20"	Inch Miles	163.65	0.42	0	0.07	0	4.55	0.006	0
	Miles	8.18	0.02	0	0.004	0	0.23	0.00	0
	Pipe Segments	197	20	0	2	0	4	1	0
16"	Inch Miles	713.98	1.12	0	0.12	0	24.53	12.76	0
	Miles	44.62	0.07	0	0.008	0	1.53	0.80	0
	Pipe Segments	1352	20	0	10	0	113	103	0
12"	Inch Miles	1162.12	3.13	0.03	0.53	0	21.27	14.36	0
	Miles	96.84	0.26	0.002	0.04	0	1.77	1.20	0
	Pipe Segments	3684	25	2	9	0	156	123	0
10"	Inch Miles	12.29	0	0	0	0	0	0	0
	Miles	1.23	0	0	0	0	0	0	0
	Pipe Segments	71	0	0	0	0	0	0	0
8"	Inch Miles	2785.82	0.47	0	6.67	0	16.69	1.50	0
	Miles	348.23	0.06	0	0.83	0	2.09	0.19	0
	Pipe Segments	11422	12	0	121	0	225	12	0
6"	Inch Miles	2703.15	0.19	0	0.30	0	6.87	0.02	0
	Miles	450.52	0.03	0	0.05	0	1.15	0.003	0
	Pipe Segments	19338	3	0	11	0	87	3	0
<6"	Inch Miles	1.59	0	0	0	0	0	0	0
	Miles	0.67	0	0	0	0	0	0	0
	Pipe Segments	102	0	0	0	0	0	0	0