INFRASTRUCTURE REPLACEMENT PLAN

2006–2025

Providence Water

PROVIDENCE WATER SUPPLY BOARD

INFRASTRUCTURE REPLACEMENT PLAN
For Fiscal Years 2006 Through 2025

Prepared In-House by the
Project Development Team of
Paul J. Gadoury, P.E., Director of Engineering
Steven D. Santaniello, Manager Capital Improvements
Christopher R. Labossiere, Engineer/Project Manager

Project Support Staff
Ronald Campbell
Peter LePage
Gary Marino
Richard A. Razza
Norman C. Ripstein
Stephen Soito, P.E.

Finance Department Support
Jeanne Bondarevskis, Director of Finance
Mary L. Deignan-White, Manager of Regulatory

Chief Engineer and General Manager
Pamela M. Marchand, P.E.

MARCH 2006

TABLE OF CONTENTS

Executive Summary

Letter from Chief Engineer

Exhibit 1 – 20 Year IFR Plan – Fiscal Years 2006 through 2025

Exhibit 2 – 20 Year IFR Plan (Pie Graph) – Fiscal Years 2006 through 2025

Exhibit 3 – 20 Year Sources and Uses of Funds – Fiscal Years 2006 through 2025

Exhibit 4 – IFR Funding Projections (Bar Graph) – Fiscal Years 2006 through 2025

Providence Water

March 23, 2006

Ms. June Swallow, P.E., Chief
Office of Drinking Water Quality
Rhode Island Department of Health
3 Capitol Hill, Room 209
Providence, RI 02908

RE: Infrastructure Replacement Plan

Dear Ms. Swallow:

Providence Water is pleased to submit herein six (6) copies of its updated Infrastructure Replacement Plan consistent with the requirements of the Comprehensive Clean Water Infrastructure Act of 1993 in accordance with Chapter 46-15.6 of the General Laws of the State of Rhode Island and the appropriate rules and regulations pertaining to the Act.

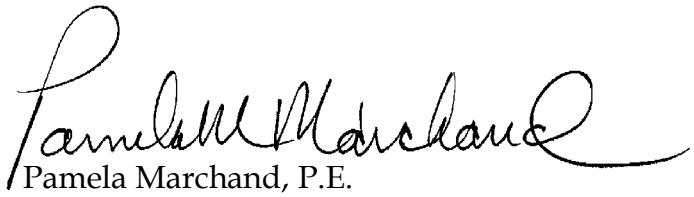
Consistent with the requirements of the Act, our plan presents our infrastructure replacement needs for 5-year and 20-year planning horizons and addresses the funding requirements for implementing the plan.

The objective of the plan is to replace aging facilities and components of the water system on a systematic basis, within the limit of their useful lives, before failures jeopardize the reliability of water service and place the public's health and welfare at risk. Funding for the plan is to be from approved revenues annually set aside in a restricted account.

While work remains to be done, we have made substantial improvements to our system since the inception of our Infrastructure Replacement Program in 1996, having invested approximately $110 million into our treatment plant, storage reservoirs, pump stations, dams, and transmission and distribution lines. Included in this plan document is a report detailing the accomplishments of our infrastructure replacement program over the period from July 1996 through December 2006. These improvements, along with the ongoing planned improvements outlined in this plan submission, will serve to safeguard the integrity of our water supply for generations to come.

Our plan was prepared by our in-house staff and reflects our best determination at this time of our anticipated system needs. The plan is, however, subject to adjustments as may become necessary as the result of changes in the condition of system components, obsolescence, regulatory requirements, or unforeseen events which cannot now be reliably predicted over a 20-year period. Also, Providence Water intends to review the distribution system rehabilitation program. Should this program be accelerated, financing with revenue bonds may be pursued at that time.

Respectfully,
PROVIDENCE WATER SUPPLY BOARD



Pamela Marchand, P.E.
Chief Engineer/General Manager

Exhibit 1

Providence Water

20 Year IFR Expenditure Plan

Fiscal Years 2006 through 2025

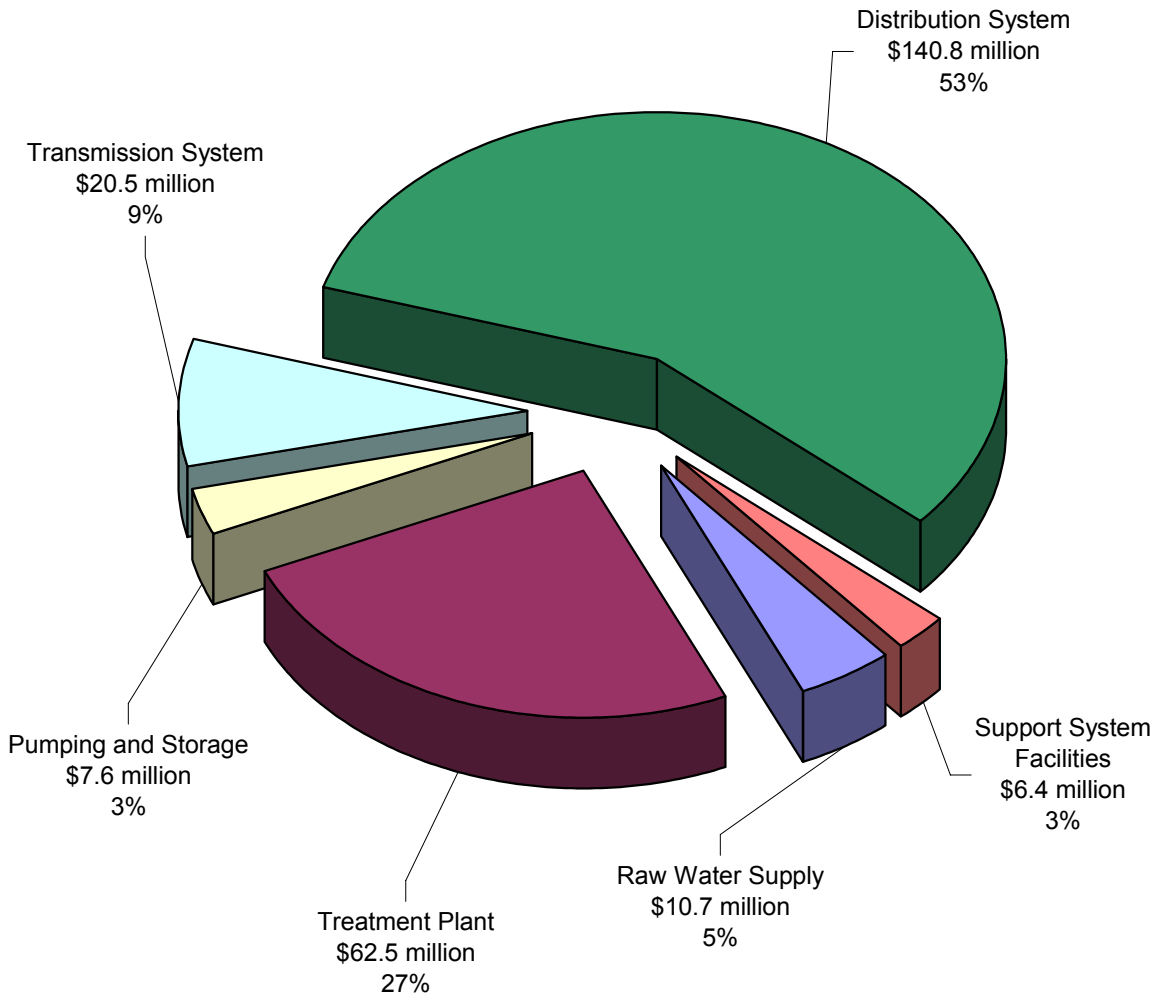
	Total Amount	Fiscal Years 2006 - 2010	Fiscal Years 2011 - 2015	Fiscal Years 2016 - 2020	Fiscal Years 2021 - 2025
Raw Water Supply	**10,720,000**	4,620,000	3,700,000	1,200,000	1,200,000
Treatment Plant	**62,480,000**	37,305,000	16,850,000	6,825,000	1,500,000
Pumping and Storage	**7,550,000**	4,950,000	700,000	1,050,000	850,000
Transmission System	**20,525,000**	8,625,000	8,300,000	2,300,000	1,300,000
Distribution System	**140,750,000**	7,650,000	27,000,000	49,550,000	56,550,000
Support System Facilities	**6,400,000**	2,400,000	1,250,000	1,650,000	1,100,000
	$248,425,000	**$65,550,000**	**$57,800,000**	**$62,575,000**	**$62,500,000**

Exhibit 2

Providence Water

20 Year IFR Expenditure Plan

Fiscal Years 2006 Through 2025



20 Year Investment - $248 million

Exhibit 3

Providence Water

Sources and Uses of Funds

IFR Funding & Expenditure Projections

Fiscal Years 2006 through 2025

	2006-2010	2011-2015	2016-2020	2021-2025	2006-2025
	Phase 1	Phase 2	Phase 3	Phase 4	Total
Sources of Funding:					
Funds Available from Prior Years	$9,867,020	$27,969	$73,341	-$1,659	$9,966,672
Current Authorized Funding	62,500,000	62,500,000	62,500,000	62,500,000	250,000,000
Total Sources of Funds	72,367,020	62,527,969	62,573,341	62,498,341	259,966,672
Uses of Funding:					
Cash Funded Construction Projects	$65,550,000	$57,800,000	$62,575,000	$62,500,000	$248,425,000
Existing Debt Service	6,789,050	4,654,628	0	0	11,443,678
Total Uses of Funds	72,339,050	62,454,628	62,575,000	62,500,000	259,868,678
IFR Program Surplus/(Deficit)	$27,969	$73,341	-$1,659	-$1,659	97,994

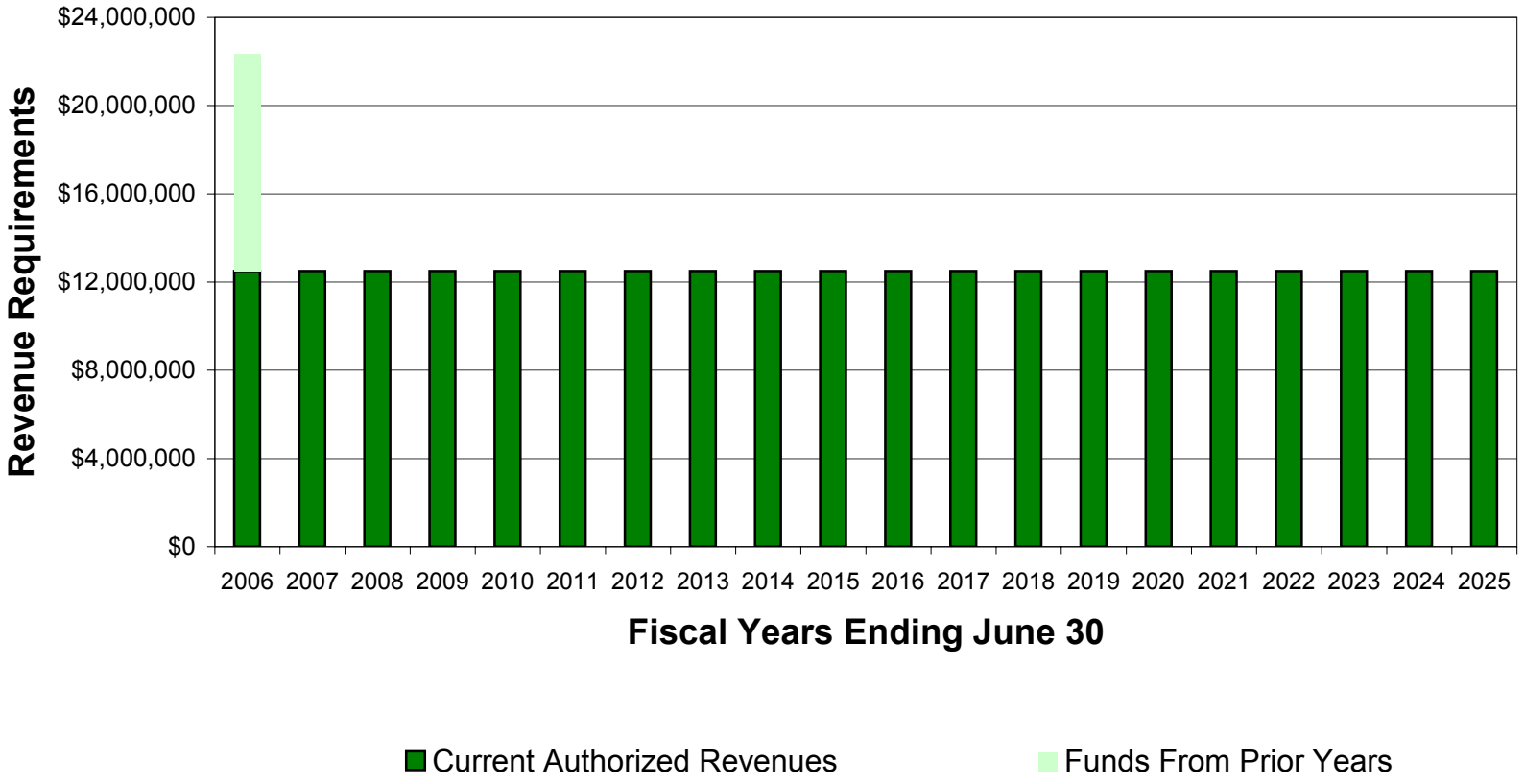
Provided by Providence Water Finance Department

Exhibit 4

Providence Water

IFR Funding Projections

Fiscal Years 2006 through 2025



Provided by Providence Water Finance Department

Infrastructure Replacement Plan FY 2006 through FY 2025

The contents of the plan and the sections are as follows:

Section I – Facilities Description – A description of the water system. Included in the section are statistical data for key components of the system, a map of the transmission and distribution system, a flow diagram originating from the source of supply to the service system, and a summary of the principal components of the system.

Section II – IFR Program Accomplishments – A reporting of IFR program accomplishments with costs from fiscal years 1996 through 2005.

Section III – Infrastructure Replacement Plan – The section contains the projects and descriptions for the 20 Year IFR Plan (fiscal years 2006 through 2025), the 5 Year IFR Plan (fiscal years 2006 through 2010), and the 15 Year Plan (fiscal years 2011 through 2025).

Section IV – Revenue Requirements – The sources and uses of funds for the 20 Year IFR Plan (fiscal years 2006 through 2025) and the IFR funding projections for the same period.

Appendix – The Comprehensive Clean Water Infrastructure Act of 1993, and the Rules and Regulations for the Clean Water Infrastructure Plans.

Section I – Facilities Description

System Description – Included in the description are the sources of supply, the treatment facility components and processes, the pump stations and storage facilities, an overview of the transmission and distribution systems, and the wholesale interconnections.

Exhibit 5 – Statistical Data – Exhibit 5 contains a summary of the major statistical data and information for the system.

Exhibit 6 – Process Diagram – Exhibit 6 is a process diagram of the Providence Water system. It shows in schematic form the sequence and inter-relation of various water treatment and delivery processes.

Exhibit 7 – Summary of the System's Principal Components by Facility Category – Exhibit 7 is a tabular listing of the various major components of the Providence Water system. Provided is a brief narrative description of the general condition of the facility, its approximate average age, and an estimate of its approximate remaining life.

SYSTEM DESCRIPTION

WATER SUPPLY SOURCES

The sole source of water used by Providence Water is the Scituate Reservoir Complex. The Scituate Reservoir complex consists of six reservoirs: the main (Scituate) reservoir and five smaller reservoirs which are tributary to the main reservoir.

Scituate Reservoir

Water in the Scituate Reservoir is impounded behind the Gainer Dam, a large zoned earth structure at the southeast end of the Reservoir which is traversed along its 3,200 foot length by Rhode Island Route 12 (Scituate Avenue). Elevation of the crest of the dam is 299.0 feet Mean High Water Datum (MHW).

The total storage capacity of the Scituate Reservoir is 37.011 billion gallons (BG). Dead storage is 400 million gallons (MG), resulting in a net storage volume of 36.611 BG. The reservoir has a water surface area of 5.30 square miles, and a watershed area of 92.8 square miles.

Crest elevation of the spillway is 284.01 feet (MHW). The flow discharges through a natural rock channel to the Pawtuxet River below the dam.

Water needed for water supply flows from the reservoir to the treatment plant.

Regulating Reservoir

The dam impounding the waters in the Regulating Reservoir is an approximately 220 foot long structure with concrete overfall. Elevation of the crest of the overflow is 285.50 feet (MHW).

Regulating Reservoir has a total storage capacity of 428 MG, of which 7 MG is dead storage. The drainage area of this reservoir is 22.3 square miles, while the water surface area is 0.38 square miles.

Barden Reservoir

The total storage in Barden Reservoir is 853 MG. Due to the arrangement of the outlets there is no dead storage. The water surface area is 0.38 square miles, and the watershed area is 33.0 square miles.

The Barden Reservoir Dam is an earth embankment structure with a concrete corewall. The length, including the spillway, is approximately 612 feet. The crest of the dam is at elevation 352.2 feet (MHW). Elevation of the crest of the spillway is 345.1 feet (MHW).

Moswansicut Reservoir

The dam forming Moswansicut Reservoir is a 450 feet long embankment structure. There are two spillways, an overflow spillway and an emergency spillway. Elevation of the overflow spillway crest is 301.90 feet (MHW); elevation of the emergency spillway crest is 303.4 feet (MHW).

Moswansicut Reservoir covers a surface area of about 0.44 square miles. It has a total storage capacity of 1.781 BG and dead storage of 1.066 BG, for a net storage of 715 MG. The drainage area of this reservoir is about 3.9 square miles.

Ponaganset Reservoir

Ponaganset Reservoir has a watershed area of 2.1 square miles, and a water surface area of 0.36 square miles. Total storage in the reservoir is 742 MG of which 49 MG is dead storage. Net storage capacity is 693 MG.

The dam impounding the Ponaganset Reservoir is an approximately 635 feet long earth embankment structure. Crest of the dam is elevation 641.4 feet (MHW). Spillway crest elevation is 633.05 feet (MHW).

Westconnaug Reservoir

Westconnaug Reservoir has a total storage capacity of 453 MG with no dead storage. Its surface area covers about 0.27 square miles. It has a drainage area of 4 square miles.

The dam is an earth embankment structure approximately 320 feet long, with a crest elevation of 457.2 feet (MHW). The crest elevation of the spillway is 454.17 feet (MHW). Both the spillway and the outlet conduit discharge into Westconnaug Brook.

TREATMENT FACILITIES

Providence Water operates one conventional water treatment plant to purify source water which flows from the Scituate Reservoir to the plant. The raw water characteristics from the Scituate Reservoir is typical of well protected surface water supplies in the New England region. It is a low pH, low alkaline, low turbidity water with seasonal overturn events.

The plant utilizes a conventional treatment process. The hydraulics of the plant allow it to be normally operated under gravity flow conditions. Pumping facilities are available for pumping water to the plant under extremely low reservoir conditions. The treatment process consists of aeration, coagulation-flocculation, lime addition for corrosion control and pH adjustment, sedimentation, disinfection, rapid sand filtration, and fluoridation.

Influent Control Chamber

The influent control chamber is a concrete structure consisting of internal chambers and control and drain valves that regulate the flow of water entering the plant.

Aeration Basin

Water flows from the influent chamber to the aeration basin. The aeration system works under gravity pressure and sprays water into the air in a fountain style. This treatment step removes volatile organics and gases. The aerated water travels by gravity to the sedimentation basins.

Basin Influent Conduit

The aerated water travels to the sedimentation basins through two 72-inch by 36-inch diameter venturi meter tubes which measure the influent flow. Water then travels on to the basins through an 8.5-foot wide, 10-foot high rectangular concrete conduit.

Coagulation/Flocculation

Quicklime is added to the water as it passes through the basin influent conduit. The pH of the water is increased to approximately 7.0 as a result of the lime addition at this point. Further mixing takes place in a tangential mixer. The water enters the mixer through a 4-foot wide, 3-foot high opening at the bottom of the mixing chamber. The mixer works under gravity feed and imparts a slow cyclical motion to the water. The cyclical motion aids in the destabilization of colloidal material and the formation of floc. This step is commonly known as flocculation. The next step is the removal of the flocculated colloidal material through sedimentation. The treatment plant has two large sedimentation basins; the north basin (43 million gallon capacity) and the south basin (111 million gallon capacity). Here, the flocculated material is allowed to settle on the bottom of the basins. The resulting ferric sludge must be removed by periodically draining and flushing the basins manually.

Filtration

Settled water travels from the basins through a 10-foot wide, 11-foot high rectangular concrete conduit to the sand filters. A second lime injection point is located in this conduit to raise the pH from 7.0 to 9.7. Chlorine is also added in this conduit for disinfection purposes. There are eighteen (18) filters which remove non-settleable floc and impurities remaining following the coagulation, flocculation, and sedimentation stages. Sixteen (16) are rapid sand filters, one (1) is a dual media filter with air scour backwash, and one (1) is a mixed media filter with air scour backwash. Each filter is operated over a flow range of 5 to 8 million gallons per day. The number of filters on-line concurrently is dependent upon water demand. Each filter has two 16-inch effluent lines with 12-inch butterfly valves that discharge into the clearwell. The average filter run is approximately 72 hours and, generally, a backwash is initiated when head loss through the filter reaches approximately 6.5 feet of water. The backwash water is supplied by gravity via a 400,000 gallon wash water tank and is discharged to waste lagoons.

Emergency Provisions

Emergency provisions at the plant include stand-by power and an emergency by-pass process that could allow water to flow to the system with bypassing of the treatment process.

Electrical service is provided by a 23 kilo-volt (KV) subtransmission line to a 2.3 KV service to the treatment plant.

The emergency electrical power for the plant is provided by a 600 KW diesel generator. This generator is capable of providing adequate power through an automatic transfer switch for treatment operations and for life safety requirements during power outages. Redundant backup power for the system is also available through a 2000 KW diesel generator.

Chemical Feed Systems

Ferric Sulfate

The plant uses ferric sulfate as a coagulant. Ferric sulfate arrives at the plant in liquid form and is stored and then transferred by pumps, as needed, into two (2) day tanks. Metering pumps are then used to provide a measured feed rate to the raw water. Ferric sulfate is added to the treatment process after aeration occurs.

Quicklime

Quicklime is added to aerated water for pH adjustment and corrosion control purposes. A pneumatic blower-style transfer system is utilized to convey lime from storage to secondary feeder hoppers from which gravimetric feeders, slakers, float tanks, and pumps are utilized to add lime to the unfinished water. Lime is added to the treatment process in two locations, both prior to, and after sedimentation.

Chlorine

Chlorine is added to the settled water for disinfection. Chlorine is delivered to the Purification Works in one ton containers which are transported to a storage room. The storage room is equipped with a ventilation system that turns on and exhausts air to the outdoors in the event that a chlorine leak is detected.

Hydrofluorosilicic Acid (Liquid Fluoride)

Hydrofluorosilicic acid is added to filtered water just downstream of the clearwell. Fluoride is delivered in liquid form and is stored in four storage tanks. Fluoride is then pumped to the injection point from a day tank at a rate based on the metered effluent flow of the plant.

Solids Handling and Disposal

The treatment plant produces ferric hydroxide sludge from the coagulation and sedimentation processes which settles and accumulates at the bottom of the sedimentation basins and must be periodically removed. The cleaning of the sedimentation basins is initiated by draining the basin. The exposed sludge is manually scoured using high pressure water and directed through drains in the basins to a series of settling sludge lagoons.

Lagoon Description

Ferric sludge from the plant is collected in a settling lagoon system. The lagoon system consists of three settling lagoons, three overflow structures and outfalls, and a series of swales which connect the various lagoons in parallel so that lagoons can be independently removed from service for dewatering and cleaning operations. Lagoons 1a and 1b are used to store the majority of water treatment residuals received by the lagoons. Lagoon 2 is used as a 'polishing' lagoon for removal of fines and pH control. Discharge limits including flow, pH and total suspended solids, are presently set by our RIPDES permit issued by the Rhode Island Department of Environmental Management.

STORAGE FACILITIES

Providence Water operates five storage facilities throughout the distribution system. Water is also collected in a 260,000 gallon clearwell at the plant before being delivered to the distribution system. These facilities are used to optimize operating efficiencies by equalizing demands, improving and stabilizing system flows and pressures, and providing reserve supplies for fire fighting.

Aqueduct Reservoir

The Aqueduct Reservoir has a storage capacity of 43.4 MG and is 390 x 590 foot enclosed underground concrete structure with a water depth of approximately 25 feet and an overflow elevation of 231 feet mean high water (MHW). The facility provides operational storage for the low service area and operates by gravity feed. Water is supplied to the reservoir through a large diameter reinforced concrete conduit.

Neutaconkanut Reservoir

From the Aqueduct reservoir, water flows through the Neutaconkanut Conduit to the Neutaconkanut Reservoir. The Neutaconkanut Reservoir has a storage capacity of 42.09 MG and is a 397 x 597 foot enclosed underground concrete structure with an average water depth of approximately 25 feet and an overflow elevation of 227 feet MHW. The facility feeds the gravity fed low service system the a portion of the high service system.

Longview Reservoir

The Longview Reservoir has a storage capacity of 24.8 MG and has an overflow elevation of 306 feet MHW. A 200 foot x 323 foot x 29 foot deep cast in place concrete underground addition was constructed immediately adjacent to the existing reservoir and was put on line in 1990. This doubled the capacity of the reservoir. The reservoirs are connected by a sluice gate in the common wall of the two reservoirs. The facility provides operational and fire storage to the high service area and feeds the extra high service area.

Ridge Road Reservoir

The Ridge Road Reservoir has a capacity of 3.5 MG and provides operational and fire storage for the extra-high service area. Water is pumped to the reservoir by the Fruit Hill Pump Station. The structure is a prestressed concrete tank with a water depth of 40 feet and an overflow elevation of 398 feet MHW.

Lawton Hill Reservoir

The Lawton Hill Reservoir has a storage capacity of 5.0 MG and is a 187-foot by 187-foot underground enclosed concrete structure with a water depth of 20 feet and an overflow elevation of 485.00 feet mean high water (MHW). The facility provides operational storage for the high service area in Western Cranston. Water is pumped to the reservoir through a 24-inch DI pipe.

PUMP STATIONS

In order to maintain an adequate supply of potable water at a sufficient pressure, Providence Water owns and operates ten potable water pump stations in the distribution system and one raw water pump station. A description of the pump stations follows.

Raw Water Pumping Station

The Raw Water Booster Pumping Station (RWBPS) contains four pumps, two with a pumping capacity of 50 MGD and two with a pumping capacity of 30 MGD. The station is used to supplement head to the water treatment plant under low reservoir water level conditions and high demand periods. The RWBPS is equipped with emergency power supplied by a 2000 KW diesel generator.

Garden Hills Pump Station

The Garden Hills Pump Station contains two 400 gallon per minute (GPM) primary pumps, a 100 GPM jockey pump, and one natural gas driven 400 GPM emergency pump used in the event of an electrical power outage. The station is used to maintain adequate pressures at the higher elevations of the Garden Hills subdivision in Cranston. The station contains an underground 7,200 gallon hydropneumatic storage tank.

Dean Estates Pump Station

The Dean Estates Pump Station serves the higher elevations in the Dean Estates subdivision. The pump station contains two 1,200 GPM primary pumps and one 1,200 GPM natural gas driven emergency pump. The facility utilizes two 10,000 gallon hydropneumatic storage tanks.

Greenville Ave. Pump Station

The Greenville Ave. Pump Station contains three 320 GPM pumps and one 750 GPM pump. The 750 GPM pump is used for fire service or other high demand periods. Emergency power is supplied by a 180 KW diesel generator.

Fruit Hill Pump Station

The Fruit Hill pump station contains two 1,500 GPM pumps and provides water to the extra high service area. Emergency power is provided by a 125 KW natural gas generator.

Bath Street Pump Station

The Bath Street Pump Station contains three pumps with a pumping capacity of approximately 6,700 GPM each. A 1000 KW diesel generator supplies emergency power for the station. The

station provides water to Longview Reservoir and the high service area as well as the high pressure fire zone in downtown Providence.

Neutaconkanut Pump Station

The Neutaconkanut Pump Station draws water from the Neutaconkanut Reservoir and supplies water to Longview Reservoir and the high service area. The pump station contains four 6,700 GPM pumps. The station is equipped with a 1,000 KW diesel engine backup power generator.

Aqueduct Reservoir Pump Station

The Aqueduct Reservoir Pump Station provides water to Lawton Hill Reservoir and the high service area of Western Cranston. The station contains four 2,000 GPM vertical turbine pumps. A 600 KW diesel generator supplies emergency power for the station.

Alpine Estates Pump Station

The Alpine Estates Pump Station contains three 370 GPM domestic pumps and one 50 GPM jockey pump and provides water to approximately 150 residential services throughout the extra-high service area of the Alpine Estates subdivision in Western Cranston. Emergency power is supplied by a 75 KW diesel generator.

Ashby St. Pump Station

The Ashby St. Pump Station contains two 100 GPM domestic pumps, one 750 GPM fire pump, and one 50 GPM jockey pump. It draws water from the high service area and provides water to approximately 100 residential services throughout the extra-high service area on Neutaconkanut Hill in Johnston. Electrical power and emergency power is supplied to the station from the Neutaconkanut Pump Station.

Cranston Commons Pump Station

The Cranston Commons Pump Station contains three 900 GPM domestic pumps and one 120 GPM jockey pump and provides water to approximately 260 residential and industrial services throughout the extra-high service area of the Cranston Commons and Alpine Estates subdivisions in Western Cranston. The station utilizes an underground 530 gallon hydro-pneumatic storage tank. Emergency power is supplied by a diesel generator which is owned

and maintained by a privately managed water/sewer utility company who also uses the generator as an emergency power supply for a booster pump station for the sewer system in the City of Cranston.

TRANSMISSION AND DISTRIBUTION SYSTEM

Large diameter pipe conduits transfer water by gravity from the dam intakes to the treatment plant.

Finished water is transmitted from the clearwell at the plant to the distribution system through two major transmission conduits, the 90-inch diameter Scituate Tunnel and Aqueduct (ScTA) and the 78-inch diameter Supplemental Tunnel and Aqueduct (STA).

Providence Water currently operates approximately 4 miles of concrete lined tunnel, 10 miles of concrete aqueduct, 85 miles of various sizes of transmission piping (16" to 66") and 838 miles of distribution piping (6" to 12").

Service Area

The Scituate Reservoir Complex is utilized by Providence Water as an active source which supplies approximately 600,000 people in the State of Rhode Island with potable water through both its retail and wholesale customers in Providence and in the surrounding communities.

The retail service area consists of all of Providence and portions of North Providence, Cranston, Johnston and Scituate.

Providence Water wholesales water to nine water utilities in the Providence area. These utilities include the Bristol County Water Authority (one interconnection), East Providence Water Division (one interconnection), Greenville Water District (one interconnection), Kent County Water Authority (two interconnections), Lincoln Water Commission (two interconnections), Smithfield Water Department (one interconnection), Warwick Water Department (two interconnections), Johnston Sewer and Water Department (six interconnections), and the East Smithfield Water District (three interconnections).

The Retail Area

The Providence Water retail area currently has 74,492 service connections. These connections include residential, industrial, commercial, and fire service connections.

The retail service area is divided into four separate pressure zones; the low service, high service, extra high service, and the Western Cranston water district.

The low service area comprises the larger portion of the retail area and serves portions of Cranston, Johnston and the southern portions of Providence. The low service area is generally defined as the area with elevations from 0 to 140 feet above Mean High Water (MHW). The pressure in the low service area is maintained by the levels at the Neutaconkanut and Aqueduct Reservoirs which are maintained at approximate elevations 225 and 230 feet MHW respectively.

The high service area serves the northern and higher elevation sections of North Providence, Providence and the Town of Johnston. The high service area is generally defined as the area with elevations from 140 to 220 feet above MHW. The pressure in the high service area is maintained by the operating level at the Longview Reservoir which is maintained at 305 feet MHW, when full. Water for the high service area is supplied by water pumped from the low service system by the Neutaconkanut and Bath Street Pumping Stations.

The extra high service area serves a small portion of the retail area in the Fruit Hill section of North Providence. The extra high service area is generally defined as the area with elevations from 220 feet to 315 feet above MHW. The water for this service area is drawn from the high service system and pumped from the Fruit Hill Pump Station to the Ridge Road Reservoir where water level is maintained at elevation 397 feet MHW, when full.

The Western Cranston water district encompasses 3.5% of the retail area which serves the Western Cranston area. The pressure in this high service area is maintained by the operating level at Lawton Hill Reservoir which is 484 feet MHW, when full. Water for this high service area is supplied by water pumped from the low service system by the Aqueduct Pump Station.

Service area mains range in size from 6 inches to 66 inches in diameter and are constructed of a variety of materials including cast iron, ductile iron, concrete, steel, and asbestos cement. Service connections range from 5/8-inch to 12-inches and are sized based upon the customer's demand. Service connections are constructed of lead, copper, galvanized steel, cast iron, or ductile iron. All services are metered.

System Metering

Providence Water meters water produced at the treatment plant and meters 100% of its service connections. Raw water flowing into the plant is measured by two 72" x 36" diameter venturi meters. These venturi meters measure the flow of raw water from the influent control chamber to the sedimentation basins.

The flow of effluent discharged from the plant to the distribution system is measured by 36 master plant effluent meters. These meters are 12-inch venturi tube meters located on the effluent lines of the rapid sand filters at the treatment plant. Plant effluent flows are also measured by two 72" X 42" finished water effluent venturi meters.

Providence Water meters all customers in its entire service area. Service area metering includes meters at interconnections to wholesale customers as well as normal metering of all retail service connections. The retail service area contains a variety of water consumers including large industrial and manufacturing accounts, commercial accounts, and residential users.

Exhibit 5
PROVIDENCE WATER
STATISTICAL INFORMATION

WATER SUPPLY SOURCES

	Watershed Area (Square Miles)	Surface Area (Square Miles)	Storage Capacity (Million Gallons)	Dam Length (Feet)	Spillway Elevation (Mean High Water)
Scituate Reservoir	92.8	5.30	37011	3200	284.01
Regulating Reservoir	22.3	0.38	428	220	285.50
Barden Reservoir	33.0	0.38	853	530	345.10
Moswansicut Reservoir	3.9	0.44	1781	450	301.90
Ponaganset Reservoir	2.1	0.36	742	635	633.05
Westconnaug Reservoir	4.0	0.27	453	320	454.17

TREATMENT FACILITIES

Providence Water operates one treatment plant to purify the Scituate Reservoir water. The plant is located appoximately 4,400 feet from the Gainer Dam in Scituate and operates as a coventional treatment process. The treatment process consists of aeration, coagulation-flocculation, corrosion control, sedimentation, rapid sand filtration, disinfection, and fluoridation.

STORAGE FACILITIES

	Storage Capacity (Million Gallons)	Overflow Elevation (Mean High Water)
Aqueduct Reservoir	43.4	231
Neutaconkanut Reservoir	42.1	227
Longview Reservoir	24.8	306
Ridge Road Reservoir	3.5	398
Lawton Hill Reservoir	5.0	485

PUMP STATIONS

Raw Water	2 - 50 MGD pumps; 2 - 30 MGD pumps; 2000 KW diesel generator
Garden Hills	2 - 400 GPM pumps; 1 - 100 GPM jockey pump; 1 - 400 GPM natural gas emergency pump
Dean Estates	2 - 1,200 GPM pumps; 1 - 1,200 GPM natural gas emergency pump
Greenville Ave.	3 - 320 GPM pumps; 1 - 750 GPM pump; 180 KW diesel generator
Fruit Hill	2 - 1,500 GPM pumps; 125 KW natural gas generator
Bath Street	3 - 6,700 GPM pumps; 1000 KW diesel generator
Neutaconkanut	4 - 6,700 GPM pumps; 1000 KW diesel generator
Aqueduct Reservoir	4 - 1,050 GPM pumps; 1 - 1,600 GPM pump; 450 KW diesel generator
Alpine Estates	3 - 370 GPM pumps; 1 - 50 GPM jockey pump; 75 KW diesel generator
Ashby St.	2 - 100 GPM pumps; 1 - 750 GPM pump; 1 - 50 GPM jockey pump; emergency power provided by Neut. P.S. and generator.
Cranston Commons	3 - 900 GPM pumps; 1 - 120 GPM jockey pump; emergency power provided by Veolia Water

TRANSMISSION AND DISTRIBUTION SYSTEM

4.5 miles - 90" Scituate Tunnel and Aqueduct
9.6 miles - 78" / 102" Supplemental Tunnel and Aqueduct
97 miles of transmission piping (16" to 66")
799 transmission valves
861 miles of distribution piping (6" to 12")
12,945 distribution valves
5,860 hydrants
74,492 service connections

WHOLESALERS

	Interconnections
Bristol County Water Authority	1
East Providence Water Division	1
Greenville Water District	1
Kent County Water Authority	2
Lincoln Water Commision	2
Smithfield Water Department	1
Warwick Water Department	2
Johnston Sewer and Water Department	6
East Smithfield Water District	3
	19

EXHIBIT 6

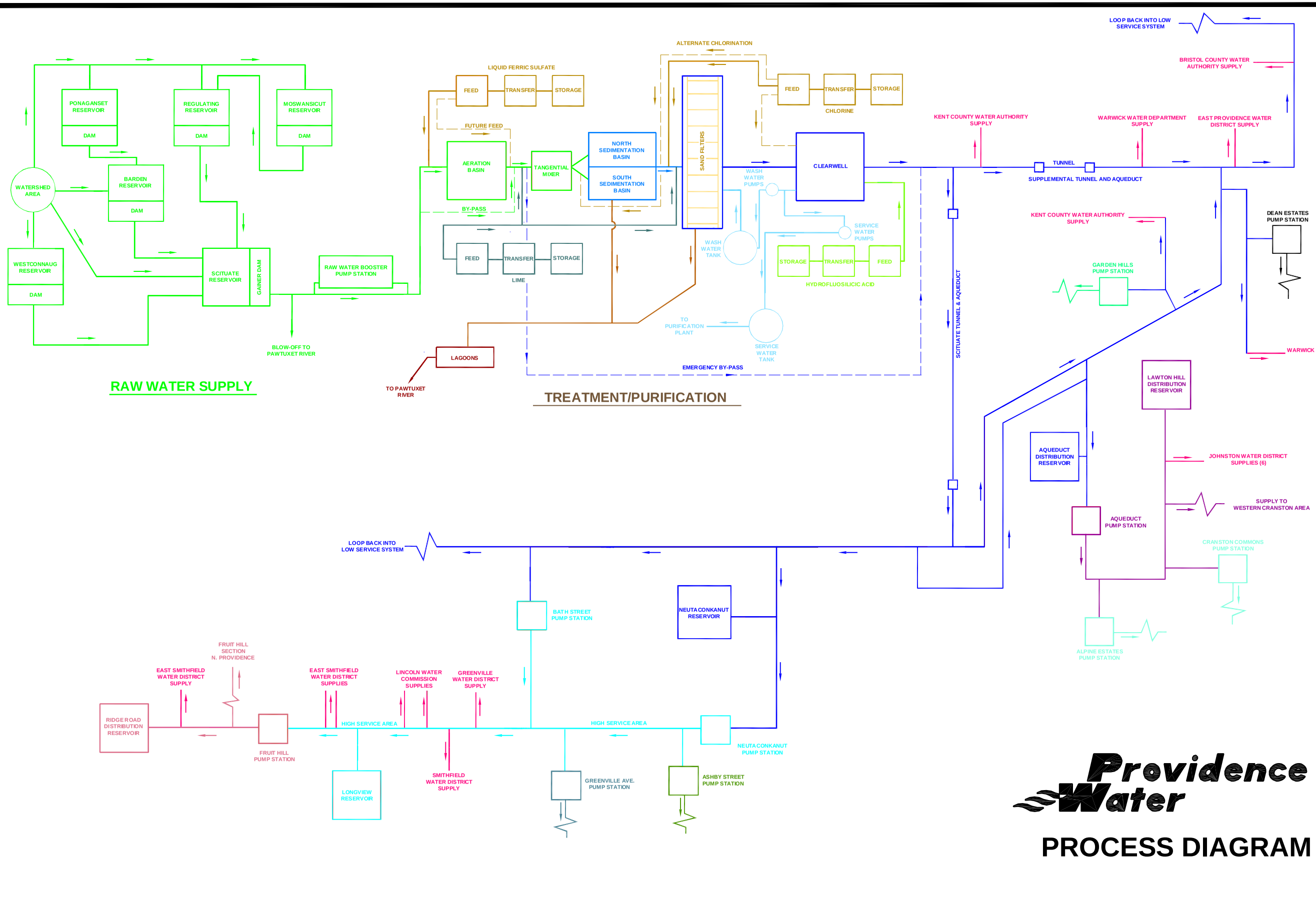

PONAGANSET RESERVOIR
DAM
REGULATING RESERVOIR
DAM
MOSWANSICUT RESERVOIR
DAM
WATERSHED AREA
BARDEN RESERVOIR
DAM
WESTCONNAUG RESERVOIR
DAM
SCITUATE RESERVOIR
GAINER DAM
RAW WATER BOOSTER PUMP STATION
BLOW-OFF TO PAWTUXET RIVER
RAW WATER SUPPLY
LIQUID FERRIC SULFATE
FEED
TRANSFER
STORAGE
FUTURE FEED
AERATION BASIN
TANGENTIAL MIXER
NORTH SEDIMENTATION BASIN
SOUTH SEDIMENTATION BASIN
BY-PASS
FEED
TRANSFER
STORAGE
LIME
LAGOONS
TO PAWTUXET RIVER
ALTERNATE CHLORINATION
SAND FILTERS
FEED
TRANSFER
STORAGE
CHLORINE
CLEARWELL
WASH WATER PUMPS
WASH WATER TANK
SERVICE WATER PUMPS
STORAGE
TRANSFER
FEED
HYDROFLUOSILICIC ACID
TO PURIFICATION PLANT
SERVICE WATER TANK
EMERGENCY BY-PASS
TREATMENT/PURIFICATION
LOOP BACK INTO LOW SERVICE SYSTEM
BRISTOL COUNTY WATER AUTHORITY SUPPLY
KENT COUNTY WATER AUTHORITY SUPPLY
WARWICK WATER DEPARTMENT SUPPLY
EAST PROVIDENCE WATER DISTRICT SUPPLY
TUNNEL
SUPPLEMENTAL TUNNEL AND AQUEDUCT
KENT COUNTY WATER AUTHORITY SUPPLY
DEAN ESTATES PUMP STATION
GARDEN HILLS PUMP STATION
WARWICK WATER DEPARTMENT SUPPLY
SCITUATE TUNNEL & AQUEDUCT
LAWTON HILL DISTRIBUTION RESERVOIR
AQUEDUCT DISTRIBUTION RESERVOIR
JOHNSTON WATER DISTRICT SUPPLIES (6)
SUPPLY TO WESTERN CRANSTON AREA
AQUEDUCT PUMP STATION
CRANSTON COMMONS PUMP STATION
ALPINE ESTATES PUMP STATION
LOOP BACK INTO LOW SERVICE SYSTEM
BATH STREET PUMP STATION
NEUTA CONKANUT RESERVOIR
FRUIT HILL SECTION N. PROVIDENCE
EAST SMITHFIELD WATER DISTRICT SUPPLY
EAST SMITHFIELD WATER DISTRICT SUPPLIES
LINCOLN WATER COMMISSION SUPPLIES
GREENVILLE WATER DISTRICT SUPPLY
RIDGE ROAD DISTRIBUTION RESERVOIR
FRUIT HILL PUMP STATION
HIGH SERVICE AREA
HIGH SERVICE AREA
NEUTA CONKANUT PUMP STATION
LONGVIEW RESERVOIR
SMITHFIELD WATER DISTRICT SUPPLY
GREENVILLE AVE. PUMP STATION
ASHBY STREET PUMP STATION
Providence Water
PROCESS DIAGRAM

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
RAW WATER SUPPLY				
Principal Reservoirs and Dams	1917 to 1927	various	100	Generally all the dams are in good to excellent condition. Gainer Dam has been rehabilitated but requires further concrete rehabilitative work on the upstream face of the spillway. The stonewall bordering each side of Gainer dam on Route 12 needs to be reconstructed. Ponaganset Reservoir dam has been rehabilitated and is in good condition. The intake structure may be replaced and relocated at a future date to protect against vandalism. Westconnaug and Moswansicut reservoir dams have been rehabilitated and are in excellent condition. Barden Reservoir has been rehabilitated but requires additional seeding on the downstream face of the dam to protect against erosion. At Regulating reservoir geotechnical, hydraulic, and concrete rehabilitative work is needed.
Reservoir Watershed Area	various	various	various	Generally in good condition. Various rehabilitative work is needed to secondary dams, fencing, gates, access and fire roads.
Gainer Dam Gate House	1927	79	50	The gatehouse dates back to its original construction in the 1920s and is generally in good condition. All sluice gates, stop shutters, and drain valves have been replaced. New electrical actuators were installed to operate the sluice gates. The gatehouse is in need of architectural and structural rehabilitation along with a replacement of the two existing cranes. Instrumentation and telemetry will need to be replaced.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
RAW WATER SUPPLY				
60 inch Conduits	1926	80	50	The twin 60” mains appear to be in good condition. The exposed section of the twin 60 inch mains inside the meter and junction chambers have been rehabilitated and a cathodic protection system was installed for the underground portion. The sluice gates inside the meter chamber were removed and reconditioned, new stems, stem guides, operators, and electrical actuators were installed at the same time. The 60” gate valves inside the Junction Chamber date back to the original plant construction and should be replaced along with new electrical operators.
90 inch Steel Aqueduct	1926	80	50	Dates back to original plant construction. The condition of the 90" raw water conduit is unknown. Now that the sluice gate replacement project at Gainer Dam gatehouse is completed the interior of the conduit can now be safely inspected, and will be evaluated under a future planned plant shutdown.
Raw Water Booster Pump Station	1966	40	50	The station is in relatively good condition. A new 2000 kW generator was installed replacing the old diesel generator. The 60" control valves to the station have been adjusted and are in good working condition. The suction and discharge valves for each of the booster pumps have been replaced. The actuators for the discharge valves have been replaced. The station is in need of architectural and structural rehabilitation, and the motor control center needs to be replaced.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
TREATMENT PLANT FACILITIES				
Treatment Plant Structure / Infrastructure	1926	80	30	The plant is generally in good condition with improvements made to the roof, lab, HVAC system, and electrical system. The plant is in need of various architectural and structural improvements.
Electrical Supply System - Treatment Plant	various	various	various	The overall system is in excellent condition. The substation that feeds the treatment plant from Hope substation has been replaced. The feeder lines from Hope substation all the way to the treatment plant have been replaced. A new 480-volt transformer has been installed at the treatment plant with a new feed line into the plant. The secondary voltage for the plant is the standard 480V service replacing the old 550V system. The old 175kW generator was replaced with 600 kW generator.
Aeration	1926	80	5	The influent structure and basin dates back to the 1920s. The concrete surfaces of the structures have deteriorated and need to be rehabilitated. The valves inside the influent structure needs to be replaced. Hydraulic improvements need to be made.
Sedimentation Basins	1939	67	5	The concrete surfaces of both north and south basins and baffles are deteriorated and need to be rehabilitated to include new handrails and walkways. All sluice gates for the sedimentation basins need to be replaced. The drain chamber, including gates, need to be rehabilitated. The access road, hydrants, and piping surrounding the sedimentation basins need to be rehabilitated. The tangential mixer is in need of concrete rehabilitative work.
Filters	1968	38	5	16 of the 18 mono-media filters are old and have outlived their useful lives. The filters and the effluent piping for the filters require replacement.
Venturi Tube Effluent Meters	1927/1943/1968	66	10	The plant's 36 venturi effluent meters appear to be in good working condition but will need to be further evaluated under the filter replacement project.
Clearwell	1927/1943/1968	66	50	The exterior yard and the interior of the clearwell have been fully rehabilitated. The two venturi meters leaving the plant have been rehabilitated.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
TREATMENT PLANT FACILITIES				
Wash Water System	1926 Tank 2004 Pumps	80 (Tank) 2 (Pumps)	50 (Tank) 30 (Pumps)	The pumps have been replaced and are in excellent condition. The washwater tank needs some concrete rehabilitative work.
Service Water System	1960 Tank 2004 Pumps	46 (Tank) 2 (Pumps)	50 (Tank) 30 (Pumps)	The pumps have been replaced and are in excellent condition. The service water tank appears to be in good condition but will be inspected under a future contract.
Ferric Storage/Transfer/Feed System	1997	9	10	A new complete liquid ferric system was installed in 1997 and is in excellent working order.
Lime Storage/Transfer/Feed System				The storage and transfer systems have been recently upgraded. The entire system is relatively new and in excellent condition.
Storage system	2006	0	20	
Transfer system	2004	2	8	
Feed system	1998	8	12	
Chlorine Storage/Transfer/Feed System	1997	9	1	The feed equipment has shown wear and all the chlorinators will need to be replaced. Various upgrades are needed in the chlorine room.
Fluoride Storage/Transfer/Feed System	2005	1	20	The entire system have been upgraded and in excellent condition.
Sludge Handling / Disposal System	2004	2	50	The system is in excellent operational condition. Sludge has been removed from lagoons #1A and #1B and a residuals management system is in operation which provides flexibility for alternating between each side of lagoon #1 to provide for future alternate drying and removal of residual deposits. Sludge has been removed from all of Lagoon #2 to restore the lagoon to its original intended function of acting as a buffering pond to maintain an acceptable standard of water quality for discharge to the Pawtuxet River.
Process Control / Data Acquisition System	2000	5	10	The SCADA system is in good operational condition but is need of improvements to the remote telemetry system.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
TRANSMISSION SYSTEM				
90-inch Scituate Tunnel and Aqueduct	1925	81	50	The entire 4.5 miles of the 90" conduit is in good condition. The conduit was inspected and various concrete rehabilitative work was conducted including crack injections, spalled concrete repairs, and the investigation and repair of hollow sounding areas. It was determined that further rehabilitative work will be required in the tunnel section consisting of the application of contact grouting to fill various voids between the concrete tunnel and the bedrock.
Supplemental Tunnel and Aqueduct (102" & 78")	1970	36	50	There are 9.5 miles of the 78" / 102" Supplemental Tunnel and Aqueduct. The 102" pipeline is in the process of being inspected and some rehabilitative work has been identified. Plans are to also inspect the 78" pipeline which has yet to be inspected.
Transmission Mains (16" to 66")	1871-1984	83	various	Some of the mains are older than 100 years and will eventually need to be replaced. Short term no mains have been identified needing replacement.
Transmission Valves (16" to 60")	1871-2006	34	various	Many of the valves are old and need to be replaced. Plans are to replace 16" and larger valves in the system that are older than 75 years with new butterfly valves.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
DISTRIBUTION SYSTEM				
Distribution Mains (6" to 12")	1871-2006	77	various	Approximately 30% of mains consist of unlined cast iron pipe installed prior to 1900. Main replacements will be necessary.
Distribution Valves (6" to 12")	1871-2006	63	various	Of the approximately 12,945 valves in the system, 1,899 have been identified as 6", 8" and 12" diameter valves installed prior to 1900. Plans are to replace these valves in conjunction with the main replacement program. Older distribution valves that are found to be defective and valves in areas of local and state road resurfacing projects will also be replaced.
Services	1871-2006	58 (all) 95 (lead)	various	Of the approximate 74,492 services in the system, over 36 percent are lead. Plans are to initially replace these services on main replacement projects and to accelerate removal of lead services in the last 15 years of the plan.
Hydrants	1941-2006	30	various	Plans are to replace all hydrants as they become 60 years old with new breakaway style hydrants.
Meters	1950 -2006	10	various	Plans are to replace the approximate 12,000 remaining older non-encoded water meters which have outlived their standard useful lives with new meters through the end of fiscal year 2007. The second phase of the program will be to begin replacing meters that are 10 years and older with new meters. Plans are to continue with the large meter replacement program by replacing older larger commercial meters with new meters.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
PUMPING AND STORAGE				
Aqueduct Reservoir and Gatehouse	1962	44	50	The reservoir and gatehouse are in good condition. The reservoir has been fully rehabilitated; exterior waterproofing was applied and cracks and construction joints on the interior of the structure were sealed.
Neutaconkanut Reservoir and Gatehouse	1928	78	50	Dates back to the 1920s. The reservoir and gatehouse is being rehabilitated under a current contract.
Longview Reservoir and Gatehouse	1928, 1990	47	50	The reservoir and gatehouse are in good condition. The reservoir has been fully rehabilitated; exterior waterproofing was applied and cracks and construction joints on the interior of the structure were sealed.
Ridge Road Reservoir	1989	17	50	The storage tank is in good condition. The tank has some exterior cracking which needs to be repaired and the tank needs to be internally inspected.
Lawton Hills Reservoir	1972	34	50	A brief diving inspection was completed in 2004 and found the tank in relatively good condition. Some rehabilitative work will be needed inside the reservoir.
Garden Hills Pump Station	1959	47	1	The improvements of the pump station are in design and rehabilitation will be conducted in the near future consisting of the replacement of the existing pumps, instrumentation and electrical upgrades, installation of an emergency generator, and architectural improvements to the pump station building.
Dean Estates Pump Station	1982	24	1	The improvements of the pump station are in design and rehabilitation will be conducted in the near future consisting of the replacement of the existing pumps, instrumentation and electrical upgrades, installation of an emergency generator, and architectural improvements to the pump station building.
Fruit Hill Pump Station	1989	17	15	The pump station is in good condition and no immediate work is planned.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
PUMPING AND STORAGE				
Bath Street Pump Station	1928	6	25	The station is in good condition. Rehabilitation of the pump station was completed in 1999 to include replacing pumps, replacing suction and discharge piping, instrumentation and electrical system upgrades, architectural/structural improvements, and installation of an emergency power generator. Some remedial work to the generator enclosure is needed to replace insulation damaged from the elements.
Neutaconkanut Pump Station	1935	6	25	The station is in good condition. Rehabilitation of the pump station was completed in 1999 to include replacing pumps, replacing suction and discharge piping, instrumentation and electrical system upgrades, architectural/structural improvements, and installation of an emergency power generator.
Greenville Ave Pump Station	1994	12	20	The pump station is relatively new but experiences operational reliability problems. The station is in need of an upgrade to its electronic and control equipment.
Aqueduct Pump Station	1972	34	1	Rehabilitation of the pump station is in progress for a modular addition adjacent to the existing pump building that will house new vertical turbine pumps, instrumentation and electrical system upgrades, and replacement of the emergency generator.
Alpine Estates Pump Station	1988	18	10	The station needs an upgrade to the electrical supply, new valves and piping for the pumps, a new pneumatic pressure tank, and various new system controls. The station is presently inactive, and upgrades are on hold pending future plans for the station.
Ashby Street Pump Station	1999	7	25	The pump station is new and in excellent condition.
Cranston Commons Pump Station	1996	10	20	The pump station is relatively new and in good condition.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Approximate Installation Date(s)	Average Approx. Age of Component	Approx. Practical Remaining Life (years)	Condition
SUPPORT SYSTEMS & FACILITIES				
Forestry Garage	1962	44	20	Various rehabilitative work has been conducted to the facility. The building is 44 years old and requires structural/architectural rehabilitation as dictated by need.
Academy Ave Administration Building	1954	52	6	Various rehabilitative work has been conducted to the facility. The building is 52 years old and requires structural, architectural, and mechanical rehabilitation as dictated by need. Site work is also needed. A new administration building is needed.
Aqueduct Reservoir Administration Building	1997	9	6	The building is constructed out of modular units. The facility is considered to be temporary and will need to be replaced.

Section II – IFR Program Accomplishments

Summary of IFR Program Accomplishments (Fiscal Years 1996 through 2006*)

Exhibit 8 – IFR Expenditures for Fiscal Years 1996 through 2006* by Facility

Exhibit 9 – IFR Expenditures for Fiscal Years 1996 through 2006* by Year

Exhibit 10 – IFR Project Status Report for Fiscal Years 1996 through 2006*

Exhibit 11 – IFR Project Costs and Schedules Report for Fiscal Years 1996 through 2006*

*Through December 31, 2005

SUMMARY OF IFR PROGRAM ACCOMPLISHMENTS - 1996 - 2006

Providence Water is a full service utility supplying drinking water and fire protection to 5 retail areas and 9 wholesale customers representing 60 percent of the State's population. The utility and the workforce operate and maintain a vast system of mains, hydrants, service connections, and meters with a multitude of appurtenances. The source water comes from a five-reservoir surface water complex, is treated to meet and exceed current and projected drinking water regulations as administered by the Rhode Island Department of Health consistent with national drinking water laws. The water supply is distributed through a complex system of transmission mains, distribution reservoirs, and pumping stations into the various communities.

In 1990 Providence Water initiated an Infrastructure Replacement Program with limited funds. In 1993, the State legislature recognizing the need for establishing a funding mechanism with the intention of staving off deterioration and obsolescence for the State's water infrastructure systems, adopted the Comprehensive Clean Water Infrastructure Act of 1993 in accordance with Chapter 46-15.6 of the General Laws of the State of Rhode Island. The law set aside portions of water revenue for a long-term planned infrastructure replacement program.

In 1996, Providence Water prepared and submitted its first 20-year Infrastructure Replacement Plan. In that plan, we outlined an aggressive plan of infrastructure replacement work in all areas of the system, with particular attention in the first years targeted especially to the critical components of the system whose age had made them susceptible to failure and to operational problems and which had the potential to threaten the integrity of the water supply. Many of these system components dated all the way back to the original plant construction in the 1920's or at the latest, to the last round of improvements which were done to the system in the 1960's and early 70's.

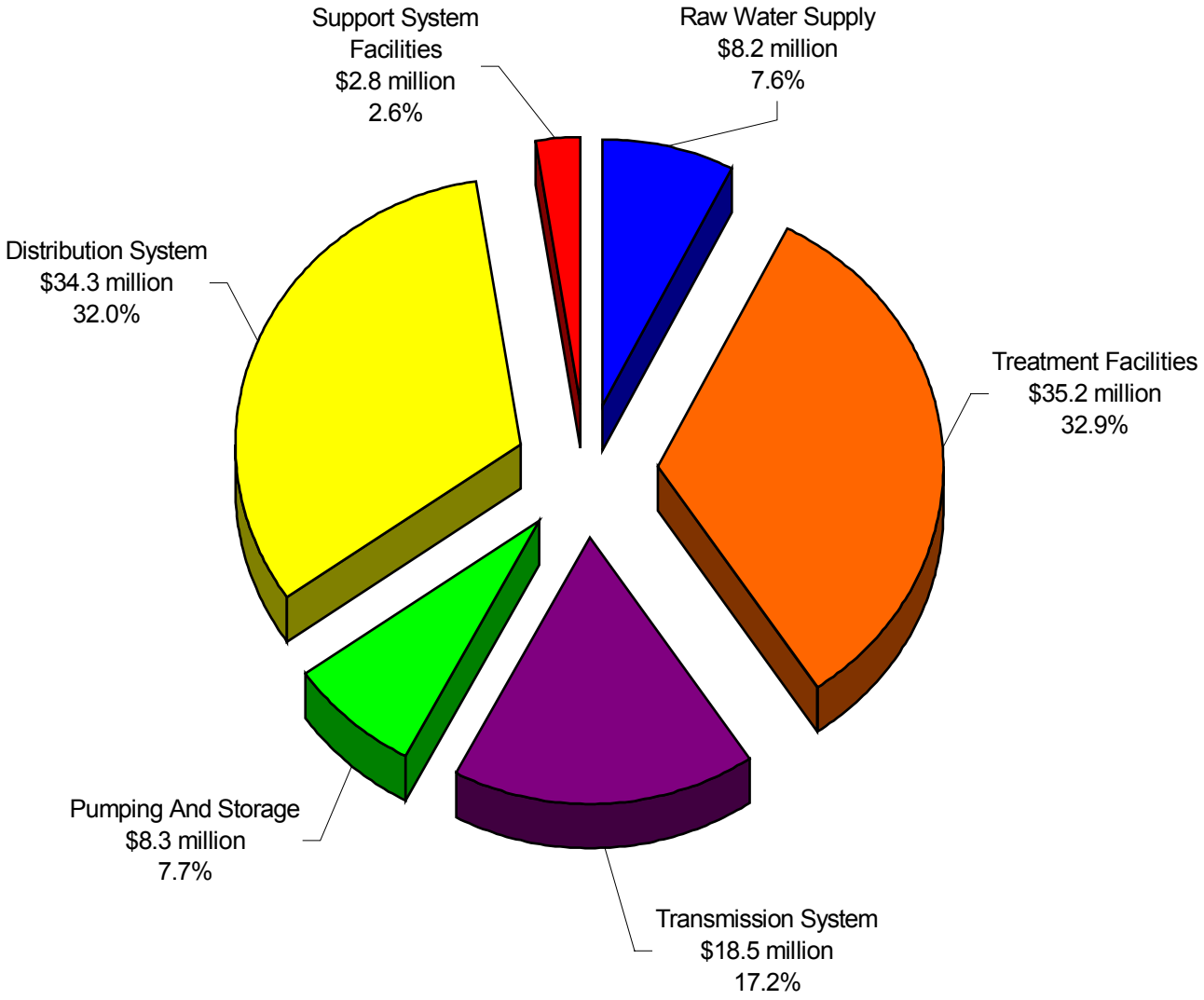
At that point, sufficient funding for accomplishing this work over the 5-year period was not yet in place and Providence Water petitioned the Public Utilities Commission (PUC) for the necessary funding authorizations. The R.I. Public Utilities Commission, recognizing the same need as Providence Water for long-term system improvements, authorized a gradually escalating funding

mechanism through rate revenues upon which we then embarked aggressively on getting these needed improvements to the system accomplished.

Providence Water submitted its second IFR plan in March 2001. Both the 1996 and the 2001 plans were structured to provide for a program of systematic and scheduled improvements to the system, both to stem the tide of deterioration that had taken place, and to provide for a continued program of scheduled upgrades of system components as they reach the end of their useful life in order to ensure the continued reliability of the water system into the future.

While work remains to be done, we have made substantial improvements to our system since the inception of our Infrastructure Replacement Program in 1996, having invested approximately $110 million into our treatment plant, storage reservoirs, pump stations, dams, and transmission and distribution lines. Included in this section is a report detailing the accomplishments of our infrastructure replacement program over the period from July 1996 through December 2005. These improvements, along with the ongoing planned improvements outlined in our plan submission, will serve to safeguard the integrity of our water supply for generations to come.

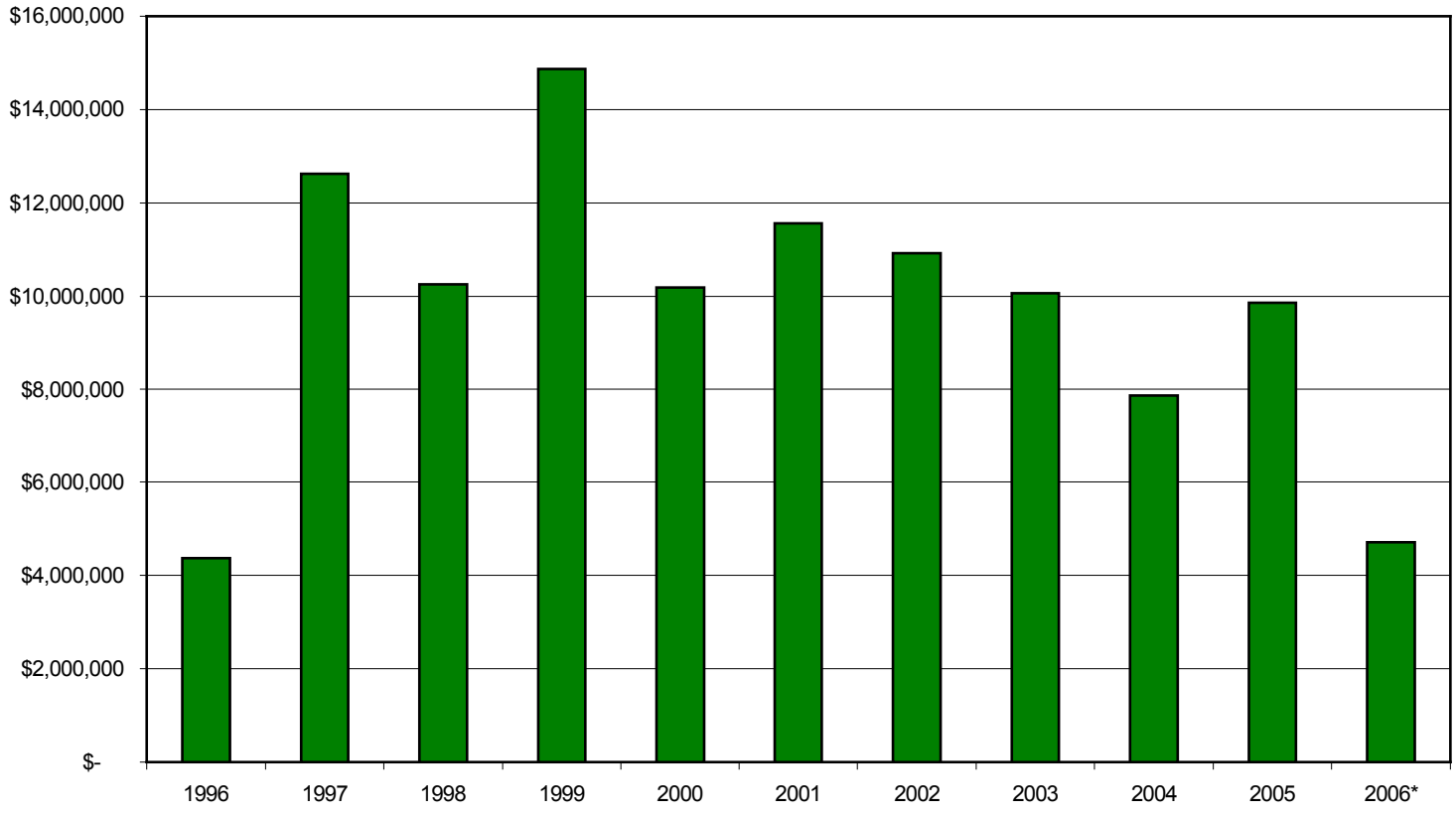
Exhibit 8
Providence Water
IFR Expenditures
Fiscal Years 1996 to 2006*



Total Investment Into System $107.3 MIL

***Through December 31, 2005**

Exhibit 9
Providence Water
Summary Of IFR Expenditures
Fiscal Years 1996 to 2006*



Fiscal Year	Expenditures	
1996	$ 4,380,022	
1997	$12,612,265	
1998	$10,248,978	
1999	$14,864,327	
2000	$10,175,318	
2001	$11,551,726	
2002	$10,915,284	
2003	$10,054,569	
2004	$ 7,864,982	
2005	$ 9,856,233	
2006*	$ 4,714,578	*1/2 year total
Total to Date	$107,238,282	

Raw Water Supply

Rehabilitate Large Dams (Gainer Dam/Regulating Dam)

Construction has been completed to rehabilitate the 400 feet long Gainer Dam concrete spillway, the blowoff structure, and the meter chamber. Also completed was work to correct undermining of the Regulating Dam spillway structure footing.

400 foot Gainer Dam spillway showing new concrete facing

Rehabilitate Large Dams (Ponaganset Reservoir)

Construction is complete for the rehabilitation of Ponaganset Reservoir. Work included repair of dam erosion and placement of riprap, construction of a downstream buttress, restoration of the gate structure and outlet works, improvements to the discharge channel, and reconstruction of the road and drainage system over the dam

Ponaganset Reservoir before rehabilitation

Ponaganset Reservoir after rehabilitation

Burton Pond Dam Rehabilitation

The project has been completed. The breached area of the earth/masonry dam has been reconditioned. Riprap was installed along the top upstream face of the dam to provide continued slope protection.

Burton Pond Dam

60" Influent Conduits - Corrosion Protection

Construction was completed to rehabilitate and recoat the 900 feet long exposed portions of the twin 60 inch riveted steel transmission mains in the meter chamber. Rust was removed, the pipes sandblasted, and protective coatings applied. The exposed portion of twin 60 inch mains inside the junction chamber structure were sandblasted and protective coatings applied to protect against corrosion. In the process two lead joints that were found leaking were resealed. Construction has been completed to provide cathodic protection to 1000 feet of the underground portion of the twin mains. Four impressed current anode beds have been installed to complete the protection system.

Corrosion on 60 inch main prior to rehabilitation

Raw Water Booster Pump Station - Replace Generator

In March 1996, the engine of the old diesel generator failed and became inoperable. The unit was obsolete and the cost made it unfeasible to further repair the generator. In December 1996 a new 2000 kW generator was installed to replace the old 1750 kW generator. This generator has the capacity to power the entire treatment plant and raw water pumps in the event of an emergency power outage.

New Raw Water Booster Pump Station generator for backup power to treatment plant

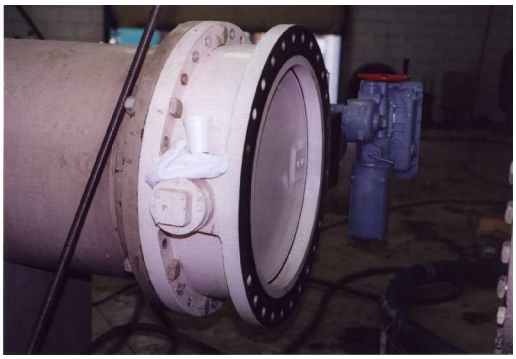
Installation of Level Measuring Equipment

New sonar equipment was installed at Gainer Dam to replace older float style equipment in order to monitor reservoir elevations.

Raw Water Booster Pump Station – Replace Valves

All eight (8) of the suction and discharge valves for the booster pumps in the pump station failed to provide a complete seal when closed. Construction has been completed in which all eight (8) valves and the four (4) actuators for the discharge valves were replaced.

Installation of spool piece after valve installation



New 30" butterfly valve with actuator

Rehabilitate Large Dams (Barden Reservoir)

Construction is complete at Barden Reservoir. Work consisted of improvements to the inlet/outlet structures (including replacement of the gates at the inlet structure), the discharge channels, the spillway area, the crest of the dam to accommodate design flood flows, erosion protection along the upstream slope, and stabilizing the dam by flattening the downstream slope of the dam.

Repairs to the downstream slope of the dam

Repairs to upstream wall at Barden Dam

Raw Water Booster Pump Station Pump Rehabilitation

The rehabilitation of two 50 MGD pumps and two 30 MGD pumps were completed. The scope of work for the project included removing and machining the impellers and shafts, replacing the bearings, laser alignment, vibration analysis, and testing the pumps.

Rehabilitate Large Dams (Westconnaug Reservoir)

With the exception of seeding portions of the crest and downstream slope, construction is complete at Westconnaug Reservoir Dam. The seeding will take place during the spring planting season. Construction consisted of improvements to the spillway to accommodate design flood flows, rehabilitation of the spillway base, and improvements to the upstream slope, the downstream face, the crest of the dam, and the access road. The existing 16-inch discharge control valve has been replaced with a new 20-inch valve. The vault that houses the discharge control valve was in poor condition and has also been replaced with a new pre-cast concrete vault.

Rehabilitation work for the smaller Jordan Pond Dam was also included with this project because of its close proximity to the Westconnaug dam. The dam was in poor condition and in need of numerous improvements to the spillway area, the outlet masonry structures, and the discharge pipe.

Rehabilitate Large Dams (Moswansicut Reservoir)

Construction is complete that improved the slope stability of the dam and corrected localized seepage including the start of a sand boil in the vicinity of the Dam's left abutment. Work included installation of a toe drain system and flattening the downstream slope of the dam with the addition of a gravel buttress.

Concrete remediation at the outlet structure

Regrading the access road on the crest of the dam

Construction is complete consisting of regrading and armoring the upstream slope of the dam, miscellaneous concrete repairs to the outlet structure, regrading the crest of the dam, clearing and grubbing both the outlet and emergency spillway discharge channels, and regrading the access road to the dam.

Large Dam Study

The last official report of record for the Gainer Dam and its five tributary dams was the 1990 Phase II Dam Investigation Report. The report was outdated and listed several deficiencies for dams that have since been corrected or are in the process of being addressed. In spite of the many improvements that were performed, insurance companies still viewed the 1990 Phase II Report as the official report of record.

A new Large Dam Study was therefore commissioned and has been completed. The scope of work for the Large Dam Study included visual inspections of the six large dams, reviewing existing data for the recently rehabilitated dams, conducting stability analyses for the dams that have yet to be rehabilitated, conducting hydrologic and hydraulic analyses for each dam, and updating Providence Water's Emergency Action Plan. The Large Dam Study now replaces the 1990 Phase II Report as the report of record.

The Large Dam Study concluded that all major issues identified in the 1990 Phase II Dam Investigation Report have been addressed and that no immediate repairs were required at any of the six dams.

Gainer Dam Gatehouse - Replace Valve Shafts, Sluice Gates and Stop Shutters

This project moved up in priority and schedule since it had to be completed to allow inspection of the 90" influent conduit in order to be able to safely isolate the conduit for inspection. Construction is complete for replacing all nine (9) sluice gates, all seventy (70) stop shutters, and two (2) drain valves. Nine (9) new electric actuators were installed to operate the sluice gates. The bar grating and trash racks were also replaced under this project. Minor punch list items remain.

Raw Water Booster Pump Station - Replace Boiler and Heating System

The old boiler, which dated back to the original construction of the pump station in 1966 experienced electrical problems, leaks, and required continual maintenance. A construction contract for needed improvements to the heating system has been substantially completed with only punchlist items remaining.

Treatment Plant Facilities

Process Control / Data Acquisition System - (Central Control Board Replacement)

Installation of a new computerized control, instrumentation, and data acquisition system at the treatment plant is complete. The system monitors and controls the operation of the entire treatment plant and remote facilities. Construction of the new control room has been completed, process control equipment has been installed, all remote pump stations and reservoirs are on-line, and all of the in-plant points have been tied into the new control system. Wholesale facilities have been tied into the SCADA (Supervisory Control and Data Acquisition) system. Certification for Y2K compliance has been received from the prime contractor. Logs and reports are fully operational.

Old analog Central Control Board at treatment plant

New state-of-the art computerized Central Control System

Replace Electronic Process Monitoring Equipment

A residual chlorine meter was installed in the clearwell to replace a failed unit. New sonar elevation equipment was installed for the filters to replace the old, unreliable elevation equipment.

Chlorine Room Rehabilitation

Construction is complete for enlarging the chlorine storage room and providing outside access only to the room. Chlorine feeders and storage equipment were replaced and a new emergency ventilation system has been installed in both the chlorine feed and storage areas.

The contractor for the project has filed for arbitration for the resolution of outstanding claims. PW has provided Discovery Documents in response to the contractor being sued by one of his subcontractors. Neither the contractor or the subcontractor have pursued this further.

Replace Lime Feed Equipment

The old lime feeders at the plant have been replaced with 4 new feeders. New injection piping has been installed to provide for an additional lime injection point prior to raw water aeration for corrosion control optimization purposes. The corrosion control optimization measures are necessary as a result of the lead and copper rule.

Two of four new lime feeders installed at treatment plant

The old tile floor of the room was removed and replaced with a new chemical resistant non-skid epoxy floor.

Replace Ferric Feed Equipment

Installation of a new liquid feed system consisting of new chemical storage tanks, new feeder pumps, controls and piping has been completed. The system replaces the old problem-ridden dry feed system.

New sulfate feeder equipment and day tanks for liquid ferric sulfate coagulant injection

Service Water / Wash Water System Controls Upgrade

Work was completed to replace elevation monitoring and control equipment for the service water tank and to install a new remote terminal unit (RTU) for transmitting service water data to the new centralized control system.

Wash Water Tank - Replace Check Valves

Two 18" check valves on the washwater pump suction lines were replaced. The old check valves experienced leakage and were not capable of holding prime to the pumps.

48" Washwater Main Rehabilitation - Corrosion Protection

Recoating of the 48" dia. filter backwash washwater pipe and associated lateral piping, located in the Pipe Gallery of the treatment plant was completed. The old coating system was considerably deteriorated, threatening the integrity of the pipe. The coating was mechanically removed and a new moisture cured two-coat urethane paint system was applied.

Recoating of 48" dia pipe in progress

Auxiliary Wash and Blower System for Filters

Installation of the new air blowers and piping for providing the capacity to air backwash the filters has been completed.

New air blower system at treatment plant for air scour backwashing of filters

Typical new effluent valve actuator at treatment plant providing precise plant effluent control

Replace Effluent Valve Actuators

All of the actuators for all of the plant's filters have been replaced with new internally programmable actuators that will provide improved effluent flow control and compatibility with the new control board system.

Rehabilitate Interior of Clearwell

Construction is complete to rehabilitate the interior of the clearwell. Work consisted of rehabilitating eroded concrete surfaces and cracks, and leaking construction joints inside the interior of the structure. Also included in the scope of work was the structural rehabilitation of two cast-in place concrete 72" x 42" effluent venturi meters. The instrumentation has been fully restored with a new pressure sensing diaphragm type system replacing the annular rings. New process piping and signal wiring has been installed to carry the signal flow to the SCADA system.

Interior of the clearwell

Concrete reconstruction and installation of new instrumentation in treatment plant's 72" x 42" effluent venturi meter

Effluent Clearwell Yard - Concrete Repairs

Construction is complete for the rehabilitation of the area of the effluent yard located directly over the clearwell. The scope of work for the project consisted of installation of a new protective structure directly above the clearwell to eliminate the possibility of rainwater or contaminants from entering. Also included were rehabilitation of the existing drainage system and replacement of deteriorated concrete slabs.

Completed clearwell protective structure

New access hatches and instrumentation panel installed over the opening of the venturi meters

Filter Gallery Rehabilitation

A project was completed in March 1996 in which a portion of the east and west walls of the filter gallery were reconditioned. The work was needed because tiles were loosening from the wall and falling in the filters.

Emergency Bypass - Rehabilitation

The rehabilitation of the emergency bypass structure located at the treatment plant has been completed. The project consisted of replacement of the sluice gates and access ladders and restoration of the concrete surfaces of the structure. In addition, a new crack-bridging cementitious coating was applied to the exterior of the emergency bypass structure.

Treatment Plant - Electrical Supply System Upgrade

Construction has been completed for replacement of the old 1920's vintage antiquated substation that fed the treatment plant, rehabilitation of the high voltage sub-transmission line from the Hope Substation to the new substation, replacement of the underground electrical feeders to the treatment plant with new above ground feeders, and provision of a 480 volt transformer and feed line into the plant. This essentially provides a completely new and reliable electrical feed service system to the plant.

Treatment Plant – Convert Secondary Voltage - 550V to 480V

A project to phase-over the treatment plant from the current antiquated 550 volt service to a standard 480 volt service has been completed. The scope of work included construction of a new electrical room dedicated solely to electrical panelboards and switchgear, the replacement of the existing 175KW emergency power generator with a new 600 KW generator, and the installation of new power and control wiring to each filter influent and drain actuator. The scope of work was expanded to include replacement of the dehumidification system located in the Pipe Gallery due to frequent breakdowns of the existing unit. Due to the condition of the equipment, it was determined to be more economical and effective to replace the system with a new 480 volt dehumidification system than to expend funds running new electrical lines to the existing 550 volt equipment.

Treatment Plant - Roof/Insulation

The replacement of the entire roof at the treatment plant has been completed. Construction consisted of the removal of the existing roof to the concrete deck and installation of new roof insulation and a new rubber membrane roof.

New treatment plant replacement roof

Forestry Garage - Roof / Insulation

Included as part of the roof replacement for the treatment plant, the roof at the forestry garage building was replaced and completed during May 1997. The decision was made to move the project up in schedule because the roof was leaking in a number of locations. The construction consisted of removal of the existing roof to the concrete deck and replacement with rubber membrane roofing.

Forestry Garage replacement roof

Treatment Plant - Replace Boilers and Water Heaters

Replacement of the old deteriorating water heaters and boilers at the treatment plant has been completed. The water heaters and boilers provide heat for the building, and hot water for domestic use and for the treatment process.

Ferric Sulfate Metering System

A project has been completed for the installation of a metering system for the ferric sulfate bulk storage system at the treatment plant. The flow meter is piped and manifolded to record the amount of ferric being dispensed into each tank.

Treatment Plant - Lab Improvements

Construction has been completed to upgrade the testing laboratory at the treatment plant. A new epoxy floor, electrical feeder lines, lighting and laboratory benches have been installed. Also installed were three rooftop HVAC units and a new chemical fume hood.

Installation of a new epoxy floor in the lab

Replace Wash Water Pumps

The two (2) 5600 GPM pumps which supply the backwash water for the treatment plant's filters were almost forty years old and had outlived their useful life. Construction to replace the pumps is complete.

Wiring new service water pump

Removal of existing Wash Water pump

Replace Service Water and Hydrant Pumps

The two (2) 1750 GPM pumps for the service water system which provides process water at the treatment plant and the 1200 GPM hydrant pump which provides water to the hydrants surrounding the sedimentation basins were almost forty years old and had outlived their useful life. Construction for the replacement of the two service water pumps and the hydrant pump is complete.

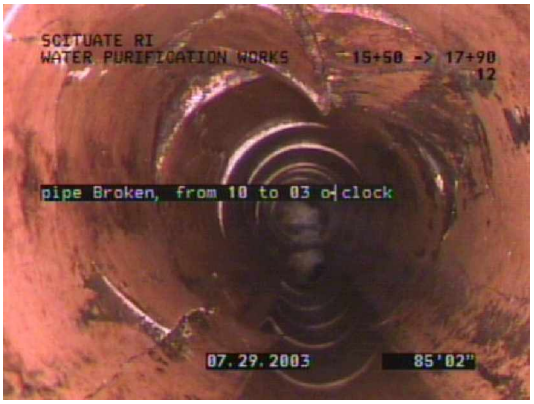
New Pumps following replacement

Access Road Drainage Improvements

A project to correct several drainage problems on the access road surrounding the sedimentation basins has been completed. The drainage system was cleaned, inspected and rehabilitated to provide proper drainage of the access road.

1,986 feet of 12" storm drain pipe was inspected with remotely operated closed circuit television equipment and cleaned through a water jetting process. The inspection identified several areas with blockages and cracks that required rehabilitation.

Section of vitrified clay pipe replaced with PVC



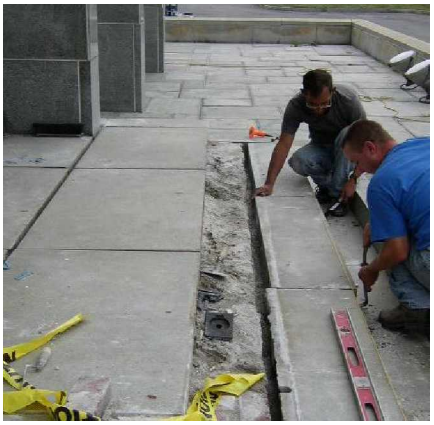
Screen shot of pipe inspection – Broken Pipe

400 feet of 12" vitrified clay pipe was replaced with 12" pvc pipe to correct damaged, collapsed and blocked sections of pipe. Four (4) catch basins were rehabilitated.

A final inspection and cleaning was performed after the rehabilitative work was completed. The final inspection revealed areas with minor damage that will be addressed in the future.

Rehabilitate limestone and granite exterior blocks

Construction is complete for the rehabilitation of the limestone and granite facade at the Treatment Plant. The Treatment Plant's limestone and granite facade was constructed during the 1960's and had deteriorated over time as a result of weathering and exposure from freeze-thaw cycles. The scope of work also included repair of mortar joints and spalled areas, cleaning of the limestone panels, parapet wall, and the brick chimney. The granite terrace and stairs were rehabilitated by removing and resetting sections of stone.



Resetting sections of stone on the stairs

Various Treatment Plant Facilities Projects

Costs were associated with IFR projects that were in progress prior to the submission of the IFR plan commencing fiscal year 1996. These projects consisted of the elimination of the stormwater runoff from entering the filters; replacement of the fluoride feed equipment, and improvements to the pipe gallery wall.

Rehabilitate Lime Transfer System

Lowering section of new blower building into place

The existing pneumatic lime transfer system at the treatment plant installed in the 1940's had outlived its useful life and was generally in poor condition and in need of replacement. The project consisted of replacing the mechanical equipment located in the lime silo, the steel transfer piping, and the mechanical pneumatic transfer equipment in the lime handling area inside the treatment plant. Work included construction of a new exterior building to house the new transfer equipment. The new transfer equipment consists of a pressure conveyance system that replaced the antiquated vacuum system. The silo once used for ferric storage was also rehabilitated and converted to a lime silo to allow for a redundant storage silo.


Footings for new access stairs to silos

The new lime transfer system was placed in operation in January 2005 and the project is currently in the final stage of construction as only minor punch list items remain.

Rehabilitate Fluoride Transfer System

The existing pneumatic fluoride transfer system dated back to its original installation in the 1960's and needed to be upgraded. Needed improvements to the ventilation system in the fluoride room combined with an increase in chemical costs associated with the former delivery mode of fluoride in 400 pound cylinders necessitated moving this project up in priority and schedule. Providence Water investigated modifications to the fluoride handling process as part of the overall project and it was determined that the best long-term solution was to convert to a liquid based, fluorosilic acid system. The new liquid fluoride system is in service and construction is complete.


Bringing new Fluoride Storage Tank into the Treatment Plant

Treatment Plant - Office A/C and Ventilation Upgrades

The construction contract for the needed improvements to the administrative offices at the treatment plant is substantially complete. Improvements included heating, ventilation, and air conditioning upgrades to the office areas and to the auditorium. In addition, a new acoustical panel ceiling was installed in the offices on the basement level of the water treatment plant and ventilation equipment was installed in the lime and fluoride transfer area of the treatment plant. Only punchlist items remain.

Placing A/C unit on top of the Auditorium

Replace water heaters for process water

The construction contract to replace the two (2) water heaters at the treatment plant is substantially complete. Both units had failed and were out of service. The process water was being heated inefficiently by one of the two large heating boilers. A new system consisting of a new small boiler and an additional heat exchanger has been installed to correct this situation. The system will provide more efficient operation as well as redundancy to the entire hot water system that is used for domestic hot water and process water for water treatment. Only punchlist items remain.

Old Process Water Heaters

Treatment Plant - Heating System Upgrade

Upgrades were needed to the heating system at the treatment plant including replacing unit heaters, thermostats, and miscellaneous piping. The construction contract for the upgrades to the various heating system components throughout the treatment plant is substantially completed with only punchlist items remaining.

New Process Water Boiler

Transmission System

102" Aqueduct - Investigation/Rehabilitation

A portion of the 102" transmission aqueduct failed in November 1996. A failure analysis was conducted to determine the cause of the failure and corrective measures needed to prevent future failure. A risk assessment and internal inspection was performed between March 1998 and April 1998. The inspection and risk assessment resulted in recommendations to rehabilitate portions of the 102" main. In November 1998 work commenced on the 102" main consisting of exterior rehabilitation, internal reinforcing of sections of pipe with carbon fiber linings, installation of manholes for additional access points, and performing additional inspections of the main.

Rupture of the 102" Aqueduct – November 17, 1996

102" Aqueduct prepared for replacement sections

Installation of new access manhole into 102" Aqueduct

Installation of a new 60" butterfly valve to replace a defective valve at Budlong Road

Application of carbon fiber to exterior of deteriorated section of 102" Aqueduct

Crew applying carbon fiber lining to interior of deteriorated section of 102" Aqueduct

During January 2000, eleven sections of pipe were rehabilitated with carbon fiber linings, external restoration was conducted to seven sections of pipe through application of new mortar coatings, and three manholes were installed for additional access and de-watering points. A 60" butterfly valve was installed to replace a defective valve. Approximately 2.5 miles of the 5 mile long pipeline easement was cleared of trees and brush in order to have access to the pipeline for monitoring and maintenance. The entire 5 mile long pipeline route is now accessible by vehicle.

Aqueduct Siphon Chamber - Replace Roof

The project has been completed.

Cathodic Protection - Transmission Mains

In 1990, a preliminary corrosion evaluation was conducted on a section of 48" steel transmission main that recommended corrosion protection of the structure to arrest any further deterioration. In order to accomplish this, the main needed to be electrically isolated. Construction has been completed for the installation of four isolation couplings and the installation of an impressed current cathodic protection system. A final inspection was conducted and a report was prepared which indicated that the system is operating to protect the main.

Interior cement mortar lining machine in 48" steel transmission main

In addition to cathodic protection, approximately 1400 feet of the 48" steel water main was cleaned and relined with cement mortar to eliminate the leaks that were found on the main.

90" Effluent Finished Water Aqueduct – Inspection / Rehabilitation

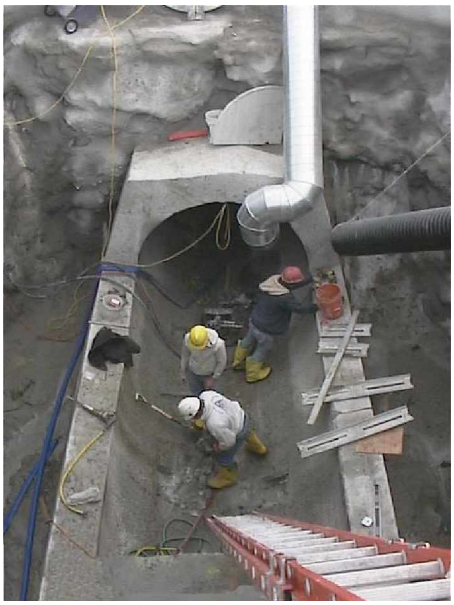
Extensive concrete corrosion damage was discovered in the treatment plant's 90-inch effluent conduit during the rehabilitation of the plant's effluent venturi meters. Subsequently, a video inspection in November 1999 revealed further extensive concrete corrosion damage continuing along the 90" aqueduct as it leaves the plant.

Concrete corrosion damage to the lower half of the effluent conduit

Extensive concrete corrosion damage in vicinity of south venturi meter

Concrete repairs to the interior of the 90" pipeline

Multiple methodologies and approaches for the rehabilitation of the 90" aqueduct were investigated and a work plan was developed that included the installation of a 90" butterfly valve in the aqueduct just downstream of the 78" aqueduct connection in order to enable the 78"/102" aqueduct to continue to function during an event in which the 90" is out of service. The installation of this valve made it possible to conduct the rehabilitative work on the 90". The interior of the 90" aqueduct was rehabilitated for a distance of 1000 feet from the Effluent Chamber to the West Portal using fast curing, potable water-safe, cementitious products.



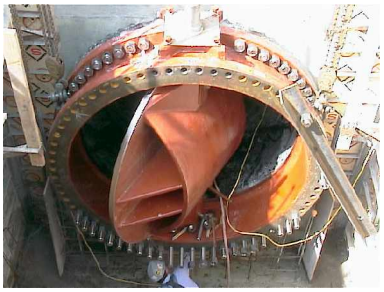
Access into 90" aqueduct at new valve location

Sawcutting top of 90" pipeline to gain access for repairs and valve installation

Removal of top of 90" pipeline

90" disc plug in place prior to rehabilitation and valve installation

Lowering the 90" valve into place



90" valve in place

Work also consisted of the inspection of the final 4 miles of aqueduct (from the West Portal to the Siphon Chamber). The inspection of the 4 miles of aqueduct indicated that portions of this stretch required rehabilitative work. A Design/Build team was awarded the project to rehab the entire 4 mile stretch of the aqueduct and construction on this project has been completed. Various concrete rehabilitative work has been completed including crack injections, spalled concrete repairs, and the investigation and repair of hollow sounding areas.

Pouring base slab of new valve enclosure

New 90" Valve Structure

A new access point was constructed adjacent to the old East Portal. The old east portal was placed out of service because it had become antiquated and was in need of repairs. A new concrete block building was constructed with a new venting mechanism, a security system, and a hoisting system.

Removal of old East Portal Structure

Opening into Aqueduct at New Access Structure

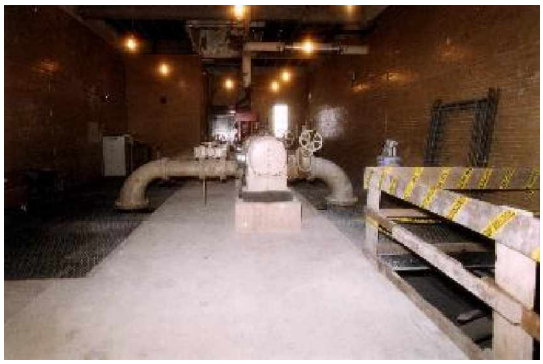
The existing Siphon Chamber needed replacement due to size constraints and deterioration of the building. The replacement of the structure moved up in priority and was added to the scope of work for this project when it became apparent that it would be more cost effective to replace the building than it would be to expend funds on the existing obsolete structure. Work on the construction of a new Siphon Chamber has been completed.

The 2 year anniversary inspection of the 90" aqueduct was conducted in January 2005. The inspection identified a few areas in need of repair. The contractor conducted the necessary repairs completing the project.

Pumping and Storage

Bath Street Pump Station Upgrade

Construction is complete. Rehabilitation of the facility included replacing pumps, replacing suction and discharge piping, instrumentation and electrical system upgrades, architectural and structural improvements, and installation of an emergency power generator. Final pump control programming has been completed.



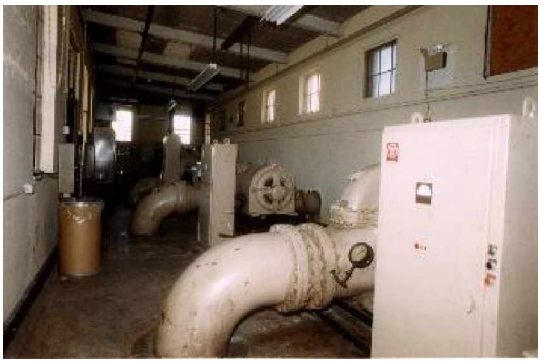
Bath Street Pump Station before upgrade

Bath Street Pump Station after upgrade

Delivery of new generator enclosure

Neutaconkanut Pump Station Upgrade

Construction is complete. Rehabilitation of the facility included replacing pumps, replacing suction and discharge piping, instrumentation and electrical system upgrades, and architectural and structural improvements. Final pump control programming has been completed.



Interior of Neutaconkanut Pump Station before rehabilitation

Interior of Neutaconkanut Pump Station after rehabilitation

Neutaconkanut Pump Station piping before rehabilitation

Neutaconkanut Pump Station piping after rehabilitation

Aqueduct Pump Station (electrical upgrade)

A project was completed to upgrade the electrical service for the pump station to 1200 amps. The old service was undersized and needed to be increased for additional capacity. The upgrade enables all five pumps to run simultaneously and provides extra capacity for future upgrades of the station.

Aqueduct Pump Station (pump upgrades)

A project was completed to increase the pumping capacity for the station from 4200 gpm to 5800 gpm. Due to the rapid development of housing in the western Cranston area of the system, the elevation at Lawton Hills Reservoir during high summer demand periods could not be properly maintained.

Dean Estates Pump Station - Replace Roof

The project has been completed.

Various Pump Stations - Electronic Equipment Upgrades

Consists of modernizing and replacing electronic instrumentation equipment at various pump stations and distribution reservoirs in the system. To date, transmitters and other equipment have been replaced at Fruit Hill, Garden Hills, Neutaconkanut, Western Cranston, and Dean Estates pump stations, and the Lawton Hills reservoir.

Longview Reservoir - Structural Rehabilitation

Construction is complete for the rehabilitation of the original section of Longview Reservoir. The rehabilitation work consisted of the application of a hot-applied reinforced rubber membrane sealant over the entire roof surface of the reservoir, sealing of all cracks and construction joints on the walls and floor of the interior of the reservoir, replacement of the sluice gate, and replacement of the stop shutters.

Old Longview Reservoir sluice gate being removed

Aqueduct Reservoir - Inspection / Rehabilitation

Construction is complete to rehabilitate Aqueduct Reservoir. The work consisted of the application of a hot-applied reinforced rubber membrane sealant over the entire roof surface and the sealing of cracks and construction joints on the interior walls and floor of the reservoir.

Neutaconkanut Gate House - Replace Roof

The project has been completed.

Neutaconkanut Reservoir Gatehouse Rehabilitation

Construction has been completed to restore the northeast section of the building that had deteriorated. Work consisted of replacing bad sections of the foundation, replacing sections of the damaged brick wall, sealing the exterior masonry joints, and providing a ventilation system for the gatehouse structure.

Greenville Avenue Pump Station – Replace surge valve

A project has been completed in which a pump control valve was replaced inside the station that eliminates surges generated by the startup and shutdown of the booster pumps.

New surge control valve at Greenville Avenue Pump Station

Distribution System

Various Distribution System Improvements

Improvements have been completed in two particular sections of the distribution system. In the Port of Providence, meters have been installed in various industrial buildings to individually meter these accounts. The Port of Providence had previously been metered through old inaccurate master meters. At Harborside Blvd., new mains were installed to Providence Water standards to replace some of the older mains in this area, new fire hydrants were installed, and individual building meters were installed to replace the older inaccurate master meter serving the area.

In the western Cranston section of the system two pressure reducing valves have been rehabilitated, and two others have been replaced. The valves are now fully functional and regulate the static pressure to that area of the system.

Installation of Pressure Reducing Valve Station

On Interstate 95, in the northbound lane at the Branch Ave overpass, two 16 inch mains, one high service and the other low service, were internally rehabilitated by installing rubber seals at each pipe joint. Approximately 155 feet of the high service main and 160 feet of the low service line were reconditioned.

Support System Facilities

Replace Telephone System

Construction that replaced the existing telephone system with a new system that is better able to handle the needs of the organization is complete. The new system provides additional capacity and is more responsive to customer service needs.

Academy Avenue Administration Building - Heating System

A project has been completed to replace the old malfunctioning boiler and controls with a new boiler. It was necessary to replace the existing boiler due to increasing maintenance and repair costs, and because of a number of leaks occurring on the unit.

Academy Avenue Administration Building - Ventilation Improvements

Construction has been completed to replace the 4 air conditioning roof units and supplemental controls at the Academy Avenue Service building. Replacement of the system increased the capacity by 120,000 BTU's. The work was needed because the old units were a constant source of problems, unreliable, and in need of numerous repairs. Additionally, the existing units were not adequate for the size of the building.

A study was conducted to evaluate the existing ventilation system for the Academy Avenue administration building, and to provide recommended improvements to the HVAC system that would improve air quality inside the building. The study served to identify and prioritize future work to the ventilation system.

Academy Avenue Administration Building - Roof/Insulation

Construction was completed to replace the roof at the Academy Avenue Administration Building. The project schedule was accelerated because the old roof had started leaking in a number of locations.

Academy Avenue Administration Building - Office Renovation

Rehabilitation of the customer service entrance at the administration building has been completed. Construction consisted of replacing the old customer service counter area with a more secure enclosed customer waiting area, a new service counter with glass partitions for security, and improved lighting.

Improvements were also made inside the stockroom at Academy Avenue in order to maximize and properly organize storage space for inventory.

Old customer service counter

New customer service counter

A project was completed to increase the capacity of the electrical system at Academy Avenue because the old 400-amp electrical service could not meet the additional power demands for the new security system. A new 800-amp electrical service consisting of a new overhead primary feed line and a new transformer was installed to replace the old service. In addition, a new electrical room inside the administration building was constructed which includes a new main circuit breaker, a distribution panel, and appurtenant lighting, receptacles, wiring, and ventilation.

Excavation for Electrical Service to Academy Avenue

Remove/Replace Underground Storage Tanks

Underground fuel storage tanks (UST) have been removed and replaced with new above ground tanks at both the Raw Water Booster pump station at the base of Gainer Dam, and the Aqueduct pump station at Aqueduct Reservoir in Cranston. Leak monitoring equipment was installed on the Transformer Building fuel tank at the treatment plant, and modifications were made to the suction and return piping to comply with DEM regulations.

Removal of old underground fuel storage tank at the Aqueduct Pumping Station

Delivery of new above ground fuel storage tank at the Aqueduct Pumping Station

A storage tank compliance assessment report has been completed and as a result, additional action is being taken to bring all our facilities into full compliance with regulatory requirements. Spill Prevention, Control and Countermeasure Plans have been developed, and record-keeping and inspection programs have been developed and implemented for all regulated tanks. Signage on several abovegound storage tanks (AST) has been upgraded, high level alarms added to the AST's at the Raw Water Booster Pump Station and Aqueduct Pump Station, and overfill prevention valves added to the AST at the Forestry/Maintenance Building. A heating oil underground storage tank at Academy Ave. has been closed in place. UST's for heating oil at the Raw Water Booster Pump Station, the Forestry/Maintenance Building, and the Purification Plant have been removed, and new AST's have been installed at those sites and at Academy Avenue.

Forestry Building - Heating System Upgrade

The original boiler for the forestry garage dated back to the 1960's and was in need of replacement. The boiler had pneumatic controls and drew power off of the 600V electrical service for the building. Replacement parts were difficult and expensive to maintain. The construction contract for the replacement of the heating system and a complete electrical upgrade of the service to a new 480V supply at the forestry building is substantially complete with only punchlist items remaining.

Removal of Original Forestry Boiler

Various Support System and Facility Improvements

Various projects have been completed for the rehabilitation to the employee parking lot at the Administration Building at Academy Ave. Portions of the lot were repaved, parking areas were relined, additional parking spaces were created, and an area was allocated for outside access of inventory supplies.

Improvements were made to the fire supply line entering the Academy Ave. building by installing a backflow prevention device to protect the water system and correct fluctuations in water pressure that will prevent the fire alarm system from inadvertently activating.

Restoration of the masonry and brickwork at Academy Avenue in progress

Construction has been completed for the restoration of the masonry and brickwork for the administration building at Academy Ave. Areas of the building surface had cracked and deteriorated because of age and exposure to the external elements.

Raw Water Supply

Evaluation of Secondary Dams

A study is in progress and a draft report is being prepared to assess the risks to, and the need for improvements to the smaller secondary dams within the watershed. These secondary dams include the Coomer Reservoir Dam, the Kimball Reservoir Dam, and the Peeptoad (Harrisdale) Pond Dam. Visual inspection and geotechnical work has been completed for each of the dams. Hydraulic and hydrologic analyses and stability analyses have been completed. A scope of work will be identified from this study for future rehabilitation work.

Treatment Plant Facilities

Chlorine Upgrades

All three chlorinators located in the chlorine room were replaced with new units. The chloramatic valves on the old chlorinators needed frequent maintenance, the eductors had become obsolete, and the chlorinators needed to be frequently calibrated.

Clarification Optimization (Pumped Flash Mixer System)

Providence Water began looking at optimization of the clarification process while investigating long term planning for the rehabilitation of the sedimentation basins and the tangential mixer at the treatment plant. Both projects are in Providence Water's IFR plan. The logistics of rehabilitating these structures is complicated, requiring that they are isolated offline for extended periods.

Providence Water therefore instituted a study in which various alternatives for rehabilitation were investigated, taking into consideration present regulatory requirements and issues which may impact the treatment processes in the foreseeable future. The study founded that the concrete open-air sedimentation basins are experiencing some short-circuiting of flows, resulting in significantly less detention time than might otherwise be possible. As a result, maximum optimization of the clarification process is not taking place.

In addition to the various concrete repairs that are planned, a series of new baffles are being considered in both basins to improve the sedimentation process.

As part of the study, jar testing was also conducted which identified areas in our clarification process that could be improved to enhance coagulation/flocculation to obtain improved removal of organics. The results of the tests indicated that a significant increase in the coagulant dose would provide for improved removal of organic disinfection by-product precursors to assist Providence Water's efforts to comply with the Stage 1 Disinfectants and Disinfection By-Products Rule. The recommendations were implemented by significantly increasing the dosage of ferric sulfate. This increase in chemical dosing necessitated the replacement of the existing ferric sulfate metering pumps with new pumps properly sized to handle the increased capacity. A Total Organic Carbon (TOC) on-line meter was installed in the ferric pump room to comply with the treatment requirements of the Disinfectant / Disinfection By-Product Regulation. A benchtop TOC analyzer has been installed in the lab to comply with the monitoring requirements of the Disinfectant / Disinfection By-Product Regulation.

The jar test results also indicate that the current coagulant rapid mix process, presently performed primarily by the aerators, is not occurring soon enough after the introduction of the ferric sulfate coagulant to result in optimal coagulation. As a result, a retrofit pump flash mix system was designed which will accomplish the desired flash mixing. This new pump flash mixer system will relocate the ferric injection point from pre-aeration (where it takes approximately 40 seconds to mix) to post aeration. This new injection point will provide near instantaneous mixing. A construction contract is in progress for the installation of this new system. The construction had to be delayed due to the additional scope of work required under the 102" rehabilitation project. Construction will resume once the 102" aqueduct is placed back in service at the start of the high demand season.

Wash Water Tank - Structural Rehabilitation

The wash water tank, which provides backwashing water to the treatment plant's filters is a circular concrete underground tank. Concrete rehabilitation inside the tank and concrete rehabilitation of the valve chamber located adjacent to the tank has been completed. Construction is in progress for the replacement of the three access hatches for the tank and for the replacement of the main 36" washwater valve.

External section of 48" Washwater pipe

Lab Improvements

The microbiology lab oven was replaced. The lab uses the oven as a hot air sterilizer to sterilize glassware used in the collection of microbiological samples. The oven is used daily. The collected samples are used to determine the quality of the source of supply and the potability of the finished water. This oven was a replacement for an existing unit which dated back to the mid 1970s for which replacement parts were no longer available.

The microbiology lab refrigerator was replaced. The laboratory uses a standard household quality refrigerator for the storage of prepared bacteriological growth media, which is used in the analysis of drinking water samples. The growth media must be kept at a constant temperature of 4 C. The refrigerator replaced an existing unit which was over 10 years old and was exhibiting interior corrosion.

Two vacuum pumps were purchased to replace units that were non-functional. One pump, for the Microbiology Lab, is used to draw drinking water samples through membrane filtration filters/funnels for coliform bacteria analysis. The second pump, for the Chemistry Lab, is used for conducting total suspended solids analysis.

A lab desiccator box was purchased to replace an existing ten-year-old unit that had become defective. The desiccator is used for maintaining samples and reagents in a low humidity environment for solids analyses.

Sludge Handling/Disposal

This project was divided into two phases. The first phase consisted of the removal, dewatering, and disposal of accumulated sludge from all of Lagoon #1 (1A and 1B) to replace lost storage capacity. Removal of sludge from Lagoon #1A began in June 1998 and was completed in July 1999. Approximately 23,000 dry tons of ferric sludge were dredged and disposed of. Under the continuing contract, all accumulated sludge in Lagoon #1B was removed and disposed of during the summer of 2000. Additional sludge which had accumulated in Lagoon #1A was also subsequently removed in 2001.

Sludge lagoon at the beginning of dredging operations

Sludge lagoon dredging operations in progress

A new culvert and stop-log structure was installed under the division road between both sections of the lagoon to replace the existing damaged culvert and to provide better control of residual deposits. Construction has been completed on a new improved residual management system. New flow channels and control structures have been installed which will route the flow between alternate lagoons to allow for future alternate drying and removal operations.

Sludge lagoon dredging operations in progress

New culvert and stop-log structure prior to final backfill

Construction has been completed for the removal, dewatering, and disposal of accumulated sludge from all of Lagoon 2, and the lagoon has been placed back in service. The lagoon was approximately at 70% capacity, and the removal of the accumulated sludge was necessary in order to restore the lagoon to its originally intended function of providing an adequate buffer to maintain an acceptable standard of water quality discharged to the Pawtuxet River. The sludge has been stockpiled and will be removed over a period of time under the current contract.

Unloading of culvert sections for residual management system

Concrete pour of wing wall on culvert sections for residual management system

A 15 year maintenance contract was also awarded for ongoing maintenance of Lagoons 1A and 1B through the continual removal of residuals from these lagoons on a regular basis. This activity will be funded through the operations budget and will not impact the IFR program.

Culvert sections prior to backfill

Flow through new residual management system

Process Control and Control System Upgrades

Two new totalizers were installed at two wholesale metering facilities. The new totalizers display additional digits to register higher consumption for large water users.

Construction is substantially complete to upgrade the central control system at the treatment plant with a new application workstation, two workstation processors, and a Windows XP workstation to provide increased speed, hard drive storage capacity, security, and expansion capabilities. Only punchlist items remain.

The pump control system at the Greenville Avenue pumping station was limited to controlling only two of the three domestic pumps, and a fire pump in the pumping sequence. This sometimes caused water pressure fluctuations in the distribution system within that pressure zone. Improvements were made to the remote transmitter unit (RTU) consisting of upgrades to the motherboard, memory card, software programming, and the keypad panel. This reduced the pressure fluctuations by incorporating the third pump into the pumping control sequence.

Planning is in progress to upgrade the remote terminal unit data acquisition systems with equipment incorporating the latest technology for increased security, more efficient data transmission and lower operating and maintenance costs. The project will also address software modifications for the Bath Street and Neutaconkanut pump station RTU's to improve control capabilities for the pumps from the treatment plant's central control system. Additionally, software modifications are required to the master terminal unit located at the treatment plant to incorporate the modifications from the remote pump station RTU's.

A study evaluating the existing SCADA communication system in terms of reliability, operating and maintenance costs, and alternative communication systems was completed. The study concluded that the existing dedicated digital service system meets the requirements for reliability and cost effectiveness when compared to other communication technologies.

Transmission System

Replace 16" and Larger Valves

Five separate contracts were completed for replacing 193 old and outmoded transmission valves in the system. The old gate style valves were replaced with new butterfly valves. The valves were comprised of the following sizes: one hundred eighteen (118) 16" valves, seven (7) 20" valves, forty-one (41) 24" valves, twenty-two (22) 30" valves, four (4) 42" valves and one (1) 48" valve.

Removal of old 42 inch transmission gate valve

Removal of old 48 inch transmission gate valve

Pumping and Storage

Aqueduct Pump Station Rehabilitation

The station upgrade is currently under construction. The station was constructed in 1972 by the City of Cranston and was acquired in 1998 by Providence Water as part of the acquisition of the Western Cranston Water District. Rehabilitation of the facility includes a modular addition to the existing building that will house new vertical turbine pumps, instrumentation and electrical system upgrades, replacement of the emergency generator, and architectural and structural improvements to the existing pump station building structure to convert its use to a storage facility.

Installation of new addition

Neutaconkanut Reservoir - Inspection / Rehabilitation

Neutaconkanut Reservoir, constructed in 1928, has a storage capacity of 42.1 MG. The facility feeds the gravity fed low service system and the Neutaconkanut Pump Station. Concrete rehabilitation of the interior of the tank is in progress. The project also consists of the installation of a new electric hoist in the gatehouse, rehabilitation of the existing stop shutters, installation of a 60" butterfly valve to functionally replace a 75-year-old gate valve, and installation of a 48" feed line adjacent to the tank to promote better water circulation within the tank.

Cleaning of Reservoir Column

Cleaning of Floor Inside Reservoir

Distribution System

Replace Distribution Valves

Since 1996, 536 distribution valves have been replaced. Construction is ongoing to replace older distribution valves in the system. Replacement of valves was significantly accelerated during the 1998 construction season to take advantage of the massive street repaving program conducted by the City of Providence.

Replace Fire Hydrants

Since 1996, 946 older and obsolete hydrants have been replaced. Construction is ongoing to replace fire hydrants in the system as they reach the end of their useful life. All hydrants being installed are of the newer breakaway type.

Replace Lead Services

Since 1996, 4085 lead services have been replaced. Replacement of lead services was significantly accelerated during the 1998 construction season to take advantage of the massive street repaving program conducted by the City of Providence. Please note, in previous reports the number of lead services were incorrectly reported, and that Providence Water has made that correction in this report.

Lead services are also being replaced on an ongoing basis by Providence Water forces in coordination with customer replacement of lead piping on their property. Lead services are also being replaced at sites identified by the Department of Health as having potential lead contamination problems, even though the lead is generally acquired primarily from sources other than water.

Typical lead service being replaced with a new copper service

Replace / Upgrade Water Mains

Since 1996, 32,924 feet of main were replaced at 78 locations. All of the mains replaced were bleeder-mains and dead-ended mains for which water quality complaints had been received. Bleeder-mains are dead-ended mains in which past rusty water problems had necessitated the installation of a continuously discharging small diameter pipe at the end of the main. Out of the 78 locations, 53 were bleeder main replacements. These have since been eliminated, resulting in a substantial reduction in the wasting of water.

Main Installation

Construction is in progress for replacing water mains with the priority being given to older mains where water quality complaints and low-pressure problems have been identified.

Replace Water Meters

Plans are to essentially replace all older non-encoded customer water meters that have outlived their standard useful life with new meters. Meters are currently being replaced by in-house forces. Since the beginning of 1996, 68,565 meters have been replaced. This will result in more accurate readings and better water accountability.

Removal of old meter from meter pit

A contract commenced in August 2003 for the testing and rehabilitation, or replacement, of large commercial and industrial meters in the system. These meters register large volumes of water and are generally sized three inches and above. To date, 301 meters have been evaluated, of which 188 have been tested, 153 have been data-logged to obtain consumption data for right-sizing, 179 have had Encoder Meter Transmitters (ERT's) installed, and 230 have been replaced.

Support System Facilities

Fire Safety System Improvements

Providence Water owns and operates 27 facilities throughout Providence, North Providence, Johnston, West Warwick, Cranston, and Scituate. A field inspection of each facility was conducted and completed by each local Fire Marshal having jurisdiction over the area. Construction has been in progress during FY 2006 and will continue for bringing all Providence Water facilities in compliance with the new Rhode Island Fire Safety Code that was adopted in February 2004. Compliance issues consist of upgrading fire sprinklers, municipal alarms, fire rated doors, fire rated wall separations, and safety rails.

Rehabilitate Roads/Fencing - PW Property

North Access Road After Repaving

Construction is complete for the restoration of the 2500 feet of access road leading into the Neutaconkanut pump station. The project consisted of removal of the badly deteriorated pavement and curbing, and installation of a new bituminous concrete surface over the entire length. Construction is complete for the restoration of the north and south access roads leading into the treatment plant. The projects consisted of removal of the deteriorated pavement and installation of a new bituminous concrete surface. Construction is complete for the restoration of the access road surrounding the storage tank at the Ridge Road site.

Construction is complete for replacing the fencing and relocating the entrance gate structure away from the street at the Engineering and Finance Department office building at the Aqueduct Reservoir site in Cranston in order to address traffic safety concerns associated with the prior entrance configuration.

The old wrought iron gates and fencing at the treatment plant were in poor condition and were reconditioned by sandblasting, priming, and painting the surface of the wrought iron. Masonry work was complete to restore the brick columns for the wrought iron gate at Raw Water Booster pump station, the brick staircase for the lower parking lot at the treatment plant, and the chimney at for forestry garage. Farm fencing was installed along the watershed to replace damaged fencing. Also, construction was conducted to replace existing concrete posts for watershed fencing with new concrete posts because the old posts had weathered or were damaged due to vehicular accidents. Construction is complete for replacing the existing slider gates at the Ridge Road tank and at Aqueduct Reservoir.

Raw Water Supply

Gainer Dam Stonewall Rehabilitation

Plans are in progress to reconstruct the stonewall located along the northerly and southerly sides of RI Route 12 along the length of Gainer Dam. The stonewall is a dry masonry type wall, approximately 2½ feet high and 7200 feet in length. Providence Water has submitted 50% design plans to RIDOT for their review and comment, and for inclusion in their contract for improvements to Route 12. Rehabilitation of the wall is being cost shared with RIDOT, and the schedule is subject to the procurement process of RIDOT.

Raw Water Booster Pump Station Electrical Upgrades

A project is in design to replace the motor control center at the RWBPS. The motor control center dates back to the original construction of the pump station in 1966 and needs to be replaced as parts have become obsolete. The project will consist of new 2300-volt switchgear, pump starters and controllers, new feeders to the motor controls, and a new incoming service feeder. The new motor control center will provide reliable pump control during low reservoir levels and power outages.

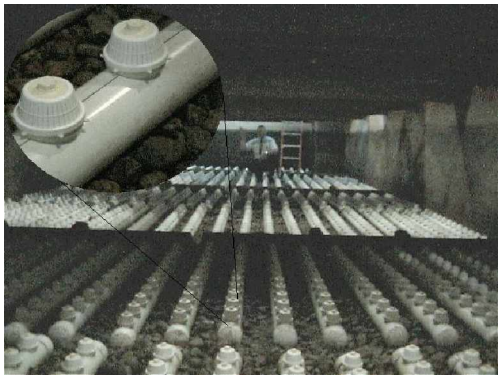
Treatment Plant Facilities

Influent Structure - Replace Valve Stems

This previously identified planned project has been incorporated into the planned influent and aerator rehabilitation project consisting of the following: concrete rehabilitation of the influent structure; replacement of the aerator/influent actuators and valves and valve stems; replacement of the influent structure drain and bypass valves; inspection/rehabilitation of the influent/effluent aerator conduits; concrete rehabilitation of the aeration basin; and replacement of the piping, nozzles and drain valves in the aeration basin. The title of the project in future reports will be changed to Plant Influent and Aerator Rehabilitation.

Replace Sand Filters

Construction is complete for the rehabilitation of Filters No. 3 & 4. Filter No. 4's rehabilitation included total reconstruction of the underdrain system including a new concrete floor base, Triton stainless steel underdrains, an air scour backwashing system, and installation of new tri-media filter media. Filter No. 3's rehabilitation included the installation of a different type of underdrain system consisting of PVC pipe laterals with PVC nozzles along with the piloting of six alternate design slotted PVC pipe laterals, installation of new dual filter media, and installation of an air scour system.



PVC Pipe Laterals with PVC Nozzles

Triton Underdrains

An insertable magnetic flowmeter has been installed in the washwater pipe to accurately monitor washwater during the backflow process. New washwater valves and actuators were installed on each side of each filter (with associated electrical and software modifications).

Providence Water has been monitoring and evaluating the water quality data from the two rehabilitated filters to determine the overall effectiveness of the filter media and underdrains. The new filters have much improved run times, rate of head loss, and reliability over the existing filters. Results indicate that there is little difference in water quality or run times between the new dual-media filter and the new tri-media filters.

Due to the substantial investment that will be made to rehabilitate the remaining 16 filters, Providence Water conducted a bench scale pilot study to evaluate taste, odor, and water quality improvements that might potentially be realized through the use of GAC filtration and other filtration methods.

A final report on this bench scale pilot study was completed in October 2004. Recommendations from the study include replacement of existing filter media with dual filter media consisting of sand and anthracite, and pre-oxidization of the incoming plant influent for the elimination of taste and odor causing compounds.

Design is in the early stages for the rehabilitation of the remaining sixteen original sand filters. In addition to the replacement/rehabilitation of the 16 filters, the scope of work also includes the evaluation, recommendation, and design for the replacement of the filter effluent piping to include the effluent valves, washwater valves, venturi tube effluent meters, and the drain valves. It was decided to combine these projects with the replacement of the 16 remaining sand filters, as the filters and their associated piping and appurtenances will require similar filter shutdowns. This methodology will reduce the overall number of filter shutdowns and minimize the amount of coordination issues during construction. The scope of work also includes work in the pipe gallery consisting of the relocation and replacement of the 48" washwater pipe, new lighting, HVAC improvements, a new outdoor access from the gallery helping to facilitate construction and improving safety conditions, and site improvements to protect the underground filter roof structures. The design is in the engineering assessment phase.

In addition, an RFP is being prepared for the construction of a bench-scale pilot plant to be located at the treatment plant that will model Providence Water's full treatment train. After this is constructed, a pilot study will commence to evaluate the effectiveness of various pre-oxidants on taste and odor causing compounds. In future Status Report submissions, this project will be separately identified.

Transmission System

102" Aqueduct - Inspection

A contract was recently awarded for inspection/design services for the 102" Aqueduct. Providence Water plans to inspect and rehabilitate this extremely important transmission aqueduct at 5-year intervals. In 2000, the aqueduct was rehabilitated and this inspection therefore represents the first follow-up 5-year inspection.

The inspection began in the fall of 2005. It utilized a new technique that involves electromagnetic imaging through the interior of the pipeline which can detect the presence of broken prestressed wires within the pipe, supplemented with a visual and structural inspection including acoustic sounding.

Based on the extensive inspection and the subsequent repair of 45 pipe sections completed in 2000, no significant additional deteriorated sections had been anticipated. The electromagnetic imaging, however, detected 71 pipe sections with potential wire breakage. The one area of greatest concern was near Oaklawn Avenue, directly opposite the street from the November 1996 break. Interior soundings confirmed areas of concrete delamination around the pipe. The pipe was excavated to further investigate its condition and was found to be deteriorated to the point of approaching failure, with numerous rusted out and broken prestressed wires. The inspection performed in 2000 had found no evidence of any deterioration or irregularities in this pipe section. The pipe section was reinforced through post-tensioning with the exterior diameter of the pipe being wrapped with steel tendons spaced 4-inches apart and covered with 3 inches of fiber reinforced concrete.

Given the rapid rate of deterioration of this pipe section in the same Oaklawn Avenue area within the five year period, a decision was made to reinforce the remaining seven pipe sections in this area that have not been previously done. These seven pipe sections will be reinforced utilizing the same internal carbon fiber lining that was performed during the previous rehabilitation project that was completed in 2000.

More extensive hammer soundings were performed on the remaining 70 pipe sections that had suspected wire breaks. Results from the hammer soundings as well as results from the electromagnetic inspections led to the development of an excavation plan for further investigation. Excavation are currently ongoing. Once the excavations are complete, all data from the electromagnetic inspection and the excavations will be reviewed, and further remedial work needs will be identified.

Note that this project is combined with the inspection and rehabilitation of the 78" Aqueduct and the aqueduct's flow control Structures "D" and "E".

78" Aqueduct - Inspection

A contract was recently awarded for inspection/design services for the 78" Aqueduct. Inspection of this line is expected to begin in the Fall of 2006. Note that this project is combined with the inspection and rehabilitation of the 102" Aqueduct and flow control Structures "D" and "E".

Improvements to Structure "D" and "E"

A contract was recently awarded for inspection/design services for Structures "D" and "E". Inspection of these structures is expected to begin in the Fall of 2006. Note that this project is combined with the inspection and rehabilitation of the 102" and 78" Aqueducts.

Pumping and Storage

Garden Hills Pump Station Upgrade

The Garden Hills Pump Station was built in 1960. The station draws its supply from the 43.4 MG Aqueduct Reservoir and boosts the pressure in the Garden Hills neighborhood of Cranston. The project is in the design stage for rehabilitation of the facility which includes replacement of the existing pumps with new variable frequency drive vertical turbine pumps, elimination of aged hydropneumatic tanks, instrumentation and electrical system upgrades, installation of an emergency generator, and architectural improvements to the pump station building.

Dean Estates Pump Station Upgrade

The Dean Estates Pump Station was built in 1982. The station draws its supply from the 43.4 MG Aqueduct Reservoir and boosts the pressure in the Dean Estates neighborhood of Cranston. The project is the design stage for rehabilitation of the facility which includes installation of new variable frequency drive vertical turbine pumps, elimination of aged hydropneumatic tanks, instrumentation and electrical system upgrades, installation of an emergency generator, and architectural improvements to the pump station building.

Distribution System

Leak Detection

The plan is to conduct a leak detection survey on the entire transmission and distribution system. The project is in the planning stages. We are evaluating the level of field work needed in advance of a full scale survey and investigating the newest technologies and methods that are used for surveying leaks.

Support System Facilities

Watershed Storage Facility

A project is currently in the planning stages to replace the 80-year-old Forestry Storage Building located near the settling lagoons. The scope of work includes asbestos abatement and demolition of the existing building; design and construction of a pre-engineered storage garage, an adjacent area for additional outside storage, and a road sand/salt storage shed. All associated site work to include grading, paving, and security fencing are included in the scope of work.

Raw Water Supply

90" Influent Conduit - Inspection

The 90" influent conduit that transports raw water from Gainer Dam to the treatment plant is approximately 75 years old. Now that work on the "Gainer Dam Gatehouse - Replace Valve Shafts, Sluice Gates and Stop Shutters" project has been completed, inspection of the 90" Influent Conduit can commence. The completion of that project now allows a safe and reliable shutdown for inspection of the conduit. Plans are to inspect the 90" influent conduit during the late spring/early summer 2006 when the treatment plant is temporarily shutdown during construction of the new ferric sulfate pump flash mixer installation.

Treatment Plant Facilities

Mixer – structural concrete rehabilitation

Substantial structural and concrete spalling has occurred at the circular concrete tangential mixer and in the area of the walkways adjacent to the mixer. The mixer's function is to provide a cyclical motion to the water that aids in the formation of a settling floc before water enters the sedimentation basins. The logistic difficulties of placing the mixer out of service while still maintaining the treatment process led to the evaluation of the optimization of the entire coagulation / flocculation / sedimentation process to assess its current effectiveness and to investigate alternative approaches. In May 2002 the study was completed. At this point, plans are to rehabilitate the mixer and the sedimentation basins together (along with the possible construction of additional baffling).

Particle Counters and Process Meter Replacement

Several types of process metering equipment are used at the treatment plant and in the distribution system for monitoring and maintaining water quality. Data is collected and logged for recording and reporting purposes. This equipment needs to be replaced at regular recommended intervals to ensure continued accuracy and reliability. A fluoride meter and two pH meters have been replaced. Specifications are being developed for the replacement of the twenty-one (21) existing particle counters.

Pumping and Storage

Lawton Hills Reservoir - Inspection / Rehabilitation

Lawton Hills Reservoir, which is located on Plainfield Pike in the City of Cranston, has a storage capacity of 5.0 MG. This underground tank was constructed in 1972. The facility provides operational storage for the high service area in Western Cranston. There are logistical difficulties in placing this tank out of service while maintaining the supply to the western Cranston area. Providence Water recently performed a brief underwater inspection of the tank that determined that no major rehabilitative work is necessary at this time. The rehabilitation of this tank will be scheduled following the completion of permanent hydraulic improvements in this section of the system which will better facilitate being able to place the tank temporarily off-line for extended periods.

Raw Water Supply

Rehabilitate large dams (Regulating Reservoir Dam)

The project will be coordinated with the upcoming RIDOT project to rehabilitate the Danielson Pike Bridge. We are awaiting a schedule from RIDOT, with the schedule subject to RIDOT's procurement process.

60" Influent Conduits - Replace Valves

Project is scheduled for fiscal year 2009.

Gainer Dam Gatehouse - Arch & Structural Rehabilitation

Project is scheduled for fiscal year 2011. Project has moved back in priority due to other pressing needs.

Treatment Plant Facilities

Replace drain gates for sedimentation basins

Project is scheduled for fiscal year 2009.

Replace aerator actuators and influent valves

Project is scheduled for fiscal year 2008.

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PROJECTS COMPLETED								
Raw Water Supply								
Rehabilitate Large Dams (Gainer/Regulating Dam)	Planning	In House	Jan 95	100%	Nov 95	NA	$1,803,178	NA
	Design	Dec 95	Jun 96	100%	Dec 96			
	Construction	Dec 95	Jun 96	100%	Oct 97			
Rehabilitate Large Dams (Ponaganset Reservoir)	Planning	In House	Feb 97	100%	Nov 97	NA	$862,563	NA
	Design	Jan 97	Nov 97	100%	Mar 98			
	Construction	Apr 98	Jul 98	100%	Oct 99			
Burton Pond Dam Rehabilitation	Planning	In House	Feb 93	100%	Mar 93	NA	$36,307	NA
	Design	In House	Mar 93	100%	Jun 95			
	Construction	Jul 95	Sep 95	100%	Oct 95			
60" influent conduits - Corrosion protection	Planning	In House	May 94	100%	Oct 94	NA	$462,311	NA
	Design	In House	May 97	100%	Dec 97			
	Construction	Jan 98	May 98	100%	Jun 99			
Raw Water Booster Pump Station - replace generator	Planning	In House	Feb 96	100%	Mar 96	NA	$506,045	NA
	Design	In House	Mar 96	100%	Apr 96			
	Construction	Jun 96	Oct 96	100%	May 97			
Installation of Level Measuring Equipment	Planning	*various projects*				NA	$7,383	NA
	Design							
	Construction							
Raw Water Booster Pump Station - replace valves	Planning	In House	Dec 96	100%	Apr 98	NA	$160,083	NA
	Design	In House	Jan 99	100%	Apr 99			
	Construction	Jul 00	June 01	100%	Mar 02			
Rehabilitate large dams (Barden Reservoir)	Planning	In House	Apr 99	100%	May 00	NA	$1,602,216	NA
	Design	Apr 00	Jul 00	100%	Feb 01			
	Construction	Mar 01	Sep 01	100%	Sep 03			
Raw Water Booster Pump Station - pump rehabilitation	Planning	NA	Mar 02	100%	Mar 02	NA	$67,200	NA
	Design	NA	NA	NA	NA			
	Construction	NA	Mar 02	100%	Jun 03			
Rehabilitate large dams (Westconaug Reservoir)	Planning	In House	Jun 00	100%	Nov 00	NA	$1,288,836	NA
	Design	Dec 00	May 01	100%	Mar 02			
	Construction	Apr 02	Aug 02	100%	Jun 04			
Rehabilitate large dams (Moswansicut Reservoir)	Planning	In House	Jun 99	100%	Feb 00	NA	$395,964	NA
	Design	Jul 01	Oct 01	100%	Nov 02			
	Construction	Jan 03	Oct 03	100%	Sep 04			
Large Dam Study	Planning	NA - Study is complete				NA	$47,485	NA
	Design							
	Construction							
Gainer Dam gate house - replace valve shafts, sluice gates, stop shutters	Planning	In House	Sep 01	100%	Dec 01	NA	$715,890	NA
	Design	In House	Dec 01	100%	Jan 02			
	Construction	May 02	Jan 03	100%	Sep 05			
Raw Water Booster Pump Station - replace boiler & heating system	Planning	In House	May 01	100%	Dec 01	$150,000	$128,621	$21,379
	Design	Apr 02	May 02	100%	Jul 03			
	Construction	Jul 03	May 04	99%	(Jun 06)			

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PROJECTS COMPLETED (cont)								
Treatment Plant Facilities								
Process Control / Data Aquisition System (Central Control Board Replacement)	Planning	In House	Jan 92	100%	Sep 93	NA	$2,611,954	NA
	Design	Sep 93	Aug 94	100%	Feb 96			
	Construction	Mar 96	Jun 96	100%	May 01			
Replace electronic process monitoring equipment	Planning	In House	Jan 96	100%	Mar 96	NA	$4,875	NA
	Design	In House	Apr 96	100%	May 96			
	Construction	In House	Jun 96	100%	Jul 97			
Chlorine room rehabilitation	Planning	In House	Feb 92	100%	May 94	NA	$571,007	NA
	Design	Jun 94	Jan 95	100%	Dec 95			
	Construction	Jan 96	Jun 96	100%	Sep 97			
Replace lime feed equipment	Planning	In House	Jun 95	100%	Jul 95	NA	$837,465	NA
	Design	Jan 95	Jul 95	100%	Mar 96			
	Construction	Apr 96	Oct 96	100%	Jan 98			
Replace ferric feed equipment	Planning	In House	Apr 92	100%	Dec 93	NA	$630,277	NA
	Design	Feb 93	Jan 94	100%	Feb 95			
	Construction	Feb 95	Jul 95	100%	Jun 97			
Service water / wash water system controls upgrade	Planning	In House	May 95	100%	May 95	NA	$5,728	NA
	Design	In House	May 95	100%	May 95			
	Construction	In House	Jun 95	100%	Oct 95			
Wash Water Tank - replace check valves	Planning	In House	Jan 96	100%	Feb 96	NA	$25,349	NA
	Design	In House	Feb 96	100%	Mar 96			
	Construction	Apr 96	Sep 96	100%	Jun 97			
48" Washwater Main Rehabilitation - Corrosion Protection	Planning	In House	Jul 00	100%	Oct 00	NA	$480,861	NA
	Design	In House	Jul 00	100%	Nov 00			
	Construction	Dec 00	May 01	100%	Sep 01			
Auxilary wash and blower system for filters	Planning	In House	Mar 93	100%	Jan 94	NA	$400,000	NA
	Design	Feb 93	Feb 94	100%	Oct 95			
	Construction	Oct 95	Apr 96	100%	Jul 97			
Replace effluent valve actuators	Planning	In House	Jan 96	100%	Mar 96	NA	$310,334	NA
	Design	In House	Mar 96	100%	Apr 96			
	Construction	Apr 96	Jan 97	100%	Jun 98			
Rehabilitate interior of clearwell	Planning	In House	Jan 96	100%	Mar 96	NA	$689,786	NA
	Design	May 96	Apr 97	100%	Jan 99			
	Construction	Feb 99	Sep 99	100%	May 00			
Effluent clearwell yard - concrete repairs	Planning	In House	Jan 96	100%	Mar 96	NA	$689,786	NA
	Design	May 96	Apr 97	100%	Jan 99			
	Construction	Feb 99	Jun 99	100%	Nov 00			
Filter Gallery Rehabilitation	Planning	In House	Jan 95	100%	Jan 95	NA	$55,426	NA
	Design	In House	Jan 95	100%	Feb 95			
	Construction	Mar 95	Jan 96	100%	Mar 96			

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PROJECTS COMPLETED (cont)								
Treatment Plant Facilities (cont)								
Emergency bypass rehabilitation	Planning	In House	Jan 96	100%	Mar 96	NA	$276,179	NA
	Design	May 96	Mar 99	100%	Oct 99			
	Construction	Jun 00	Apr 01	100%	Jun 01			
Treatment Plant - Electrical Supply System upgrade	Planning	In House	Jan 94	100%	Jan 95	NA	$945,081	NA
	Design	Jan 95	Feb 95	100%	May 95			
	Construction	Aug 95	Mar 96	100%	Sep 96			
Treatment Plant - Convert Secondary Voltage - 550V to 480V	Planning	In House	Feb 99	100%	Feb 00	NA	$1,293,691	NA
	Design	NA	Jun 99	100%	Feb 00			
	Construction	Jun 00	Jan 01	100%	Dec 01			
Treatment Plant roof/insulation	Planning	In House	Mar 96	100%	Apr 96	NA	$243,618	NA
	Design	Jan 95	Apr 96	100%	Jun 96			
	Construction	Jul 96	Apr 97	100%	Dec 97			
Forestry garage roof / insulation	Planning	In House	Mar 96	100%	Apr 96	NA	$81,206	NA
	Design	Jan 95	Apr 96	100%	Jun 96			
	Construction	Jul 96	Apr 97	100%	Dec 97			
Treatment Plant - Replace boilers & water heaters	Planning	In House	Dec 93	100%	Jan 94	NA	$202,087	NA
	Design	Feb 93	Feb 94	100%	Dec 94			
	Construction	Dec 94	Jun 95	100%	Jun 97			
Ferric sulfate - metering system	Planning	In House	Jan 01	100%	May 01	NA	$42,535	NA
	Design	In House	May 01	100%	May 01			
	Construction	Jul 01	Jan 02	100%	Feb 02			
Treatment Plant - lab improvements	Planning	In House	Oct 94	100%	Jul 96	NA	$511,399	NA
	Design	In House	Aug 96	100%	Nov 00			
	Construction	Dec 00	Sep 01	100%	Dec 02			
Replace wash water pumps	Planning	In House	Apr 01	100%	Oct 01	NA	$269,816	NA
	Design	In House	Nov 01	100%	Dec 01			
	Construction	Dec 01	Mar 02	100%	Apr 04			
Replace service water and hydrant pumps	Planning	In House	Apr 01	100%	Oct 01	NA	$63,388	NA
	Design	In House	Nov 01	100%	Dec 01			
	Construction	Dec 01	Mar 02	100%	Apr 04			
Access Road Drainage Improvements	Planning	In House	May 02	100%	Jun 03	NA	$140,916	NA
	Design	NA	NA	NA	NA			
	Construction	Jun 03	Jul 03	100%	Dec 03			
Rehabilitate limestone and granite exterior blocks	Planning	In House	Nov 03	100%	Dec 03	NA	$167,619	NA
	Design	In House	Dec 03	100%	Jan 04			
	Construction	Jan 04	Jun 04	100%	Sep 04			
Various Treatment Plant Facilities Projects	Planning	*various projects*				NA	$98,097	NA
	Design							
	Construction							

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PROJECTS COMPLETED (cont)								
Treatment Plant Facilities (cont)								
Rehabilitate Lime Transfer System	Planning	In House	Jun 01	100%	Feb 02	NA	$1,958,643	NA
	Design	Feb 02	Jun 02	100%	Sep 03			
	Construction	Oct 03	Jun 04	100%	Nov 05			
Rehabilitate Fluoride Transfer System	Planning	In House	Jun 01	100%	Feb 02	NA	$839,418	NA
	Design	Feb 02	Jun 02	100%	Sep 03			
	Construction	Oct 03	Jun 04	100%	Sep 05			
Treatment Plant Office a/c and ventilation upgrades	Planning	In House	May 01	100%	May 01	$1,000,000	$868,495	$131,505
	Design	Jun 01	Jun 01	100%	Jul 03			
	Construction	Jul 03	May 04	99%	(Jun 06)			
Replace water heaters for process water	Planning	In House	May 01	100%	Dec 01	$100,000	$85,490	$14,510
	Design	Apr 02	May 02	100%	Jul 03			
	Construction	Jul 03	May 04	99%	(Jun 06)			
Treatment Plant - heating system upgrade	Planning	In House	Aug 02	100%	Sep 02	$550,000	$506,032	$43,968
	Design	Oct 02	Oct 02	100%	Jul 03			
	Construction	Jul 03	May 04	99%	(Jun 06)			
Transmission System								
102" Aqueduct-Investigation/Rehabilitation	Planning	In House	Dec 96	100%	Feb 98	NA	$6,038,079	NA
	Design	NA	Nov 98	100%	Oct 99			
	Construction	NA	Jan 00	100%	Apr 00			
Aqueduct Siphon Chamber - replace roof	Planning	In House	Jan 96	100%	Jul 96	NA	$5,754	NA
	Design	In House	Jul 96	100%	Mar 98			
	Construction	Apr 98	Jul 98	100%	Aug 98			
Cathodic protection - transmission mains	Planning	In House	Apr 97	100%	Jun 98	NA	$83,050	NA
	Design	Jun 98	Jul 98	100%	Jan 00			
	Construction	Jul 00	Aug00	100%	Dec 00			
90" effluent finished water aqueduct - Inspection / Rehabilitation	Planning	In House	Apr 99	100%	Dec 00	NA	$7,373,121	NA
	Design	Jun 00	Jun 00	100%	Nov 01			
	Construction	Dec 01	May 02	100%	Mar 05			
Pumping and Storage								
Bath Street pump station upgrade	Planning	In House	Nov 89	100%	Jan 93	NA	$2,472,410	NA
	Design	Feb 93	Oct 93	100%	Apr 95			
	Construction	May 95	Oct 95	100%	Nov 99			
Neutaconkanut pump station upgrade	Planning	In House	Nov 89	100%	Jan 93	NA	$1,847,123	NA
	Design	Feb 93	Oct 93	100%	Apr 95			
	Construction	May 95	Oct 95	100%	Nov 99			
Aqueduct pump station (electrical upgrade)	Planning	NA	Jul 98	100%	Dec 98	NA	$105,723	NA
	Design	NA	Jan 99	100%	Apr 99			
	Construction	Jul 99	Oct 99	100%	Mar 00			
Aqueduct pump station (pump upgrade)	Planning	In House	Mar 00	100%	Apr 00	NA	$80,542	NA
	Design	In House	Mar 00	100%	Apr 00			
	Construction	Apr 00	Jun 00	100%	Jul 00			

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PROJECTS COMPLETED (cont)								
Pumping and Storage (cont)								
Dean Estates Pump Station - replace roof	Planning	In House	Jan 96	100%	Jul 96	NA	$5,754	NA
	Design	In House	Jul 96	100%	Mar 98			
	Construction	Apr 98	Jul 98	100%	Aug 98			
Various Pump Stations - electronic equipment upgrades	Planning	In House	Jan 96	100%	Mar 96	NA	$15,202	NA
	Design	In House	Apr 96	100%	May 96			
	Construction	May 96	Jun 96	100%	Jul 97			
Longview reservoir - structural rehabilitation	Planning	In House	Jan 96	100%	Mar 96	NA	$652,785	NA
	Design	May 96	Jan 97	100%	Jun 97			
	Construction	Jun 97	Apr 98	100%	Sep 99			
Aqueduct reservoir - inspection / rehabilitation	Planning	In House	Jan 96	100%	Mar 96	NA	$1,451,462	NA
	Design	May 96	Sep 97	100%	Feb 98			
	Construction	Mar 98	Apr 99	100%	Oct 00			
Neutaconkanut Reservoir Gatehouse - replace roof	Planning	In House	Jan 96	100%	Jul 96	NA	$5,754	NA
	Design	In House	Jul 96	100%	Mar 98			
	Construction	Apr 98	Jul 98	100%	Aug 98			
Neutaconkanut Reservoir Gatehouse Rehabilitation	Planning	In House	Oct 99	100%	Mar 00	NA	$45,848	NA
	Design	In House	Apr 00	100%	Jun 00			
	Construction	Jul 00	Nov 00	100%	May 01			
Greenville Ave Pump Station - Replace surge valve	Planning	In House	Apr 00	100%	Aug 01	NA	$17,260	NA
	Design	NA	NA	NA	NA			
	Construction	Sep 01	Oct 01	100%	Nov 01			
Distribution System								
Various Distribution System Improvements	Planning	*various projects*				NA	$2,454,094	NA
	Design							
	Construction							
Support System Facilities								
Replace telephone system	Planning	In House	Apr 97	100%	Jun 97	NA	$350,370	NA
	Design	In House	Jun 97	100%	Jul 97			
	Construction	Jul 97	Nov 97	100%	Nov 98			
Academy Avenue Administration Building - heating system	Planning	In House	May 97	100%	Jun 97	NA	$40,370	NA
	Design	In House	Jun 97	100%	Jul 97			
	Construction	Jul 97	Oct 97	100%	Oct 97			
Academy Avenue Administration Building - ventilation improvements	Planning	In House	Apr 97	100%	Apr 97	NA	$74,555	NA
	Design	In House	May 97	100%	May 97			
	Construction	May 97	Oct 97	100%	Oct 98			
Academy Avenue Administration Building - roof / insulation	Planning	In House	Mar 95	100%	Apr 95	NA	$69,208	NA
	Design	In House	Apr 95	100%	Mar 95			
	Construction	Jun 95	Oct 95	100%	Aug 96			
Academy Avenue Administration Building - office renovation	Planning	*various projects*				NA	$571,723	NA
	Design							
	Construction							

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PROJECTS COMPLETED (cont)								
Support System Facilities (cont)								
Remove / replace underground storage tanks	Planning Design Construction	*various projects*				NA	$629,948	NA
Forestry Building - heating system upgrade	Planning Design Construction	In House Oct 02 Jul 03	Aug 02 Oct 02 May 04	100% 100% 99%	Sep 02 Jul 03 (Jun 06)	$300,000	$282,917	$17,083
Various Support System and Facility Improvements	Planning Design Construction	*various projects*				NA	$98,151	NA
CONSTRUCTION								
Raw Water Supply								
Evaluation of secondary dams	Planning Design Construction	NA - Project is a study - 90% complete				$100,000	$56,577	$43,423
Treatment Plant Facilities								
Chlorine Upgrades	Planning Design Construction	In House In House In House	Sep 05 Sep 05 Sep 05	20% 20% 20%	- - - - - - - - - - - - - - -	$200,000	$41,256	$158,744
Clarification Optimization (Pumped Flash Mixer System)	Planning Design Construction	In House Feb 03 Sep 04	Nov 03 Mar 03 Jun 05	100% 100% 10%	Jul 03 Sep 04 (Aug 06)	$1,000,000	$436,383	$563,617
Wash water tank - structural rehabilitation	Planning Design Construction	In House Feb 03 Apr-05	Dec 02 Sep 03 Oct 05	100% 100% 30%	Feb 03 Apr-05 (Jul 06)	$150,000	$59,160	$90,840
Lab Improvements	Planning Design Construction	Work is Ongoing - Various Projects				NA	$10,011	NA
Sludge handling / disposal	Planning Design Construction	In House Jan 95 Sep 97	Jan 96 Feb 96 Jun 98	100% 100% 50%	Nov 02 Feb 03 (Jul 16)	$27,000,000	$16,486,025	$10,513,975
Process Control and Control System Upgrades	Planning Design Construction	Work is Ongoing - Various Upgrades				$550,000	$354,510	$195,490

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
CONSTRUCTION (cont)								
Transmission System								
Replace 16 inch & larger valves	Planning Design Construction	Work is Ongoing - 193 large valves replaced				(1)	$4,694,268	NA
Pumping and Storage								
Aqueduct Pump Station Rehabilitation	Planning Design Construction	In House Jun 03 Dec 04	Oct 02 Dec 03 Apr-05	100% 100% 50%	Mar 03 Sep 04 (Jun 06)	$2,000,000	$1,082,289	$917,711
Neutaconkanut reservoir - inspection / rehabilitation	Planning Design Construction	In House Feb 03 Apr-05	Dec 02 Sep 03 Oct 05	100% 100% 25%	Feb 03 Apr-05 (Dec 06)	$2,000,000	$477,798	$1,522,202
Distribution System								
Replace distribution valves	Planning Design Construction	Work is Ongoing - 536 valves replaced				(1)	$1,740,325	NA
Replace fire hydrants	Planning Design Construction	Work is Ongoing - 946 fire hydrants replaced				(1)	$2,727,697	NA
Replace lead services	Planning Design Construction	Work is Ongoing - 4085 lead services replaced				(1)	$12,371,107	NA
Replace / upgrade water mains	Planning Design Construction	Work is Ongoing - 32,924 feet of main replaced				(1)	$4,039,555	NA
Replace water meters	Planning Design Construction	Work is Ongoing - 68,565 meters replaced				(1)	$10,989,496	NA
Support System Facilities								
Fire Safety System Improvements	Planning Design Construction	In House NA NA	Jul 04 Apr 05 Apr 05	80% 80% 30%	(Jun 06) (Jun 06) (Jun 06)	$2,100,000	$317,747	$1,782,253
Rehabilitate Access Roads and Fencing - PW Property	Planning Design Construction	*various projects*				$1,000,000	$320,775	$679,225

(1) Distribution work is ongoing and long term

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
DESIGN								
Raw Water Supply								
Gainer Dam stonewall rehabilitation	Planning	In House	Jan 02	100%	Jun 02	$600,000	$2,499	$597,501
	Design	In House	Jun 02	75%	- - - - -			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Raw Water Booster Pump Station Electrical Upgrades	Planning	In House	Jul 05	100%	Sep 05	$1,000,000	$34,192	$965,808
	Design	In House	Sep 05	75%	(Apr 06)			
	Construction	(Apr 06)	- - - - -	- - - - -	- - - - -			
Treatment Plant Facilities								
Influent Structure - replace valve stems	Planning	In House	May 01	100%	Dec 01	$100,000	$2,827	$97,173
	Design	- - - - -	- - - - -	- - - - -	- - - - -			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Replace sand filters	Planning	In House	Jul 03	100%	Nov 04	$25,000,000	$1,893,965	$23,106,035
	Design	Feb 05	Oct 05	10%	(Nov 06)	(see narrative)		
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Transmission System								
102" aqueduct - inspection / rehabilitation	Planning	In House	Sep 04	100%	Dec 04	$6,000,000	$255,370	$5,744,630
	Design	Dec 04	Sep 05	60%	- - - - -			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
78" aqueduct - inspection / rehabilitation	Planning	In House	Sep 04	100%	Dec 04	$2,200,000	$6,726	$2,193,274
	Design	Dec 04	(Dec 06)	0%	- - - - -			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Improvements to structures "D" and "E"	Planning	In House	Sep 04	100%	Dec 04	$300,000	$6,726	$293,274
	Design	Dec 04	(Dec 06)	0%	- - - - -			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Pumping and Storage								
Garden Hills Pump Station upgrade	Planning	In House	Dec 04	100%	Feb-05	$550,000	$10,058	$539,942
	Design	Jun 05	Sep 05	20%	(Jun 06)			
	Construction	(Jul 06)	- - - - -	- - - - -	- - - - -			
Dean Estates Pump Station upgrade	Planning	In House	Dec 04	100%	Feb-05	$550,000	$10,058	$539,942
	Design	Jun-05	Sep 05	20%	(Jun 06)			
	Construction	(Jul 06)	- - - - -	- - - - -	- - - - -			
Distribution System								
Leak Detection	Planning	In House	May 01	100%	Jan 02	$110,000	$3,242	$106,758
	Design	In House	- - - - -	- - - - -	- - - - -			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Support System Facilities								
Watershed Storage Facility	Planning	In House	Jul 04	100%	Nov 05	$550,000	$18,044	$531,956
	Design	In House	Oct 05	90%	(May 06)			
	Construction	(Apr 06)	- - - - -	- - - - -	- - - - -			

IFR STATUS REPORT	SCHEDULE					COST		
PROJECT DESCRIPTION	Project Stage	RFP's Issued	Start Date / or (Projected Date)	Percent of Project Complete	Completion Date / or (Projected Date)	Latest Cost Estimate	Expenditures to 12/31/05	Funds Needed to Complete
PLANNING								
Raw Water Supply								
90" influent conduit - inspection	Planning Design Construction	In House - - - - - - - - - -	Aug 01 - - - - - - - - - -	20% - - - - - - - - - -	(Jul 06) - - - - - - - - - -	$40,000	$760	$39,240
Treatment Plant Facilities								
Mixer - structural concrete rehabilitation	Planning Design Construction	Jul 01 - - - - - - - - - -	Jul 01 - - - - - - - - - -	50% - - - - - - - - - -	- - - - - - - - - - - - - - -	$500,000	$0	$500,000
Particle counters and process meter replacement	Planning Design Construction	*various projects*				NA	$26,995	NA
Pumping and Storage								
Lawton Hills reservoir - inspection / rehabilitation	Planning Design Construction	In House - - - - - - - - - -	Dec 02 - - - - - - - - - -	25% - - - - - - - - - -	- - - - - - - - - - - - - - -	$400,000	$0	$400,000
PENDING								
Raw Water Supply								
Rehabilitate large dams (Regulating Reservoir Dam)	Planning Design Construction	No Action				$1,200,000	$0	$1,200,000
60" influent conduits - replace valves	Planning Design Construction	No Action				$370,000	$0	$370,000
Gainer Dam gatehouse - arch. & structural rehabilitation	Planning Design Construction	No Action				$200,000	$0	$200,000
Treatment Plant Facilities								
Replace drain gates for sedimentation basins	Planning Design Construction	No Action				$300,000	$0	$300,000
Replace aerator actuators and influent valves	Planning Design Construction	No Action				$600,000	$0	$600,000
Total IFR Expenditures							**$107,238,283**	

Section III – Infrastructure Replacement Expenditure Plan

Background – Infrastructure Replacement Expenditure Plan

Exhibit 1 – 20 Year IFR Expenditure Plan – Fiscal Years 2006 through 2025 – The twenty year infrastructure replacement expenditure plan is a summary of forecasted expenditure needs for the next twenty years, from fiscal year 2006 (beginning July 1, 2005) through FY 2025 (ending June 30, 2025) aggregated by major categories into four separate five year plan increments. Management staff at Providence Water assessed the facilities consistent with the definitions within the regulations and developed a twenty-year project plan. Project needs were determined based on factors such as age, condition, level of priority, and use of engineering and practical judgment.

Project needs are based on the best available information and assessments available at this time and will be adjusted and / or modified as changing needs, priorities, or regulatory requirements may necessitate. We consider this plan to be a living document subject to amendments as may be required to match changing State and Federal regulations and changing field conditions. The system's needs have been and will continue to be reevaluated by Providence Water staff on an ongoing basis. Our schedule of proposed facility replacements is consistent with deterioration or obsolescence, as we know conditions to be now. The plan's focus is on replacement of facilities necessary to continue to deliver a reliable and healthy water supply to all our customers consistent with drinking water standards and regulations as they presently exist.

All expenditures estimates calculated herein include a 2 percent annual cost adjustment for inflation.

Exhibit 2 – 20 Year IFR Plan – Fiscal Years 2006 through 2025 – Pie chart for 20 Year IFR Expenditure Plan.

Exhibit 12 – Five Year IFR Expenditure Plan Fiscal Years 2006 through 2010 – The Five Year Expenditure Plan is a detail of the planned infrastructure replacement program over the five year period from FY 2006 through FY 2010. The plan is detailed on a project-by-project basis with projects grouped according to functional categories within the system. Project needs are based on the best available information and assessments available at this point in time. The plan will be adjusted and / or modified as changing needs and priorities may require. All expenditure estimates include a 2 percent annual inflationary cost adjustment.

Exhibit 13 – Planned IFR Expenditures for Fiscal Years 2006 through 2010 – Pie chart for Five Year IFR Expenditure Plan

Exhibit 14 – Five-Year IFR Project Overview Fiscal Years 2006 through 2010 – A brief narrative overview of the scope of each project for the Five Year IFR Expenditure Plan.

Exhibit 15 – Fifteen Year IFR Expenditure Plan – Fiscal Years 2011 through 2025 – The Fifteen Year Expenditure Plan is a summary of the planned infrastructure replacement program over the fifteen year period from Fy 2011 through Fy 2025. Projects and estimated expenditures over this time frame are less detailed than those of the initial five-year plan. They are generally summarized according to major system components and aggregated into three five-year time increments. Project needs are based on the best information and assessments available at this point in time and will be adjusted and / or modified as changing needs and priorities may dictate. All expenditure estimates include a 2 percent inflation cost adjustment.

Exhibit 16 – Fifteen Year IFR Project Overview Fiscal Years 2011 through 2025 – A brief narrative explanation of the scope of anticipated replacement work associated with each major component of the system for the Fifteen Year IFR Expenditure Plan.

Background

The plans contained herein are the five (5), fifteen (15), and twenty (20) year forecasts of project needs and expenditures. The five-year plan is organized by specific projects with projects grouped according to functional categories over the five-year period from FY 2006 through FY 2010. The fifteen-year plan is generally summarized according to major system components and aggregated into three individual 5-year time increments over the 15-year period from FY 2011 through FY 2025. The twenty-year plan is a composite of expenditure forecast for the next twenty years (fiscal years 2006 through 2025), aggregated by major system category into four separate five-year plan increments.

The original water supply for our system was obtained from the Pawtuxet River at Pettaconsett in the City of Cranston, with the first service pipe being opened on December 1, 1871. From 1871 to 1902, water was pumped directly from the river and discharged into the system without any purification treatment. In 1906, the City's first slow sand filter water purification system was constructed on the Warwick side of the Pawtuxet River. In addition to Providence, the original water works served Cranston, Warwick, Johnston, and North Providence.

As early as 1910, only 39 years after the completion of this supply, it was apparent that with the growth of Providence and the extension of the distribution system in nearby communities, it would not be many years before the flow from the Pawtuxet River would be inadequate to meet the increased demands. In fact, for a number of years, the consumption during extremely dry weather exceeded the natural flow of the river, and the shortage was made up from water stored in small reservoirs owned by companies operating mills further up the stream.

The constant menace of possible shortages of water resulted in the appointment by the City Council in January 1913, of a committee to investigate the possibility of developing an increased water supply. Legislation was enacted under which the present supply was built.

The Pawtuxet River served the City of Providence from the time water first reached residents' homes in 1871 to 1926 when the deteriorating quality of water, affected by disposal of residential and industrial pollutants into the area's groundwater system, became a serious problem.

By 1915, health issues and the increasing demand on the Pawtuxet River prompted a milestone Providence City Council decision to develop a new modern water supply system. This consisted of the construction of a large reservoir and treatment plant on the north branch of the Pawtuxet River in the town of Scituate. This system, which today still provides water to most of the State of Rhode Island, consists of the main Scituate Reservoir supply and its five tributary reservoirs.

The main Scituate reservoir was formed by the construction of a dam across the Pawtuxet River at the former village of Kent. The dam, principally of earth, is about 3,200 feet long and 100 feet high. Water storage in the reservoir began on November 10, 1925. An aqueduct from the dam feeds the nearby treatment plant which was placed in operation on September 30, 1926.

The original treatment plant was state-of-the-art at the time of its construction. The plant was considered to be among the most technologically advanced of its day, and for many years the filtration system was the only plant of its type in New England. As demand continued to grow, the treatment plant underwent major expansions and renovations in the 1940's and again in the 1960's. Today, the plant has a maximum treatment capacity of 144 million gallons of water per day and still remains the largest treatment facility in New England.

The system has continued to expand where today it consists of almost 74,500 active service connections serving almost two-thirds of the State of Rhode Island through a system of storage tanks, pumping stations, and 958 miles of transmission and distribution mains.

Subsequent to its original construction in the 1920s, Providence Water undertook expansion and capital improvement programs in the 1940's and again in the 1960's. In the context of replacement work, this consisted primarily of improvements to the treatment plant and pumping stations. Since that time, no significant replacement work was accomplished again until the 1990's when Providence Water developed and implemented a proactive infrastructure replacement program intended to reverse the trend of aging and deterioration.

In January 1993 the Rhode Island State Legislature enacted the Comprehensive Clean Water Infrastructure Act. The intent of the legislation was for water suppliers to develop long-term infrastructure replacement programs which would ensure the continued integrity of their systems and provide for funding of this program from water rates.

Pursuant to the enactment of the legislation, the Rhode Island Department of Health, Division of Drinking Water Quality, promulgated Rules and Regulations governing infrastructure replacements for water suppliers. The Rules and Regulations for Clean Water Infrastructure Plans were enacted in January 1995.

On February 29, 1996, Providence Water submitted its first 20 Year Infrastructure Replacement Plan to the Rhode Island Department of Health. The second IFR plan was submitted March 30, 2001. In accordance with the regulations each plan identified improvements over each 20-year period. The plans were amended from time to time since 1996 to meet new challenges and to address changing needs and priorities. Since FY 1996 through December 31, 2005, $107.3 million has been reinvested back into the system, with $23.3 million of improvements in the distribution system, $35.2 million in water treatment facilities, $18.5 million in the transmission system, $8.3 million on pumping and storage facilities, $8.2 million on reservoirs and dams, $11.0 million on meter replacements, and $2.8 million on support facilities. Since the inception of our program of infrastructure replacements in 1990, approximately $116.1 million has been spent in improving the system.

In 2002, Providence Water's engineering staff began conducting an updated facility needs assessment of the major components of the water system. The assessment was incorporated into a database organized by categories, facilities, and components as appropriate. Our engineers assessed the condition of the system components and provided recommendations for restoring their useful lives. The database is a living document and is updated as improvements are made in the system. Our facility needs assessment acted as a tool for identifying projects in this plan. Our new plan continues to address improvements to all areas of the system in accordance with the Regulations of the Act, intending to provide for a continued program of scheduled upgrades of system components as they reach the end of their useful lives to ensure the continued reliability of the water system into the future.

Our plan addresses $248 million of needed improvements over the next twenty-year period, with $66 million scheduled over the first five years. The latter years of the plan emphasize a major shift and concentration of work into the distribution area. The oldest portion of the distribution system is 135 years old, with approximately 28 percent of the mains having been installed in the 1800's. To insure the integrity and reliability of the system into the future, the upgrading and replacement of distribution mains and their appurtenances will be one of the major future concentrations of the Infrastructure Replacement Program.

Exhibit 1

Providence Water

20 Year IFR Expenditure Plan

Fiscal Years 2006 through 2025

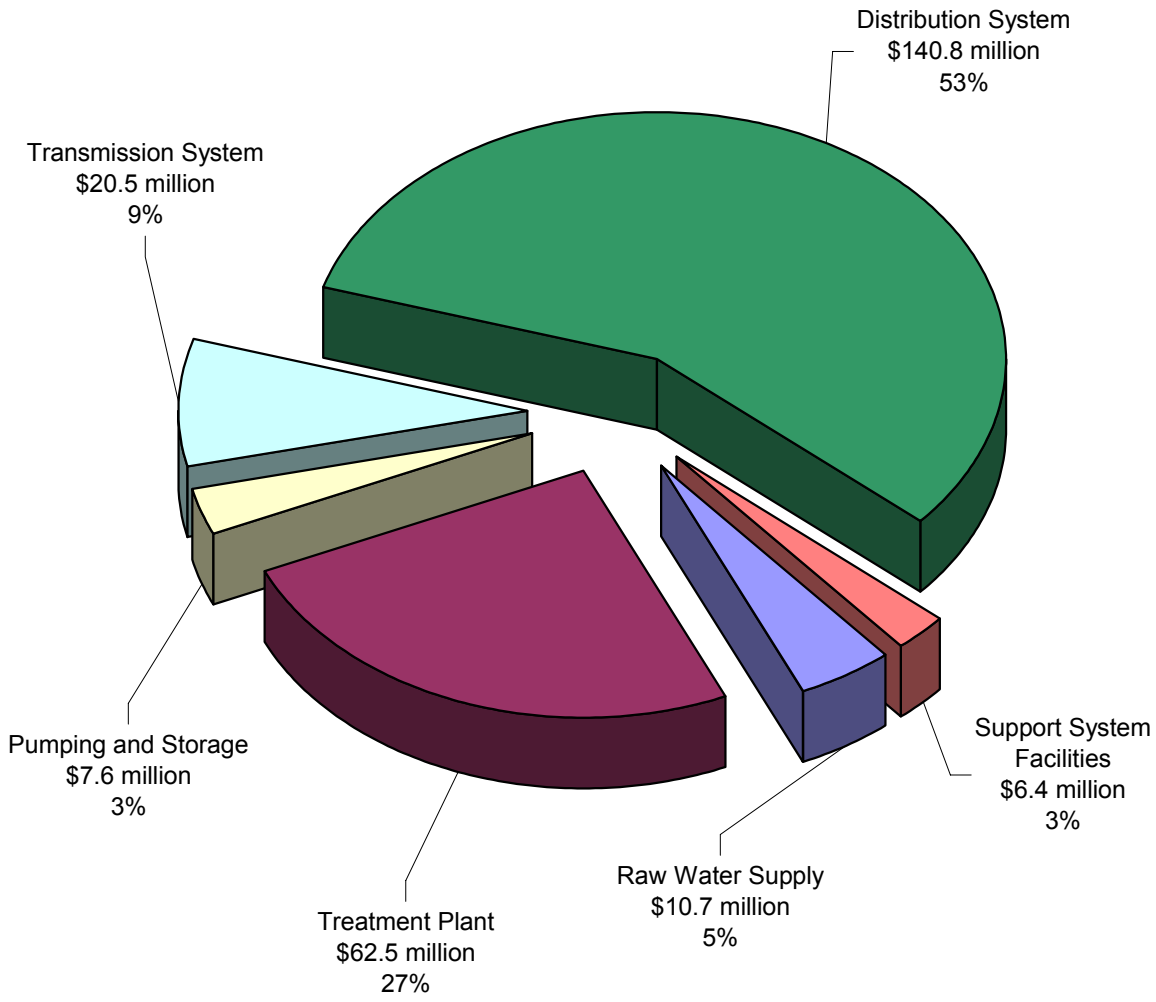
	Total Amount	Fiscal Years 2006 - 2010	Fiscal Years 2011 - 2015	Fiscal Years 2016 - 2020	Fiscal Years 2021 - 2025
Raw Water Supply	**10,720,000**	4,620,000	3,700,000	1,200,000	1,200,000
Treatment Plant	**62,480,000**	37,305,000	16,850,000	6,825,000	1,500,000
Pumping and Storage	**7,550,000**	4,950,000	700,000	1,050,000	850,000
Transmission System	**20,525,000**	8,625,000	8,300,000	2,300,000	1,300,000
Distribution System	**140,750,000**	7,650,000	27,000,000	49,550,000	56,550,000
Support System Facilities	**6,400,000**	2,400,000	1,250,000	1,650,000	1,100,000
	$248,425,000	**$65,550,000**	**$57,800,000**	**$62,575,000**	**$62,500,000**

Exhibit 2

Providence Water

20 Year IFR Expenditure Plan

Fiscal Years 2006 Through 2025



20 Year Investment - $248 million

Exhibit 12
Providence Water
5 Year IFR Expenditure Plan
Fiscal Years 2006 through 2010

	Total Amount	Budget 2006	Budget 2007	Budget 2008	Budget 2009	Budget 2010
RAW WATER SUPPLY						
Reservoirs, Dams, and Watershed						
Gainer Dam stone wall rehabilitation	**500,000**			500,000		
Regulating Reservoir dam rehabilitation	**1,000,000**			100,000	900,000	
Large dam improvements	**280,000**	80,000	50,000	50,000	50,000	50,000
Replace watershed storage facility	**500,000**	100,000	400,000			
Fencing, fire lanes, property rehabilitation	**500,000**	50,000	50,000	50,000	50,000	300,000
Raw Water Structures and Conduits						
RWBPS electrical upgrades	**1,000,000**	100,000	900,000			
RWBPS heating system improvements	**15,000**	15,000				
Gainer Dam gate house - replace telemetry	**20,000**				5,000	15,000
Meter & junction chambers rehabilitation	**500,000**			100,000	400,000	
60" influent conduits - replace valves in junction chamber	**250,000**			50,000	200,000	
60" influent conduits - inspection	**50,000**			50,000		
90" influent conduit - inspection	**5,000**	5,000				
Raw Water Supply Total	**4,620,000**	**350,000**	**1,400,000**	**900,000**	**1,605,000**	**365,000**
TREATMENT PLANT						
Plant Influent and Aerator						
Influent structure rehabilitation	**200,000**		100,000	100,000		
Aerator / Influent actuators and valves replacement	**300,000**		100,000	200,000		
Influent structure - replace drain and bypass valves	**450,000**		150,000	300,000		
Influent / Effluent aerator conduits Inspect / Rehabilitate	**100,000**		50,000	50,000		
Aeration basin concrete rehabilitation	**150,000**		50,000	100,000		
Aeration basin - replace piping, nozzles, and drain valves	**300,000**		100,000	200,000		
Aerated, Settled, and Filter Influent Conduits						
Settled water conduit - installation of access hatch	**25,000**			25,000		
Concrete conduits inspect / rehabilitate	**200,000**		50,000	150,000		
Influent venturis inspection	**125,000**		25,000	100,000		
Emergency bypass - clean tunnel and install sluice gate	**50,000**			50,000		

Exhibit 12
Providence Water
5 Year IFR Expenditure Plan
Fiscal Years 2006 through 2010

	Total Amount	Budget 2006	Budget 2007	Budget 2008	Budget 2009	Budget 2010
Sedimentation Basin						
Sedimentation basins sluice gates replacement	**1,750,000**			250,000	750,000	750,000
Basin drain chamber (including gates) replacement	**500,000**			100,000	400,000	
Sedimentation basins concrete rehabilitation	**5,750,000**		250,000	500,000	2,500,000	2,500,000
Sedimentation basins handrails and walkways replacement	**250,000**			50,000	100,000	100,000
Mixer - concrete rehabilitation	**750,000**			50,000	700,000	
Basin fire hydrants and piping replacement	**100,000**				50,000	50,000
Chemical Storage, Transfer, and Feed Systems						
Chlorine feed equipment replacement	**50,000**	50,000				
Chlorine room upgrades	**200,000**		50,000	150,000		
Lime transfer system upgrades	**30,000**	30,000				
Fluoride system upgrades	**20,000**	20,000				
Ferric system upgrades (pumped flash mixer)	**1,000,000**		1,000,000			
Filters						
Filter replacement (including valves & piping)	**18,000,000**	200,000	300,000	5,500,000	6,000,000	6,000,000
Washwater tank rehabilitation	**300,000**	300,000				
Particle counters	**120,000**	120,000				
Building, Support, and Operational Systems						
Treatment plant architectural improvements	**150,000**		50,000	50,000	50,000	
Treatment plant heating system upgrades	**5,000**	5,000				
Treatment plant water heaters for process water replacement	**20,000**	20,000				
Office air conditioning and ventilation upgrades	**10,000**	10,000				
PW lab / equipment Improvements	**200,000**	40,000	40,000	40,000	40,000	40,000
Service water tank inspection / improvements	**125,000**		25,000	100,000		
SCADA system upgrades	**500,000**	100,000	100,000	100,000	100,000	100,000
Treatment process pilot model	**500,000**		500,000			
Sludge removal and disposal	**5,000,000**	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Sludge lagoon discharge upgrades	**75,000**		75,000			
Treatment Plant Total	**37,305,000**	**1,895,000**	**4,015,000**	**9,165,000**	**11,690,000**	**10,540,000**

Exhibit 12
Providence Water
5 Year IFR Expenditure Plan
Fiscal Years 2006 through 2010

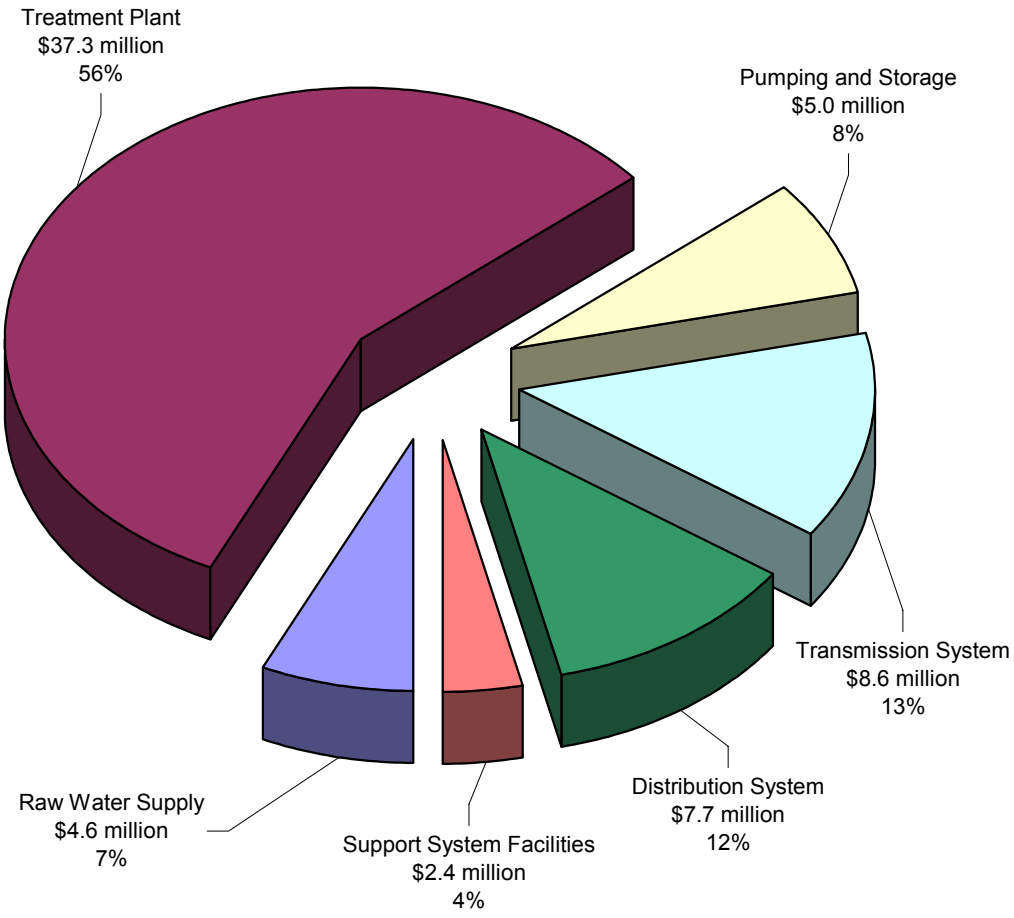
	Total Amount	Budget 2006	Budget 2007	Budget 2008	Budget 2009	Budget 2010
PUMPING AND STORAGE						
Neutaconkanut reservoir rehabilitation	**2,000,000**	1,500,000	500,000			
Ridge Road tank - inspection	**5,000**		5,000			
Aqueduct pump station upgrades	**1,800,000**	1,300,000	500,000			
Dean Estates & Garden Hills pump station upgrades	**1,100,000**	100,000	1,000,000			
Bath Street pump station upgrades	**35,000**		25,000		10,000	
Neutaconkanut pump station upgrades	**10,000**				10,000	
Pumping and Storage Total	**4,950,000**	**2,900,000**	**2,030,000**	**0**	**20,000**	**0**
TRANSMISSION SYSTEM						
78" / 102", and Structures D & E inspection / rehabilitation	**7,400,000**	4,300,000	2,500,000	600,000		
66" transmission main inspection	**100,000**		100,000			
60" transmission main inspection	**250,000**		250,000			
16" and larger valves replacements (1)	**875,000**	25,000	400,000		225,000	225,000
Transmission System Total	**8,625,000**	**4,325,000**	**3,250,000**	**600,000**	**225,000**	**225,000**
DISTRIBUTION SYSTEM						
Replace / Upgrade water mains	**3,100,000**	500,000	500,000	500,000	600,000	1,000,000
Replace Distribution Valves	**500,000**	100,000	100,000	100,000	100,000	100,000
Replace lead services	**500,000**	100,000	100,000	100,000	100,000	100,000
Replace fire hydrants	**400,000**	75,000	75,000	75,000	75,000	100,000
Replace water meters	**3,000,000**	600,000	600,000	600,000	600,000	600,000
Leak detection	**150,000**			50,000	50,000	50,000
Distribution System Total	**7,650,000**	**1,375,000**	**1,375,000**	**1,425,000**	**1,525,000**	**1,950,000**
SUPPORT SYSTEM FACILITIES						
Forestry building heating system improvements	**25,000**	25,000				
Fire system protection improvements	**1,500,000**	1,500,000				
Administration building and facilities improvements	**750,000**	150,000	150,000	150,000	150,000	150,000
Fencing and roads rehabilitation	**125,000**	25,000	25,000	25,000	25,000	25,000
Support System Facilities Total	**2,400,000**	**1,700,000**	**175,000**	**175,000**	**175,000**	**175,000**
TOTAL	**$65,550,000**	**$12,545,000**	**$12,245,000**	**$12,265,000**	**$15,240,000**	**$13,255,000**

Exhibit 13

Providence Water

5 Year IFR Expenditure Plan

Fiscal Years 2006 through 2010



5 Year Investment - $65.6 million

EXHIBIT 14 – Five Year IFR Project Overview - FY 2006 through 2010

RAW WATER SUPPLY

Reservoirs, Dams and Watershed

Gainer Dam Stone Wall Rehabilitation

The stonewall that traverses both sides of the roadway of Gainer Dam on Route 12 (Scituate Avenue) has deteriorated and is in need of rehabilitation. The stonewall was constructed in 1921 and is a dry masonry type wall approximately 2.5' high and 7200' long. The wall is considered an aesthetic landmark within the local community and was identified as such in the Town of Scituate Comprehensive Plan (1991). A portion of this project qualifies for funding through the Transportation Enhancement Program.

Regulating Reservoir Dam Rehabilitation

The dam was recently inspected in 2004 and needed rehabilitative work was identified from the inspection. Remedial work will include armoring the upstream slope of the dam to prevent erosion, constructing a paved drainage ditch at the right abutment to control runoff, correcting erosion behind the downstream wingwalls, repairing/replacing the low level walls along the upstream and downstream slopes as necessary, and rehabilitation of the spillway structure. Plans are for the installation of a sluice gate in the outlet works which would replace the current stop log channel, creating a safer operation for employees.

Large Dam Improvements

Six dams that are part of the Scituate Reservoir water complex, Gainer Memorial Dam and its five tributary reservoirs dams: Barden Reservoir Dam, Westconnaug Reservoir Dam, Moswansicut Pond Dam, Ponaganset Reservoir Dam, and Regulating Reservoir (Horseshoe) Dam. All the dams, with the exception of the Regulating Reservoir Dam, have recently undergone major rehabilitative work to correct deficiencies. Work under this project is to address minor deficiencies as identified through continuing inspections.

At Westconnaug Reservoir Dam, plans are for the installation of a new security gate at the main entrance of the dam, and reloaming and reseeding the crest of the dam to protect against erosion.

At the Gainer Memorial Dam, plans are for removing trees and brush along the 4000 foot long dike of the dam to protect the structural integrity of the dike. The dike is located northeast of the 3,200 foot long dam.

At Barden Reservoir Dam, plans are for periodic evaluation and rehabilitation, as needed, of the 3 gate operators because of their difficulty of operation. Other work includes, for safety reasons, the installation of handrails and guardrails along the downstream walls at the toe of the dam and along the side of the dam. Reloaming and reseeding the grassed areas is needed to protect against erosion.

At Ponaganset Reservoir Dam, plans are for rehabilitating the intake structure to limit unwarranted access to the structure.

At Moswansicut Pond Dam, the grassed areas need to be reloamed and reseeded to protect against erosion.

All six dams will continue to be inspected on a quarterly basis, and future work plans will be developed as necessary dependent on the findings.

Replace Watershed Storage Facility

The existing storage facility is over eighty-years old and is in very poor condition and needs to be replaced. Plans are to replace the building with a new a 7500 square foot pre-engineered steel building and an adjacent 20'x40' salt barn to store watershed material, equipment, and supplies.

Fencing, Fire Lanes, Property Rehabilitation

Plans are to replace approximately 10 miles of fencing, and to install gates at all the fire lanes into our property along RI Route116. Plans are to clear and regrade some of the fire lanes and some of the access roads leading to the reservoir. The fences and access roads, much of which is in poor condition, date back to their original construction in the 1920's. The fencing and road improvements are selected by priority as determined by previously conducted inventories and evaluations.

Rockland Cemetery, located in Scituate, contains over 400 burial lots and about 1500 bodies. During the construction of the reservoir, bodies from many existing cemeteries were moved to Rockland Cemetery. Maintenance of the grounds including the road and drainage around the cemetery became the obligation of Providence Water. The existing 2400 feet of gravel road is in poor condition and requires constant maintenance due to the failure of the drainage system. Plans are for rebuilding and regrading the 2400 feet of roadway along with drainage improvements consisting of rehabilitating 5 existing culverts, 3 catch basins, and 1400 feet of paved stone channel.

Raw Water Structures and Conduits

Raw Water Booster Pump Station Electrical Upgrades

The motor control center at the RWBPS, dates back to the original construction of the pump station in 1966 and needs to be replaced as parts have become obsolete. The project will consist of new 2300-volt switchgear, pump starters and controllers, new feeders to the motor controls, and a new incoming service feeder. The new motor control center will provide reliable pump control during low reservoir levels and power outages.

Raw Water Booster Pump Station Heating System Improvements

The old boiler at the RWBPS, which dated back to the original construction of the pump station in 1966 experienced electrical problems, leaks, and required continual maintenance. A construction contract has been ongoing during FY 2006 that addresses replacement of the hot water heating system in its entirety including a new oil-fired boiler, circulator pumps, expansion tank, air eliminator tank, piping, unit heaters, fin tube radiation, destratification fans, and electric and temperature controls. Improvements are being made to the domestic hot water system with the incorporation of a tankless water heater inside the new boiler.

Gainer Dam Gate House - Replace Telemetry

The existing telemetry from the gatehouse consists of a reservoir level chart recorder and transmitter. This equipment needs to be replaced at regular recommended intervals to ensure continued accuracy and reliability. Plans are to replace this equipment in accordance with replacement recommendations.

Meter and Junction Chambers Rehabilitation

At the meter chamber, plans are for replacing the existing exterior waterproof roof membrane, removing and replacing the damaged sections of fence along the roof, injecting construction joints to stop leakage of groundwater into the tunnel, and the upgrading of communications equipment. Plans are for also installing a new breaker in the 480V panelboard in the Gainer Dam Gatehouse for connecting the existing feeders into the new breaker (the feeders may also be replaced if necessary), changing out the existing 600V/120-230V transformer with a new 480V/120V-230V transformer, and installing additional lighting along the entire length of the chamber.

At the junction chamber, plans are for installing a new aluminum staircase to allow access from the entry platform to the lower portion of the structure, cleaning and painting the outside steel access doors, and installing new lighting to improve lighting conditions inside the structure.

60" Influent Conduits - Replace Valves

The two existing 60-inch gate valves and adjacent air release valves date back to the original construction of the twin 60's in the 1920's. The gate valves are used to isolate each leg of the 60" raw water lines. These valves no longer operate properly and are in need of replacement. In conjunction with this project, new electrical operators will be installed for the valves. This will necessitate an upgrade of the existing 120V electrical service to a 480V service, replacing the existing transformer with a new 480V transformer and installing a new panelboard. A new 480V/120V transformer will need to be installed for the existing electrical equipment that feeds secondary electrical equipment such as lighting, the cathodic protection system, and the security system.

60" Influent Conduits - Inspection

Plans are to inspect the interior and exterior of the conduits every 10-years. Exposed piping inspection includes evaluation of the exterior coating and an internal pipe assessment. Underground pipeline inspection includes an over-the-line survey, an evaluation of soils along the pipeline, soil resistively testing, an internal pipeline assessment, and evaluation and testing of the existing cathodic protection system. As the need for remedial work cannot be anticipated in advance, the budgeted amount for this project is only for the inspection.

90" Influent Conduit - Inspection

The 90" influent conduit is approximately 75 years old. Now that work on the project "Hydro gate house - Replace Valve Shafts, Sluice Gates and Stop Shutters" has been completed, inspection of the 90" Influent Conduit can commence, as the sluice gate replacements under that project now allow for a safe and reliable shutdown for inspection of the conduit. Plans are to inspect the 90" influent conduit during construction of the ferric sulfate pump flash mixer while the treatment plant is temporarily shutdown. Because remedial work needs are unknown, money is budgeted for the inspection only.

TREATMENT PLANT

Plant Influent and Aerator

Influent Structure Rehabilitation

The influent structure is a reinforced concrete structure which has been in service for over 75 years. The exterior above-grade portion of the structure is exposed to the weather and concrete deterioration is evident. Steel grating on the structure is corroding and requires replacement. Plans are for the rehabilitation of the concrete structure and appurtenances. As part of the project, a hydraulic analysis will be performed to evaluate the feasibility of increasing the hydraulic capacity for raw water influent through the structure.

Aerator / Influent Actuators and Valves Replacement

Modulating the aerator/influent valves controls the raw water influent flow into the treatment plant. There are 4 manually operated 36-inch gate valves and 4 electrically operated 36-inch butterfly valves for the aerators that need to be replaced because of corrosion and age. Anticipated work consists of replacing all 4 gate valves, all 4 butterfly valves, electric actuators, all electrical ducts, installing new power wiring and a new motor control system, and incorporating the new valve operators into the existing SCADA system.

Influent Structure - Replace Drain and Bypass Valves

Four 36-inch bypass gate valves are located in the influent control structure for the purpose of diverting raw water directly from the 90-inch influent conduit to the influent tunnel in the event that there is a need to bypass the aeration basin. There are also three 36-inch by 36-inch drain sluice gates and a 72-inch by 72-inch influent venturi sluice gate. The drain sluice gates are used to drain the aerator effluent conduit, influent control structure, influent tunnel, settled water conduit, and the mixer. The influent venturi sluice gate is used during periods of extremely low influent flow for the purpose of diverting influent water through only one venturi meter for maintaining flow meter accuracy. The valves, valve stems and operators are all over 75 years old and show evidence of corrosion. The stems for the valves are worn, in some cases distorted and inoperable, and require replacement. The project calls for the replacement of the 4 bypass gate valves, the 3 drain sluice gates, the influent venturi sluice gate, and all valve stems and

guides. The existing manually operated valve actuators will be replaced with electric actuators, with position and control signals, that will be incorporated into the existing SCADA system.

Influent / Effluent Aerator Conduits Inspect / Rehabilitate

The raw water enters the aerator basin through four 48-inch riveted steel conduits from the influent control structure and exits the aerator through a 108-inch reinforced concrete conduit back to the influent control structure. Anticipated work consists of an internal inspection of the steel and concrete conduits, performing an external inspection of the steel conduits, performing structural analyses of the steel pipe and reinforced concrete conduits, and performing any required rehabilitative work.

Aeration Basin Concrete Rehabilitation

The aeration basin is a reinforced concrete lined basin measuring 140 feet wide by 200 feet long by 6.5 feet deep. The concrete lining is 8 inches thick and was cast in place in individual panels. The expansion joints between panels were sealed with caulking. A 25 foot diameter by 42 inch high by 18 inch thick circular reinforced concrete weir is located in the center of the aeration basin where aerated water drops down to enter the 108 inch aerated effluent conduit. The concrete panels have settled and shifted resulting in an uneven surface and exposed joints between the concrete panels. The concrete is also severely deteriorated due to exposure to weather and treatment chemicals. Anticipated work includes replacement of the reinforced concrete lining, and inspection and structural analysis of the remaining concrete structures for addressing needed rehabilitative work.

Aeration Basin - Replace Piping, Nozzles, and Drain Valves

Aeration is effected through 367 aerator nozzles and 2 jets in the aeration basin. There are four independent sets of aerator nozzles and jets. The nozzles, spaced 24 inches apart, are installed vertically on three rectangular sets of cast iron pipe. Work consists of internal and external inspection and structural evaluation of the cast iron pipe and fittings, and inspection and performance evaluation of the aerator nozzles. The budget amount for this project includes complete replacement of all piping, fittings, nozzles, and the drain valve for the aeration basin. In the event that the evaluation determines that total replacement is not necessary, the budget will be modified.

Aerated, Settled, and Filter Influent Conduits

Settled Water Conduit - Installation of Access Hatch

Aerated and settled water is conveyed to the various treatment processes through circular and rectangular reinforced concrete conduits constructed in 1925. There is limited access to the upper settled water conduit as it is currently configured. Plans are for the installation of an access hatch. The hatch would facilitate entry into the settled water conduit by providing a safer and more convenient access point for maintenance and inspection operations.

Concrete Conduits Inspect / Rehabilitate

The 12 foot high by 8.5 foot wide rectangular reinforced concrete lower conduit conveys the aerated water to the tangential mixer. A bypass chamber connects the lower conduit to the upper settled water conduit. The upper settled water conduit is an 11.5 foot high by 10 foot wide rectangular reinforced concrete conduit that conveys settled water from the settling basins to the filter influent conduit which conveys the settled water to the 18 filters. Located directly below the filter influent conduit is a rectangular washwater drain conduit that conveys water released from backwashing operations of the filters to the main washwater drain that eventually leads to the sludge lagoons. Plans are to conduct an internal inspection and structural evaluation of all 4 concrete structures and to address any areas requiring remedial action.

Influent Venturis (Aerated Water Conduit) Inspection

Aerated water enters two 72 inch diameter reinforced concrete conduits, 45 feet in length, which lead to two 72 inch by 36 inch cast in place venturi flow meters. These venturis measure the flow rate of water entering the plant.

Each venturi meter contains an inlet pressure venturi meter casting and a throat pressure venturi meter casting. Each casting contains multiple ports evenly spaced along the circumference which are connected to metal tubing to convey the high pressure and low pressure differentials for calculating the flow rate. Plans are to perform an internal inspection and structural analysis of the concrete and castings of venturi meters, evaluation of the pressure lines and sensors, replacement of pressure differential metering equipment, and evaluation and calibration of the venturi flow meters for accuracy.

Emergency Bypass - Clean Tunnel and Install Sluice Gate

A 6 foot wide by 7.5 foot high bypass tunnel connects the lower influent (aerated water) conduit to the emergency bypass chamber. The purpose of the bypass tunnel is to allow aerated water, with emergency disinfection treatment, to flow directly to the effluent conduit in the event it became necessary to bypass the plant because of an emergency. A buildup of lime sludge currently occurs in the bypass tunnel due to its location downstream of the lime solution injection point in the lower conduit, and is an impediment in the event that the bypass would need to be utilized. Plans are for cleaning the lime sludge buildup, conducting an internal inspection and structural analysis of the concrete emergency bypass tunnel, and addressing required rehabilitative work. A sluice gate with a new actuator, valve stem, and guides would be installed at the entrance of the bypass tunnel to prevent the future buildup of lime sludge.

Sedimentation Basin

Sedimentation Basins Sluice Gates Replacement

There are 22 Sluice Gates located in the sedimentation basins. All of these gates date back to the original construction of the treatment plant in the 1920's. The gates control the flow of water into the basins from the mixer (4), from each basin to the other (4), from the basins to the settled water conduit (8). There are also gates that allow the basins to be drained (4) as well as gates that allow the basins to be bypassed (2). All the gates are in need of replacement due to their condition, failure to correctly seal, and/or difficulty to operate. The addition of electrical actuators to these currently manually operated valves will be included.

Basin Drain Chamber (including gates) Replacement

The drain chamber is a small concrete structure that controls the flow from the drain structures located inside the basins to the inlet of the main drain for the treatment plant. From there water travels through the main drain of the treatment plant grounds to the settling lagoons. Four sluice gates are located inside the drain chamber. Plans are to replace all 4 gates because of leakage and difficulty of operation. Concrete rehabilitation of the drain chamber also will be addressed.

Sedimentation Basins Concrete Rehabilitation

The sedimentation basins are open concrete basins. The North basin covers an area of almost 10 acres and the South basin covers an area of just over 26 acres. The concrete slab bottom of the basins has undergone deterioration. Plans are for the removal and replacement of defective concrete panels and concrete curbing, injection of chemical grout into cracks in the separation walls, and installation of a sealant between parapet wall sections around the perimeter of the basins.

Also being considered is the installation of additional baffling within the basins to lengthen the effective flow path and improve sedimentation.

Sedimentation Basins Handrails and Walkways Replacement

The concrete walkway in between the north and south basins shows deterioration and needs to be rehabilitated. The other walkways to various structures inside the basins will be replaced with stainless steel walkways and railings. Other areas where handrails have deteriorated will be replaced with new stainless steel railings.

Mixer - Concrete Rehabilitation

Substantial structural and concrete spalling has occurred at the circular concrete tangential mixer and in the walkways adjacent to the mixer. The mixer's function is to provide a cyclical motion to the water that aids in the formation of a settling flocculation before water enters the sedimentation basins. Plans are to perform concrete rehabilitative work on the mixer.

Basin Fire Hydrants and Piping Replacement

There are 11 hydrants located along the perimeter of the sedimentation basins that are connected to about 1 mile of 6" water main. The entire system was installed during the construction of the basins in 1939. The system is periodically used during the cleaning of the basins to wash the settled residuals to the drain structures. The hydrants are old and replacement parts are difficult to find. The hydrants need to be replaced with new type hydrants. The water main, when activated, has numerous leaks and needs to be replaced or rehabilitated.

Chemical Storage, Transfer, and Feed Systems

Chlorine Feed Equipment Replacement

The chlorine feed equipment is in need of replacement. The corrosive nature of chlorine has significantly impacted the reliability of the existing feeders. The feeders require frequent maintenance and need to be replaced.

Chlorine Room Upgrades

Architectural upgrades are needed in the chlorine room consisting of a new epoxy floor, painting of the walls and ceiling, new lighting, and the replacement of the crane in the storage room. Other upgrades planned include the replacement of chlorine gas detectors, and piping modifications in order to improve access to the feeders during scheduled maintenance of the chlorinators.

Lime Transfer System Upgrades

The existing pneumatic lime transfer system at the treatment plant installed in the 1940's had outlived its useful life and was in poor condition and in need of replacement. A construction contract has been ongoing during FY 2006 for replacing the mechanical equipment located in the lime silo, the steel transfer piping, and the mechanical pneumatic transfer equipment in the lime handling area inside the treatment plant. Improvements are in process for housing the new transfer equipment in a new structure at the base of the silos and converting the existing vacuum system to a new pressure conveyance system. The silo once used for ferric storage was also rehabilitated and converted to a lime silo for additional storage capacity.

Fluoride System Upgrades

The existing pneumatic fluoride transfer system dated back to its original installation in the 1960's and needed to be upgraded. Improvements to the ventilation system in the fluoride room were needed and chemical costs had increased with the delivery mode of obtaining fluoride in 400 pound cylinders. Providence Water investigated modifications to the fluoride handling process as part of the overall project. It was determined that the best long-term solution was to convert to a liquid based, fluorosilic acid system consisting of 4 bulk storage tanks, a smaller day tank, and a pump metering system to introduce fluoride after the clearwell. During FY 2006, construction has been ongoing to replace the old granular system with this new liquid fluoride

handling/injection system. The 4 bulk storage tanks, along with the smaller day tank, were placed in the room formerly occupied by the former ferric chloride and lime transfer vacuum receivers and hopper baghouse units. The existing fluoride blower, hopper, and feeder units were demolished as part of this project.

Ferric System Upgrades (Pumped Flash Mixer)

The current coagulant rapid mix process performed primarily by the aerators is not rapid enough after the introduction of the ferric sulfate coagulant to result in optimal coagulation. In order to assist efforts for compliance with the Stage 1 Disinfectant and Disinfections By-Products Rule, Providence Water identified areas in the clarification process that could be improved for enhancing coagulation/flocculation to obtain better removal of organic disinfection by-product precursors. As a result, plans are to install a retrofit pump flash mix system which will accomplish the desired flash mixing. This new pump flash mixer system will relocate the ferric injection point from pre-aeration (where it takes approximately 40 seconds to mix) to post aeration. This new injection point will provide near instantaneous mixing for optimal coagulation/flocculation.

Filters

Filter Replacement (Including Valves & Piping)

The filter media in the plant filters dates back to the 1960's and parts of the underdrain system date back to the plant's original construction in the 1920's. Two of the 18 filters have recently been rehabilitated with filter media (one consisting of tri media, the other dual media). These two filters served as full-scale pilot evaluations to determine the preferred media type for the remaining sixteen filters. It was determined that the remaining sixteen filters would be rehabilitated with the dual media.

At this time under the plan of having only two filters offline at any given time, the schedule for replacement of the filters will be four a year period. In the first five years of the plan, it is expected that 12 of the 16 filters will be replaced. Also as part of the filter replacement, the existing underdrain system will be replaced for each filter. All influent and effluent valves and actuators (with the exception of the recently installed 12" effluent actuators) will also be

replaced. All piping, including the main 48" washwater pipe in the central pipe gallery will be replaced under this project. Other work in the pipe gallery includes new lighting, HVAC improvements, and construction of a new outdoor access at the north end of the pipe gallery. Site improvements will also be made to improve the underground filter roof structures.

Washwater Tank Rehabilitation

The washwater tank, which provides backwashing water to the treatment plant's filters, is a circular concrete underground tank. Plans are for concrete rehabilitation inside the tank, replacement of three access hatches for the tank, replacement of the main 36" washwater valve, and concrete rehabilitation of the valve chamber located adjacent to the tank.

Particle Counters

Several types of process metering equipment are used at the treatment plant and in the distribution system for monitoring and maintaining water quality. Data is collected and logged for record and reporting purposes. This equipment needs to be replaced at regular recommended intervals to ensure continued accuracy and reliability. Plans are for the replacement of the 21 existing particle counters. The new particle counters combined with recent upgrades to the plant SCADA system will allow for the information from the counters to be more easily captured into the plant's data logging and reporting system.

Building, Support, and Operational Systems

Treatment Plant Architectural Improvements

Various architectural improvements are needed at the Treatment Plant. Interior lighting that hasn't yet been upgraded with energy efficient fixtures needs to be replaced. Flooring systems in the treatment plant need some level of rehabilitative work, and in some areas floor tiles contain asbestos need to be removed and replaced with new flooring. All of the restrooms need to be rehabilitated. Ventilation also needs to be improved in the lime feeder room. The auditorium projector system is outdated and needs to be replaced. Some of the personnel spaces need to be rehabilitated.

Treatment Plant Heating System Upgrades

Construction has been ongoing during FY 2006 for the upgrades to the various heating system components throughout the treatment plant. Rehabilitation of the system includes replacement of unit heaters and cabinet unit heaters throughout the plant, the addition of new unit heaters, electrical and temperature controls, replacement of piping and insulation, circulator pumps, valves, backflow preventers, and replacement of the service water line in the pipe gallery. New electrical feeders, distribution panels, panelboards, transformers and switchgear are included in the boiler room area and lime hopper area.

Treatment Plant Water Heaters for Process Water Replacement

Construction has been ongoing during FY 2006 to replace the two (2) water heaters for the process water at the treatment plant. Both units failed and were out of service. Rehabilitation consists of a new system to include a new boiler, circulator pumps, mixing valves, piping, and an additional heat exchanger. The system will provide more efficient operation as well as redundancy to the entire hot water system that is used for domestic hot water and process water for water treatment.

Office Air Conditioning and Ventilation Upgrades

Construction has been ongoing during FY 2006 for needed improvements to the heating system for the administrative offices at the treatment plant. Improvements include heating, ventilation, and air conditioning upgrades to the office areas, hallway, and the auditorium. Improvements also consist of a new acoustical panel ceiling in the offices and hallway on the basement level of the plant. Included in the project are new air handler units and associated ductwork and registers to replace the old cabinet unit heaters in the lime and fluoride transfer area. Exhaust fans and new electrical and temperature controls are included to control temperature and air ventilation during the non-heating season.

PW Lab / Equipment Improvements

Testing of the raw and treated water is required on a regularly scheduled basis to comply with State and Federal regulatory requirements. The testing and monitoring equipment has a normal life ranging from 4 to 15 years depending on the type of equipment and frequency of use. The plan is to replace this equipment as it becomes necessary. The budget amounts shown in the plan are for anticipated needs.

Service Water Tank Inspection / Improvements

The 40,000 gallon welded steel service water tank, constructed in 1961, is a double ellipsoidal tank, approximately 90 feet high and 20 feet in diameter with a 36-inch diameter riser 63 feet in height. Four cylindrical leg columns with level beams and radial rods support the tank. The tank was last inspected and painted in 1993. Plans are to perform a structural review of the tank and to repair any leaks and pits that are identified. As part of the scope, a coating application will be applied to the interior and exterior surfaces of the tank, and the current cathodic protection system will be evaluated and replaced if needed.

SCADA System Upgrades

Construction has been in process during FY 2006 for upgrades to the computerized central control system at the treatment plant. Improvements include a new application workstation, two workstation processors, new monitors and a Windows XP log and report workstation to provide increased speed, hard drive storage capacity, security, and expansion capabilities. New hardware needs to be installed to improve data acquisition from existing and future process metering equipment.

Plans are to upgrade the remote terminal unit data acquisition system with equipment incorporating the latest technology for increased security, more efficient data transmission, and lower operating and maintenance costs. Plans are to address software modifications for the Bath Street and Neutaconkanut pump station RTU's to improve control capabilities for the pumps from the treatment plant's central control system. Additionally, software modifications are required to the master terminal unit located at the treatment plant to incorporate the modifications from the remote pump station RTU's.

The SCADA system comprises state-of-the-art computer hardware and software equipment. However technology is ever-changing and upgrades are routinely needed. Funds have been budgeted for the upgrade of the remote RTU system and additional software programming on an as needed basis. An annual amount is budgeted to anticipate ongoing needs which include future hardware replacements and software upgrades. Hardware needs will consist of replacing printers, monitors, memory modules, and upgrades to the workstation. Software upgrades will consist of upgrades for newer versions of operating software for optimizing use of the system and for new applications. Any additional applications for the SCADA system will require the acquisition of data input/output cards, modems, remote terminal units, and software revisions for incorporation of the new equipment into the system.

Treatment Process Pilot Model

A bench-scale pilot plant will be constructed at the treatment plant. This bench-scale pilot plant will model the entire treatment train and will be used to evaluate the effectiveness of various pre-oxidants on the removal of taste and odor causing compounds from the raw water source. Upon completion of the pilot model, a future project may be added to include the implementation of the pre-oxidation system at the treatment plant.

Sludge Removal and Disposal

The three lagoons (1A, 1B, & 2) were constructed in 1924 during the construction of the treatment plant to receive periodic sludge discharges resulting from backwash operations at the plant and sludge released during cleaning operations of the north and south sedimentation basins. Sludge had been allowed to accumulate in the three basins since the plant was placed in operation severely limiting their storage and settling capacity. All sludge accumulation has now been removed from the three lagoons to restore them to their original design intent of providing an adequate buffer to maintain an acceptable standard of water quality discharged in the Pawtuxet River. Remaining work for sludge removal consists of removing the previously stockpiled sludge that was dredged from Lagoon 2. Lagoon 2 was approximately seventy (70) percent full prior to the dredging operations. Payment for this work will continue over the subsequent years in accordance with a payment schedule.

Sludge Lagoon Discharge Upgrades

Presently there is no walkway to the outlet structures for lagoons 1B and 2. Additionally there is no convenient way of measuring flow into the Pawtuxet River. Plans are for access improvements to the overflow structures at lagoons 1B and 2. Additionally, a flow monitoring control will be installed in the discharge channel of lagoon 2 to measure the amount of flow discharged into the Pawtuxet River.

PUMPING AND STORAGE

Neutaconkanut Reservoir Rehabilitation

Neutaconkanut Reservoir has a storage capacity of 42.1 MG. This underground tank was constructed in 1928. The facility feeds the gravity fed low service system and the Neutaconkanut Pump Station. Construction has been ongoing during FY 2006 for performing concrete repairs to the interior of the tank, installation of a recirculation line, rehabilitation of the existing stop shutters, installation of a 60" butterfly valve to functionally replace a 75 year old gate valve, and installation of a new electric hoist inside the gate house.

Ridge Road Reservoir - Inspection

The Ridge Road Reservoir, constructed in 1989, is an above ground prestressed concrete tank with a storage capacity of 3.5 MG, and provides operational and fire storage for the extra-high service area of North Providence. The exterior of the tank shows some minor cracking which needs to be further evaluated to determine the appropriate repair method. Plans are also for an interior inspection of the tank to assess its condition. Given the partial information at this time, the amount budgeted in the plan does not include remedial work and is for the inspection and evaluation of the tank only.

Aqueduct Pump Station Upgrades

The station was constructed in 1972 by the City of Cranston and was acquired in 1998 by Providence Water as part of the acquisition of the Western Cranston Water District. Construction has been in process during FY 2006 to rehabilitate the station to include a modular addition to the existing building that will house new vertical turbine pumps, instrumentation and electrical system upgrades, replacement of the emergency generator, and architectural and structural improvements to the existing pump station building structure to convert its use for the storage of equipment, materials, tools, and records.

Dean Estates & Garden Hills Pump Station Upgrades

The Dean Estates Pump Station was built in 1982. The station draws its supply from the low service system and boosts the pressure in the Dean Estates neighborhood of Cranston. Plans are for the rehabilitation of the facility which includes installation of new variable frequency drive vertical turbine pumps, elimination of aged hydropneumatic tanks, instrumentation and electrical system upgrades, installation of an emergency generator, and architectural improvements to the pump station building.

The Garden Hills Pump Station was built in 1960. The station draws its supply from the 43.4 MG Aqueduct Reservoir and boosts the pressure in the Garden Hills neighborhood of Cranston. Plans are for the rehabilitation of the facility which includes replacement of the existing pumps with new variable frequency drive vertical turbine pumps, elimination of aged hydropneumatic tanks, instrumentation and electrical system upgrades, installation of an emergency generator, and architectural improvements to the pump station building.

Bath Street Pump Station Upgrades

The Bath Street Pump Station was completely rehabilitated in 1999 and is in good operating condition. Improvements to the station would consist of recoating all exposed piping that shows surface deterioration. The anti-graffiti coating on the brick exterior needs to be reapplied. The interior stairway needs recoating and some of the ceiling tiles need to be replaced. The wooden front doors need to be rehabilitated or replaced. The generator enclosure for the station requires remedial work to upgrade some of the sound attenuation insulation that has deteriorated.

Neutaconkanut Pump Station Upgrades

The Neutaconkanut Pump Station was completely rehabilitated in 1999. There are several small interior cracks in the brick veneer that must be corrected. Groundwater is penetrating into the station through pipe openings in the concrete walls. Some of the exposed piping has surface deterioration which needs recoating and all interior walls and ceilings need refurbishing. A floor access cover at the bottom of the stairway to the lower level of the station needs to be replaced. The septic tank system for the station needs to be inspected.

TRANSMISSION SYSTEM

78", 102", and Structures D & E Inspection / Rehabilitation

The 78" and 102" transmission lines, approximately 9.6 miles in length, were constructed in the 1960's and consist of prestressed concrete cylinder pipe (PCCP) and two sections of concrete lined tunnel. During November 1996, a section of this pipeline where it crosses Oaklawn Ave experienced a failure where the side wall of the pipeline blew out creating a huge crater in the ground releasing millions of gallons of water.

Following the break, Providence Water conducted a complete inspection and risk assessment of the entire 102" pipeline. The inspection uncovered 45 suspect areas all of which were reinforced, most of which was done through an innovative technique of reinforcing the pipe with interior or exterior carbon fiber wrapping. Rehabilitation of the line was completed in calendar year 2000. Since the failure of a section of the 102" pipeline in 1996, an inspection and rehabilitation program was developed for inspecting and rehabilitating, as necessary, these transmission lines on a regular schedule.

The inspection of the 102" line commenced during FY 2006, consisting of both a visual and structural inspection of the pipeline utilizing a new technique that involves electro-magnetic imaging through the interior of the pipeline which can detect the presence of broken wires within the pipe, as well as acoustic sounding of the line in appropriate areas. Based on the extensive inspection 5 years ago, and the subsequent repairs made, it was not our expectation that any significant additional deterioration would be found. The electro-magnetic imaging however, detected 71 areas with potential wire breakage. The one area of greatest concern was near Oaklawn Avenue, directly opposite the street from the November 1996 break. Interior sounding confirmed areas of concrete delamination around the pipe. We excavated the pipe to further investigate and found the pipe to be deteriorated to the point of an approaching failure, with numerous rusted out and broken wires. The inspection 5 years ago had found no evidence of any deterioration or irregularities with this pipe section. At this point, we are making plans to repair this section utilizing post-tensioning repairs. In addition we have expanded the scope of work to include carbon fiber lining rehabilitation of at least 7 pipe sections; and exposure of up to 28 pipe sections through excavations for external inspections acoustic sounding.

Additionally, an acoustic fiber optic line will be installed to provide future live monitoring of the pipeline to detect future wire breaks in the aqueduct. Inspection of the 78" aqueduct is also planned. Structures D & E will also be evaluated structurally and rehabilitated as needed. Since at this time all remedial work cannot be quantified, the budget amount for this project is subject to change.

66" Transmission Main Inspection

The 66" main, approximately 8500 feet in length, installed in 1926, is a riveted steel pipeline. Plans are to perform an inspection of the pipe consisting of an over the line sight survey, soil resistivity testing, a soil chemistry analysis, leak detection, and an internal and external inspection. Since remedial work cannot be quantified at this time, the budget amount for this project is only for the inspection.

60" Transmission Main Inspection

The Neutaconkanut Conduit, installed in 1926, is a 60-inch reinforced concrete steel cylinder pipeline. Plans are to inspect all 21,000 feet of this main consisting of an over the line sight survey, soil resistivity testing, a soil chemistry analysis, leak detection, and internal and external inspections of the pipeline. Since remedial work cannot be quantified at this time, the budget amount for this project is only for inspection.

16" and Larger Valves Replacements

There are approximately 800 transmission valves in the system. Because of their size, the ability to successfully operate these valves when needed is critical in an emergency shutdown. Plans are to replace the 16" and larger valves in the system that are older than 75 years with new butterfly valves with the emphasis placed on the most critical valves.

DISTRIBUTION SYSTEM

Replace / Upgrade Water Mains

The Providence Water system consists of approximately 860 miles of pipe ranging in size from 6" to 12". Of these mains, approximately 28% are pre 1900 and will be candidates for upgrading or replacement. The first order of priority will be to replace mains where water quality complaints or flow problems have been documented. Identifying mains to be replaced will require subsequent study and evaluation. Generally, older unlined cast iron mains will need to receive first priority. Factors such as flow tests, hydraulic modeling, water quality complaints, past leak history, and main sampling will all be considered. Emphasis will also be given to replacements in areas of local and state road resurfacing projects where cost savings can be realized. The upgrading or replacement of distribution mains will be one of the major concentrations of the future of the program.

Replace Distribution Valves

Of the approximately 12,945 valves in the system, 1,900 have been identified as 6", 8" and 12" diameter valves pre 1900. Plans are to replace these valves in conjunction with the main replacement program. This will generally prioritize the replacement of valves, using the same criteria for mains, by age and overall condition. In accordance with current practice, emphasis will also continue to be given to replacements in areas of local and state road resurfacing projects where cost savings can be realized.

Replace Lead Services

As is the case with valves, emphasis will be given replacing lead services in conjunction with the main replacement program. Lead services were installed up until 1937 (with a few isolated exceptions) at which time copper was used to the present day. Of the approximate 74,000 service connections, approximately 27,000 (36%) of these are lead services. As a result of lead testing within the system under the requirements of the Lead and Copper Rule, it is not required that Providence Water replace lead services. However, Providence Water will continue to replace lead services in conjunction with street resurfacing projects and services that are found to be leaking. Services will also be replaced on an ongoing basis under special conditions when requested by the owner in accordance with internal policy, and at sites identified by the

Department of Health as having lead contamination problems, even though the lead is generally acquired primarily from sources other than water.

Replace Fire Hydrants

There are 5,860 hydrants in the system. Plans are generally to replace all hydrants as they become 60 years old with new breakaway style hydrants. Hydrant replacements over the first five years of the program will be consistent with that plan.

Replace Water Meters

Plans are to replace the approximate 12,000 remaining older non-encoded water meters which have outlived their standard useful lives with new meters through the end of fiscal year 2007. The second phase of the program will be to begin replacing meters that are 10 years and older with new meters. Additionally, plans are to continue with the large meter replacement program by replacing older larger commercial meters with new meters. These meters register water for large industrial accounts and are sized 3" and above. Because of the large volume of water that they register, the need for accuracy is essential.

Leak Detection

The system is comprised of approximately 860 miles of distribution mains, 97 miles of transmission mains, 800 transmission valves, 12,945 distribution valves, 74,000 services, and 5,860 hydrants. The plan is to perform a leak detection survey in the first five years of the program. Because of the size of the system, it will take about 3 years to perform a complete survey. Initial plans are to evaluate the level of field work needed to perform a full scale survey and to investigate the most recent technologies and methologies that are used for surveying leaks.

SUPPORT SYSTEM FACILITIES

Forestry Building Heating System Improvements

The original boiler for the forestry garage dated back to the 1960's and was in need of replacement. The boiler had pneumatic controls and drew power off of the 600v electrical service for the building. Replacement parts were difficult and expensive to maintain. Construction has been ongoing during FY 2006 for replacement of the hot water heating system including a new oil-fired boiler, circulator pumps, expansion tank, air eliminator tank, piping, unit heaters, fin tube radiation, and electric and temperature controls. Included in the project are improvements to the domestic hot water system with the addition of a heat exchanger to the new boiler system (used during the heating season) and the replacement of the electric water heater (used during the non-heating season). Also included are improvements to the electrical system by completely upgrading the electrical service to a new 480V supply including panelboards, distribution panels, transformers, and disconnect switches.

Fire System Protection Improvements

Providence Water owns and operates 27 facilities throughout Providence, North Providence, Johnston, West Warwick, Cranston, and Scituate. A field inspection of each facility was conducted and completed by each local Fire Marshal having jurisdiction over the area. Construction has been in progress during FY 2006 and will continue for bringing all Providence Water facilities in compliance with the new Rhode Island Fire Safety Code that was adopted in February 2004. Compliance issues consist of upgrading fire sprinklers, municipal alarms, fire rated doors, fire rated wall separations, and safety rails.

Administrative Buildings and Facilities Improvements

The Forestry Maintenance Garage, the Academy Avenue Administration Building, and the Aqueduct Reservoir Office Buildings will be in need of ongoing improvements. Funds are annually budgeted for reconditioning the offices, architectural and structural improvements, rehabilitation of the electrical, plumbing, and mechanical systems, security and fire system upgrades, and site improvements.

Fencing and Roads Rehabilitation

Plans are to replace gates and damaged fencing at some of the various distribution reservoirs, pump stations, and at Academy Ave. At this time, no access roads are of immediate concern. The fencing and roads are selected by priority as determined by previously conducted inventories and evaluations.

Exhibit 15

Providence Water

15 Year IFR Expenditure Plan

Fiscal Years 2011 through 2025

	Total Amount	Budget 2011 - 2015	Budget 2016 - 2020	Budget 2021 - 2025
RAW WATER SUPPLY				
Large dam improvements	**1,750,000**	750,000	500,000	500,000
Secondary dam improvements	**2,100,000**	1,500,000	300,000	300,000
Fencing, fire lanes, property rehabilitation	**750,000**	250,000	250,000	250,000
90" and twin 60" influent conduits - inspection	**100,000**		50,000	50,000
Raw water facilities improvements	**1,400,000**	1,200,000	100,000	100,000
Raw Water Supply Total	**6,100,000**	**3,700,000**	**1,200,000**	**1,200,000**
TREATMENT PLANT				
Treatment plant architectural improvements	**5,000,000**	4,000,000	500,000	500,000
Conduits and structures inspect / rehabilitate	**250,000**			250,000
Filter replacement (including valves & piping)	**7,000,000**	7,000,000		
Chemical storage/transfer/feed systems improvements	**1,700,000**	100,000	1,600,000	
Process Meters	**125,000**	50,000	25,000	50,000
PW lab / equipment Improvements	**600,000**	200,000	200,000	200,000
SCADA system upgrades	**3,500,000**	500,000	2,500,000	500,000
Sludge removal and disposal	**7,000,000**	5,000,000	2,000,000	
Treatment Plant Total	**25,175,000**	**16,850,000**	**6,825,000**	**1,500,000**
PUMPING AND STORAGE				
Pump stations upgrades	**1,600,000**	100,000	750,000	750,000
Storage tanks inspections / improvements	**1,000,000**	600,000	300,000	100,000
Pumping and Storage Total	**2,600,000**	**700,000**	**1,050,000**	**850,000**

Exhibit 15

Providence Water

15 Year IFR Expenditure Plan

Fiscal Years 2011 through 2025

	Total Amount	Budget 2011 - 2015	Budget 2016 - 2020	Budget 2021 - 2025
TRANSMISSION SYSTEM				
Aqueducts and transmission mains inspection / rehabilitation	**7,900,000**	6,300,000	800,000	800,000
16" and larger valves replacements	**4,000,000**	2,000,000	1,500,000	500,000
Transmission System Total	**11,900,000**	**8,300,000**	**2,300,000**	**1,300,000**
DISTRIBUTION SYSTEM				
Replace / upgrade water mains	**75,500,000**	17,000,000	28,500,000	30,000,000
Replace distribution valves	**1,650,000**	500,000	550,000	600,000
Replace lead services	**41,500,000**	6,000,000	16,000,000	19,500,000
Replace fire hydrants	**5,250,000**	1,000,000	1,500,000	2,750,000
Replace water meters	**9,000,000**	2,500,000	3,000,000	3,500,000
Leak detection	**200,000**			200,000
Distribution System Total	**133,100,000**	**27,000,000**	**49,550,000**	**56,550,000**
SUPPORT SYSTEM FACILITIES				
Building and facilities improvements	**3,000,000**	1,000,000	1,000,000	1,000,000
Fencing and roads rehabilitation	**800,000**	250,000	450,000	100,000
Underground fuel storage tanks replacements	**200,000**		200,000	
Support System Facilities Total	**4,000,000**	**1,250,000**	**1,650,000**	**1,100,000**
TOTAL	**$182,875,000**	**$57,800,000**	**$62,575,000**	**$62,500,000**

EXHIBIT 16 – Fifteen Year IFR Project Overview – FY 2011 through 2025

RAW WATER SUPPLY

Large Dams Improvements

The concrete face of the upstream portion of the Gainer Dam spillway is deteriorating and is in need of repair. In the first five years of the 15-year plan, plans are for the concrete rehabilitation of the upstream face of the spillway including new reinforcing steel.

Improvements have recently been conducted at Ponaganset, Westconnaug, Moswansicut, and Barden Reservoirs, and the rehabilitation of Regulating Reservoir is to be conducted in the first five years of the 20-year plan.

In the 15-year plan, plans are to inspect all 6 dams and structures and to conduct remedial work as required to preserve their useful lives. Amounts are budgeted for needed improvements for the continual upkeep of all 6 dams and appurtenant structures.

Secondary Dams Improvements

Several small secondary dams are located throughout the watershed. These secondary dams were constructed primarily for mill purposes in the mid to late 1800's prior to the development of the Scituate Reservoir. Four dams have been identified highest in priority, and in need of various geotechnical and hydraulic rehabilitative work: Burton Pond, Coomer, Harrisdale, and Kimball Dams. Plans are to rehabilitate these 4 dams in the first years of the fifteen-year plan. In addition, a study is needed to provide a risk assessment and structural analysis for the remaining smaller secondary dams along the watershed. This will establish a scope of work in the subsequent years of the twenty-year plan that will address improvements for preserving their useful lives. The two latter five-year incremental budget amounts account for anticipated improvements at these smaller dams.

Fencing, Fire Lanes, Property Rehabilitation

There are approximately 40 miles of fencing and 66 miles of access roads and fire lanes that exist on the watershed and Providence owned property. The fences and access roads, some of which are in poor condition, date back to their original construction in the 1920's. Fencing and roads are identified for rehabilitation from previously conducted inventories and evaluations. An amount has been budgeted to perform rehabilitative work as needed.

90 inch and twin 60 inch Influent Conduits - Inspection

Plans are to inspect the interior and exterior of the two 60-inch raw water conduits and the 90-inch influent conduit every 10 years. Any remedial work that may be required as a result of the inspection will be addressed. Since the quantity of remedial work cannot be anticipated in advance, the budget amount for this project is only for inspection.

Raw Water Facilities Improvements

The Raw Water Facilities, for the intent of the fifteen-year plan, are identified as the Gainer Dam Gate House, Raw Water Booster Pump Station, Meter Chamber, and the Junction Chamber. In the first five years of the IFR plan rehabilitative work is planned at the meter and junction chambers. Various architectural improvements are needed at the Gainer Dam Gatehouse and Raw Water Booster Pump Station that won't be conducted until the first five-year increment of the 15-year plan. Additionally, these facilities will be regularly inspected and rehabilitative work will be performed as required. Funds have been budgeted for architectural improvements at the Raw Water Station and the Gainer Dam gatehouse and in subsequent years for improvements that it is anticipated will be required.

TREATMENT PLANT

Treatment Plant Architectural Improvements

In the first five years of the 15-year plan, plans are for replacing the exterior siding with a new exterior cover, replacing the windows with new energy efficient units, and upgrading the service and personnel elevators. Additionally, the plant will be in need of ongoing improvements. Funds are budgeted for reconditioning the offices, architectural and structural improvements, rehabilitation of the electrical, plumbing, and mechanical systems, security and fire system upgrades, and site improvements.

Conduits and Structures Inspect / Rehabilitate

This project consists of an internal inspection and structural analysis of the influent control structure, influent/effluent aerator conduits, aerated water conduit (lower conduit), emergency by-pass tunnel, settled water conduit (upper conduit), filter influent conduit, clearwell, washwater tank, and service water tank every ten years. A budget amount has been included to perform these inspections and to address minor concrete rehabilitative work.

Filter Replacement (Including Valves & Piping)

It is expected that 12 of 16 filters will be replaced in the first five years of the twenty-year plan and that 4 of the filters will be remaining. It is planned that these 4 filters will be replaced in the first year of the 15-year plan. As part of the filter replacement, the existing underdrain system will be replaced for each filter.

Chemical Storage/Transfer/Feed Systems Improvements

Four chemicals are added in the treatment process at different locations at the treatment plant.

Ferric Sulfate is added in liquid form in the influent chamber prior to the aerators. Due to the corrosive nature of the chemical, it is anticipated that restoration of the transfer and feed systems will need to be conducted during the 15-year period.

Powdered Quick Lime is added in a slurry at two locations in the treatment process. The first location is in the aerated water conduit prior to the sedimentation basins and a second time in

the filter influent tunnel prior to the filters. The storage and transfer systems are new and the feeders are 8 years old. It is anticipated that replacement of the lime feeders will be necessary during the 15-year period. In addition, due to the corrosive nature of the dry chemical, sections or all of the transfer piping will need to be replaced.

Chlorine gas is injected in the settled water conduit prior to the filters. The chlorine feeders and other improvements to the chlorine system and rooms are being addressed in the 5-year plan. Due to the corrosive nature of chlorine, funds have been budgeted in the 15-year plan to replace the feeders.

Fluoride is added as a liquid in the clearwell just prior to water leaving the treatment plant. The fluoride system is new and no additional work on this system is anticipated.

Process Meters

Several types of process metering and monitoring equipment are used at the treatment plant and in the distribution system for monitoring and maintaining water quality. The data is collected and logged for record and reporting purposes. Replacement of this equipment on a regular interval is required to ensure the accuracy and reliability of the data. Based on scheduled replacements, in the fifteen-year plan PW is planning to replace fluoride residual meters, chlorine residual meters, particle counters, pH meters, turbidimeters, and a total organic carbon meter.

PW Lab / Equipment Improvements

Testing of the raw and treated water is required on a regularly scheduled basis to comply with State and Federal regulatory requirements. The testing and monitoring equipment has a normal life ranging from 4 to 15 years depending on the type of equipment and frequency of use. The plan is to replace this equipment as it becomes necessary. The budget amounts shown in the plan are for anticipated needs.

SCADA System Upgrades

Given that the nature of computer technology is ever changing, a budget amount is accounted for in the plan to address continued upgrade needs for the SCADA system. Needs will consist of hardware replacements, software upgrades, and new hardware and software additions to the system.

It is anticipated that a complete replacement of the control and monitoring system may need to occur in the next ten to fifteen years. However, the actual life cycle may be longer or shorter and is generally determined by technological advancements of both hardware and software. Replacement of the system is budgeted in the program.

Sludge Removal and Disposal

All sludge accumulation has now been removed from the three lagoons to restore them to their original design intent of providing solids settling and an adequate buffer to maintain an acceptable standard of water quality discharged into the Pawtuxet River. Remaining work for sludge removal consists of removing the previously stockpiled sludge that was dredged from Lagoon 2. Payment for this work will continue in the 20-year plan in accordance with contractual requirements.

PUMPING AND STORAGE

Pump Stations Upgrades

The Ashby Street Pump Station was installed in 1999 and the Fruit Hill Pump Station was constructed in 1989. It is anticipated that various mechanical, electrical, architectural, and structural improvements will be needed at these pumps station as they are identified through inspections.

The Cranston Commons pump station was built in 1990. Long-term plans are to replace the below grade pump station with an above ground pre-engineered packaged unit with its own emergency back-up generator.

The Alpine Estates Pump Station was constructed in 1987. The station is presently inactive because the Cranston Commons Pump Station can adequately serve the Alpine Estates area of Cranston previously served by the Alpine Estates pump station. There are no immediate plans to rehabilitate this station but it is identified in the 15 year plan should circumstances change where there is a need to reactivate the station. Improvements would consist of an upgrade to the electrical supply, new pumps, new valves and piping for the pumps, and new system controls. The project is on hold pending future plans and no costs have been identified in the plan.

In addition, plans are to periodically inspect all mechanical, electrical, architectural, and structural components of each pump station. Funds have been budgeted for anticipated improvements at Ashby Street, Fruit Hill, and Cranston Commons pump stations, and to remedy deficiencies as they are identified at the remaining 7 pump stations.

Storage Tanks Inspection / Improvements

Lawton Hills Reservoir has a storage capacity of 5.0 MG and was constructed in 1972. The facility provides operational storage for the high service area in Western Cranston. Providence Water recently performed an underwater inspection of the tank which did not identify any immediate repair needs. In the first five-year increment of the fifteen-year plan, plans are to perform a dry inspection of the tank, clean the floor of the structure, and perform concrete rehabilitation to the walls, joints, and columns inside the tank as may be needed, and conduct various drainage, paving, and fencing improvements.

The 15-year plan is to alternately perform a visual inspection and an extensive inspection every five years for the 5 tanks in the system. A visual inspection is considered to be an inspection of a tank by a diver without dewatering the structure. An extensive inspection is defined as having structural specialists perform the inspection in a fully dewatered structure. A comprehensive report would follow evaluating the tank's condition and providing remedial recommendations for addressing any areas needing rehabilitation. Since remedial work cannot be quantified at this time, the budget amount in the plan is only for inspection.

TRANSMISSION SYSTEM

Aqueducts and Transmission Mains Inspection / Rehabilitation

The 78"/102" transmission main, constructed in the 1960's, extends for approximately 9.6 miles. During the first 5 years of the plans, acoustic fiber optic lines are to be installed to continuously monitor the aqueducts. The fiber optic cable is fastened in a continuous section on the pipeline, and is connected to a data acquisition system which is able to acoustically detect and locate breaks as they take place in the high-strength steel wires. Reinforcing wires breaks in concrete cylinder pipe significantly reduces the strength of the pipe. Future rehabilitative work will be conducted based on wire breaks detected from the live fiber optic monitoring system. Since remedial work cannot be quantified at this time, the budget amount is only for inspection.

The 90" effluent finished water aqueduct, constructed in the 1920's, runs approximately 4.5 miles. It is constructed of a concrete lined tunnel section between the west and east portals, and reinforced concrete pipe thereafter. This 90" aqueduct was recently inspected and rehabilitated as extensive concrete corrosion damage was discovered during the inspection. Plans are to perform interior and exterior inspections of the pipeline. Also during the last inspection of the tunnel section of the aqueduct it was discovered that the contact grouting that was to have taken place during the original construction of the aqueduct was never performed or performed incorrectly. The contact grouting will be performed to effectively fill void spaces between the tunnel lining and the excavated rock/earth. This will inhibit the infiltration of groundwater into the aqueduct while improving the structural integrity of the tunnel and the tunnel lining, which in turn will significantly reduce the need for future repairs. In addition, the 90" aqueduct including the effluent venturi meters, will be inspected on a regular schedule and future rehabilitative work will be conducted based upon the results of the inspection. An amount has been budgeted for inspection of the entire length of the aqueduct and for conducting contact grouting of the tunnel section.

The 66" main, installed in 1926, is a riveted steel pipeline and extends for 8500 feet. The 60" reinforced concrete steel cylinder pipeline (Neutaconkanut Conduit), installed in 1926, extends for 22,140 feet. Plans are to perform interior and exterior inspections of the pipelines, and to provide corrosion protection, where applicable. Since remedial work cannot be quantified at this time, the budget amount is only for inspection.

16" and Larger Valves Replacements

All transmission valves installed through 1950 are being targeted for replacement over the 15-year period. Plans are to replace the 16" and larger valves in the system that are older than 75 years with new butterfly valves with the emphasis placed on the more critical valves.

DISTRIBUTION SYSTEM

Replace/Upgrade Water Mains

The system consists of approximately 860 miles of pipe ranging in size from 6" to 12". Of these mains, approximately 28 percent are pre 1900 and will be candidates for upgrading or replacement. Generally, older unlined cast iron mains will need to receive first priority. The upgrading or replacement of distribution mains will be one of the major concentrations of the future of the program. The initial general plan is to replace all pre 1900 mains, but determinations of mains to be replaced will also be based on other factors including water quality, flow capacity, and overall condition of the mains.

Replace Distribution Valves

Distribution valves will generally need to be replaced on an oldest first basis. Of the 12,945 valves in the system, approximately 1,900 have been identified as 6", 8", and 12" diameter valves that are pre 1900. Plans are to replace these valves in conjunction with the main replacement program. This will generally prioritize the replacement of valves using the same criteria for mains, by age and overall condition. Priority will be given to replace older distribution valves that are found to be defective, and in accordance with current practice, emphasis will continue to be given to replacements in areas of local and state road resurfacing projects where cost savings can be realized.

Replace Lead Services

Of the 74,000 total services in the system, 27,000 (36 percent) are lead. As is the case with valves, emphasis will be given to replace lead services in conjunction with the main replacement program. Providence Water will also continue to replace lead services in conjunction with street resurfacing projects and services that are found to be leaking. Lead services will also be replaced on an ongoing basis when requested by the owner in accordance with internal policy, and at sites identified by the Department of Health as having lead contamination problems, even though the lead is generally acquired primarily from sources other than water. The replacement of all lead services will be one of the major concentrations of the future of the program.

Replace Fire Hydrants

The objective of the hydrant replacement program will be to maintain ages of hydrants in the system at no more than 60 years old. Hydrant replacements over the 15 years will be consistent with that plan.

Replace Water Meters

The overall objective of meter replacements (5/8" through 2") will be to replace meters every 10 years or on an as needed basis as malfunctioning meters are encountered. Plans are to regularly test the older larger commercial meters and to replace them as it becomes necessary.

Leak Detection

The system is comprised of 860 miles of distribution mains, 97 miles of transmission mains, 800 transmission valves, 12,945 distribution valves, 74,400 services, and 5,860 hydrants. The plan is to perform a leak detection survey in the first five years of the plan, and 10 years thereafter.

SUPPORT SYSTEM FACILITIES

Buildings and Facilities Improvements

The Forestry Maintenance Garage, the Academy Avenue Administration Building, and the Aqueduct Reservoir Office Buildings will be in need of ongoing improvements. Funds are budgeted for reconditioning the offices, architectural and structural improvements, rehabilitation of the electrical, plumbing, and mechanical systems, security and fire system upgrades, and site improvements. The budget amount assumes the scenario that the Academy Avenue administration building will still be in use as is currently the case. Should a new facility be constructed, it is assumed that the budget amount for building and facility improvements will be substantially reduced.

Fencing and Roads Rehabilitation

The access road for the sedimentation basins travels along the outside of the basins for approximately 1 mile and consists of a bituminous surface. The road is in poor condition and construction of a new road is needed. Drainage improvements are also needed to eliminate some areas of ponding.

It is anticipated in the 15-year plan that various facility access roads at approximately 9 separate locations will need to be resurfaced. Fences at 11 facilities also are in need of replacement or rehabilitation. Restoration of some of the roads and fencing may be included with the rehabilitation of their respective facility and would not be separately rehabilitated under this category.

Underground Fuel Storage Tanks Replacements

Planned work is scheduled for the second five years of the fifteen year plan consisting of replacing the underground diesel tank at the transformer building in Scituate, and replacing the diesel / gasoline split tank located at Academy Ave. The replacement schedule is in accordance with the life expectancy of the tanks and in consideration of EPA and RIDEM regulations for underground storage tanks.

Section IV – Revenue Requirements

Overview of Revenue Requirements

Exhibit 3 – Sources and Uses of Funds – FY 2006 through 2025 – Providence Water has developed a Sources and Uses of Funds Plan based on planned replacement needs, current authorized funding, and minimal proposed new funding. The Exhibit lists the projected Sources and Uses of Funds in four five-year phases. The plan is subject to change as it is implemented. Any additional funding or borrowing will be addressed as we move forward.

Exhibit 4 – IFR Funding Projections – A graphical depiction of the sources of funds in each year of the twenty-year plan.

Overview of Revenue Requirements

Providence Water has developed a Sources and Uses of Funds Plan using current authorized funds based on our anticipated replacement needs within our system. EXHIBIT-3 lists the projected Sources and Uses of Funds in four five-year phases. The current authorized funding amount is $12.5 million per year. The plan is subject to change as it is implemented. Any additional funding or borrowing will be addressed as we move forward.

Sources of Funds

Providence Water began funding a restricted Infrastructure Replacement fund in 1996. The RI Public Utilities Commission granted Providence Water a phased-in funding approach to begin its IFR program. In 1996, we were authorized $4 million per year. In January of 1997 and May of 1998 the amount was increased by $2 million each time to a total of $8 million. Providence Water requested an additional increase that was approved and effective February 2000. A subsequent increase, effective January 2001, has brought the total annual authorized amount to $12.5 million.

Providence Water has a short term revolving line of credit with Bank of America that allows Providence Water to access funds in case of an emergency or cash flow fluctuations. Providence Water has no plans to issue bonds for any project in our IFR plan at this time. If our IFR Plan needs to be revised for projects not included in the plan at this time, Providence Water has two options: we can issue bonds through the Drinking Water State Revolving Fund or request additional funding through a rate filing with the Public Utilities Commission.

Uses of funds

Providence Water has cash funded projects totaling $248,425,000 over the 20-year plan period. This amount includes $777,009 per year authorized by the Public Utilities Commission for capitalized labor and benefits to be reimbursed through our IFR Fund. Debt service is included as a use of funds in this plan. In phase 1 and phase 2, existing debt service totals $11,443,678 million and is expected to be paid off in year 2014. As the debt service on these bond issues is paid off, Providence Water plans to use the funding to support cash funded construction projects.

To recap, total cash funded construction projects are $248.4 million, and funding for debt service is approximately $11.5 million, for a total use of funds of $259.9 million. Our IFR Plan is subject to change and we will invariably have to make amendments to this plan to match changing State and Federal regulations and changing field conditions. Our replacement plan is based on the best information available at this time.

Exhibit 3

Providence Water

Sources and Uses of Funds

IFR Funding & Expenditure Projections

Fiscal Years 2006 through 2025

	2006-2010	2011-2015	2016-2020	2021-2025	2006-2025
	Phase 1	Phase 2	Phase 3	Phase 4	Total
Sources of Funding:					
Funds Available from Prior Years	$9,867,020	$27,969	$73,341	-$1,659	$9,966,672
Current Authorized Funding	62,500,000	62,500,000	62,500,000	62,500,000	250,000,000
Total Sources of Funds	72,367,020	62,527,969	62,573,341	62,498,341	259,966,672
Uses of Funding:					
Cash Funded Construction Projects	$65,550,000	$57,800,000	$62,575,000	$62,500,000	$248,425,000
Existing Debt Service	6,789,050	4,654,628	0	0	11,443,678
Total Uses of Funds	72,339,050	62,454,628	62,575,000	62,500,000	259,868,678
IFR Program Surplus/(Deficit)	$27,969	$73,341	-$1,659	-$1,659	97,994

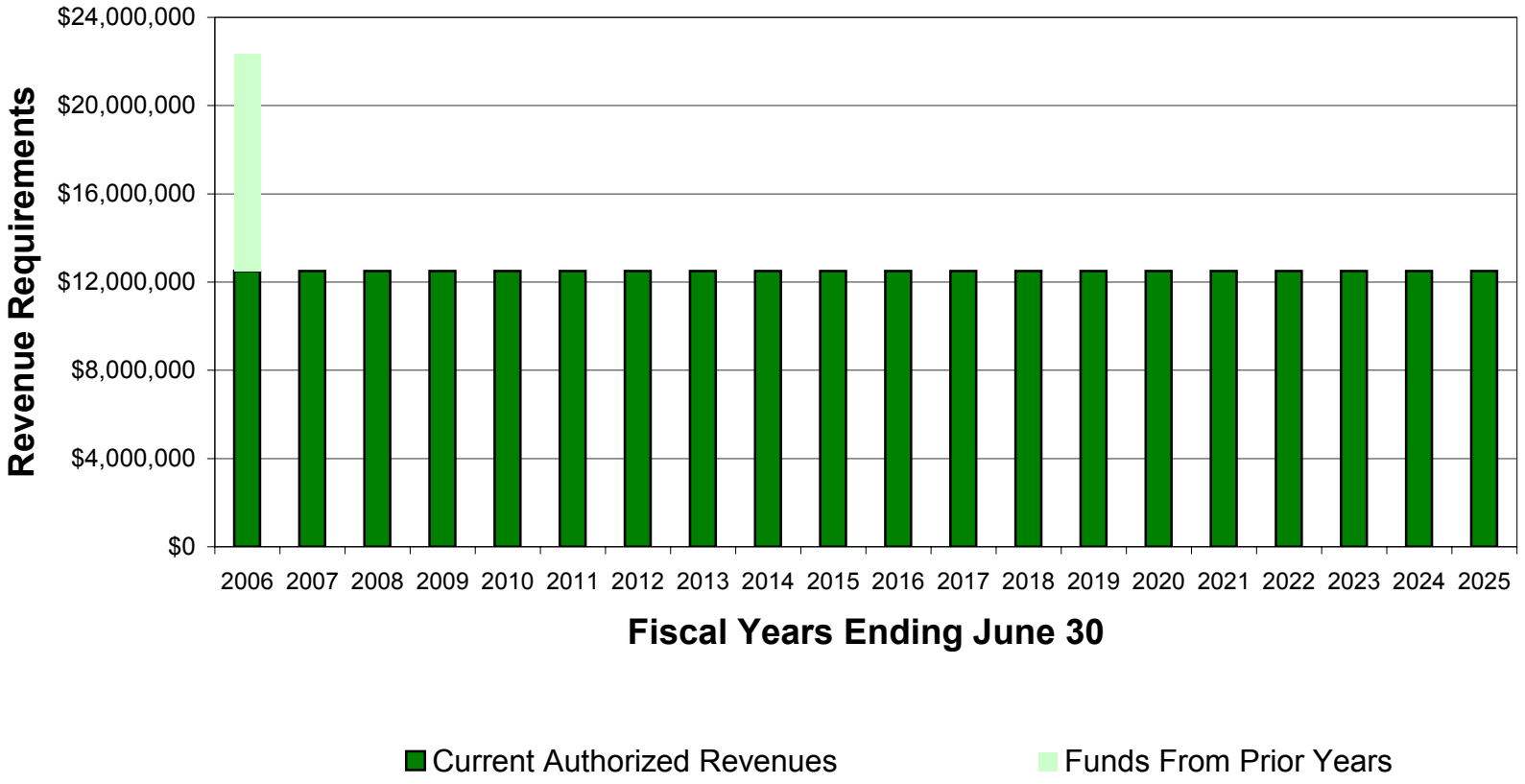
Provided by Providence Water Finance Department

Exhibit 4

Providence Water

IFR Funding Projections

Fiscal Years 2006 through 2025



Provided by Providence Water Finance Department

Appendix

The Comprehensive Clean Water Infrastructure Act of 1993
Chapter 46-15.6 of the General Laws of Rhode Island

Rules and Regulations for Clean Water Infrastructure Plans

TITLE 46
Waters and Navigation
CHAPTER 46-15.6 - Clean Water Infrastructure

Index Of Sections

§ 46-15.6-1 Short title. – This chapter shall be referred to as the "Comprehensive Clean Water Infrastructure Act of 1993".

§ 46-15.6-2 Legislative findings, intent, and objectives. – The general assembly hereby recognizes and declares that:

(1) Water is vital to life and comprises an invaluable natural resource which is not to be abused by any segment of the state's population or its economy. It is the policy of this state to restore, enhance, and maintain the chemical, physical, and biological integrity of its waters to protect health;

(2) The waters of this state are a critical renewable resource which must be protected to insure the availability of safe and potable drinking water for present and future needs.

(3) It is a paramount policy of the state to protect the purity of present and future drinking water supplies by protecting the infrastructure of potable water, including treatment plants, pipes, valves, pumping stations, storage facilities, interconnections, and water mains.

(4) It is imperative to provide a uniform and valid mechanism to base assistance for the construction, repair, protection, and/or improvement of potable water infrastructure replacement.

(5) The decay of infrastructure and related construction due to deterioration or functional obsolescence can threaten the quality of supplies and, therefore, can endanger public health; thus it is necessary to take immediate and continuing steps to repair and replace the infrastructure used to deliver water supplies in order to restore water system facilities.

(6) Failure to replace the infrastructure used to deliver water supplies may cause and probably will continue to degrade the quality of public drinking water.

(7) Protection of water quality is necessary from the collection source through the point of delivery to the ultimate consumer.

(8) The potable threat to public health caused by unsafe drinking water far outweighs the economic costs for the construction of the potable water infrastructure replacement.

(9) That the objectives of this chapter are:

(i) To establish a funding mechanism to insure that infrastructure replacement programs are carried out by each municipality and by each municipal department, agency, district, authority, or other entity engaged in or authorized to engage in the supply, treatment, transmission, or distribution of drinking water, and

(ii) That the plans and their execution achieve and insure that the investment of the public in such facilities is not eroded.

§ 46-15.6-3 Infrastructure replacement program. – All municipalities, municipal departments and agencies, districts, authorities or other entities engaged in or authorized to engage in the supply, transmission, distribution of drinking water on a wholesale or retail basis, and which obtain, transport, purchase, or sell more than fifty million (50,000,000) gallons of water per year, shall be referred to as "water suppliers" for the purpose of this chapter. All water suppliers shall prepare, maintain, and carry out an infrastructure replacement program as described in this chapter.

§ 46-15.6-4 Content of infrastructure replacement component. – (a) The infrastructure replacement component (hereinafter referred to as component) shall include without limitation:

(1) A detailed financial forecast of facility replacement improvement requirements for the next twenty (20) years including but not limited to the principal components of the water system such as reservoirs, dams, treatment plants, pipes, valves, fire hydrants, pumping stations, storage facilities, pumping and well equipment, interconnections and water mains. Each financial forecast shall analyze the condition and life expectancy of the existing facilities, prioritize needed repairs and replacements and amortize such improvement requirements on an annual basis over the next twenty (20) years in accordance with rules and regulations promulgated herein. Water suppliers which have in effect infrastructure improvement or rehabilitation programs and mechanisms for funding approved by their appropriate governing bodies may submit their existing programs for complete or partial compliance with the provisions of this section.

(2) A method that establishes and maintains fiscal controls and accounting depreciation standards sufficient to ensure proper accounting for evaluation of facility requirements necessitated by this chapter in accordance with rules and regulations promulgated herein.

(b) Components shall be consistent with applicable local comprehensive plans in which the service areas are or are planned to be located.

(c) Proceeds from the watershed protection fund shall be usable for reimbursement of water suppliers for preparation of their infrastructure replacement components as described in this chapter up to fifty percent (50%) of the cost of the component.

§ 46-15.6-5 Completion, filing, approval and implementation of infrastructure component. – (a) Each water supplier required by this chapter to prepare and maintain an infrastructure replacement component shall complete and adopt a component two (2) years subsequent to the date each party's water supply management plan per § 46-15.3-7.5 is due.

(b) Water suppliers subject to the requirements of § 46-15.6-3 shall file a copy of all components, only to the extent the components differ from plans filed under § 46-15.3-5.1 thereto with the following: the division of drinking water quality of the department of health (hereinafter referred to as "the department").

(c) A water supplier subject to § 46-15.6-3 shall review their components at least once every five (5) years and shall modify or replace their components as necessary.

(d) The department shall coordinate expeditious review of components prepared by water suppliers subject to this chapter. Upon receipt of components prepared by water suppliers under this chapter the department of environmental management's water supply management division, or its successor, and the division of public utilities and carriers (for those water suppliers within their jurisdiction) shall have one hundred and twenty (120) days to review the components and submit comments thereon to the department. Upon consideration of written comments by all agencies designated herein the department shall determine whether the component complies with the requirements of this chapter. This determination shall be made within eight (8) months of the initial submission. A thirty (30) day public comment period shall be included in this eight (8) month review period. Failure by the department to notify water suppliers of its determination within the prescribed time limit shall constitute approval.

(e) Each water supplier shall implement the requirements of its infrastructure replacement program and component, including its infrastructure replacement fund, as mandated by this chapter in accordance to rules and regulations promulgated per § 46-15.6-7.

§ 46-15.6-6 Financing infrastructure replacement. – The cost of infrastructure replacement programs and indemnification as required by this chapter shall be financed as follows:

(1) The cost of programs to implement infrastructure replacement shall be paid by the water users at a rate directly proportionate to the users' water consumption. The charges shall be limited to those necessary and reasonable to undertake the actions required by this chapter. These charges shall be based upon the annual funding requirements of the facility improvements necessitated over each successive twenty (20) year period. Interest earned on money in this infrastructure replacement fund shall be credited to this infrastructure replacement fund.

(2) Each water supplier designated in § 46-15.6-3 shall establish a special account designated as the infrastructure replacement fund to be held as a restricted receipt account and to be administered by the water supplier solely to implement and carry out the replacement of infrastructure as required by this chapter.

(3) Any money which may accumulate in the infrastructure replacement fund in excess of that needed to implement the annual infrastructure replacement program or in excess of that exclusively pledged to repayment of outstanding bonds or notes or loan repayments to implement the infrastructure replacement program shall revert to the rate payers of that particular system on a biannual basis.

(4) Each water supplier designated in § 46-15.6-3 may, as a complete or partial alternative to direct funding of its infrastructure replacement program, finance its infrastructure replacement program through bonding. The annual debt service of each bond or bonds shall be applied and credited towards the annual requirement of the infrastructure replacement program's annual funding requirements.

(5) The Rhode Island public utilities commission, as to water suppliers within its jurisdiction, shall permit an increase for just and reasonable infrastructure replacement in the portion of the water suppliers' rate structure to comply with this chapter and shall allow the water supplier to add this required funding to its rate base in accordance with this chapter.

§ 46-15.6-7 Rules governing content of programs, components, review, evaluation, funding, and implementation. – The department with the concurrence of the department of environmental management's water supply management division or its successor, and the Rhode Island public utilities commission, as to water suppliers within its jurisdiction, shall forthwith promulgate rules and regulations for the review of components as pertains to financial forecasts of facility replacement, improvement requirements and fiscal controls and accounting depreciation standards per § 46-15.6-4(a)(1) and (a)(2). The department with the concurrence of the department of environmental management's water supply management division or its successor, and the Rhode Island public utilities commission, as to water suppliers within its jurisdiction, shall promulgate the criteria or standards which it will use to evaluate the implementation of approved components, programs and funding mechanisms.

§ 46-15.6-8 Severability. – If any provision of this chapter or of any rule, regulation or determination made thereunder, or the application thereof to any person, agency or circumstances, is held invalid by a court of competent jurisdiction, the remainder of the chapter, rule, regulation, or determination and the application of such provisions to other persons, agencies, or circumstances shall not be affected thereby. The invalidity of any section or sections of this chapter shall not affect the validity of the remainder of this chapter.

§ 46-15.6-9 Excluding requirement of state mandated cost. – The provisions of §§ 45-13-7 – 45-13-10 shall not apply to §§ 46-15.6-1 – 46-15.6-8.

RULES AND REGULATIONS FOR CLEAN WATER INFRASTRUCTURE PLANS

[R46-15.6-INFRA]

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION

Department of Health

October 1994

AS AMENDED
January 1995
January 2002 (re-filing in accordance with the provisions of section 42-35-4.1 of the Rhode Island General Laws, as amended)

INTRODUCTION

The waters of this state are a critical renewable resource which must be protected to insure the continued availability of safe and potable drinking water for present and future needs. It is a paramount policy of the state to protect the purity of present and future drinking water supplies by protecting the infrastructure of potable water, including sources, treatment plants and distribution systems. The decay of water supply infrastructure due to deterioration or functional obsolescence can threaten the quality of water supplies and therefore can endanger public health. Therefore, it is necessary to take timely and continuing steps to repair and replace the infrastructure used to treat and deliver drinking water from public water suppliers. By planning and funding for future infrastructure replacement, unexpected large capital expenditures causing sudden increases in water rates can hopefully be avoided. The intent of this Infrastructure Replacement Plan is to provide a planning and funding mechanism to insure that infrastructure replacement programs are carried out by each municipality, district, agency, authority, or other entity engaged in the supply, treatment, transmission, and/or distribution of drinking water. Goals of the plan include the justification of a facility replacement program, the provision of a dedicated and sufficient funding mechanism, the prioritization of infrastructure replacement, and the prevention of the erosion of drinking water infrastructure.

These rules and regulations are promulgated pursuant to the requirements and provisions of RIGL Chapter 46-15.6 Clean Water Infrastructure of the General Laws of Rhode Island, as amended.

The terms and provisions of the rules and regulations shall be liberally construed to allow the Department of Health to effectuate the purposes of the state law, goals and policies consistent with the Clean Water Infrastructure Act, Chapter 46-15.6 of the General Laws of Rhode Island, as amended.

TABLE OF CONTENTS

SECTION 1.0 DEFINITIONS

Wherever used in these rules and regulations the following terms shall be construed as follows:

1.1 Audit--the annual formal examination of the water supplier's financial statements including all investments, interest, expenditures, and operating costs.

1.2 Commission--the Public Utilities Commission (PUC) of the State of Rhode Island.

1.3 Comprehensive Plan--the Comprehensive Plan adopted and approved in accordance with RIGL Chapter 45-22.2, the RI Comprehensive Planning and Land Use Regulation Act. A document prepared by each local municipality which contains the planning and implementation program for land use, housing, economic development, natural and cultural resources, services and facilities, open space and recreation, and circulation.

1.4 Department--the Department of Health (DOH), Division of Drinking Water Quality.

1.5 Distribution facilities--the pipes and appurtenant facilities employed specifically to deliver, to dispense, to render or to circulate potable water directly to the consumer.

1.6 Drinking Water--potable water served to the public.

1.7 Economic life--the expected financial lifespan of a component of a public water system which is used to depreciate the capital expense of the component.

1.8 Eligible expenditures--those costs and expenses necessary to fund, manage, and implement the infrastructure replacement plan, only. This may include associated accounting fees, consulting fees, replacement construction, etc.

1.9 Infrastructure--the permanent underlying framework of the public water system, including but not limited to, supplies, transmission, storage, distribution, pumping, and treatment facilities.

1.10 Life expectancy--the expected physical lifespan of a component of a public water system.

1.11 Maintenance--a planned program of inspection, adjustment, exercise, lubrication, etc. which allows the maximum continuous service of the equipment in the system at the lowest possible cost to the utility as required in the Department of Environmental Management's Water Supply Management Planning Section 8.07(c). Routine maintenance expenditures are not eligible for funding from the Infrastructure Replacement Plan.

1.12 Rate fee--the charge per unit for public water based upon a ratio, scale, or standard relative to the cost of supplying potable drinking water.

1.13 Rehabilitation--rehabilitation which restores existing facilities or components to a condition which extends the physical and economic life of the component. Rehabilitation is an eligible expenditure under the Infrastructure Replacement Plan.

1.14 Repair--expenditures to return into service a component of the infrastructure that has failed is not an eligible expenditure under the Infrastructure Replacement Plan.

1.15 Replacement--new construction to substitute for existing facilities or components which can not be rehabilitated or repaired cost effectively is an eligible expenditure under the Infrastructure Replacement Plan.

1.16 Special account--an account established by physically opening an account designated as the "Infrastructure Replacement Fund" that is acceptable under this Act. This account shall be self-contained in that deposits and withdrawals are recorded by the financial institution through a fiduciary relationship with the utility. This special account shall be a restricted receipt account dedicated solely for funding of eligible expenditures from the infrastructure replacement program and be administered by the general manager of the water supplier or his designee. All receipts, income, and interest earned on these funds shall be accrued within this special account.

1.17 Surcharge--a fee charged in addition to normal system rate fees which is used to fund extraordinary or special conditions of the water system.

1.18 Transmission facilities--shall mean the pipes, pumping stations, and storage facilities required to carry raw and/or potable water from a water source to or throughout an area served or to be served by a water supply system for the specific purpose of supplying water to support a general population.

1.19 Water supplier--any municipality, municipal department, agency, district, authority, or other entity engaged in or authorized to engage in the supply, treatment, transmission, or distribution of drinking water on a wholesale or retail sales basis.

1.20 Water supply sources--are Department of Health approved sources of supply connected to a water supply system and available for distribution. These sources may be surface waters or groundwater wells.

1.21 Water supply management plan--a plan prepared by applicable public water suppliers which plans and implements effective and efficient conservation, development, utilization, and protection of water supply resources consistent with the present and future needs of the State and its people as defined in RIGL 46-15.4.

SECTION 2.0 APPLICABILITY - PREPARATION OF PLANS

2.1 All water suppliers which supply, obtain, transport, distribute, purchase, and/or sell on a wholesale or retail basis, more than fifty million (50,000,000) gallons of water per year shall be required to prepare, maintain, and carry out a clean water infrastructure replacement plan as described in these regulations.

SECTION 3.0 CONFORMITY WITH OTHER LEGISLATION

3.1 The clean water infrastructure replacement plans shall be in conformity with all applicable provisions of state and federal laws including the federal Safe Drinking Water Act (42 USC Section 300f et seq.); Chapter 46-13 of the General Laws of Rhode Island, Public Drinking Water Supply. Infrastructure replacement plans must be consistent with the Comprehensive

Plan for the community or communities associated with the water system. Infrastructure replacement plans shall also be consistent with the Water Supply Management plans required under Chapter 46-15.4.

SECTION 4.0 CONTENTS OF PLANS

4.1 Clean water infrastructure replacement plans shall be prepared in the format, and shall address each of the topics listed in this section, to the extent that each is relevant to the water supplier, the water source, the water system, and the transmission/distribution/storage system. Systems which currently have an infrastructure replacement plan may review the existing plan and utilize existing information to the extent that it is consistent with the intent of the infrastructure replacement plan outlined below. The initial plan may include a schedule for the completion of the evaluation of major components or items which require detailed investigation. The schedule must demonstrate an expeditious, responsible, and reasonable time period for compliance.

4.2 All principal components of the water system such as sources, reservoirs, dams, spillways, intakes, treatment plants, pump stations, storage facilities, pumping and well equipment, shall be listed and evaluated. Relatively small and numerous components of the system such as water mains, distribution piping, valves, hydrants, and interconnections may be evaluated as a group. This evaluation shall consider the following:

a. A brief description of the system with a schematic of the process flow will be included in the plan. This description of the system may be taken directly from the Water Supply Management Plan where relevant and is not intended as a duplicate effort but to facilitate the evaluation of individual components. Age and condition of the existing component and the necessity for replacement of the component within a twenty (20) year time frame shall be evaluated. Specific components may be in need of immediate replacement while others may extend well beyond the twenty year time frame. Replacement should be evaluated and prioritized over a minimum of five (5) year intervals. The level of detail in the analysis of the component should reflect the priority of the component to the proper operation of the system as well as the age and known condition of the component. A detailed schedule for the initial five year interval must be included. No infrastructure replacement construction is required to take place within any time interval if demonstrated to not be necessary.

b. Life expectancy of the component shall be determined. Life expectancy shall be determined by design criteria, specific site conditions, maintenance records, manufacturer's documentation, engineering evaluation, physical inspection, invasive and/ or non-destructive integrity testing, or a combination of all of the above. Records of inspection and maintenance may be reviewed when determining the life expectancy of the component. The attached Guideline, Appendix 1, is intended to serve as a general rule of thumb for component life expectancy and actual life expectancy within an individual system may be demonstrated to be significantly more or less than the Guideline value.

c. Consideration shall be given to the public water system's ability to meet current and future requirements of the Safe Drinking Water Act. Treatment requirements should be analyzed to the extent possible to insure that infrastructure replacement and/or rehabilitation will comply with mandated requirements consistent with the Safe Drinking

Water Act.

d. A financial forecast shall be based on the analysis of the condition and life expectancy of the existing facilities, prioritized needed repairs and replacements and amortize proportionally such improvement requirements on an annual basis over the next twenty years consistent with their respective life expectancy. The forecast shall include contingency costs, range of construction costs, and/or confidence limits of the financial forecast.

e. Infrastructure replacement shall meet the needs of the water suppliers, however priority of anticipated replacement and grouping of replacement projects by time of replacement, similarity of projects, and importance of the component to the system shall be considered when establishing the schedule. Priority should be given to components which have a known need for replacement and less detailed analysis given to relatively new infrastructure items.

4.3 When planning infrastructure replacement, the water supplier shall consider sizing facilities to meet the approved local comprehensive plans for existing or proposed service areas. The existing or proposed service area shall be defined consistent with that described in the supplier's most recent Water Supply Management Plan. Funding for proposed expansion shall come from the capital improvement program utilizing new capital rather than from replacement funding. It is intended that the infrastructure replacement plan evolve from the Water Supply Management Plan and expand the concepts of capital improvement planning initiated in the Water Supply Management Plan. The infrastructure replacement plan shall be consistent with sound waterworks practice.

4.4 The infrastructure replacement plan must recognize and maintain existing fiscal controls and accounting standards in accordance with Generally Accepted Government Accounting Principles sufficient to ensure fiscal responsibility for the evaluation and implementation of the infrastructure replacement. These fiscal controls and accounting standards must be established where none currently exist. The financial requirements of the plan shall conform to those outlined in Section 6.0 of these regulations.

4.5 Funds from the watershed protection fund may be used for the preparation of clean water infrastructure replacement plans up to fifty (50) percent of the cost of the plan. Disbursements from the fund shall be in accordance with Chapter 46-15.3-11 of the Public Drinking Water Resources Board Operating Fund. The remaining costs are eligible for funding through the Safe Drinking Water Revolving Loan Fund. The plan shall incorporate the proposed rate structure impacts, schedule of proposed rate changes, and schedule for full funding consistent with the funding requirements for scheduled infrastructure replacement.

SECTION 5.0 REVIEW OF PLANS

5.1 Water suppliers subject to the requirements of this chapter shall file six copies of the clean water infrastructure plan with the Division of Drinking Water Quality of the Department of Health (the Department). Plans must be submitted no later than one year subsequent to the date the system's water supply management plan is due in accordance with RIGL Section 46-15.4-4.

5.2 The Department shall coordinate review of the plan with the Department of Environmental Management's Division of Water Supply Management, the Department of Administration's Division of Planning, the Water Resources Board, and the Public Utilities Commission. The PUC shall only review Plans for those systems which are regulated by the PUC. Each Department shall have 120 days to review the plan and submit comments to the Department of Health. Upon consideration of the comments, the Department shall determine if the plan complies with the requirements of these regulations within two hundred forty days (240) of the initial submission. A thirty day public comment period is inclusive in this two hundred forty day (240) review period.

5.3 Water suppliers shall review and update their infrastructure replacement plans at a minimum frequency of every five years. Major modifications or revisions to the infrastructure replacement plan shall be submitted for review more frequently as necessary.

5.4 Water suppliers shall implement the infrastructure replacement plan according to the approved plan. On-site review of facility components may be conducted by the Department when appropriate and/or applicable. The responsible official of the water supply system shall be required to verify that construction expenditures are consistent with the plan.

SECTION 6.0 FINANCING INFRASTRUCTURE IMPROVEMENTS

6.1 Each water supplier subject to the requirements of this chapter shall establish a separate special account designated as the Infrastructure Replacement Fund to be held as a restricted receipt account and to be administered by the water supplier solely to implement and carry out the replacement or rehabilitation of infrastructure in accordance with the approved plan. The dedicated account should be invested in accordance with the standards established for the agency, municipality, or water supplier.

6.2 The costs of programs to implement infrastructure replacement shall be paid by the users of the water system at a rate directly proportional to the users' consumption of water. Charges shall be limited to those necessary and reasonable for implementation of the plan. These charges shall be based upon the annual funding requirements of the facility improvements necessitated over each successive twenty year period.

6.3 Interest earned on this account shall be credited to this account only. Accumulated funds in excess of that estimated to be necessary to implement the plan shall revert to the rate payers of the system on a biannual basis. Funds will be allowed to accumulate with the intent to build sufficient capital to finance the estimated costs of major projects. It is understood that annual investments may be necessary over many years to fund major projects. Funds accumulated that are in excess of that estimated to implement the plan will cause the water supplier to reduce the future charges for infrastructure replacement.

6.4 Water suppliers may alternatively fund the infrastructure replacement program through partial or complete external funding at the option of the water supply system. Debt service and debt service issuance costs for any and all funding shall be an eligible expense as part of the program's funding requirements.

6.5 The Public Utilities Commission, as to water suppliers within its jurisdiction, shall permit an increase for just and reasonable infrastructure replacement in the portion of the water

suppliers' rate structure to comply with this chapter and shall allow the water supplier to add this required funding to its rate base in accordance with this chapter. Proposed increases in rates by regulated water utilities to finance infrastructure improvements shall be filed and reviewed in conformance with Chapter 39 of the RI General Laws.

6.6 The applicable section of the water supplier's annual audit shall be submitted to the Department to verify compliance with the funding intentions of the infrastructure replacement plan. The dedicated fund for infrastructure replacement will be a separate line item in the audit. Financial and summary status reports shall be submitted for each on-going project which outlines funds spent on the project, funds remaining, percentage of completion, and a brief description of work completed and work remaining. Project expenditures must be consistent with the plan and be eligible expenditures under the plan. Audits shall be submitted within 180 days from the end of the water suppliers fiscal year. Extensions will be allowed for reasonable cause.

SECTION 7.0 SEVERABILITY

7.1 If any provision of these rules and regulations or the application thereof to any person or circumstance is held invalid by a court of competent jurisdiction, the remainder of the rules and regulations shall not be affected thereby. The invalidity of any section or sections or parts of any section or sections shall not affect the validity of the remainder of these rules and regulations.

APPENDIX 1

TYPICAL LIFE EXPECTANCY

EQUIPMENT	YEARS
Source of supply plant	
Structures and improvements	35-40
Collecting/impounding reservoirs	50-75
Intake structures	35-45
Wells and springs	25-35
Galleries and tunnels	25-50
Supply mains	50-75
Pumping plant	
Structures	35-40
Pumping equipment	10-15
Other pumping plant	20
Water treatment plant	
Structures	35-40
Water treatment equipment	15-20
Transmission/Distribution	
Structures	35-40
Reservoirs and tanks	30-60
Mains	50-75
Services	30-50
Meters	15
Hydrants	40-60
General plant	
Structures	35-40
Furniture/equipment	15-20
Transportation equipment	7
Stores equipment	10
Tools, shop equipment	7-10
Laboratory equipment	10-15
Power operated equipment	10
Communication equipment	10